THOMAS PRINTWORKS

Notice to Plan Purchasers and Plan Rooms

The list of Plan Purchasers and all addenda will be posted to our bid site for your use.

www.thomasprintworks.com/bids

Please check this site regularly to keep up-to-date on the latest revisions.

Although we endeavor to notify all plan purchasers via email as updates are issued, it is your responsibility to verify that you have the most up-to-date bid information for this project. For all intents and purposes, you will be considered notified when any new files are posted to this site.

DALLAS INDEPENDENT SCHOOL DISTRICT
CONSTRUCTION SERVICES

Project Manual

VOLUME 1 OF 2

CSP 207325

ORG 159 – L.L. Hotchkiss Elementary School - Renovation

A/E FIRM
WRA ARCHITECTS

Civil Engineer: Click Engineering
Structural Engineer: Ponce Fuess
MEP Engineer: ReSTL Engineering

Technology: Datacom
Landscape: CCA Landscape Architects

11/23/2025

DALLAS INDEPENDENT SCHOOL DISTRICT
CONSTRUCTION SERVICES

Project Manual

VOLUME 1 OF 2

CSP 207325

ORG 159 – L.L. Hotchkiss Elementary School - Renovation

A/E FIRM
WRA ARCHITECTS

11/23/2025

ARCHITECT AND CONSULTANTS SEALS PAGE

ARCHITECT:

WRA Architects, Inc.
6000 Headquarters Dr.
Suite 600
Plano, TX 75024
214.750.0077



CIVIL ENGINEER:

Click Engineering
325 North St. Paul Street
#2850
Dallas, TX 75201
214.871.2302



LANDSCAPE ARCHITECT:

CCA Landscape Architects
12700 Hillcrest Rd.
#149
Dallas, TX 75230
214.739.9105



STRUCTURAL ENGINEER:

Ponce Fuess Engineering
3333 Lee Parkway
#475
Dallas, TX 75219
469.310.2850



MEP ENGINEER:

Restl Engineers
5757 Alpha Rd.
Suite 101
Dallas, TX 75240
214.334.0357



TECHNOLOGY CONSULTANT:

Datacom Design Group
300 N. Coit Rd.
Dallas, TX 75080
214.334.0357



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SECTION 00 01 15 – LIST OF DRAWING SHEETS

The list below is a description of the documents provided to the contractor as part of this Request for Competitive Sealed Proposal – 207325

1.01 Drawing List with Revision Number and Date: 06/11/2025

1.01.A Project Manual List with Revision Number and Date: 06/11/2025

ORG 159 - L.L. Hotchkiss Elementary School – Renovation

Drawings:

Civil
C1.01 – Demolition Plan
C2.01 – Dimension Control and Paving Plan
C3.01 – Grading Plan
C4.01 – Existing Drainage Area Map
C4.02 – Proposed Drainage Area Map
C5.01 – Erosion Control Plan
C5.02 – Erosion Control Details
C6.01 – Construction Details

Landscape
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L3.00 – Irrigation Plan
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L4.01 – Planting Details

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S201 – Existing Floor Plan Level 1 – Overall
S202 – Floor Plan Level 1 – Enlarged Plans
S210 – Existing Floor Plan Roof – Overall
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S501 – Typical Steel Details

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AD100 – Overall Site Demo Plan
AD201 – Floor Plan Level 1 – Overall Demo
AD201.1 – Demo Images
AD202 – Floor Plan Level 2 – Overall Demo
A100 – Overall Site Plan
A102 – Overall Work Area Plan
A111 – Enlarged Site Plan and Site Plan Details
A112 – Site Plan Details
A201 – Floor Plan Level 1 Overall
A202 – Floor Plan Level 2 Overall
A221 – Enlarged Toilet Plans
A231 – Plan Details
A301 – Door Schedules, Frame Types & Partition Details
A311 – Door/Window Details

A312 – Existing Window Details
A401 – Exterior Elevations – Area A
A402 - Exterior Elevations – Area B
A403 - Exterior Elevations – Area C
A404 - Exterior Elevations – Area D,E
A800 – Overall RCP
A901 – Finish Floor Plan Level 1
A930 – Sign Types and Room Signage Schedule
A931 – Exterior Door Numbering Signage

Mechanical
H1.10 – Partial HVAC Plans – Classroom Demolition
H2.10 – Partial HVAC Plans – Classrooms
H2.11 – Overall roof & Partial HVAC Plans
H6.00 – HVAC Schedules and Details
HPE 1.0 – MEP Abbreviations and General Notes
HPE 2.0 – MEP Symbols

Electrical
E1.00 – Electrical Site Plan
E1.10 – Electrical Demolition Plan
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E6.00 – Electrical Schedules
E7.00 – Electrical Risers

Technology
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T002 – Responsibility Matrix – Communications
T201 – Overall Floor Plan – Level 1 – Communications
T401 – General Details - Communications

Security
SC001 – Legend and Notes – Security
SC002 – Responsibility Matrix – Security
SC201 – Overall Floor Plan – Level 1 – Security
SC301 – Door Elevation Details - Security

Procurement Services **November 23, 2025**

The Dallas Independent School District ("District") is soliciting Competitive Sealed Proposals ("CSP") from qualified sources relative to the provision of the following request For Competitive Sealed Proposals ("CSP"). This procurement will be managed under the Dallas ISD Construction Services department.

For information on how to obtain the CSP documents, go to the District's **Construction Services** website **http://www.dallasisd.org. Click on "Departments;" click on "Construction Services/Bond Office;" click on "Bond Vendor Opportunities;"** then click on the bid package number. Follow the Document Distribution instructions to obtain the CSP documents. The CSP documents contain the necessary information to submit a CSP to the District, including construction documents, selection criteria, estimated budget, project scope, schedule, and other information that contractors may require to respond to the request.

Please return the "Intention to Propose" form (Specification Section 00 11 17) to the Construction Services Procurement Director listed on the form.

CSP #	Description	Closing Date	Buyers Initials
207325	**L.L. Hotchkiss Elementary School - Renovation**	**01/06/2026**	**DBE**

A pre-proposal meeting will be held for L.L. Hotchkiss Elementary School on Tuesday, December 02, 2025 via MS Teams at 10:00 AM for all interested parties. This meeting is not mandatory, but information discussed will be extremely helpful in preparation of the proposal.

MICROSOFT TEAMS INFORMATION

Meeting ID: 299 989 645 004 2
Passcode: Fw28T5hi

All general contractors and sub-contractors are encouraged to attend this meeting. Contractors will meet A/E(s) and PM at the school to start site tours. The first site tour will take place immediately following the pre-proposal. The following is the schedule for each site tour:

School Org#	School Name	Date	Time	School Address, Location of Meeting
159	**L.L. Hotchkiss Elementary School**	**12/02/2025**	**4:00 PM**	**6929 Town North Drive Dallas, TX 75231**

All Construction Services procurements must be physically delivered to the Construction Services office, at the Linus D. Wright Dallas ISD Administration Building 9400 North Central Expressway, Suite 800 Dallas, TX 75231. (Call 972.925.7200 for directions). Delivery to other locations will result in rejection of a CSP.

Completed CSP Package **Part 1-A, 1-B and 1-C are due on Tuesday, 01/06/2026 at 2:00 PM** (local time).

Completed CSP Package **Part 2 is due on Wednesday, 01/07/2026 at 3:00 PM (**local time).

Any materials received after the respective closing dates / times will not be considered.

The District will open and read the names of the proposers and prices submitted in responsive CSPs beginning at 3:30 PM local time upon submittal of Part 2 of the Package, via Microsoft Teams at Dallas ISD Construction Services, Linus D. Wright Dallas ISD Administration Building 9400 North Central Expressway, Suite 800 Dallas, TX 75231.

MICROSOFT TEAMS INFORMATION

Meeting ID: 299 489 447 417 2
Passcode: tw7Zo6r6

No further information will be officially released until after the date the Agenda is publicized for the Board of Trustees briefing.

The right is reserved to reject any or all bids, proposals, CSPs, or statements of qualification and to waive technicalities.

The Dallas Independent School District is committed to the ideals of equal opportunity in all its business endeavors.

The Dallas Independent School District's Construction Services projects have a 30% Small Business Enterprise (SBE) aspirational goal in construction.

RUN TWO TIMES ONLY AS FOLLOWS:
11/23/2025 and 11/30/2025

DALLAS INDEPENDENT SCHOOL DISTRICT

PROCUREMENT SERVICES – CONSTRUCTION SERVICES

DOCUMENT DISTRIBUTION

CONSTRUCTION SERVICES

CSP 207325
Org 159 - L.L. Hotchkiss Elementary School - Renovation
J159_P0395_1

SOLICITATION TIMELINE:

Issue Date:	**11/23/2025**
First Advertisement Date	**11/23/2025**
Second Advertisement Date	**11/30/2025**
Preproposal Meeting	**12/02/2025**
Question Deadline	**12/05/2025**
Question Responses from the District	**12/10/2025**
CSP Response Due Dates Pt 1-A, Pt 1-B, and Pt 1-C	**01/06/2026**
CSP Response Due Date Pt 2	**01/07/2026**
CSP Evaluation	**01/15/2026**
Anticipated Board Approval	**02/26/2026**

1. DOCUMENT DISTRIBUTION:

   The attached "Document Distribution" page details how documents and addenda will be distributed.

2. ESTIMATED CONSTRUCTION BUDGET INCLUDING ALLOWANCES:

   Total Estimated Construction Budget (CCL + IC+ Allowances) for CSP 207325 $4,124,796.26

3. Scope of Work. The Work consists of:

   ORG 159 – L.L. Hotchkiss Elementary School - Project consists of the following:

   1. Provide new marquee sign at front entry
   2. Provide new way-finding site signage
   3. Provide secure front vestibule - Renovation
   4. Replace exterior waterproofing/ sealant joints
   5. Paint all previously painted exterior surfaces and power wash as required
   6. Provide new landscaping
   7. Construct new side entry pre-fabricated metal canopy
   8. Replace outdated exterior windows
   9. Provide security window film at front vestibule
   10. Remove and replace concrete sidewalks
   11. Replace fire alarm
   12. Provide exterior lighting controls

13. Replace exterior lighting with LED
14. Provide/replace IDF & MDF air conditioning units
15. Provide new VAV Boxes
16. Provide security access control and new cameras with pathways (secure front vestibule)

4. Contact Information:

Technical questions and all other questions related to this solicitation are to be referred to:

Attention:	**Dallas ISD Procurement Services**
Email:	**ProcurementCS@dallasisd.org**

Please notate the solicitation number 207325 in the subject line of your email.

DOCUMENT DISTRIBUTION
CSP PACKAGE 207325

Documents will be distributed as follows:

Hard copy and file distribution are provided, beginning Monday, November 24, 2025

Printing Company Name:	**Thomas Printworks**
Attention:	**Jon Sauve**
Address:	**3610 Oak Lawn Avenue**
City, State and Zip	**Dallas, Texas 75219**
Phone:	**469-320-4940**
Email:	**jon.sauve@thomasprintworks.com**

Any addendum issued will be listed or posted at the **Dallas ISD Construction Services** website http://www.dallasisd.org/ **Click on "Departments"; click on "Construction Services/Bond Office"; click on "Bond Vendor Opportunities"**; then click on the bid package number. Any and all addenda that are too large in size for the website will not be posted on the District website. However, all such addenda will be listed on the website with the date of issuance of each addendum, and instructions to proposers for procuring such addenda from **Thomas Printworks.**

Documents are available as follows:

- **Full size sets of plans and specifications and USB drives of the same information and details are available for purchase at the Printing Company noted above. Purchase price must be obtained directly from the Printing Company.**

- **The purchases of additional USB drives of proposal documents in PDF format are available only to purchasers of at least one (1) full size plans and specifications. Purchase price must be obtained directly from the Printing Company.**

- **Addenda will be available from the Printing Company for purchase. Purchase price must be obtained directly from the Printing Company.**

Delivery pricing can be obtained from **Thomas Printworks.**

The bidder or proposer is responsible for obtaining all Addenda prior to submitting a bid or proposal to the District.

A list of Plan Rooms and other entities that have documents available for viewing are as follows:

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT THE FOLLOWING:

Dallas/Fort Worth Minority Supplier Development Council
Sha'Ron Richardson
construction@dfwmsdc.com
214-630-0747
8828 N. Stemmons Freeway, Ste. 550
Dallas, TX 75247

Regional Hispanic Contractors Association
John H. Martinez
john@regionalhca.org
972-786-0909
3918 North Hampton Rd.
Dallas, TX 75212

Regional Black Contractors Association of North Texas, Inc.
John Proctor
info@blackcontractors.org
214-565-8946
2627 Martin Luther King Jr. Blvd,
Dallas, TX 75215

Fort Worth Hispanic Chamber of Commerce
Gilbert Juarez
gilbert@pic-printing.com
https://www.fwhccplanroom.com/
817-625-5411
1327 N. Main Street
Fort Worth, TX 76164

Greater Dallas Hispanic Chamber of Commerce
Gabriela Carvallo
gabriela@gdhcc.com
214-521-6007
1402 N. Corinth St., Ste 225
Dallas, TX 75215

Construction Connect
Michael Stubbs
Content@ConstructConnect.com
800-364-2059
30 Technology Parkway South, Ste 100
Norcross, GA 30092

Dodge Data & Analytics formerly McGraw-Hill Construction Dodge
support@construction.com
877-784-9556
4300 Beltway Place, Ste. 180
Arlington, TX 76018

Dallas Black Chamber of Commerce
Tigist Solomon
tsolomon@dbcc.org
214-702-6652
2922 Martin Luther King Jr. Blvd., Building A, Ste. 104
Dallas, TX 75215

Fort Worth Metropolitan Black Chamber of Commerce
Jeremiah Anderson
janderson@fwmbcc.org
817-871-6558
1150 South Fwy, Ste. 211
Fort Worth, TX 76104

Virtual Builders Exchange, LLC
Heidi Shaffer
heidi@virtualbx.com
210-564-6900
4047 Naco Perrin, Ste.100
San Antonio, TX 78217

SECTION 00 11 17 – INTENTION TO PROPOSE FORM

Please return this Intention to Propose Form within **Five (5) Days** of receipt of this Request for Competitive Sealed Proposal Package. Doing so will enable us to keep a record of interest in this project. It is your responsibility to continue to monitor the District Website for any modifications or addenda issued prior to the submittal deadline. Email this form to:

ATTN: **Dallas ISD Procurement Services c/o Bond/Construction Services**
Linus D. Wright Dallas ISD Administration Building
9400 North Central Expressway, Suite 800
Dallas, TX 75231
E-mail: ProcurementCS@dallasisd.org

Subject: Dallas ISD Construction Services
CSP 207325

Dear **Procurement Services:**

We hereby acknowledge receipt of the proposal documents for the above referenced COMPETITIVE SEALED PROPOSAL (CSP) Package, and confirm that:

(Check appropriate box)

☐ We do intend to submit a proposal for this work. We understand that this proposal will be prepared by us at no cost or obligation to: WRA Architects or Dallas ISD.

☐ We do not intend to submit a proposal on this work. The reason(s) we decline to offer a proposal is as follows:

_____

_____

_____

Yours sincerely,

_____ _____
Name Signature

_____ _____
Firm Title

_____ _____
Phone Date

_____
Fax

_____
Email Address

SECTION 00 21 13 – INSTRUCTIONS TO PROPOSERS

1.01 GENERAL INFORMATION

1.01.1. Scope

In accordance with the Texas Government Code Chapter 2269 the Dallas ISD is requesting Competitive Sealed Proposals (CSP) from general construction contractors. The following instructions by the Dallas Independent School District are intended to afford proposers an equal opportunity to participate in the proposal process.

1.01.2. Discrepancies and Interpretations

Proposer must notify the Architect/Engineer during procurement, at least ten (10) business days prior to the scheduled Proposal opening date, with any questions arising out of the drawings or specifications or if discrepancies, ambiguities or omissions are found in the Proposal documents, or if further information or interpretation is desired.

Answers to inquiries will be provided in writing to all proposers in addenda form. All provisions and requirements of such addenda will supersede or modify affected portions of the Proposal documents. All addenda will be incorporated into and bound with the Contract Documents. No other explanation or interpretation will be considered binding.

1.01.3. Submittal Procedures

Submit the Proposal in sealed packages of sufficient size to hold all of the copies of the Proposal documents. These should be packaged following the instructions in Specification Section 00 41 10 – Overall Proposal Packaging Checklist.

Provide a properly formatted label, using page one of the advertisement, on the exterior of the Proposal envelope or package providing the proposer's identification including due date and time.

If the Proposal is submitted by mail, place the sealed Proposal package in a mailing envelope addressed as required in this section. Delivery of the Proposal prior to the advertised time set for the Proposal opening is the responsibility of the proposer. Dallas ISD is not responsible for mail delivered from the post office.

1.01.4. Preparation of Competitive Sealed Proposals

The Proposal must be based on conditions at the project site, the project Drawings, the project manual and any addenda issued.

All original Proposal Forms must be authoritatively executed and submitted on the Proposal forms furnished by Dallas ISD.

If the **Technical Proposal** form does not provide sufficient space to adequately respond to a question, the proposer should attach additional 8 1/2" X 11" white paper sheets as required, referencing the page and question numbers to which the response pertains.

A Proposal with omissions, alterations, conditions, or carrying riders or other qualifiers which modify the Proposal form may result in the proposal being deemed as non-responsive.

If the proposer chooses to issue a "No Response" (N/R) to a question on the Proposal, an explanation of this action is required. Failure to do so may be viewed by Dallas ISD as incomplete and may subject the entire Proposal to rejection.

Only one proposal shall be submitted by each proposer. If two or more Proposals are submitted, either in one envelope or in separate envelopes, such multiple Proposals will be deemed as non-responsive. The blank Proposal form bound in the Specification is for the proposer's information reference only.

Facsimile or emailed proposals will not be accepted and modifications are not allowed. Any modifications not inside the proposal envelopes/packages will not be considered part of the Contractor's proposal.

The proposer will receive no compensation or reimbursement of expenses incurred in the preparation of this Proposal.

Dallas ISD reserves the right to reject any or all Proposals. Dallas ISD also reserves the right to waive errors and omissions in any proposal if it deems it in the best interest of Dallas ISD to do so.

1.01.5. Public Information and Notice of Confidentiality

Dallas ISD considers all Proposal information, documentation and supporting materials submitted in response to this Request for Competitive Sealed Proposal to be non-confidential and / or non-proprietary in nature, and therefore, shall be subject to the public disclosure under the Texas Public Information Act (*Texas Government Code*, Sec. 552.001, et seq.) after the award of the contract. Exceptions to this are listed in this Project Manual.

The Proposer must identify and designate those portions of their technical Proposal which contain trade secrets or other proprietary data. If the Proposal includes such data, the proposer shall:

Mark the cover sheet of the Technical Proposal with the following phrase: "This Proposal includes data that shall not be disclosed outside Dallas ISD, and the A/E design team and shall not be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate this Proposal."

Mark each sheet and the specific data on that sheet that the proposer wishes to restrict with the following phrase: "Use or disclosure of this specifically marked data is subject to the restrictions regarding confidentiality cited on the cover sheet of this Proposal."

1.01.6. Proposal Guaranty Bond

A Proposal bond on Dallas ISD Proposal Guarantee Bond Form, from a Surety authorized to transact business in the State of Texas, in the amount of not less than ten percent (10%) of the greatest total amount of the proposed contract amount (Base Price plus all Allowances), payable without recourse to the order of the Dallas ISD Board of Trustees, must accompany the Proposal as a guarantee that, if awarded the Contract, the proposer will promptly enter into and execute the Contract and Performance and Payment Bonds on the forms provided.

The Proposal Guarantee Bond must be accompanied by a properly dated and executed Power of Attorney with a raised Surety seal on each document. Failure to do so will constitute an irregular Proposal which may be deemed as non-responsive. Use of a Surety company's bond form is not acceptable and may result in the Proposal being deemed as non-responsive.

Should the successful proposer fail to execute and return to Dallas ISD, the Contract and Bonds within ten (10) calendar days after the date of transmittal of the Contract Documents for execution, the Proposal Guaranty becomes the property of Dallas ISD.

No cashier's checks, official checks, or other items will be accepted. Only a Proposal Guaranty Bond as described in this paragraph for proposal security.

Deadline for Signing Contract and DALLAS ISD's Rights if Delay

The completion of this Project is crucial and must remain on a timely schedule. In order to keep the Project on a judicious schedule, the selected proposer must:

a. Sign the Contract no later than ten (10) calendar days after the date of Board approval when the selected proposer has been notified that it is the successful proposer, and

b. Provide the safety plan for the Project and all required bonds and insurance no later than five (5) business days after the successful proposer has signed the contract.

If the selected proposer fails to meet the district's specified deadline of ten (10) calendar days, the Dallas ISD has the right to:

a. Award the contract to the next successive responsive proposer subject to the district's ranking and evaluation.

1.01.7. Insurance

Original Certificates of Insurance, as well as copies of the original insurance policies and endorsements as required by the contract documents are due not later than 5 business days after execution of contract by the owner.

1.01.8. Ownership of the Competitive Sealed Proposal and Contractor's Proprietary Information

Submitted Proposals, documentation and supporting materials shall become the property of Dallas ISD.

1.01.9. Site Investigation

It is the responsibility of each proposer to examine the project site, existing improvements, and adjacent property and be familiar with existing conditions, and the full scope of the work before submission of a Proposal. By submitting a proposal, the Proposer certifies his acceptance of this requirement.

After investigating the project site and comparing the Drawings and Project Manual with the existing conditions, the proposer should immediately notify the A/E of any conditions for which requirements are not clear; or about which there is any question regarding the extent of the Work involved.

Should the successful proposer fail to make the required investigations and should a question arise after award of contract as to the extent of the Work arising from existing conditions, the A/E will review the issues and make a recommendation to the Project Manager.

Requests for site visits by individual proposers after the formal Pre-Proposal Meeting for the purpose of evaluating and preparing a proposal, will not be accommodated. State law requires proper background checks and badging or accompaniment by District personnel for site visits. It is not practical for the District to provide such accompaniment for individual proposers outside the prescribed Pre-Proposal and Site Visit parameters. Therefore the only viable and appropriate opportunity for viewing the site prior to the proposal date is to attend the Pre-Proposal Meeting and Site Visits.

1.01.10. Evaluation and Contract Award Process

Proposals will be opened publicly to identify the names of the proposer and their respective proposed contract amount (Base Price which includes all Allowances) beginning at 3:00pm Central time upon submittal of Part 2. Other contents of the Proposals will be afforded security sufficient to preclude disclosure of the contents prior to award.

The Proposal Evaluation Committee will evaluate the Proposals. The criteria for evaluation and selection of the successful proposer for this award will be based upon the factors listed in the Evaluation Criteria herein and in the Request for Competitive Sealed Proposal documents.

The Proposal Evaluation Committee consists of the following:

- Construction Services Staff ("CSS")

- SBE (“SBE”)
  DALLAS ISD SBE Program Manager

- Construction Proposal Evaluators (“CPE”)
  Five (5) Owner Representatives and or other in-house staff (as assigned)

- Safety Manager Consultant (“SM”)

After opening the Proposals, the Proposal Evaluation Committee will evaluate and rank each Proposal with respect to the published selection criteria. This ranking will be used to make an advisory recommendation to the Dallas ISD Board of Trustees and is subject to their approval. Per Texas Government Code Ch. 2269, Dallas ISD may negotiate a contract with the selected proposer offers for cost adjustment and other elements of the Proposal. Other than the data read at the Proposal opening, Dallas ISD will endeavor not to disclose any information derived from the Proposals submitted by competing firms in conducting such discussions. The selected Contractor will be required to sign the Dallas ISD Contract form once the district’s Board of Trustees grant the formal recommendation for award at the particular monthly publicly held Board meeting.

If Dallas ISD determines that it is unable to reach a satisfactory agreement with the first ranked proposer, Dallas ISD will formally and in writing, terminate discussions with that proposer. Dallas ISD will then proceed with negotiations with each successive proposer as they appear in the order of ranking until an agreement is reached, or until Dallas ISD has rejected all Proposals. After termination of discussions with any proposer, Owner will not resume discussions with that proposer.

Following execution of a contract agreement between Dallas ISD and the successful contractor(s), the proposers will be notified about the outcome of the selection process.

The award or rejection action regarding this Proposal is at the sole discretion of Dallas ISD. Dallas ISD makes no warranty regarding that a contract will be awarded to any proposer.

If a Contract is awarded, it will be awarded to the proposer offering the best value to Dallas ISD. Dallas ISD is not bound to accept the lowest priced Proposal, if that Proposal is judged and or determined not to be the best value for Dallas ISD.

1.02.1 RECEIPT OF PROPOSALS

See Specification Section 00 41 10 Overall Proposal Packaging Checklist - for packaging instructions and Section 00 11 13 Advertisement for CSP for proposal receipt instructions and details

1.03.1 ADDENDA, ALLOWANCES, ALTERNATES AND UNIT PRICES

Addenda. Contractors are required to acknowledge receipt of all addenda issued prior to the Proposal due date. Failure to acknowledge all addenda in the Proposal Form will result in the Proposal being deemed as non-responsive.

Allowances. Contractors are required to include the Allowances described in Section 01 21 00 in the Base Proposal. Refer to the General, Supplementary and Other Conditions of the Contract for Construction for other related details on allowances.

Contingency Allowance. All construction contracts shall contain an Owner Controlled Contingency Allowance (OCCA). The contingency allowance is to be used only for expenditures which do not require a change order. The contingency allowance may be used to pay for changes in the work including but not limited to those resulting from hidden or unforeseen conditions.
The contingency allowance may be used to pay claims. Use of the contingency allowance must be authorized in advance by the Owner’s Project Manager. Refer to Specification Section 00 41 11, for the contingency allowance. The contractor shall not be entitled to markups or profit related to use of the Owner Controlled Contingency Allowance.

Alternates. Contractors are required to submit prices for the Alternates described in Section 01 23 00 to add work or to deduct work from the Base Proposal. Contractor shall be responsible for any changes in the Work affected by acceptance of Alternates. Refer to Drawings and Technical Specifications Sections for items of work affected by Alternates. Election of Alternates will be exercised at the option of the Owner. Contractor will include as part of each alternate, miscellaneous devices, accessory objects and similar items incidental to, or required for, a complete installation. The amount shown in Specification Section 00 41 12 for each alternate shall include all plant, labor, material, equipment, overhead, profit, insurance and other costs incidental to the performance under the alternate. Failure to provide this information as an alternate is unacceptable and may result in the Proposal being deemed as non-responsive.

Unit Prices. Contractors are required to submit unit prices for any items that are listed in Spec. Section 01 22 00. The amount shown in Specification Section 00 41 12 for each unit price listed task/item shall include all overhead, profit, insurance and other costs incidental to the performance of the listed task/item. Failure to provide the requested unit pricing may result in the Proposal being deemed as non-responsive.

1.04.1 EVALUATION CRITERIA

Evaluation for ranking of firms submitting proposals will be based on the criteria shown in the following table (the weighting of each item by the points shown indicate the relative importance of each item and shall be utilized in the ranking of Proposal). Carefully review the submittal requirements, as failure to submit a Proposal in the proper format and in proper number may cause that Proposal to be rejected. The selection shall follow the Texas Government Code Chapter 2269, Contracting and Delivery Procedures for Construction Projects. The firm that offers the best value to the district based on published selection criteria and on its ranking evaluation will be selected. The District shall first attempt to negotiate a contract with the selected firm. Should negotiations be unsuccessful, the firm will be notified in writing of the decision to end negotiations, and the District will proceed to the next firm in the order of selection ranking until a contract is reached or all proposals are rejected. Based upon the proposal material submitted, the following criteria will be used to evaluate firms.

Criteria Number	Criteria Description	Category Value
1	**Purchase Price**	
1a	¹ Proposal Price - This section will be scored according to published formula by Construction Services Procurement personnel and provided for all evaluators:	40 points
	Category Total:	**40 points**
2	**Reputation of Vendors and of the Vendor's Goods or Services**	
2a	References – Designated evaluators will check references to score this section:	5 points
	Category Total:	**5 Points**
3	**The Quality of the Vendor's Goods or Service**	
3a	Safety Plan, and Insurance Rate Modifier (IRM):	5 points
3b	Proposed Project Team(s) and Management approach to proposed projects:	7 Points
	Category Total:	**12 Points**
4	**The Extent to which the Goods or Services Meet the District's Needs**	
4a	General Contractor's current/past K-12 new or renovation construction experience:	10 points
4b	Proposed Construction schedule and phasing plan:	5 points
	Category Total:	**15 points**
5	**The Vendor's Past Relationship with the District**	
5a	Rated based on Past Project Performance, Quality, Compliance with Terms & Regulations.	5 points
	Category Total:	**5 points**
6	**The impact on the Ability of the District to Comply with Laws and Rules Relating to Historically Underutilized Businesses (SBE)**	
6a	Proposer demonstrated a commitment to the district's SBE program by providing enhancements to the administration of the proposer's contracting process for the work to be done by SBE firms. Examples of this commitment may include any of the following: expedited payments, Mentor Protege Programs, early release of retainage, expanding the pool of diverse subcontractors to firms that have not done business with the district, etc.	3 Points
6b	Proposer submitted a list of two (2) SBE subcontractor references.	2 Points
6c	Proposer is a certified SBE OR Proposer submitted a Joint Venture Agreement with a certified SBE OR Proposer submitted a Prime Subcontractor Teaming Agreement with a certified SBE.	5 Points
6d	Proposer submitted a diverse list of certified SBE subcontractors, sub-consultants or suppliers that meets or exceeds the district's SBE aspirational goal in meaningful and significant roles OR Proposer demonstrated outreach designed to meet the SBE project goals with a diverse SBE team of subcontractors, suppliers and subconsultants.	5 Points
6e	Proposer demonstrated a comprehensive framework and understanding of the district's SBE program by: providing a written and detailed SBE compliance plan, designating a high ranking individual who will be responsible for M/WBE contract compliance, monitoring and reporting, ensuring no unauthorized changes to SBE subcontractors, adhering to the SBE commitment and subcontractor payment terms, executing the SBE subcontracting schedule, complying with the district's SBE Program.	5 Points
	Category Total:	**20 Points**
7	**The Total Long-Term Cost to the District to Acquire the Vendor's Goods and Services**	
7a	Financial status of the vendor (as rated by Dun & Bradstreet):	3 Points
	Category Total:	**3 Points**
8	**Any other Relevant Factor Specifically Listed in the Procurement Document**	
8a	N/A	0 points
	Category Total:	**0 points**
	Total	**100 Points Maximum**

[1] Proposed Pricing Formula:

Maximum Score = Forty (40) Minimum Score = Zero (0)

Notes: Low Bidder can only receive the full 40 points if at or under the advertised Construction Budget Estimate (A7)

Notes: Bids that are under budget will only lose 1 point per % from Low Bidder (Column G)

Notes: Bids that are over budget will be penalized 1 point per % from Low Bidder to the Budget & 2 points per % from the Budget

Notes: The low bidder is awarded points up to 20% over budget. If Low bid is 20% or more over Construction Budget Estimate (A7), no bidder shall receive any points for price.

NOTE: If all bidders are 20% or more over budget resulting no points being awarded, Dallas ISD shall use an alternative price evaluation formula to award points for the bids received. Low bidder will be awarded 5 points and each bidder will lose 1 point per percent from the low bid.

Formula = P10-G10*100 P= Max Points Allowed (40) G= % from Low Bid

Step 1- Determine Low Bidder (Column C)

Formula = =IF(Bid=$E$6,"Low Bidder","-")

E6 = Low Bid

Step 2- Calculate Bid Delta ($) from Budget (Column D)

Formula = =Bid-$A$7)

A7 = Construction Budget Estimate

Step 3- Calculate Bid Delta (%) from Budget (Column E)

Formula = =ROUND((Bid-$A$7)/$A$7,2))

A7 = Construction Budget Estimate

Step 4- Determine if Bid is Over or Under Budget (Column F)

Formula = =IF(Bid<=$A$7,"Under Budget","Over Budget"))

A7 = Construction Budget Estimate

Step 5- Calculate Bid Delta (%) from Low Bid (Column G)

Formula = =IF(C10="low bidder",0,ROUND(E10-MIN($E$10:$E$40),2)))

C10 = Low Bidder vs Not Low Bidder

Step 6- Calculate Points Lost for Bids Under Budget. (Column H)

Bid Proposals that are UNDER the Construction Budget Estimate provied will be scored with an escalator of 1. 1 Point Per Percent from low bid will be deducted from max points of 40.

Pricing Formula = =IF(C10="low bidder",0,IF(F10="under budget",ROUND((G10*100)-K10,0),IF(MIN($E$10:$E$40)>0%,0,ROUND(-MIN($E$10:$E$40)*100,0)))))

Under Budget

Step 7- Calculate Points Lost for Bids Over Budget. (Column K)

Bid Proposals that are OVER the Construction Budget Estimate provided will be scored with an escalator of 1 from the Low Bid to the Budget and an Escalator of 2 from the Budget to their bid. 1 Point Per Percent from the low bid will be deducted from low bid to budget & 2 points per percent from budget to their amount from max points of 40.

Pricing Formula = =IF(F10="under budget",0,IF(F10="OVER BUDGET",IF(C10="low bidder",ROUND((E10*100),0),ROUND((E10*100),0)))))

Step 8- Add Multiplier to Points Lost for Bids Over Budget (Column M)

Bid Proposals that are OVER the Construction Budget Estimate provied will be scored with an escalator of 1 from the Low Bid to the Budget & an Escalator or 2 from the Budget to their bid. 1 Point Per Percent from low bid will be deducted from low bid to budget & 2 points per percent from budget to their amount from max points of 40.

Pricing Formula = =IF(C10="low bidder",K10*2,IF(F10="under Budget",0,(E10*100)*2)))

Step 9- Calculate Total Points Lost (Column N)

Add Points Lost from Step 7 (Column J) + Points Lost from Step 8 (Column M)

Pricing Formula = =J10+M10)

Step 10- Calculate Total Points Awarded (Column Q)

Subtract Points Lost from Max Points of 40

Pricing Formula = =IF(C10="low bidder",K10*2,IF(F10="under Budget",0,(E10*100)*2)))

C10 = Low Bidder vs Not Low Bidder

SECTION 00 31 00 - AVAILABLE PROJECT INFORMATION

121.01 PROJECT NAME/ADDRESS

CSP 207325, consisting of improvements to:

Org #	PROJECT NAME	PROJECT TYPE	ADDRESS
159	**L.L. Hotchkiss Elementary School**	**Renovation**	**6929 Town North Drive Dallas, TX 75231**

1.02 OWNER

Dallas Independent School District
Construction Services
Linus D. Wright Dallas ISD Administration Building
9400 N. Central Expressway, Suite 800
Dallas, TX 75231

State Notification

- A copy of the 10-day Abatement and/or Demolition notification submitted to the State, must be forwarded to the following departments within reasonable time frame:
- Dallas ISD Environmental-DDANIELS@dallasisd.org
- Bond Safety Department- C105785@dallasisd.org

Guidelines for Facility Owner Section

- 10-day Abatement and Demolition State Notification, the below information must be included on **the facility owner section:**
- Name: Dallas Independent School District- Construction Services
- Attention: Contract Manager
- Address: 9400 N US 75-Central EXPY, STE 800 Dallas, TX 75231

1.03 OWNER'S PROJECT MANAGER (PM)

Terrence Mack will be the Owner's Project Manager (PM) for the management of planning, design, permitting, construction, and post-construction for this CSP. All correspondence and communication during the contract finalization, construction and post-construction processes shall be directed to the Architect/Engineer firm (A/E) with copy to **Terrence Mack.** During construction, the PM shall have authority to act on behalf of Dallas ISD for Owner related direction.

Terrence Mack, Design Manager
Dallas Independent School District
Construction Services
Linus D. Wright Dallas ISD Administration Building
9400 N. Central Expressway, Suite 800
Dallas, TX 75231
Phone: 818-913-1548
E-mail: C97635@dallasisd.org

1.04 ARCHITECT/ENGINEER FIRM (A/E)

WRA Architects has been retained by Dallas ISD as the primary Architect/Engineer (A/E) for this bid package. All Drawings and Specifications have been prepared by the Architect/Engineer (A/E), including those dated 06/11/2025. All correspondence and communication regarding these documents shall be directed to the Architect/Engineer (A/E) with a copy to Project Manager.

WRA Architects
6000 Headquarters Dr.
Suite 600,
Plano, TX 75024
Main Contact: Eddie Garcia
Phone: 956-793-9631
Email: Egarcia@wraarchitects.com

1.05 Summary of Work. See related Section 01 10 00 Summary of Work

1.06 Project Schedule. The Contractor shall diligently prosecute and achieve Substantial Completion of the Work no later than as shown below.

Org # - SCHOOL NAME and PROJECT TYPE	SUBSTANTIAL COMPLETION	FINAL COMPLETION
159 – L.L. Hotchkiss Elementary School – Renovation	07/31/2027	60 days after Substantial

A Notice to Proceed (NTP) will be required before any work may commence. The NTP will be issued to the contractor when signed contracts, and any other required forms required, are returned to the Owner with valid bonds and insurance.

A separate contract will be issued by Dallas ISD for each school. The Contractor will be required to provide Payment and Performance Bonds for each contract. Contractor shall be responsible for all permit costs including plan review fees.

1.07 Estimated Construction Budget (including allowances). The estimated construction budget for each school and total for the package is shown in the table below. The Owner reserves the right to reject any and all proposals if they exceed the estimated construction budget amount. The total base proposal amount for the package, which includes the listed allowances, will be considered in the evaluation of the Contractor's proposal.

For accounting purposes each school construction budget stands alone. In Section 00 41 11 Proposal Form Base – Base Bid (Part 1-A of the CSP), Proposers are required to enter a cost per school breakdown of their proposed Base Bid amount including allowances so that the cost per school can be verified against the per school budget during negotiations. These breakdowns are not for evaluation purposes and will not be read at the proposal opening.

School Org #	School Name and Project Type	Construction Cost Limitation (CCL)	In Contract Owner Controlled Contingency (IC) 5% for Renovation 2.5% for New	Total Other Owner Allowances	Estimated Construction Budget (CCL + IC + Allowances)
159	L.L. Hotchkiss Elementary School – Renovation	$3,928,377.39	$196,418.87		$4,124,796.26

1.01 **Student Safety is Priority-One**. The General Contractor ("the Contractor") has the duty of care to perform the Work safely. The Dallas ISD Safety Program and School Operational Parameters are incorporated into the Project Contract Documents. **Under the AIA 101 and 201, the Contractor's Superintendent is the person responsible for the daily safe execution of the Work.** The Contractor recognizes the critical need for the safety of all persons involved with the construction project, and most specifically the safety of students and the campus staff, and the need to conduct any and all construction operations in such a way as to NOT endanger the students and to NOT DISRUPT THE SCHOOL OPERATIONS.

The Contractor's Superintendent will plan his work with the students' safety as priority one. **On a daily basis, the Contractor will plan and execute his work (in coordination with the campus Principal, but under DISD Construction Services direction) with the utmost care to not endanger the students' safety or the schools' operations. To this end, for each active project, the Contractor's safety manager and the Contractor's job site specific safety person MUST attend each DISD monthly Safety Committee Meeting. The PMF PM will also attend.**

Daily Contractor Operations:

- Prior to the start of each work shift, daily jobsite specific Job Hazard Analysis (JHAs) will be provided by the Contractors' subs and reviewed by the Contractor.

- Prior to the end of each work shift, the Contractor's Superintendent will walk the site, and take the requisite action, to physically field verify that the campus has been made safe for student occupancy (the following morning), to protect the Work, materials and equipment from vandalism and theft. All gates and doors must be secured, and all warning signs must be posted.

- And at the end of the workday, the Contractor WILL audit the campus life safety systems and then call Central Control at 214.932.5627, to confirm to Central Control that the fire alarm system and security systems are back on normal operations.

- **The Contractor will not rely on DISD ("the Owner") staff, school personnel, or PMF PM to perform his end of shift duties of making the campus safe for occupancy and auditing the life safety systems.**

The Superintendent must have OSHA 30-Hour Training and must be proficient in enforcing the Dallas ISD Safety Program and School Operations Parameters. Each Foreman, that will be working on site, must have the OSHA 10-Hour Training.

2.01 **School Operating Hours.** For Contractor construction purposes, access to school facilities shall be limited during the school's normal working hours. During school operating hours, student occupancy and use is priority one. **And during normal hours, on a daily basis, the Contractor will plan and execute his work (in coordination with the campus Principal, but under DISD Construction Services direction) with the utmost care to not endanger the students' safety or the schools' operations.** To this end, during school operating hours, the Contractor will incorporate student safety as priority one in his daily task specific Job Hazard Analysis ("JHAs") and there will be no digging during normal school operating hours.

3.01 **Normal hours** are defined as the time and days when DISD provides for custodial staff to be on site. The cost for DISD custodial staff, during normal working hours on normal working days, shall NOT be included in the Contractor's proposal. During procurement, the Contractor is free to call the campus to inquire as to the campus normal hours of operation. The DISD School calendar is readily available on the Dallas ISD website with a listing of the campus working days.

4.01 **After Hours Access.** The campus custodian must be on site when the Contractor is working after hours. **The Contractor is responsible for all after-hours custodial costs.** This cost shall be included in the Contractors proposal price. After hours are defined as the time when DISD does not have custodial staff on site. The Contractor will incur custodial overtime costs, at the rate of $30 per hour, for DISD custodial staff presence at the school site. The Contractor will not rely on DISD

("the Owner") staff or school to perform the Contractor's housekeeping duties. Custodial staff will be on site only to allow the Contractor access to the campus. Custodial staff will not perform cleanup work for the Contractor.

The Contractor is responsible for all after-hours custodian costs on days and times including but not limited to nights, weekends, DISD non-working days, and holidays. Any request by the Contractor to enter areas of the school, after normal operating hours, shall be coordinated and approved in advance per the (5) step process outlined on the DISD **'After Hours Access Request Form'**.

The contractor shall utilize the After-Hours Access Request form and submit said form to DISD at least two (2) working days prior to the needed access date. Contractor shall submit copies of each fully executed form(s) to the Project Manager ("PMF") via email each day and during each weekly progress meetings so that they may be attached to the meeting minutes. Upon request, the PMF PM will provide the After-Hours Access Request form to the Contractor in electronic format. **After execution of the Work, the Contractor must email all custodial forms to the PMF prior to leaving the site. Noncompliance will require the Contractor to daily hand deliver (the following morning) the end of the day executed OT form to the bond office.**

5.01 **Holidays, Spring, Summer, Fall, and Winter Break Operations.** The Contractor will explicitly show each holiday, spring, summer, fall, and winter break and each SPA on his schedule. The Contractor will plan the project's construction operations to perform major portions of the Work after hours, during holidays, and at times when the campus is NOT occupied. The heating scope should be performed during the summer and the cooling scope should be performed during the heating season.

The DISD School Calendar is available on the Dallas ISD website with a listing of all the holidays and breaks. Any requirement by the Contractor to enter areas of the school during the evenings, non-working days, and holidays shall follow the (5) step process outlined on the DISD 'After Hours Custodial Request Form' and the area will be made safe for student occupancy (the following morning).

6.01 **Summer School Status**. The Contractor will plan the construction Work to perform major portions of the Work during the summer, after hours, during holidays, and at times when the campus is NOT occupied. The heating scope should be performed during the summer and the cooling scope should be performed during the heating season. The Dallas ISD School Calendar is available on the Dallas ISD website with a listing of all the holidays and breaks.

To the extent feasible, the Owner will plan NOT to have summer school at school sites affected by construction. Select campuses may have summer programs and or early school start dates. **Upon mobilization to the campus, it is the Contractor's responsibility to coordinate with the campus Principal to phase the Work in such a way as to incorporate summer programs and or early campus start dates into the project Work schedule.**

WHEN WORKERS AND DISD TEACHERS/STAFF ARE BOTH WORKING IN THE SAME AREA, THE CONTRACTOR'S SUPERINTENDENT (OR SAFETY MANAGER) WILL HAVE THE STAFF & STUDENTS SAFETY AS PRIORITY ONE. SPECIFICALLY, (2) WEEKS BEFORE THE STUDENTS RETURN FROM SUMMER BREAK, THE CONTRACTOR WILL TRANSITION FROM DAY TO NIGHT WORK. DURING THIS TWO-WEEK PERIOD, IF FOR ANY REASON THE CONTRACTOR HAS TO WORK DURING THE DAY THEN THE CONTRACTOR'S SUPERINTENDENT (OR SAFETY MANAGER) WILL WALK, MONITOR, AND COMMAND AND CONTROL HIS WORKFORCE UNDER THE EXPLICIT SCOPE OF MONITORING TO KEEPING THE STAFF/STUDENTS SAFE.

7.01 **State Testing Dates**. The Contractor will NOT be allowed to perform construction activities during critical achievement test periods. After hours work will NOT be allowed on testing days. During state testing periods, the Contractor's Superintendent will be required be on site prevent his workers from being on site during testing periods. The campus State testing dates are campus specific. **Upon mobilization to the campus, it is the Contractor's responsibility to coordinate**

with the campus Principal to inform himself of the requisite state testing days and to explicitly include said campus testing dates into the project Work schedule.

For each calendar year, Contractor shall allow for a minimum of 11 testing days for Elementary Schools, 18 testing days for Middle Schools and 23 testing days for High Schools. Actual testing days and dates may vary for each school and must be confirmed with the respective school Principal.

The System-wide Testing Schedule may be available under the School Calendar on the Dallas ISD website. The Contractor should consult this calendar to determine the number of testing days that will take place during the duration of the Project and the Contractor shall include those days in his proposal.

8.01 **The Contractor Will Not Disrupt the Campus Utilities, Critical Systems, or Critical Areas of Operation**. The Contractor has the duty of care to perform the Work safely and in a manner to NOT impact the campus Critical systems and to not disrupt school operations. The campus critical systems and areas of operation are areas/systems that are required for campus occupancy. **The campus critical systems include but are not limited to the campus air conditioning systems, the campus utilities (water, sewer, electrical, etc.), the campus life safety systems, the internet, the MDF/IDF rooms, and critical areas such as the kitchen and the campus admin areas.** Any renovation work that would require a shutdown of a critical system or impact an area of operation MUST be accomplished during after hours, weekends, non-working days, holidays, and other times when the school is not in operation. All critical system and areas of operation shutdown SPAs must be shown on the project schedule and planned for in advance so that the campus is ready for student occupancy. To this end, the Contractor must provide DISD with a written Critical System Safe Plan of Action ("Critical System SPA") notification no less than 10 calendar days in advance.

A shutdown of a critical system requires written Owner approval. **The Contractor will not impact a critical system or a critical area of operation without explicit written approval from the Owner.** To this end, the Contractor MUST provide a written Critical Systems and Areas of Operation Safe Plan of Action ("Critical System SPA") and MUST decide for temporary systems or services that are acceptable to the Owner. The Contractor must provide temporary power for the campus life safety systems. During an electrical power shutdown, the life safety and campus security systems must remain operational under temporary power. And during power shutdowns the campus food must be refrigerated under temporary power to prevent spoilage.

9.01 **10-Day Notice of Power Shutdown**. The Contractor has the duty of care to perform the Work safely and in a manner to NOT damage the Owner's equipment. **To this end, the Contractor must provide the Owner with a written proposed Power Shutdown Safe Plan of Action ("Power Shutdown SPA") no less than 10 calendar days in advance of the shutdown.** The COMPLETE proposed SPA will be transmitted via email to both the Project Management Firm PM (PMF) and the DISD Safety Manager. After review by the Owner's Safety Manager (with 10 calendar days in advance notice), the PMF PM will transmit said Power Shutdown SPA to DISD's Contract Manager, DISD Central Maintenance Office, the A/E team, and the campus custodial staff. All utilities shutdowns must be shown on the project schedule.

During electrical power shutdowns, the life safety and campus security systems must remain operational. The Contractor must provide temporary power for the campus life safety systems. And during power shutdowns the campus food must be refrigerated under temporary power to prevent spoilage.

10.01 **Worker Identity Badges**. The Contractor must provide each construction workers with a DISD approved third party issued identification badge, that shall be worn, visibly at all times while the worker is present on the campus construction site. **All workers must undergo a background check via Dallas ISD's approved third party vendor. After badging, prior to being allowed on site, each worker must attend a 2-hour DISD Safety Orientation. The Contractor is responsible for all badging and safety orientation costs.**

11.01 **Construction Fencing, Parking and Staging Areas**. Because the Work is a Phased project, the Contractor SHALL include the cost of all hard barriers and signage in his bid. The Contractor SHALL include the cost of covered walkways in his bid. The Contractor SHALL provide hard barriers and signage at his own cost. No CAEAs or additional funds will be provided to the Contractor for fencing, signage, parking, relocation of the jobsite trailer and or relocation of the staging areas.

Six-foot fencing and privacy cloth SHALL be provided to enclose the Contractor's laydown areas and job site trailer. Contractor site activities, storage offices, and fabrication shall be limited to the areas enclosed by construction fences. Contractor parking SHALL be limited to the area enclosed by the construction fence or other Owner approved areas adjacent to school property. The Contractor SHALL include the cost of offsite parking for his workers in his bid.

Because the Work is a Phased project, the Contractor shall include the cost of all required hard barriers and signage in his bid. The Contractor will incorporate all costs associated with deenergizing and or relocating hard barriers, electrical exit signs, etc. for each phase of the phased Work. The Contractor must coordinate all temporary barriers with the Fire Marshall. As the Contractor shuts down a part of the school, the Contractor SHALL erect, at his own cost, a floor to ceiling barricade to completely separate his work area from the campus occupants. The barrier shall be made of 3/4" plywood, it shall extend from floor to ceiling, wall to wall, shall have a door that can be locked, and shall be painted on the Owner's side. This barrier shall remain in place until the Work is completely finished. Safety warning signage shall be displayed near the temporary barrier. Temporary construction barriers and safety signage must be provided at tie-ins from Additions to existing structures.

12.01 **Fire Alarm System Maintenance, Operation, Removal and Certification**. Life Safety Systems are critical systems for occupancy and may only be disabled under a SPA and WRITTEN Owner approval. The Contractor shall be responsible for all costs and coordination of any disconnection, removal, shunting, reconnection, testing, and re-certification of the fire alarm and security systems as required to accomplish the Work. The Contractor is responsible for maintaining the existing fire alarm system, security system, and life safety systems operational throughout construction duration. If the Contractor requires the temporary or permanent relocation of fire alarm devices in order to complete the Work, then Contractor shall be responsible for notifying the PMF Project Manager and utilizing DISD's Vendor (if the system is under warranty) to disconnect, remove, secure, protect, reinstall, re-test and re-certify said equipment or system. If no vendor is indicated (or it is not under warranty), then the Contractor may select a qualified fire alarm vendor of his choosing. The Contractor is responsible for all costs and coordination of any disconnection, removal, shunting, reconnection, testing, and re-certification of the fire alarm system required to accomplish the Work and to receive the requisite green tag or certificates from the applicable Fire Department.

Anytime an existing fire alarm system or security system is disabled, prior to leaving the site for the day, the Contractor must contact Dallas ISD's Safety and Security Central Control at 214.932.5627. The Contractor will be required to provide his name, company, cell phone number, the reason for placing the system in trouble and how long the system will be disabled. The fire alarm and or the security system will not be left disabled overnight. **At the end of the workday, the Contractor must audit the campus life safety systems and call Central Control at 214.932.5627, to confirm that he has place the fire alarm system and security systems back on normal operations.** The Contractor will not rely on DISD ("the Owner") staff or school security personnel to perform this duty.

Contractor shall comply with the following time restrictions, when scheduling Fire Alarm inspections, and placing the life safety systems on TEST, **that require contact with DISD Central Control**. The Contractor will be responsible for any and all costs associated with said inspections (including but not limited to scheduling the Fire Marshal, City or any other personnel needed for this inspection).

- 7:00 AM - 9:00 AM (Arrival): Fire Inspections can occur before 7:00 AM or after 9:00 AM
- 2:30 PM - 4:00 PM (Dismissal): Fire Inspections can occur before 2:30 PM or after 4:00 PM

13.01 **Technology/Communications**. The Contractor has the duty of care to perform the Work in a manner to NOT damage the Owner's equipment. To this end, the Contractor must provide DISD with a written Power Shutdown Safe Plan of Action ("Power Shutdown SPA") notification of power or other utility shutdown no less than 10 calendar days in advance of the shutdown.

Contractor is responsible for any damages or changes to the existing technology/communication system throughout the duration of the construction and must make any appropriate repairs. If the Contractor requires the temporary or permanent relocation of technology in order to complete his work, then the Contractor is responsible for notifying Dallas ISD and completing all disconnections, removals, temporary facilities, security, protection, re-installation, re-testing and re-certification, etc. to maintain the system. The original warranty will need to be maintained / restored. Contractor is responsible for all costs and coordination.

14.01 **Water and Electrical Utilities.** On new construction projects, the Contractor shall provide and pay for all temporary and permanent utility services necessary for the execution and completion of the Work. On new construction projects, where new utility services are being installed, the Contractor shall establish temporary utility accounts and pay for said temporary utility costs for the duration of the project (until Substantial Completion). Utility costs paid by the Contractor after Substantial Completion shall be reimbursed by the District.

On renovation projects, the contractor is allowed to use temporary power and water from the existing school for the Work inside the building.

15.01 **Off-Limit School Areas**. The Contractor shall provide for hard barriers between his work and the campus occupants. When working in the existing building, the Contractor shall not use the school's cafeteria, telephones, restrooms, vending machines, staff parking lots or any other school facility. The Contractor shall include in his bid, the cost for temporary worker restrooms and the costs for offsite parking.

16.01 **No Overhead Lifting and No Trenching During Normal School Hours**. The Contractor shall NOT perform overhead lifting activities over areas occupied by students, school personnel, or visitors. The Contractor recognizes the critical need for the safety of all persons involved with the construction project, most specifically the students and the campus staff, and the need to conduct any and all construction operations in such a way as to NOT endanger the students and to NOT DISRUPT THE SCHOOL OPERATIONS. **Any Work that would require lifting over an occupied area or excavating MUST be accomplished during after hours, weekends, non-working days, holidays, and other times when the school is NOT in operation.** Roofing kettle operations will not be allowed to commence while the campus is occupied.

The Contractor shall NOT perform any trenching or excavating activities during regular school hours. Prior to digging, the Contractor shall perform a GPR and overlay the utilities finding over the Work areas. One week prior to any planned excavation or trenching, the Contractor shall conduct a Pre-Dig meeting (on site) with all the subs involved. Agenda will include a discussion about the GPR findings, the scope and review of the existing underground utilities as it relates to the planned trenching / excavation. At the pre-dig meeting, Contractor shall present a contingency plan if any utility is struck during execution of such work. The GPR findings overlay will be shared with all subcontractors and will be posted for worker ready reference at the jobsite trailer.

All utilities must first be hand dug, to field verify the depth and location of said line. Only after field verifying the depth and location, may the Contractor use mechanical equipment to excavate.

17.01 **Delivery of Materials and Equipment.** The Contractor shall issue a directive to all of his subcontractors that deliveries for this project shall be made to the Contractor and not to the campus office or to DISD personnel. It will be the Contractor's responsibility to replace, at his own cost, equipment or deliveries that are lost because of noncompliance with said delivery requirements.

The Contractor will also direct his subcontractors to NOT make deliveries during student arrival, student departure and on student testing days.

18.01 **Owner's Right to Salvaged Items**. Dallas ISD reserves the right to salvage any and all materials. The Contractor shall notify the Owner at least 4 weeks prior to the start of demolition (in each area where demolition will be performed). During said 4 weeks, the Owner may furnish a list of items to be salvaged, labeled, logged, and delivered to a place of DISD's choosing. Upon request, the Contractor will provide a receptacle acceptable to DISD for said salvageable items.

19.01 **Equipment Access**. During installation of new chilled water, hot water lines, new VAVs, AHUs, RTUs, Boilers, etc. the Contractor will install the new work in a way where he provides the requisite equipment access at each service side panel in accordance with the manufacturer's recommendation. The Contractor will account for insulation thickness, all existing and new above ceiling MEP and will coordinate his work prior to installation of new equipment. Please refer to the Contract Documents for specific details and preinstall meetings.

20.01 **Removal of Fixed Furnishings, Fixtures or Equipment.** The Contractor is responsible for the cost of removal, cataloguing, protection and the re-installation of fixed furnishings, fixtures or equipment required by the Contractor for the execution of his Work. The Contractor will include in his base bid, the costs to relocate and protect from damage said furniture, equipment, and property within any given room.

21.01 **Moveable Furnishings or Equipment.** This is a phased project. The Contractor will be responsible for any relocation of furniture or school property within any given room as necessary to perform the Work. The Contractor will include in his base bid, the costs to relocate and protect from damage said furniture, equipment, and property within any given room. The Contractor must obtain written approval to relocate furnishings or equipment within the room from the Owner via the PMF PM.

22.01 **I.T. Equipment and Safety/Security Equipment**. The Contractor SHALL coordinate a preinstallation meeting between DISD IT, the Contractor and the PMF PM. The Owner will be responsible for moving I.T. equipment and chemicals from science labs, when necessary. A pre-move meeting will be held at least five (5) days prior to any move requiring the Owner's involvement. If required, to accommodate significant demolition and construction activities, DISD will provide and the PMF will manage a moving services vendor to relocate movable furnishings and equipment out of each phased classroom area and into temporary facilities. The Contractor shall be responsible for coordinating the phasing of the Work with the Owner's moving vendor. Contractor will be responsible for the protection of any furnishing or equipment remaining in the Work areas.

23.01 **Tobacco and Alcohol Products Prohibited.** Use of all tobacco, alcohol and illegal uncontrolled substances is prohibited on Dallas ISD property. The Contractor will take daily action to enforce compliance.

24.01 **The Contractor Will Not Interact with Students/Campus Staff.** This is a phased project. The Contractor will install hard barriers between his Work and the campus occupants. As the Work progresses, the Contractor will move or relocate the hard barriers are required to prevent worker/student/staff interaction. The Contractor shall issue daily instructions to all of his subcontractors to refrain from interactions with students and campus staff.

25.01 **The Contractor Will Not Use Existing School Facilities.** Construction crews MUST stay away from all areas existing school facilities that are not within the limit of the designated work area. When working in the existing building, the Contractor shall not use the school's cafeteria, telephones, restrooms, vending machines, staff parking lots or any other school facility. The Contractor shall include in his bid, the cost for temporary worker restrooms and the costs for offsite parking. The Contractor shall issue instructions to all of his subcontractors to avoid interactions with students and campus staff. The Contractor will not rely on DISD ("the Owner") staff or school security personnel to perform his duties.

26.01 **Pressurized Testing.** Repressurizing of an existing system will be accomplished gradually and methodically and in a way that it does not damage the existing infrastructure. The Contractor has the duty of care to perform the Work safely and in a manner to NOT impact the campus Critical systems. Pressurized testing, on MEP systems, shall be done after hours, weekends, non-working days, holidays, and other times when the school is not in operation by Dallas ISD that occupied areas are not impacted, directly or indirectly, due to the testing.

27.01 **No Roofing Work Activities Allowed Over Occupied Areas.** On a daily basis, the Contractor will plan and execute his work with the utmost care to not endanger the students' safety or the campus operations. Activities that may cause a hazard to the below occupants is restricted. To this end, prior to the start of each work shift, daily jobsite specific Job Hazard Analysis (JHAs) will incorporate this requirement. NO roofing work or hot work is allowed, regardless of the extent, when the campus is occupied. Specifically, roof work not allowed while the campus is occupied includes, but is not limited to roof coring, roof drilling, installation of roofing electrical and plumbing pipes, no installation of roof blocking, no installation of gas lines or equipment curbs, no installation of flashing, no roof demolition activities, no placing materials on the roof, and no maintenance or warranty work that would require changing of a piece of equipment.

Minimal inspections and maintenance activity are allowed. For example, activities that would require a workman to access the roof and make minor adjustments or to change a small blower. Said activity must be coordinate in advance.

28.01 **Demolition Activities Will Be Conducted With Student Safety As Priority One.** On a daily basis, the Contractor will plan and execute his demolition work with the utmost care to not endanger the students' safety or the campus operations. Prior to the start of each work shift, daily jobsite specific Job Hazard Analysis (JHAs) will be provided, and the Asbestos report will be reviewed so as to prevent an asbestos release. And during abatement demolition and containment, the MEP chilled water lines, electrical lines, low voltage, fire suppression lines, etc. will be temporarily supported by the abatement contractor. This cost will be part of the contractor's base scope and will be included in his bid.

29.01 **Phased Project With Student Safety As Priority One.** On a daily basis, the Contractor will plan and execute his work with the utmost care to not endanger the students' safety or the campus operations. Prior to the start of each work shift, daily jobsite specific Job Hazard Analysis (JHAs) will be provided.

Since the school buildings will be in use during construction, the Work shall be conducted in phases as proposed in the Contract Documents phasing drawings. **Phasing proposed by the Contractor during procurement will be deemed proposed and not as accepted.** After the Notice to Proceed ("NTP') is issued to the Contractor, the Contractor's proposed phasing will be reviewed by the PMF Project Manager. The PMF PM will make a recommendation for DISD Contract Manager acceptance or rejection. **If proposed phasing plan is rejected by the PMF PM or DISD Contract Manager, then the phasing plan in the Contract Documents stands**.

Because the Work is a Phased project, the Contractor will include the cost of all required hard barriers and signage in his bid. The Contractor will incorporate all costs associated with demoing and or relocating hard barriers, electrical exit signs, etc. for the phased Work. The Contractor must coordinate all temporary barriers with the Fire Marshall. As the Contractor closes down a part of the school, the Contractor SHALL erect (at his own cost) a floor to ceiling barricade to completely separate his work areas from the campus occupants. Said barrier shall be made of 3/4" plywood, shall extend from floor to ceiling, shall be installed from wall to wall, shall have a door that can be locked, and shall be painted on the Owner's side. Hard barrier will remain in place and be relocated as work progresses until the Work is completely finished. The door will be kept secured to prevent students from entering construction areas.

30.01 **Project Schedule.** The Contractor will plan and execute his work with the utmost care to not endanger the students' safety or the campus operations. The Contractor will explicitly show each holiday, spring, summer, fall, winter break and each SPA on his schedule. The Contractor will plan

the construction Work to perform major work activities after hours, during holidays, and at times when the campus is NOT occupied.

Even though DISD does not operate its HVAC systems as true 4 pipe system, most DISD campuses have a 4-pipe system. Hence, the cooling scope should be performed during the heating season and the heating scope should be performed during the summer. These activities must be planned in advance and shown on the project schedule. The cooling portion of the work that is performed during the summer break must be fully operational by the time the teachers return from their summer break. The heating work that is performed during the winter holidays must be fully operational by the time the students return.

The Project Schedule must show that during the summer break, 2 weeks prior to students' arrival, the contractor will shift to working nights, weekends, DISD non-working days, and holidays. 2 weeks prior to students arrival, the teachers will occupy the campus during the day to prepare their classrooms for student use.

The Contractor must plan in advance and show on the project schedule all Dallas ISD Safety Manual high risk SPAs including but not limited to Pre Crane, Pre-Dig, Pre-Crawlspace, Pre-Dig, and Pre-Utility SPAs.

31.01 **Weekly Owner, Architect, Contractor ("OAC Meetings").** The Contractor's Project Manager and Superintendent MUST attend all weekly OACs. Missing more than 2 OACs will be grounds for replacing the Contractor's Project Manager and or Superintendent.

On a weekly basis the Contractor will organize and host an Owner, Architect, and Contractor ("OAC") progress meeting. At said meeting the Contractor will provide all attendees a hard copy of the project schedule, a copy of the 3 week look ahead, the RFI Log, the ASI Log, the PCO Log, the Submittals Log, and a hard copy of the Equipment Long Lead Items List. After the OAC meeting, the Owner, Architect, and the Contractor will walk the site to review installed work.

32.01 **DISD Monthly Safety Meeting.** For each active project (that has not reached Substantial Completion), the Contractor's Safety Manager and the Contractor's job site Superintendent MUST attend each DISD monthly Safety Committee Meeting. Noncompliance with said requirement will be grounds for replacing the Contractor's Safety Manager and or Contractor's Site Safety Person.

33.01 **Inclement Weather SPAs.** The Contractor will comply with DISD Inclement Weather SPA reporting requirements. The Contractor's Project Manager and Superintendent on a daily basis will monitor the weather to mitigate the damage to DISD property. The Contractor will take proactive action to prevent water intrusion. When HVAC or roofing work is in progress, the Contractor will temp in his Work to prevent water intrusion.

34.01 **Jobsite Trailer Postings.** On a weekly basis, the Contractor will plan and execute his work with the utmost care to not endanger the students' safety and to provide his subcontractors the most up to date project information available. To this end, the below items will be posted immediately adjacent to the job trailer entrance:

- The Project Team's Contact List w/Phone Numbers and Email.
- A Complete Copy of the Operations Parameters.
- A Colored Copy of The Most Recent GPR Report.
- A Site Map Showing the Location of each Utility Shutdown Valve.
- A Copy of the Project Baseline Schedule
- A Copy of the 3 Week Lookahead Schedule.
- A Copy of the Project's Phasing Plan.
- A hard copy of the last OAC Hand Outs.

On a daily basis, the Contractor will plan and execute his work (in coordination with the campus Principal, but under DISD Construction Services direction) with the utmost care to not endanger the students' safety or the campus operations.

Prior to the start of each work shift, daily jobsite specific Job Hazard Analysis (JHAs) will be provided. And, prior to the end of each work shift, the Contractor's Superintendent will walk the site, and take the requisite action, to make the campus safe for student occupancy (the following day), to protect the Work, materials and equipment from vandalism and theft. And at the end of the workday, the Contractor's Superintend will check all the life safety systems and then call Central Control at 214.932.5627, to confirm that the fire alarm and security systems are operational. The Contractor will not rely on DISD ("the Owner") staff or school security personnel to perform his duties.

35.01 **Lessons Learned.** For each active project, the Contractor must incorporate the below lessons learned into the planning and execution of the Work.

1) This is a phased project. The roof, windows, floors, and ceiling demolition and abatement scope will be phased by wing. Demo of the entire campus roof, windows, floors, and ceiling demolition and abatement scope will NOT be allowed at once.

2) The Contractor's Superintendent will plan his work with the students' safety as priority one. If the work endangers campus operations, it must be performed after hours, on weekends, holidays or times when the campus is not occupied.

3) **During the Summer Break, the Contractor PM and Superintendent are not allowed to take vacation. Noncompliance with said requirement will be grounds for replacing the PM and or Superintendent.**

4) All long lead item submittals must be driven to conclusion within 90 days of the Notice to Proceed. The project submittals must be driven to conclusion within 120 days of the notice to proceed.

5) Immediately after mobilizing, the Contractor will audit all of the school's life safety systems (Fire Alarm and Security Panels) and the Contractor will provide DISD will a video of any deficiencies. It will be assumed that all the systems are in perfect condition if the Contractor does not provide said video within 30 days from mobilization. At this point the Contractor will be responsible for any and all costs to repair the life safety systems.

6) For new building additions and or new building construction work any utilities work that would require a shutdown of a critical system or impact an area of operation MUST be accomplished after hours, weekends, non-working days, holidays and other times when the school is not in operation. All utilities must first be hand dug, to field verify the depth and location of said line. Only after field verifying the depth and location, may the Contractor use mechanical equipment to excavate.

7) Jurisdictional inspections shall be coordinated with the campus to not impact campus operations. The Contractor is required to include the costs of all inspection whether during normal of after-hours in his bid.

REIMBURSABLE **Fund Code:** ____

Dallas Independent School District
Construction Services
After Hours-Work, Holidays and/or Holidays Authorization Form: General Contractor(s)

SECTION A. GENERAL INFORMATION

Contract P.O.#: _____ TEA/ORG. #:_____ School Name:_____

Contractor Name: _____ Contractor Person In-Charge: _____

Scope: _____

Name of Dallas ISD Operations Employee: _____ Biometric Code:_____
Cellular Number for Dallas ISD Operations Employee_____

SECTION B. PRE-WORK NOTIFICATION:

Date of **Scheduled** Work: _____Hours of **Scheduled** Work: _____

Time **Scheduled** From _____ To _____

Contractor Person-In-Charge Signature: _____ **Date:** _____

Dallas ISD Program Administrator Approval : _____ **Date:** _____

SECTION C. POST-WORK CERTIFICATION:

Date of **Actual** Work _____ ☐

Time **Actually** worked From _____ To _____ Biometric Clock Used – Check 'X' if Yes
If Not Used – See Step 3 below

Hours of **Actual** Work _____

Contractor Person-In-Charge Signature: _____ **Date:** _____

Dallas ISD Operations Employee Signature: _____ **Date:** _____

PROCESS FOR PRE-WORK NOTIFICATION AND POST-WORK CERTIFICATION:

Step 1. At least two (2) working days prior to scheduled access, Contractor shall fill out Sections A & B, sign Section B, and email the form to Program Management Firm who will obtain Dallas ISD Program Administrator Approval. Contractor will be provided name of the Operations employee by the Program Management Firm.

Step 2. Contractor and Operations employee from Dallas ISD will meet at main entry of building at the scheduled start time.
- Contractor must notify Program Management Firm within 24 hours or pre-arranged date if contractor is unable to work.
- In case of work being cancelled for some reason, Contractor shall fill out the actual hours in Section C as "0" and email the form to the Program Management Firm.

Step 3. Upon completion of the scheduled day(s)'s work, Contractor shall complete Section C on the same form; Contractor and the Operations employee shall sign Section C; and Contractor shall send the completed form, no later than one (1) business day after execution of work, (all sections completed and signed off) to Program Management Firm. Please use a cover sheet for this step, which shows your name and contact number.
- Section C – Contractor to verify with Operations employee if Biometric Clock was used. If not used, Operations employee must complete and provide District's Non-Exempt Attendance Report with an explanation why Biometric Clock was not used.

Step 4. Contractor shall submit copies of completed and fully executed form(s) for a given month, with the respective application for payment on a monthly basis.

Step 5. **Dallas ISD shall make payment to the Operations employee(s)** based on the standard compensation procedures for Dallas ISD in accordance with the "Fair Labor Standards" Act. **Final Payment to the Contractor will be reduced by the reimbursement amount.**

Failure to follow all these steps listed above will result in:

- **Pre-Work Notification**: If the Contractor does not obtain the Dallas ISD Program Administrator approval at least two (2) working days prior to the requested scheduled access, overtime will not be worked for the day or days expected.
- **Post-Work Notification:** After the work has been completed the signed off form must be submitted the next day. If the completed form is not submitted timely the District may consider the removal of the Contractor's Person-In-Charge from the project.
- Failure to comply with the District's requirements may have a negative impact on the Contractor's ability to be assigned future work for the District.

Dallas Independent School District
Bond Program
Scheduled Utility Shutdown Authorization Form: General Contractor(s)

SECTION A. GENERAL INFORMATION: ☐ ***Permanent** ☐ **Temporary**

School Name and Org. #: _____

Bond Program Manager (PM) Name: _____

General Contractor (GC) Person In-Charge: _____ _____

Sub-Contractor (SUB) Person In-Charge: (Name) _____ (Contact No.) _____

SECTION B. PRE-WORK NOTIFICATION:

Utility System(s) to Be Shut down: _____

Utility Meter number _____

Description of Work Performed: _____

Describe Procedure for Shutdown: _____

Safety Measures/ Precautions for Shutdown: _____

Date/ Time **Requested** for Shutdown:

Shutdown Date	Shutdown Time	Restart Date	Restart Time

It is requested that the noted** building system(s) be allowed for "shutdown" **by the General Contractor to allow for our tie-in of services for the Project as enumerated below. We note that** five (5) days advance notice **is required as a minimum. I hereby certify that the required work has been coordinated and scheduled to achieve completion within the requested time-period.

SUB Person-In-Charge:	**(Sign)**	**(Date)**
GC Person-In-Charge:	(Sign)	(Date)
Bond Program Manager (PM) Approval:	(Sign)	(Date)
DISD Project Manager Approval:	(Sign)	(Date)

SECTION C. POST-WORK CERTIFICATION:

Actual Date/ Time for Shutdown:

Shutdown Date	Shutdown Time	Restart Date	Restart Time

GC Person-In-Charge Certification:	(Sign)	(Date)
Bond Program Manager (PM) Certification:	(Sign)	(Date)
DISD Project Manager Certification:	(Sign)	(Date)
DISD Sustainability Certification:	(Sign)	

SECTION D. PROCESS FOR SCHEDULED UTILITY SHUTDOWN AUTHORIZATION

A. The General Contractor is to complete the *Utility Shutdown Request Form*, at least **5 working days** prior to the scheduled utility shutdown, and submit it to the respective Bond Program Manager for approval.

B. The Bond Program Manager (PM) will review and approve submitted *Utility Shutdown Request Form* and forward to the respective Dallas ISD Project Manager for approval.

C. The Dallas ISD Project Manager will review and approve form and return to the PM.

D. PM forwards approved form to Director/Maintenance Solutions and notifies Deputy Chief Director, Emergency Operations and Bond Program Safety Manager.

Note: All scheduled shutdown requests will require a jobsite meeting with the Program Manager and the School staff 48 hours in advance to discuss the outage procedures and status of all District departments involved on the shutdown request.

Note: For electrical shutdowns (Scheduled/ involuntary), when required for building operations, the General contractor must supply a power generator to keep the telephones, data and alarms working at all times.

***Permanent shutdowns are facilities or specific meters that will not require power/ utility to be restored.**

SECTION 00 41 10 – OVERALL PROPOSAL PACKAGING CHECKLIST

1.01 Proposers are to package all submittal information as follows. Documents should be bound in 3 ring binders with tabs for each section of the proposal form. Do not spiral or GBC bind the documents.

2.01 Both Parts of the Proposal response shall be labeled as follows:

Proposal for CSP 207325
Org 159 - L.L. Hotchkiss Elementary School

Due 01/06/2026
Time Due: 2:00pm
Part 1-A, 1-B, 1-C
<<Name of Proposer>>

Please Note: Part 1-C Proposal Form- Alternates & Unit Pricing (Section Div 00 41 12) - Should the solicitation contain an opportunity for alternate pricing, please ensure that the Section Part 1-C Proposal Form – Alternates & Unit Pricing Section 00 41 12 is submitted in an individually sealed envelope labeled accordingly with the specified CSP number, CSP title and Part 1-C Proposal Form – Alternates & Unit Pricing. ***Alternates Pricing will not be opened by the District unless the District engages in negotiations with the vendor submitting the alternate pricing package.***

Due 01/07/2026
Time Due: 3:00pm
Part 2
<<Name of Proposer>>

Proposals will be read at 3:00pm following the receipt of Part 2

3.01 Part 1-A of the Proposal shall contain completed Specification Sections
00 41 11 Proposal Form – Base Bid (with all addenda acknowledged)
00 43 13 Proposal Guarantee Bond Form
00 45 00 Dallas Independent School District Required Forms Package
00 45 20 Certificate of Non-Discrimination
00 45 22 Notification of Hazardous Materials Affidavit Form
00 45 23 Family Conflict of Interest Questionnaire (CIQ)
Submit one (1) original of each Section for Part 1-A.

4.01 Part 1-B of the Proposal shall contain completed Specification Section
00 41 13 Technical Proposal Form
Submit one (1) original, and one (1) copy of each Section for Part 1-B and one (1) soft copy (electronic) via flash drive or USB of each Section for Part 1-B, Section 00 41 13 Technical Proposal Form section.

5.01 Part 1-C of the Proposal shall contain completed Specification Sections
00 41 12 Proposal Form – Alternates and Unit Pricing
Submit one (1) original of each Section for Part 1-C in a separate, sealed envelope marked according to the specifics noted in Section 2.01 on this page.

6.01 Part 2 of the Proposal shall contain completed Specification Sections
00 45 39 SBE Compliance Guidelines and Forms
Submit one (1) original, one (1) copy, and one (1) soft copy (electronic) in either CD Rom or flash drive of each Section for Part 2.

DALLAS INDEPENDENT SCHOOL DISTRICT

Materials Escalation Price Reconciliation Form

The intent of this document is to establish guidelines to reasonably reconcile ONLY the Project's materials cost escalation. No overhead, profit, or insurance costs are to be included. The Contractor has a duty to mitigate Materials Cost Escalation. Therefore, as a condition precedent to any cost adjustments, the Contractor must comply with establishing the Project Baseline Schedule as required under Division 1 of the Project's Contract Documents. All terms shall have the same meaning as defined in the executed AIA Agreement for this project.

1. **DELIVERY METHODS:**
   - Competitively Sealed Proposal (CSP)
   - Construction Manager at Risk (CMAR, CMaR, CM@Risk)

2. **PARTIES**
   - DISD (Owner)
   - Program Management Firm (PMF, Program Manager, PM)
   - Architect or Engineer of Record (A/E)
   - Contractor (GC)

3. **PROJECT**
   a. ORG# _____ PROJECT NAME: _____

   b. Notice to Proceed (NTP) Date: _____

   c. Date City Permits Ready for GC Pick Up: _____

   d. Date of Escalation of Materials Document Submission to Owner: _____

4. **PRICE IMPACTED MATERIALS:** It is understood that vendors providing materials to the Owner's Project may be experiencing industry-wide economic fluctuations that affect the price, availability, delivery, and execution of the Project. The intent of this document is to reasonably reconcile ONLY the Project's materials cost escalation. This form will be used by the Owner to provide a good-faith adjustment of market price-impacted materials.

5. **PROJECT BASELINE:** Compliance with establishing the project baseline will be a condition precedent to requesting Owner approval of a materials cost escalation. The Contract Documents (Drawings, Specs, and Contract) establish the elements required to establish the project baseline. The Contractor has a duty to mitigate Materials Cost Escalation.

6. **PRICE INCREASE:** In the event of a Materials' Price INCREASE, the Contract Price shall be reasonably adjusted to reconcile the Materials' Price INCREASE.

DALLAS INDEPENDENT SCHOOL DISTRICT

Materials Escalation Price Reconciliation Form

7. **PRICE DECREASE:** In the event of a Materials Price DECREASE, the Contract Price shall be reasonably adjusted to reconcile the Materials' Price DECREASE.

8. **LIMITATION ON CONTRACT PRICE ADJUSTMENT:** Regardless of Proposed Materials' Price Increases or Decreases, the Contract Price shall not be adjusted by more than 15% of the original Contract Price or any other restrictions on cost increases found in State law or the terms of the contract between Owner and Contractor.

9. **NO ADJUSTMENT FOR MATERIALS QUANTITIES:** No adjustments will be made for changes in materials quantities. The intent of this document is to reconcile ONLY materials costs.

10. **SCHEDULE OF VALUES & PAYMENT:** Payment for adjustments will be in accordance with the executed AIA Agreement, change orders, or CAEAs for this project. Similar to other Owner Cost/Credits, in accordance with Division 1 of the Specifications, the cost or the credit for materials reconciliation will be shown as a line item in the Project's Pay Application's Schedule of Values.

_____

OWNER (DISD)

_____

CONTRACTOR (GC)

_____

ARCHITECT (A/E)

DALLAS INDEPENDENT SCHOOL DISTRICT

Materials Escalation Price Reconciliation Form

EXHIBIT "MATERIALS ESCALATION" – BASELINE PRICE Matrix

The intent of this document is to establish a Baseline so that the materials escalation costs may be subsequently reconciled. To establish an objective cost baseline, the Contractor must provide the Owner a date stamped copy of the actual materials costs proposal from the materials vendor/manufacturer.

1. Price Impacted Material: _____

   Date of Price: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide a Copy of Manufacturer Docs:

2. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

3. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

4. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

5. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

DALLAS INDEPENDENT SCHOOL DISTRICT

Materials Escalation Price Reconciliation Form

6. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

7. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

8. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

9. Price Impacted Material: _____

   Baseline Price: _____ (Unit)

   Pricing Method: _____

   Provide Copy of Manufacturer Docs:

10. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

11. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

DALLAS INDEPENDENT SCHOOL DISTRICT

Materials Escalation Price Reconciliation Form

12. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

13. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

14. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

15. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

16. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

17. Price Impacted Material: _____

    Baseline Price: _____ (Unit)

    Pricing Method: _____

    Provide Copy of Manufacturer Docs:

SECTION 00 41 11 – PROPOSAL FORM – BASE PROPOSAL

Name of Contractor	

COMPETITIVE SEALED PROPOSAL (Part 1A)
to
DALLAS INDEPENDENT SCHOOL DISTRICT
FOR THE FOLLOWING WORK:

PART 1. General Information

Competitive Sealed Proposal (CSP) 207325, consisting of improvements to:

ORG #	PROJECT NAME	PROJECT TYPE	ADDRESS
159	L.L. Hotchkiss Elementary School	Renovation	6929 Town North Drive Dallas, TX 75231

PART 2. Proposal Form

2.01 Agreement of Proposal Submittal

The undersigned, as a designated representative of the proposer, declares such firm is the only entity, as principal, with any interest in this Proposal, and the Proposal is made without collusion with any other entity.

The proposer affirms that the form of Contract, Instructions for Competitive Sealed Proposals, Supplemental Instructions for Competitive Sealed Proposal, Addenda, selection criteria, weighting/scoring system, estimated budget, Specifications, and the Drawings pertaining to this Proposal have been examined and the firm has also examined the locations, conditions, and classes of materials for the proposed Work and agrees to provide all necessary labor, materials, plant and equipment, machinery, tools, apparatus and construction means to accomplish the Work described in the Contract Documents in the manner prescribed.

The proposer agrees the quantities of Work to be performed and materials to be furnished may be increased or decreased as may be considered necessary, in the sole opinion of Dallas ISD's designated representative, to complete the Work as planned and contemplated. Adjustment for changes in Work will be in accordance with the General Conditions.

Proposal amounts must be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

2.02 Addenda

The proposer acknowledges receipt and incorporation of the following addenda into this Proposal. Proposer is to fill in the Addenda # and date and initial in the box to show receipt.

CSP 207325

Addendum No.	Addendum No.	Addendum No.	Addendum No.

Name of Contractor	

2.03 Withdrawal of Proposals

A Proposal may be withdrawn only upon written request by the proposer or his duly authorized representative, provided such request is received by the Owner at the place designated for receipt of Proposals and prior to the time fixed for the opening of Proposals.

No Proposal may be withdrawn after the time fixed for the opening of Proposals for a period of 90 days.

2.04 Award of Contract

The proposer to whom the award of a Contract is made will be promptly notified following Board action. If a proposer, (a) withdraws his Proposal within 90 days after the date and time fixed for the opening of Proposals in the Advertisement for Proposals, or, (b) fails or refuses to execute the Agreement, or other required forms within ten (10) days after the same are presented to him for signature, or (c) fails or refuses to furnish properly executed Performance and Payment Bonds, and certification of required insurance upon the execution of the Agreement, the Owner may award the Work to another proposer or may re-solicit the contract. The Proposal Bond is forfeited if Proposal is withdrawn after the Proposal opening, or Contract Documents are not executed in accordance with the above requirements.

The Owner reserves the right to reject any or all Proposals and to waive any irregularities in any Proposal received. The Owner further reserves the right to limit the number of contracts awarded and/or to be performed concurrently to any one Contractor if such appears to be in the best interest of the District. Awards will be per published criteria and weights. Price is only 40% of the evaluation criteria, and awards may be made to other than the low dollar proposer.

2.05 Notice To Proceed (NTP) and Notice of Intent to Award (NIA)

The Contractor shall not commence the Work under this Contract until execution of the Notice to Proceed (NTP) duly signed by Dallas ISD's designated representative.

The Contractor shall acknowledge that a Notice of Intent to Award (NIA) may be issued at the Owner's discretion. The purpose of the NIA is to expedite pre-construction activities. Upon receipt of the duly signed NIA, the Contractor shall promptly proceed with the activities listed and authorized by the NIA.

2.06 Collusion, Litigation, Default, Competency

By completing and submitting a Proposal, the proposer agrees to comply with the requirements of the following paragraph. A proposer who subsequently does not agree to comply with these requirements may be disqualified. The responses to the items of the Contractor's Qualification Statement will be used in evaluation of the Proposals on the project.

Proposers may be disqualified, and their proposals not considered for any of the following specific reasons:

1. Reason for believing collusion exists among proposers.
2. Reasonable grounds for believing that any proposer is interested in more than one proposal for the work contemplated.
3. The proposer is involved in any litigation against the Board.
4. The proposer is in arrears on any existing contract with Dallas ISD or has defaulted on a previous contract with Dallas ISD.
5. Lack of competency as revealed by the financial statement, experience and equipment questionnaires, or omission of required proposal submittals.

Name of Contractor	

6. Uncompleted work which, in the judgment of the Board, will prevent or hinder the prompt completion of this Work, if awarded.
7. Inaccurate information or circumstances that establish reasonable grounds for belief that the proposer is not a "responsible proposer" include, but are not limited to the below examples:
    a. Incomplete Bid Submittal – e.g., Missing Base Bid proposal number.
    b. Incorrectly Calculated Total Base Bid - Proposal plus Owner's Controlled Contingency MUST add up to Total Base Bid. Please double check to confirm compliance.

By entering into a contract with Dallas ISD, the proposer agrees that (1) Work on the project will begin upon receipt of the Notice to Proceed, (2) Contractor will participate as a team member in cooperation with the Architect/Engineer (A/E) and Owner, (3) The Work will not interfere with normal instructional and learning programs of the school, (4) The Contractor will assign a full time competent superintendent for each school in the CSP and that same superintendent(s) shall remain for the duration of the contract, contingent upon that person's continued employment with the Contractor, (5)The Contractor will furnish and pay for the Bid, Performance, and Payment Bonds.

- Projects of $25,000 and under: Bid bond is required
- Projects over $25,000 and up to and including $100,000: Bid and Payment Bond is required
- Projects over $100,000: Bid, Performance and Payment Bonds are required

2.07 Ultimate Corporate Ownership

Is proposer a corporation? Check One, Yes ____ No____

Proposer's legal name and address of principal place of business:

_____

_____

Ultimate parent company or majority owner's name and address of principal place of business:

_____

_____

Name of Contractor	

2.08 Contractor's Price (40 Points out of 100 Possible Points in the Selective Criteria)

The Proposer's Price is defined as the total amount, including Cost of the Work and allowances, for the performing or causing to be performed all Work including labor and materials, necessary to build, construct, erect and equip in accordance with the Contract Documents, Drawings, and Specifications.

Contractor agrees to base its price on the proposed completion schedule and the phasing plan presented in the contract documents. The Contractor may, at their option, propose a project duration that is of less duration and indicate this duration in the box below (See **Proposer's Proposed Substantial Completion Date** box below). However, the duration proposed by the Contractor must be based upon the number of phases identified in the contract documents and must not be predicated upon the use of additional temporary swing space other than the swing space identified in the contract documents. Contract documents identify the number of existing classrooms or temporary portable buildings available to the contractor for swing space.

Base proposal is defined as the Cost of the Work not including allowances or alternates.

(Amount shall be shown in both words and numbers; in the event of discrepancies, the words will govern.)

A	**Proposer's Price for all schools in CSP 207325, which includes the Allowances as per item 2.09 below:** _____ **Dollars**	**$**_____

Proposer's Price Breakdown (to be completed by proposer):

Base Proposal minus Allowances:	**$**
2.09 B: Owner Controlled Contingency Allowance (5%/2.5% of Base Price minus Allowances):	**$196,418.87**
2.09 C: Other Owner Allowances (provided by Owner, see 2.09 C below):	**$**
2.09 D: Proposer's Abatement Cost included in 2.08 A (Abatement is to be included in GC Base scope price. The intent of this section is to show the breakout of the abatement cost.)	
2.08 A: Proposer's Base Price plus (+) Allowances (should equal amount in Section 2.08 A above):	**$**

Name of Contractor	

2.09 Allowance Items

The following allowances are further described in Specification Section 01 21 00.

B	Allowance Description: In Contract Owner Controlled Contingency (IC)	Dollar Amount ($) *Proposer to Fill In
159	L.L. Hotchkiss Elementary School	$196,418.87

C	Allowance Description: In Contract Owner Controlled Allowances	

2.10 Alternates

This information is to be submitted with section 00 41 12 (Part 1-C of the CSP Package.)

2.11 Unit Pricing

This information is to be submitted with section 00 41 12 (Part 1-C of the CSP Package.)

2.12 Breakout or Separate Pricing

The successful Proposer shall provide a proposed preliminary schedule of values for each school within the CSP 3 days after Board award. In the chart below, the Proposer must provide the cost breakdown per school of the base price provided by the Proposer in paragraph 2.08A of this section

The following information is requested for information and budget verification only and it is not the basis for the quantitative evaluation of this proposal.

School Org #	School Name and Project Type	Estimated Construction Budget	Proposer's Base Bid Proposal Breakdown per School
159	L.L. Hotchkiss Elementary School - Renovation	$4,124,796.26	
NOTE: If a project has more than one school, then the proposal MUST be itemized by campus. An Addition/Renovation project MUST have 2 lines (one line for the addition and one line for the renovation scope). The Total Project bid must add up to the sum of all the itemized components.			

Org #	School Name	Owner's Expected Substantial Completion Date	Proposer's Proposed Substantial Completion Date
159	L.L. Hotchkiss Elementary School	07/31/2027	

Name of Contractor	

2.13 Liquidated Damages

Time is of the essence in all Phases of the Work. It is specifically understood and agreed by and between Dallas ISD and Contractor that time is of the essence in the substantial completion of the Project.

The Contractor acknowledges and recognizes that Dallas ISD is entitled to full and beneficial occupancy and use of the completed work immediately following expiration of the Contract time. The Contractor further acknowledges and agrees that, if the Contractor fails to substantially, or cause the Substantial Completion of any portion of the Work within the Contract Time, the Owner will sustain actual damages as a result of such failure. The exact amount of such damages will be difficult to ascertain. Therefore, Dallas ISD and Contractor agree that, if the Contractor shall neglect, fail, or refuse to achieve substantial completion of the Work by the Substantial Completion date, subject to any proper extension granted by Dallas ISD, then Contractor agrees to pay to Dallas ISD the following sum(s) for each day in which such Work is not substantially completed, not as a penalty, but as liquidated damages, for the damages ("Liquidated Damages") that would be suffered by Dallas ISD as a result of delay for each and every calendar day that the Contractor shall have failed to have substantially completed the Work as required herein.

	Liquidated Damages	*** Dollars Per Calendar Day**		
		Addition	**Renovation**	**New**
159	**L.L. Hotchkiss Elementary School**	0.025% of Construction Budget	0.025% of Construction Budget	0.025% of Construction Budget

*** The Dallas ISD's liquidated damages cost formula is 0.025% of the construction budget for the project, up to a maximum of $1,500.00 per calendar day.**

Name of Contractor	

PART 3. Execution

3.01 Proposal Form Execution

Contractor's Firm Name (legal name)	
Federal Tax I. D. Number	
Contractor's Street Address	
Contractor's Phone Number	
Contractor's Fax Number	
Contractor's Email Address	

SUBMITTED BY:

(Corporation, Partnership, Individual, etc.)

Name of President of Corporation *or*
Name of Principal Owner

Name of Secretary of Corporation
(if applicable)

(Corporation, Partnership, etc.,) is organized under the laws of the State of _____.

Firm: _____

By: _____
Printed Name

Title: _____

Signature: _____

Legal Address: _____

_____

Date: _____
Affix Corporation Seal here (if applicable)

SECTION 00 41 12 – PROPOSAL FORM – ALTERNATES AND UNIT PRICING

Name of Contractor	

COMPETITIVE SEALED PROPOSAL (Part 1C)
to
DALLAS INDEPENDENT SCHOOL DISTRICT
FOR THE FOLLOWING WORK:

PART 1. General Information

CSP PACKAGE 207325, consisting of improvements to:

Org #	PROJECT NAME	PROJECT TYPE	ADDRESS
159	L.L. Hotchkiss Elementary School	Renovation	6929 Town North Drive Dallas, TX 75231

PART 2. Proposal Form

2.01 through 2.09

Refer to Specification Section 00 41 11.

2.10 Alternate Price Items

The Contractor proposes the following sums as **additions to** or **deductions from** the Base Price amount for alternates. Failure to quote every item may cause the entire Proposal to be considered non-responsive. If there is no cost change in the alternate(s) pricing, the Contractor should enter "$0.00" as the price for the alternate. Do not make an entry of N/A.
All Alternates must be priced. Alternates are not listed in the order of preference.

159 L.L. Hotchkiss Elementary School - Renovation

No.	Alternate Description	Proposer's Add Price	Proposer's Deduct Price

2.11 Unit Prices

The Contractor proposes the following all-inclusive unit prices for the items/tasks. Failure to provide unit pricing for each item may result in the Proposal being deemed as non-responsive. Do not make an entry of N/A. All unit prices must be priced. Unit prices are not listed in order of preference.

159 L.L. Hotchkiss Elementary School - Renovation

No.	Unit Price Item	Unit of measure	Proposer's Unit Price
			$
			$

2.12 through 2.14

Refer to Specification Section 00 41 11.

Name of Contractor	

PART 3. Execution

3.01 Proposal Form Execution (Part 1A)

Contractor's Firm Name (legal name)	
Federal Tax I. D. Number	
Contractor's Street Address	
Contractor's Phone Number	
Contractor's Fax Number	
Contractor's Email Address	

SUBMITTED BY:

_____

(Corporation, Partnership, Individual, etc.)

Name of President of Corporation *or*
Name of Principal Owner

Name of Secretary of Corporation
(if applicable)

_____ _____

(Corporation, Partnership, etc.,) is organized under the laws of the State of _____.

Firm: _____

By: _____

Title: _____

Legal Address: _____

_____

Date: _____

Affix Corporation Seal here (if applicable)

SECTION 00 41 13 – TECHNICAL PROPOSAL FORM

Name of Contractor	

COMPETITIVE SEALED PROPOSAL (Part 1-B)
to
DALLAS INDEPENDENT SCHOOL DISTRICT

PART 1. GENERAL

1.01 Contractor Firm Information

Contractor's Firm Name (Legal Name)	
Contractor's Point of Contact with Signature Authority	
Street Address	
Phone Number	
Point of Contact Email Address	
Type of Business: _____ Corporation, _____ Partnership, _____ Sole proprietorship, _____ Joint Venture	
State of Incorporation	
In continuous business since (Date of Incorporation/ Years in Business):	

List other fully staffed offices or fully staffed branch offices of your organization:

Name	Branch Manager	Telephone Number

Corporate Officers, Partners, or Owners of Organization:

Name	Title	Construction Experience (Years)

Check box(es) corresponding to the nature of your business:
___Large Business (100 or more employees) ____Small Business (fewer than 100 employees)
___Minority Owned Business; Certified with _____
___Women Owned Business; Certified with _____
___Other (Define) _____

Has your organization ever defaulted or failed to complete any work awarded? _____Yes _____ No
If yes, stipulate where and why:

Has your organization ever paid liquidated damages or a penalty for failure to complete a contract on time? ___Yes ___No
If yes, stipulate where and why:

Name of Contractor	

PART 2. TECHNICAL PROPOSAL

The Contractor is requested to submit a complete response to each of the items listed in this technical proposal form. If the question is not applicable, please provide a response after each question or section with the words: NOT APPLICABLE TO THIS PROJECT. Responses requiring additional space should be brief and submitted as an attachment to this section.

2. Reputation of Vendors and of the Vendor's Goods or Services (5 Points out of 100 Possible Points in the Selective Criteria)

2 a. References (5 Points of the 5 points Possible under Reputation of Vendors and of the Vendor's Goods or Services)

Provide five projects, from five separate organizations, with appropriate references using the attached form. Answer the questions for each relevant project, with emphasis on school, educational, and/or renovation experience, that your organization has in-progress or completed in the last four years, using the format below:

A member of the Evaluation Committee will verify the information with the references provided and may ask additional questions of the references. Contractor should ensure availability of the references after bid opening.

SECTION 00 41 13 – TECHNICAL PROPOSAL FORM

Name of Contractor	

Project No. _____:

Owner / Name and Location of Project:	
Type of Project: (Renovation, Remodeling, Addition, New Construction?)	
Procurement Method: (Competitive Bidding, CSP, CM at Risk, Other)	
Type of Contract: (Lump Sum, Cost Plus, T&M, other)	
Contract Amount: (at time of award)	
Final Contract Amount: (If in progress, contract amount to date)	
Contract Time: (at time of award)	
Percent Complete:	
Projected/Actual Completion Date:	
If completed, was the project completed on time? If in progress, is the project on schedule?	
What kind of delays occurred?	
Did Contractor operate in a safe manner? Was safety a priority to the Contractor?	
Reporting Tools used: (Daily reports, weekly reports, monthly reports)	
Superintendent's Name: Project Manager's Name:	
Owner* or Appropriate Owner's Representative** Reference Contact Name/Telephone/Email/Address: *If reference iPros no longer employed by the Owner indicate current Employer and Title. **Program Managers cannot be used as a reference from a past projects on one of their own current projects.	

Name of Contractor	

Proposer should copy this form for use on 5 past projects.

3. The Quality of the Vendor's Goods or Service (17 Points out of 100 Possible Points in the Selective Criteria)

3 a. Safety Plan and Insurance Rate Modifier (IRM): (5 Points of the 12 points Possible under Criteria 3)

A. List your organization's Insurance Rate Modifier (IRM) for the current year as obtained from your insurance agent. Copy of IRM from insurance agent to be attached as confirmation.

_____current year IRM

B. Complete the matrix for the five past years, as obtained from OSHA No. 300 Log:

	Year _____	Year _____	Year _____	Year _____	Current Year _____
Number of injuries and illnesses					
Number of lost time accidents					
Number of recordable cases					
Number of fatalities					
Number of employee direct hire fixed hours worked (round to 1,000's)					

C. Are regular project safety meetings held by Field Supervisor(s)? _____Yes _____No

If yes, frequency: ___Weekly ___Bi-Weekly ___Monthly ___As Needed

D. Are project safety inspections conducted? _____Yes _____ No

If yes, who performs inspection? _____

How often? ___Weekly ___Bi-Weekly ___ Monthly ___As Needed

E. Does your organization have a written safety program? _____Yes _____No

If yes, two copies of the full safety manual must be provided. Two CD-ROMs, each containing the safety manual in PDF format clearly marked as “Safety Manual” is preferred.

If no, then the contractor may adopt the Dallas ISD Safety manual. Will your organization adopt the DALLAS ISD Safety Manual? _____Yes _____No

Name of Contractor	

F a. Does your organization have a safety orientation program for new employees?

____Yes ____No

For employees promoted to Field Supervisor. ____Yes ____No

If yes, does your Supervisor Safety Program include instructions on the following topics?

	Yes	No
Safety work practices		
Toolbox safety meetings		
First aid procedures		
Accident investigation		
Fire protection		
HazCom Program		
Record keeping		
Emergency response procedures		
New worker orientation		

F b. Provide a resume of the Safety Manager.

G. Does your organization have a written Drug and Alcohol policy in place? ____Yes _____No

If yes, provide a copy of the policy as an attachment.

If no, please note when adopting the Dallas ISD safety manual, the contractor is also adopting the "Drug and Alcohol Policy" included within.

3 b. Proposed Project Team(s) and Management approach to proposed projects and Contractor's Pending Claims and or Litigation: (7 Points of the 12 points Possible under Criteria 3)

Please note that Dallas ISD requires a full-time superintendent to be assigned to each individual job site while Work is in progress, contingent upon the continued employment of those personnel by the Contractor. Contractor's staffing approach and organization must reflect this requirement. Contractor may not make any changes to these personnel assignments without the prior approval of the Program Manager and the Owner.

A. Provide a Staff Organization Chart depicting your staff roles, relationships, and responsibilities.

B. Identify the proposed key staff: Project Manager, Superintendent, Assistant Superintendent(s), Cost Estimator, Scheduler, Safety Manager, etc. by name and title and provide the following information for each. Include additional key staff, as necessary. Indicate which staff are assigned either on a full time or part time basis. For part time personnel, identify the percent of full-time participation. For example, Project Manager 50% of Full-time, Safety Manager 75% of Full-Time, Scheduler 25% of Full-Time, etc.

Name of Contractor	

Staff: Project Manager

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Full Time or Part Time (For part time personnel, identify the percent of full-time participation. For example, Project Manager 50% of Full-time, etc.)	
Relevant experience with similar projects: (educational and/or renovations and/or additions as applicable)	
Years with the Organization:	

Staff: Superintendent 1 – School Name: _____

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Relevant experience with similar projects:	
Years with the Organization:	

Staff: Superintendent 2 – School Name: _____

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Relevant experience with similar projects:	
Years with the Organization:	

Name of Contractor	

Staff: Superintendent 3 – School Name:_____

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Relevant experience with similar projects:	
Years with the Organization:	

Staff: Superintendent 4 – School Name:_____

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Relevant experience with similar projects:	
Years with the Organization:	

Staff: Superintendent 5 – School Name:_____

Name:	
Current Assignment: (Project name, client name and anticipated project completion date.)	
Total years of construction experience:	
Relevant experience with similar projects:	
Years with the Organization:	

Proposer should copy this form as needed to present information for all proposed staff.

C. CONTRACTOR'S PENDING CLAIMS AND/OR LITIGATION

Attach a list of pending claims and/or litigation at time of submitting Proposal. (Show project name, owner, and summary explanation.)

Name of Contractor	

4 The Extent to which the Goods or Services Meet the District's needs (15 Points out of 100 Possible Points in the Selective Criteria)

4 a. General Contractor's current/past K-12 new or renovation construction experience: (10 Points of the 15 points Possible under Criteria 4)

Provide below the School District, School Name, Project Type, **Completion Date** and **Final Construction Value** for a **minimum of 5**** K-12 Projects completed by your company **as a prime contractor**.

School District	School Name	Renovation, Addition, or New Const.	Completion Date	Final Construction Contract Value

*** A separate sheet may be attached with additional projects.*

4 b. Proposed Construction schedule and phasing plan: (5 Points of the 15 points Possible under Criteria 4)

The Contractor understands that Dallas ISD desires that the Project be completed on or before the duration of the contract. The Contractor shall prepare and submit a proposed construction schedule for each of the schools in the CSP and present this schedule with Section 00 41 13. **Additions and Renovations work within a school must be broken out into two separate items**. This schedule may be as detailed as the Proposer would like but must have a minimum of schedule information (major construction phases, activities, and milestones) as is necessary to facilitate negotiations.

Provide, as an attachment to the Technical Proposal form, a GANTT chart depicting how you anticipate delivering the project in the time frame outlined in this proposal. Describe the scope of work to be completed in each phase of each school.

Note: Contractors may, as a Cost Saving Recommendation, offer for Dallas ISD's consideration, an alternative plan, which may alter the duration in the contract documents. However, any such proposal must be presented as a Cost Saving Recommendation in the Technical Proposal – Part B (Section 00 41 13). The contractor must clearly identify the alternative work schedule, alternative duration, and alternative base price. The evaluation committee will evaluate alternative plans and schedule and determine if the plans may benefit Dallas ISD.

Name of Contractor	

The Contractor's proposed schedule is a vital part of the evaluation process and sufficient information should be provided for Dallas ISD to assess the Contractor's time frame, work plan and approach.

A. Describe the type of software utilized to prepare the construction schedules. **(Attach proposed project schedule)**

Name of Contractor	

5. The Vendor's Past Performance with the District (5 Points out of 100 Possible Points in the Selective Criteria)

5 a. Past Project Performance, Quality, and Compliance with Terms and Regulations (5 Points of the 100 points Possible under Criteria 5).

The District will evaluate the quality of construction and materials used. Check for transparency in reporting and communication. Check for excessive claims or disputes with clients. Contractor's ability to adhere to district directives, procedures, and requirements. Assess adherence to project timelines and budgets. Ensure good business practices (i.e. receivables, payments, deliverables).

Name of Contractor	

6. The contractor is to complete all Small Business Office Compliance forms in Section 00 45 39 for selection criteria 6. (Category Total: 20 Points of the 20 Points possible under Criteria 6.)

6a. Proposer demonstrated a commitment to the district's Small Business Office (SBE) program by providing enhancements to the administration of the proposer's contracting process for the work to be done be SBE firms. Examples of this commitment may include any of the following: expedited payments, Mentor Protégé Programs, early release of retainage, expanding the pool of diverse subcontractors to firms that have not done business with the district, etc. (3 points)

6b. Proposer submitted a list of two (2) Small Business Office subcontractor references. (2 points)

6c. Proposer is a certified SBE, or Proposer submitted a Joint Venture Agreement with a certified SBE OR Proposer submitted a Prime Subcontractor Teaming Agreement with a certified SBE. (5 points)

6d. Proposer submitted a diverse list of certified SBE subcontractors, subconsultants or suppliers that meets or exceeds the district's SBE aspirational goal in meaningful and significant roles OR Proposer demonstrated outreach designed to meet the SBE project goals with a diverse SBE team of subcontractors, suppliers and subconsultants. (5 points)

6e. Proposer demonstrated a comprehensive framework and understanding of the district's SBE program by: providing a written and detailed SBE compliance plan, designating a high ranking individual who will be responsible for SBE contract compliance, monitoring and reporting, ensuring no unauthorized changes to SBE subcontractors, adhering to the SBE commitment and subcontractor payment terms, executing the SBE subcontracting schedule, complying with the district's SBE Program guidelines, etc. (5 points)

Name of Contractor	

7. The Total Long-Term Cost to the District to Acquire the Vendor's Goods and Services (3 Points out of 100 Possible Points in the Selective Criteria)

7 a. Financial status of the vendor (as rated by Dun & Bradstreet):
Category Total: (3 Points of the 3 points Possible under Criteria 7)

A. Provide the complete corporate or company name of your firm and the D-U-N-S Number as it is recorded with Dun & Bradstreet. This information will allow the owner to confirm that the correct reports are being used for the evaluation.

D-U-N-S Number: _____

Name of Contractor	

C8. ADDITIONAL INFORMATION:
The following information must be provided to complete the evaluation of the Contractor's technical proposal.

A. DISCLOSURE OF INTERESTED PARTIES

1. Disclosure of Interested Parties – In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that a governmental entity or state agency may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity or state agency at the time the business entity submits the signed contract to the governmental entity or state agency. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

After Board of Trustee authorization, the successful Vendor will be required to complete an electronic Form 1295 on the Texas Ethics Commission website (https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm) prior to entering into a contract with the District in accordance with this statute. Additional information is available on the Texas Ethics Commission website at www.ethics.state.tx.us.

Submission of a response to this CSP indicates Respondent's acceptance and intended compliance with this requirement.

Name of Contractor	

PART 3. TECHNICAL PROPOSAL FORM EXECUTION

3.01 Proposal Form Execution

Contractor's Firm Name (legal name)	
Federal Tax I. D. Number	
Contractor's Street Address	
Contractor's Phone Number	
Contractor's Email Address	

SUBMITTED BY:

(Corporation, Partnership, Individual, etc.)

Name of President of Corporation *or*
Name of Principal Owner

Name of Secretary of Corporation
(if applicable)

(Corporation, Partnership, etc.,) is organized under the laws of the State of _____.

Firm: _____

By: _____

Title: _____

Legal Address: _____

_____

Date: _____
Affix Corporation Seal here (if applicable)

SECTION 00 43 13 – PROPOSAL GUARANTEE BOND

Name of Contractor	

KNOW ALL MEN BY THESE PRESENTS, THAT we _____ as Principal, and _____ as Surety, are held and firmly bound unto the Board of Trustees, Dallas Independent School District, Dallas, Dallas County, Texas, hereinafter called the Obligee, in the penal sum of _____ Dollars ($_____), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Competitive Sealed Proposal, dated _____, 20_____, being for the construction of _____ with appurtenances thereto, at Dallas, Dallas County, Texas, the kind and extent of work involved being set forth in detail in the proposed Contract Documents;

NOW, THEREFORE, if the Obligee shall accept the proposal of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such proposal, and give such bond or bonds as may be specified in the proposal or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said proposal and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said proposal, then this obligation shall be null and void, otherwise to remain in full force and effect.

This Proposal Guarantee Bond applies to all contracts in excess of $100,000 involving a contract for construction, alteration or repair of any public building or the completion or prosecution of any public work.

This Proposal Guarantee Bond must be payable to the awarding authority, Dallas Independent School District, as the named Obligee, and it must be approved as to form by such awarding authority.

Surety must be corporate surety duly authorized to do business in Texas.

This Proposal Guarantee Bond must be equal to 10% of the full amount of the contract which it secures.

Power of Attorney from Corporate Surety should be attached to this Proposal Guarantee Bond.

Name of Contractor	

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals this _____ day of _____, 20_____, the name and Corporate Seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Business Address)	(Individual Principal)
(Business Address)	(Corporate Principal)
ATTEST:	
Secretary	President
Business Address	Corporate Surety
ATTEST: _____	BY: _____

PART 1 GENERAL

Schedule "A"*
Building Construction Prevailing Wage Rates 2012
City of Dallas

Building Construction Projects (does not include single family homes and apartments).

**Use Schedule B - Current Engineering (Highway/Heavy) Construction Wage Determination For Paving and Utilities Incidental to Building Construction.*

Schedule "A"

CLASSIFICATION	PREVAILING RATE	FRINGES
Acoustical Installer	$12.16	---
Backhoe Operator	$10.64	$1.41
Bricklayer	$21.06	$7.18
Brick, Tender	$8.60	$1.30
Carpenter	$23.15	$8.20
Cement Mason/Concrete Finisher	$11.38	---
Drywall Hanger	$11.71	---
Electrician	$24.50	12.25% + 4.70
Electrician, Cable Splicer	$26.41	4.50 + 12.5%
Floor Layer, Carpet	$13.13	---
Front End Loader Operator	$8.77	---
Glazier	$12.26	$1.10
Mechanical Insulator	$10.55	$1.00
Laborer, Unskilled (Excluding Landscape Laborers)	$7.58	$1.30
Painter Brush & Spray	$10.76	$2.20
Painter doing drywall finishing only	$10.42	---
Paperhanger	$11.30	$2.20
Lather	$17.38	$1.04
Hydraulic Crane (35 tons & under)	$23.70	$9.35
Hydraulic over 35 tons, Derricks, Overhead Gentry, Stiffleg, Tower, etc., and Cranes with Pile driving or Caisson Attachments	$24.70	$9.35
Plasterer	$15.06	$2.94
Plasterer tender	$9.00	---
Plumber	$12.80	$1.63
Roofer	$9.45	$1.04
Sheet Metal Worker (Including HVAC Duct Work)	$12.80	$2.05
Sprinkler Fitter (Fire Sprinkler)	$25.84	$16.47
Iron Worker, Structural	$21.60	$4.40
Iron Worker, Reinforcing	$10.33	$2.94
Tile Setter	$13.75	------- --

Schedule "B"

CLASSIFICATION	PREVAILING RATE
Asphalt Distributor Operator	$15.32
Asphalt Paving Machine Operator	$13.99
Asphalt Raker	$12.69
Broom or Sweeper Operator	$11.74
Concrete Finisher -Paving and Structures	$14.12
Concrete Paving Finishing Machine	$16.05
Concrete Paving Saw Operator	$14.48
Crane Operator, Lattice Boom 80 Tons or Less	$17.27
Crane Operator, Lattice Boom over 80 Tons	$20.52
Crane, Hydraulic 80 Tons or Less	$18.12
Crawler Tractor	$14.07
Electrician	$19.80
Excavator, 50,000 Pounds or Less	$17.19
Excavator, over 50,000 Pounds	$16.99
Flagger	$10.06
Form Builder/Setter, Structures	$13.84
Form Setter -Paving & Curb	$13.16
Foundation Drill Operator, Crawler Mount	$17.99
Foundation Drill Operator, Truck Mount	$21.07
Front End Loader 3 CY or Less	$13.69
Front End Loader, over 3 CY	$14.72
Laborer -Common	$10.72
Laborer -Utility	$12.32
Loader / Backhoe	$15.18
Mechanic	$17.68
Milling Machine	$14.32
Motor Grader, Fine Grade	$17.19
Motor Grader, Rough	$16.02
Pavement Marking Machine	$13.63
Pipe Layer	$13.24
Reclaimer / Pulverizer	$11.01
Roller, Asphalt	$13.08
Roller, Other	$11.51
Scraper	$12.96
Servicer	$14.58
Small Slipform Machine	$15.96
Spreader Box	$14.73
Steel Worker (Reinforcing)	$16.18
Truck Driver -Lowboy -Float	$16.24
Truck Driver -Off Road Hauler	$12.25
Truck Driver -Single Axle	$12.31
Truck Driver -Single or Tandem Axle Dump Truck	$12.62
Truck Driver -Tandem Axle Tractor with Semi Trailer	$12.86
Truck Driver -Transit Mix	$14.14
Tunnel Boring Machine Operator (greater than 48")	$13.61
Tunneling Machine Operator (48" or less)	$9.16

Welder	$14.84
Work Zone Barricade Servicer	$11.68

If the construction project involves the expenditure of federal funds of $2,000 or more, the minimum wages to be paid various classes of laborers and mechanics will be based upon the wages that will be determined by the Secretary of labor to be prevailing for the corresponding classes of laborers and mechanics employed on the project of a character similar to the contract work in the City of Dallas.

Except for work on legal holidays, the "General Prevailing Rate of Per Diem Wage" for the various crafts or type of workers or mechanics is the product of (A) the number of hours worked per day, except for overtime hours, times (B) the above respective rate per hour.

For legal holidays, the "General Prevailing Rate of Per Diem Wage" for the various crafts or type of workers or mechanics is the product of (A) one and one-half times the above respective rate per hour times (B) the number of hours worked on the legal holiday.

The "General Prevailing Rate for Overtime Work" for the crafts or type of workers or mechanics is one and one-half times the above respective rate per hour.

Under the provisions of Chapter 2258 of the Government Code, the contractor shall forfeit as a penalty to the entity on whose behalf the contract is made or awarded, sixty dollars ($60.00) for each laborer, worker or mechanic employed, for each calendar day, or portion thereof, such laborer, worker or mechanic is paid less than the said stipulated rates for any work under the contract, by him, or by any subcontractor under him.

Solicitation Number: CSP 207325
Solicitation Title: ORG 159 - L.L. Hotchkiss Elementary School - Renovation

REPRESENTATION AND CERTIFICATION

By submitting this Offer, the Offeror certifies that he/she is a responsible authorized officer of the company and certifies the accuracy of the following statements:

1. Represents that to the best of its knowledge it is not indebted to the District. **Indebtedness** to the District shall be basis for non-award and/or cancellation and/or termination of any award.
2. By signing this bid/proposal, vendor makes the assurance that vendor has not been debarred or suspended from conducting business with the US Government according to Executive Order 12549 entitled "**Debarment and Suspension**."
3. Pursuant to the Texas Education Code, Subchapter B, Section 44.034, "**Notification of Criminal History**", a person or business entity that enters into a contract with a school district must give advance notice to the district if the person and/or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony. Subsection (b) states "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract." Subsection (c) this notice is not required of a publicly held corporation.
   1.___My firm is a publicly held corporation, therefore, this reporting requirement is not applicable.
   2.___My firm is not owned nor operated by anyone who has been convicted of a felony.
   3.___My firm is owned or operated by the following individual(s) who has/have been convicted of a felony.
   Name of Felon(s):_____
   Details of Conviction(s):_____

4. "**Non-Collusion Statement**" and "**Anti-Lobbying Certification**": "The undersigned affirms that they are duly authorized to execute this Representation and Certification, Offer, and/or Contract and that this company, corporation, firm, partnership, etc., or individual has not prepared this bid in collusion (*An agreement between two or more persons to deceive the school district or defraud the school district of its rights*) with any other bidder, school board member, or school district employee, and that the contents of this bid as to prices, quality of product, terms and/or conditions, etc., have not been communicated by the undersigned nor by any other employee, agent and/or representative of the company, corporation, firm, partnership, etc., or individual to any other person engaged in this type of business prior to the official opening of this bid for the intent or purpose of collusion." In accordance with Title 31, USC Section 1352, no attempt has been or will be made by this company's officers, employees, or agents to lobby, directly or indirectly, with the District's Board of Trustees between bid/proposal submission date and award by the Board.

5. The District promotes, to the maximum extent allowed by law, participation by **economically disadvantaged business enterprises** in all District competitive procurement. Are you a qualified economically disadvantaged business enterprise, historically underutilized business, or minority/women owned business enterprise?
   (check one) _____ **Yes** _____ **No**
   Type of Certification: _____
   Issued by: _____ **Date of Issue:** _____
   Please attach proof of certification to this submittal. **Certified by:** _____

6. "**Conflict of Interest**": No officer, agent, or stockholder of the Offeror is a member of the staff, or related to any employee of the District except as noted herein: _____.
   Texas Statute enacts disclosure requirements if certain school officials or family members receive a gift (other than gifts of food, lodging, transportation, or entertainment accepted as a guest) that had an aggregate value of $250 or more over a twelve-month period that the district is considering or has awarded a contract for the sale or purchase of property, goods, or services. Has your firm, parent firm, subsidiary, and/or affiliate provided a gift (other than gifts of food, lodging, transportation, or entertainment accepted as a guest) that had an aggregate value of $250 or more over a twelve-month period to any District official, administrator, and/or Board member? [ ] Yes [ ] No
   If yes, explain (the gift, name of individual receiving gift, date gift was provided, etc.)._____
   _____ **(COMPLETE THE ATTACHED QUESTIONNAIRE FORM)**

7. Offeror agrees to the attached "**General Terms and Conditions**" and any "**Special Terms and Conditions**" (if applicable) of this solicitation and in case of conflict with other documents provided by Offeror, these General and/or Special Terms and Conditions take precedence and prevail unless specifically identified and changes are signed by both parties.

8. "**Insurance, Bonds**": Insurance and/or bond requirements are enumerated elsewhere in Contract documents. Submission of a certificate of insurance/bond by the undersigned (or an agent/broker on behalf of the undersigned) represents that the coverages and perils covered by the insurance/bond meet or exceed the requirements of the solicitation document and/or subsequent contract. The District may make reasonable reliance on the submitted certificate of insurance/bond. The certificate of insurance/bond must accurately reflect the policy coverages and will become a part of the Contract Documents and incorporated by reference, but the Contract terms/conditions and statement of work take precedence over any and all contents of the certificate of insurance/bond including, but not limited to, disclaimers, qualifications, etc. Failure to provide insurance/bond in accordance with Contract may be cause for termination for default and other remedies allowed by law and/or equity. Offeror must notify the District entity, in writing, by certified mail or personal delivery, within ten days after the vendor knew or should have known of any changes that materially affects the insurance/bond coverage.

9. "**Workers Compensation**": Offeror acknowledges that the District will NOT provide Workers Compensation coverage to the Offeror and Offeror represents to the District that all employees, subcontractors, agents, representatives, etc. of the Offeror who will provide products, goods, or services to the District will be covered by worker's compensation coverage for the duration of the Contract, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

10. "**Criminal Background Checks/Searches**": Offeror represents that criminal background checks/searches have been conducted (or will be conducted prior to start of Work if required) in accordance with the General Terms and Conditions (Criminal Background Check) and "Instructions to School District Contractors Regarding Criminal History Background Searches Under Texas Education Code (TEC) 22.0834" (attached).

11. **"No Boycott of Israel".** Offeror certifies that it (and any of its affiliates or parent company), does not, and will not, boycott Israel during the term of any contractual arrangement with DALLAS ISD. For purposes of any contractual arrangement with DALLAS ISD, "boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

12. **"Prohibition of Contracts Engaged in Business with Iran, Sudan, or Foreign Terrorist Organizations"**. Offeror certifies that it is not a company identified by the Texas Comptroller as a company known to have contracts with or provide supplies or services to a foreign terrorist organization.

13. **"Transactions with an Abortion Provider or Affiliate".** Offeror certifies that it is not an abortion provider nor an affiliate of such a provider as noted in Texas SB 22, codified in Texas Government Code Chapter 2273, and effective September 1, 2019. If this provision is violated by Offeror, Agreement and/or taxpayer resource transaction is voidable by Dallas ISD and Offeror agrees to defend and indemnify Dallas ISD against any action brought by the Office of the Attorney General for a violation of Section 2273.003.

I, the undersigned officer or authorized agent for the firm named below, certify that the information provided herein has been reviewed by me and is true to the best of my knowledge.

Company Name: _____ **Submitter's Name/Title:** _____

Email Address: _____

Submitter's Signature: _____ **Telephone No.** _____

Address: _____ **City, State and Zip Code:** _____

Fax No. _____ **Date:** _____

THIS SHEET MUST BE COMPLETED, SIGNED, AND RETURNED WITH FIRM'S OFFER.

Notice to Offerors
Conflict of Interest Disclosure Statements
Texas Local Government Code, Chapter 176

Offerors are required to file a Conflict of Interest Questionnaire with the District if a relationship exists between the Offeror's company and an officer of the District. Offerors are encouraged to review and become familiar with all disclosure requirements of Texas Local Government Code, Chapter 176. Conflicts of interest exist if:

1. the person has employment or other business relationship with the local government officer or a family member resulting in the officer or family member receiving taxable income; or
2. the person has given the local government officer or family member one or more gifts (excluding food, lodging, transportation, and entertainment) that have an aggregate value of more than $250 in the twelve- month period preceding
   the date the officer becomes aware of an executed contract or consideration of the person for a contract to do business with the District.

Disclosure is required from Offerors regarding each affiliation or business relationship between the Offeror and:

1. an officer of the District;
2. an officer of the District that results in the officer or family member receiving taxable income;
3. an officer of the District that results in the Offeror receiving taxable income that does not come from the District;
4. a corporation or other business entity in which an officer of the District serves as an officer or director, or holds an ownership interest of 10% or more;
5. an employee or Offeror of the District who makes recommendations to an officer of the District regarding the expenditure of money;
6. an officer of the District who appoints or employs an officer of the District that is the subject of the questionnaire; and
7. any person or entity that might cause a conflict of interest with the District.

If a conflict exists, forms must be filed:

1. No later than the seventh business day after the date that the person begins contract discussions or negotiations with the government entity, or submits to the entity an application, response to a request for qualification or bid, correspondence, or other writing related to a potential agreement with the entity.

2. The Offeror also shall file an updated questionnaire:
   a. not later than September 1 of each year in which a covered transaction is pending, and
   b. the seventh business day after the date of an event that would make a statement in the questionnaire incomplete or inaccurate.

3. A Offeror is not required to file an updated questionnaire if the person had filed an updated statement on or after June 1, but before September 1 of the year.

Officers of the Dallas Independent School District are:

Lance Currie (District 1)
Sarah Weinberg (District 2)
Dan Micciche (District 3)
Prisma Y. Garcia (District 4)
Byron Sanders (District 5)
Joyce Foreman (District 6)
Ben Mackey (District 7)
Joe Carreon (District 8)
Ed Turner (District 9)
Stephanie Elizalde, Ed.D. Superintendent of Schools

If no conflict of interest exists, you must fill out Box 1 and type N/A on Box 3 of the CIQ form, sign and date it.

If you are required to file, send the completed form to Dallas Independent School District, Procurement Services Department, 9400 North Central Expressway Suite 1510, Dallas, Texas 75231

July 2022

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____
Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

_____ _____
Signature of vendor doing business with the governmental entity Date

Form provided by Texas Ethics Commission www.ethics.state.tx.us Revised 11/30/2015

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

Form provided by Texas Ethics Commission www.ethics.state.tx.us Revised 11/30/2015

Solicitation Number: CSP 207325
Solicitation Title: ORG 159 - L.L. Hotchkiss Elementary School - Renovation

Dallas ISD, 9400 North Central Expressway, Dallas, TX 75231

FELONY CONVICTION NOTICE

Statutory citation covering notification of criminal history of contractor is found in the Texas Education Code #44.034. Following is an example of a felony conviction notice:

FELONY CONVICTION NOTIFICATION

State of Texas Legislative Senate Bill No. 1, Section 44.034, Notification of Criminal History, Subsection (a), states "a person or business entity that enters into a contract with a school district must give advance notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony."

Subsection (b) states "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract."

THIS NOTICE IS NOT REQUIRED OF A PUBLICLY-HELD CORPORATION

I, the undersigned agent for the firm named below, certify that the information concerning notification of felony convictions has been reviewed by me and the following information furnished is true to the best of my knowledge.

A. [ ] My firm is a publicly-held corporation, therefore, this reporting requirement is not applicable.

B. [ ] My firm is not owned nor operated by anyone who has been convicted of a felony:

C. [ ] My firm is owned or operated by the following individual(s) who has/have been convicted of a felony:

Name of Felon(s): _____

Details of Conviction(s): _____

_____

Company Name:_____ Submitter's Name/Title:_____

Address:_____City, State and Zip Code:_____

Email Address: _____

Submitter's Signature:_____Telephone No._____

Fax No._____800 # (if available)_____

Date:_____

Solicitation Number: CSP 207325
Solicitation Title: ORG 159 - L.L. Hotchkiss Elementary School - Renovation

IDENTIFICATION BADGE(S)

1. Identification Badge: Offeror's employees, agents, and consultants and subcontractors, subject to the criminal history record review requirement shall be identified by a photographic identification badge.

2. If the Offeror is the person or owner or operator of the business entity, that individual may not self-certify regarding the criminal history record information and its review and must submit original evidence acceptable to the District with this Agreement showing compliance.

3. Pursuant to Dallas ISD's Board Policy CJA (LOCAL) Purchasing and Acquisition:

   All contracts must comply with the requirements for criminal background checks. All vendors must give advance notice to the District if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony. The District may terminate any resulting agreement if the District determines that the person or business entity failed to provide notice as required by this paragraph or misrepresented the conduct resulting in the conviction.

4. The above requirement is required for all suppliers who will provide a service to Dallas ISD and will be on District property. The background checks and badges must be done through the supplier's company or the District's third-party provider, Field Control Analytics at www.fcbackground.com/clientsignup using project code: VENDISD15 or be issued by the supplier's company.

Company Name:_____ Submitter's Name/Title:_____

Address:_____City, State and Zip Code:_____

Email Address: _____

Submitter's Signature:_____Telephone No._____

Fax No._____800 # (if available)_____

Date:_____

Instructions to School District Contractors
Regarding Criminal History Background Searches
Under TEC 22.0835

TEC 22.0834 directs school district contractors (i.e., Company) to obtain state and national criminal history background searches on their employees who will have direct contact with students, and to receive those results through the DPS criminal history clearinghouse (Fingerprint-based Applicant Clearinghouse of Texas –FACT). In order for contractors to receive the information through FACT, they must first establish an account with the DPS for FACT clearinghouse access. The Company owner must sign a user agreement with the DPS. To obtain the user agreement and more information, Company must contact:

Access and Dissemination Bureau
Texas Department of Public Safety
Crime Records Service
P. O. Box 149322
Austin, Texas 78714-9322

Email: FACT@txdps.state.tx.us
Phone: (512) 424-2365

For fastest service, please email or call. State in the message that Company is a school district contractor and needs to have an account established for DPS FACT clearinghouse access. Please include:

Company Name
Company Address
Company Phone
Name of Company point of contact
Phone of Company point of contact
Company email to be used for notification of FACT records and messages

The information in the DPS FACT Clearinghouse is confidential, and access must be restricted to the least number of persons needed to review the records. The account must include at least one designated supervisor to make necessary changes and to monitor the site's security and the access to the criminal history data retrieved. Additional users must be limited to those who need to request, retrieve, or evaluate data regarding the individual applicants.

PLEASE NOTE: After the Company signs the DPS User Agreement for FACT, DPS will provide the Company with a revised ***FAST Fingerprint Pass*** that Company will have to provide to its employees and applicants. Company's employees and applicants will use that ***FAST Fingerprint Pass*** when scheduling their FAST fingerprinting.

Company Name:_____ Submitter's Name/Title:_____

Address:_____City, State and Zip Code:_____

Email Address: _____

Submitter's Signature:_____Telephone No._____

Fax No._____800 # (if available)_____

Date:_____

Name of Contractor	

DALLAS INDEPENDENT SCHOOL DISTRICT
CERTIFICATE OF NON-DISCRIMINATION

In connection with the execution of this Contract, the Contractor shall fully comply with the District non-discrimination requirement cited below.

"The Dallas Independent School District does not discriminate on the basis of sex, disability, race, religion, color, age, gender, sexual orientation, and/or national origin in the educational programs or activities which it operates, and it is required by Title IX, Section 504, Title VII, and the Americans With Disabilities Act not to discriminate in such a manner. This policy not to discriminate extends to employment in and admission to such programs and activities."

Submittal to District of reasonable evidence of discrimination will be grounds for Termination of the Agreement. This policy does not require the employment of unqualified persons.

By the signing of this Certificate, the Contractor signifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. It certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The undersigned agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this proposed Contract. As used in this certification, the term 'segregated facilities' means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. It further agrees that (except where it obtained identical certifications from proposed consultants for specific time period) it will obtain identical certification from proposed Subcontractors prior to the award of a Contract exceeding $10,000.00 which are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed Subcontractors (except where the proposed Subcontractors have submitted identical certifications for specific time periods): **Notice to Prospective Subcontractors of requirement for certification of non-segregated facilities.** A certification of non-segregated facilities, as required by the May 19, 1967 Order (32 FR. 7439, May 19, 1967) on elimination of segregated facilities, by the Secretary of Labor, must be submitted prior to the award of a Contract exceeding $10,000.00 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.11."

By: Signature:

_____ _____

(PRINT NAME OF PERSON SIGNING FOR CONTRACTOR) (CONTRACTOR REPRESENTATIVE SIGNATURE)

Date: Contractor:

_____ _____

SECTION 00 45 22 – NOTIFICATION OF HAZARDOUS MATERIALS

Name of Contractor	

STATE OF TEXAS

COUNTY OF DALLAS

Before me, the undersigned authority on this day personally appeared _____, known to me to be the person whose name is subscribed below, who, on oath stated:

"As the appropriate official of the company, contractor, or subcontractor submitting this affidavit in conjunction with a bid submitted to the Dallas Independent School District, I acknowledge that this company, contractor, or subcontractor has been notified that copies of the Asbestos Hazard Emergency Response Act (AHERA) for the school(s) where such company, contractor or subcontractor has contracted to perform work are available at the individual school library and at the Professional Library at the Dallas Independent School District, 9400 N. Central Expressway, Dallas, Texas 75231. I understand that it is our responsibility to familiarize ourselves with such plans and that it is our responsibility to inform every worker that we use on this project as to the availability of these plans.

We also acknowledge that we will be required to obtain written clearance from the Dallas Independent School District, Bureau of Hazardous Materials Management, prior to executing any work on this project."

_____

Name of Company

Signature _____

Name _____

Title _____

STATE OF TEXAS

COUNTY OF DALLAS

Sworn to and subscribed before me at Dallas, Texas this the _____ day of _____, 20 _____, A.D.

_____

Notary Public in and for Dallas County, Texas

FAMILY CONFLICT OF INTEREST QUESTIONNAIRE

This Questionnaire must be completed by every individual or entity that contracts or seeks to contract with the District for the sale or purchase of property, goods, or services.

The questionnaire(s) required by this policy shall be filed with the Director of Procurement Services not later than the seventh (7TH) business day after the date that the individual or entity begins contracts discussions or negotiations with the District or submits to the District an application, response to a request for proposals or bids, correspondence, or other writing related to a potential agreement with the District. If the individual or entity becomes aware of new facts or change of facts that would make the completed questionnaire(s) inaccurate, the individual or entity shall file an amended questionnaire(s) within seven (7) days of the date the individual or entity first learned of the new facts or changes in facts.

Family or family relationship means a member of an individual's immediate family, including spouse, parents, children (whether natural or adopted), aunts, uncles, and siblings.

For individuals who contract or seek to contract with the District for the sale or purchase of any property, goods, or services:

> Identify each and every family relationship between yourself (and any member of your family) and any full-time District Employee (and any member of such employee's family) (please include name and sufficient information that will allow proper identification of any named individual):
>
> _____

For entities that contract or seek to contract with the District for the sale or purchase of property, goods, or services:

> Identify each and every full-time District employee (and any member of the employee's family) who serves as an officer or director of the entity, or holds an ownership interest of 10 per cent or more in the entity (please include name and sufficient information that will allow proper identification of any named individual):
>
> _____

If more space is required please attach a second page. If the answer to any question is none, or not applicable, please write "None" or "Not Applicable" in the space reserved for that answer.

"I certify that the answers contained in this questionnaire are true and correct."

Individual: _____ Date: _____

Entity: _____

By: _____ Date: _____
Signature

Title: _____

Certified this _____ day of _____ , 20_____, by _____
Notary Public

_____
Notary Seal

SBE Compliance Guidelines and Forms

Date Issued:
August 27, 2025

Contact Info:
Small Business Office
9400 N. Central Expressway
Dallas, TX 75231
972-925-7290
Email: sbo-construction@dallasisd.org
Website: www.dallasisd.org
Contact: Wilton Munnings
972-925-7222

Read Carefully: The SBE Program requirements are applicable to any bidder/proposer. These forms should be attached to any bid/proposal totaling $50,000 or more and are due at the time of bid/proposal opening.

JOINT VENTURE AGREEMENT

BY AND BETWEEN

_____

AND

_____

AS

_____, a Joint Venture JV

FOR

Dallas Independent School District

_____

JOINT VENTURE AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 20___ (the "Effective Date"), by and between _____Inc. ("NAME"), a _____ ("STATE") corporation, whose business address is _____ ,_____ ("CITY") , _____ ("STATE") _____ ("ZIP"); and _____, Inc. ("NAME"), a _____ ("STATE") corporation, whose business address is_____, _____ ("CITY") , _____ ("STATE") _____ ("ZIP"), hereinafter referred to individually as a "Party" or collectively as the "Parties". The name of the Joint Venture shall be called _____. All business of the Joint Venture shall be conducted under this name.

Recitals

A. The Parties have agreed to enter into a joint venture for the purpose of submitting a proposal, bid, solicitation or otherwise (the "Proposal") to provide owners representative services or work to the Dallas Independent School District in response to Bid/RFP/RFQ No. _____ entitled _____ (the "Solicitation"), which to the extent the Proposal is successful, will result in a contract with the Owner.

B. The Parties desire to enter into this Agreement to fix and define between themselves their respective interests and responsibilities for the purposes of providing the requisite Services, Work, or both.

C. The Parties affirm and agree that they shall participate in the preparation of the Proposal and pursue the Contract with each other, that no Party shall submit a competitive proposal or otherwise seek the award of the Contract contemplated herein either alone or with others without notice to the Parties to this Agreement and entering into a Non-Disclosure Agreement, and in reliance thereon have entered into this Agreement.

D. The Parties agree and affirm to register the Joint Venture with the State and forward the Certificate of Filing and Tax Identification Number to the Dallas Independent School District, if the Joint Venture is awarded a Project with the Owner.

E. The Parties affirm and agree the joint venture participation split represented in this Agreement and no employee or former employee [of less than one year], relative, affiliate or subsidiary company is listed or included as a joint venture partner.

F. In the event the Parties agree to pursue other DISD projects as a joint venture, they will enter into an addendum to this Agreement, subject to District approval, identifying that project and any modified terms of this Agreement, if any, in connection with the pursuit or award of same.

NOW, THEREFORE, in consideration of the mutual covenants contained herein, it is agreed as follows:

Agreement

Article 1: Definitions and Interpretation

1.1 Capitalized terms used in this Agreement shall have the meaning set forth below or as defined elsewhere in this Agreement.

1.1.1 "Agreement" means this document.

1.2

1.2.1 "Managing Business Party" the Joint venture partner designated to provide the accounting and financial services, on behalf of the Joint Venture required to reflect the conduct of the Joint Venture's affairs

1.2.2 "Owner" means Dallas Independent School District.

1.2.3 "Contract" means any contract (together with any amendments, supplements or modifications thereto) awarded to the Joint Venture by the Owner for the performance of the Services, Work, or both, for the Project

1.2.4 "Deputy Project Manager" means the individual specifically designated pursuant to Article 3 of and charged with assisting the Project manager and Senior Project manager in the overall responsibility to direct the Joint Venture's performance under the Contract.

1.2.5 "IRC" means the Internal Revenue Code of 1986 as amended as of the date of this contract.

1.2.6 "Joint Venture" means an association between _____, Inc., and _____, Inc. engaged in a solitary business enterprise for profit.

1.2.7 "Management Committee" means the group formed pursuant to Article 4 as the final authority of the Joint Venture and having the powers and duties as provided herein.

1.2.8 "Project" means the "DALLAS ISD" Construction" project the subject of the solicitation.

1.2.9 "Project Manager" or "Senior Project Manager" means the individual specifically designated pursuant to Article 3 of and charged with overall responsibility to direct the Joint Venture's performance under the Contract.

1.2.10 "Proposal" means the proposal(s) submitted by the Joint Venture to the Owner to secure the award of the Contract for the Project. The Proposal shall include, but not limited to, all pursuit efforts, including any presentation or other interview. The term "Proposal" does not include task order specific proposals.

1.2.11 "Services" or "Work" means services or work under the Contract to be performed by the Joint Venture in furtherance of the Project.

1.2.12 "Task Order Contract" means a contract for services that does not procure or specify a firm quantity of services (other than a minimum or maximum quantity) and that provides for the issuance of orders for the performance of tasks during the period of the contract. 1.2. Terms importing the singular include the plural and vice versa where the context requires.

1.3. The headings used in this Agreement are included for ease of reference only and shall not affect the construction or interpretation hereof.

Article 2: Association of the Parties

2.1 Formation. The Parties hereby agree to form the Joint Venture pursuant to the provisions hereof for the limited purpose and scope set forth in this Agreement. The Parties hereby further agree to perform the Joint Venture's responsibilities and obligations as an integrated team, providing staffing (including key

personnel) and resources generally in proportion to their respective interests in the Joint Venture as set forth in Article 5.

2.2 Purpose. This Joint Venture is entered into solely for the purpose of submitting the Proposal and, if the Contract is awarded to the Joint Venture, the performance of the Services, Work, or both, as identified in the Solicitation. The Parties agree that the Joint Venture is a temporary association and that it will not place any limitation or liability on the Parties beyond the specific undertakings contained in this Agreement.

2.3 Name. The Joint Venture shall operate under the name _____, a Joint Venture.

2.4 Duration. The Joint Venture will continue until dissolved in accordance with this Agreement. Subject to the foregoing, the Joint Venture shall:

2.4.1 dissolve automatically (i) should the Parties fail to agree as to the form, terms or conditions of the Proposal, (ii) if the Project is cancelled prior to award, or (iii) if the Contract is not awarded to the Joint Venture, but only after any challenge to the award of the Contract, by administrative protest or litigation (or appeal of a decision on such protest or litigation), is fully concluded without an award of the Contract to the Joint Venture, or

2.4.2 if awarded the Contract, be dissolved upon completion of all Services, Work, or both, required to be performed under the Contract, receipt of full payment of all sums for which the Joint Venture is entitled under the Contract, the settlement of all disputes and final accounting, and the expiration of all warranties and all other obligations arising in connection with the Contract.

2.43 if awarded the Contract, the Joint Venture shall not be dissolved, without thirty (30) days written notice and the prior written consent of the Dallas Independent School District

2.5 In the event the Contract is terminated, the Joint Venture shall conclude its affairs in an orderly manner at the earliest practicable date, subject to the requirements of Section 2.4 above. However, should the Services, Work, or both, be only suspended, the Joint Venture shall remain in effect during the period of such suspension.

2.6 The Parties agree that they shall cause the Joint Venture to sign the Contract promptly upon its being tendered for signature in a form mutually agreed upon by the Parties and the Owner.

2.7 Scope of Services or Work. The Services, Work, or both, to be performed by the Joint Venture shall generally be of the type and nature described in Exhibit A.

Article 3: Operation of the Joint Venture

3.1 If required by applicable law or regulation, the Joint Venture shall be registered and licensed as a business in the jurisdiction where the Joint Venture's principal office is located.

3.2 The principal business address of the Joint Venture shall be _____. Services may be performed in the Owner's offices, in the Joint Venture office, in the respective offices of the Parties or DALLAS ISD as authorized, at the project site or at such locations as the Parties may mutually agree upon.

3.3 All correspondence from the Owner regarding the Contract shall be sent to the Project Manager and/or _____ at the principal business address of the Joint Venture, with a copy provided to each of the Joint Venture members.

3.4 Initial Proposal Effort. Each Party will participate in preparing the Proposal required for the Contract under the direction of the Project Manager. Each Party will bear its own labor and travel costs associated

with this effort. Third party direct costs for expenses and other services such as video imaging, photography, document development, technical writing and editing, graphics, printing, and reproduction, as well as any specialty sub-consultant services, shall be shared between the Parties in proportion to each Party's Agreed Percentage of Participation as specified in Article 5; provided, however, that all Parties must pre-authorize any such expenditure.

3.5 Integrated Services. During the construction and pre-construction phase of the project, the Parties intend to perform the Services as an integrated organization with each Party providing competent personnel to the Joint Venture consistent with the staffing resource plan set forth in Exhibit B and as necessary to enable the Joint Venture to successfully perform the Services, Work, or both, in accordance with the terms of the Contract. In addition, and at the direction of the Management Committee, Services may be performed, in whole or in part, by consultants retained by the Joint Venture, one or more of the Parties, or both, and Work may be performed, in whole or in part, by subcontractors retained by the Joint Venture, one or more of the Parties, or both. Notwithstanding the foregoing, personnel assigned to the Joint Venture shall remain on the payroll of the assigning Party. The staffing resource plan may be amended from time to time as may be deemed necessary by the Management Committee. A Party may not remove from the Project or reassign to another project any "key personnel" listed on Exhibit B without the prior consent of the Management Committee and notice to the Director of the MWBE Department or his/her designee within five (5) business days from the date of removal or reassignment.

3.6 Subject to the limitation noted above with respect to key personnel, in the event that an individual assigned to the Project is unable or unwilling to perform the Services, the Work, or both, in a professional and timely manner, or if the Owner directs the Joint Venture to remove a particular individual from the Project, or if the Project Manager, in the good faith exercise of his/her discretion, determines that an individual should be removed from the Project, then the assigning Party shall replace such individual with a qualified employee reasonably acceptable to the Management Committee and, if applicable, the Owner. If the assigning Party cannot furnish a qualified substitute candidate within a reasonable period of time after the vacancy arises, then the vacancy shall be filled by an individual employed by the other Party.

3.7 Project Manager. Subject to the authority of the Management Committee and any limitations set forth herein, the Project Manager is the individual charged with responsibility to direct the Joint Venture's performance under the Contract. Subject to Owner approval (if required), _____ shall serve as the Project Manager during the term of the Contract, subject to the continuing approval of the Management Committee. If this individual, as determined by the Owner or the unanimous consent of the Management Committee, is unable to satisfactorily perform his duties as Project Manager, the Management Committee will nominate an employee of _____- to serve as the successor Project Manager. In performing his duties, the Project Manager shall treat both Parties fairly and shall not discriminate in favor of either Party.

3.8 In addition to the other duties set forth herein, the Project Manager is to:

3.8.1 Serve as the primary interface between the Joint Venture and the Owner;

3.8.2 Ensure compliance with the DALLAS ISD MWBE Program requirements

3.8.3 Submit Change Orders to the Owner;

3.8.4 Report monthly, or as requested, to the Management Committee;

3.8.5 Oversee the Services, Work, or both, of the Joint Venture;

3.8.6 Prepare and maintain Project schedules;

3.8.7 Consult and confer with the Deputy Project Manager; and

3.8.8 Perform such additional duties as directed by the Management Committee.

3.9 Deputy Project Manager. The Deputy Project Manager shall be designated by the MWBE partner and will support and assist the Project Manager in the performance of his/her duties as set forth above. Subject to Owner approval (if required), _____ shall serve as the Deputy Project Manager during the term of the Contract, subject to the continuing approval of the Management Committee. If this individual, as determined by the Owner or the unanimous consent of the Management Committee, is unable to satisfactorily perform his duties as Deputy Project
3.10 Manager, the Management Committee will nominate an employee of _____ MWBE Joint Venture Partner to serve as the successor Deputy Project Manager.

Article 4: Joint Venture Organization

4.1 _____ shall be responsible for the fiscal and administrative tasks of managing the business operations of the Joint Venture (the "Managing Business Party") and shall appoint an individual responsible for these tasks. As the Managing Business Party, _____will appoint one of its Management Committee Members to act in the role of Chairperson of the Management Committee commencing on the effective date of this Agreement.

4.2 The Project Management Committee ("Management Committee") will be comprised of two or three (___) representative from _____, and one (_) representative from _____. The Parties individual representatives designated to comprise the Management Committee are referred to herein as the primary representative(s). The Managing Business Party shall designate an individual on the Committee as the Chairperson to manage the administrative and management functions of the Committee. In addition to its primary representatives or representative, each Party shall also name an alternative representative for its primary representatives or representative. A Party's alternative representative shall act in the capacity of its primary representative should its primary representative be unable to fulfill his or her duties as described herein. If not identified below, representatives shall be designated within thirty (30) days of the date of this Agreement by written notice to the other Party. A Party may change its designated representative(s) or alternate representative upon ten (10) days written notice to the other Party. No proxies shall be permitted. Each Party's designated primary and alternate representative(s) shall have full power and authority to act for and on behalf of the Party so appointing them with respects to all matters coming before the Management Committee.

4.3 Meetings of the Management Committee shall not be held unless each Party is represented. If the Parties representatives are not all available, the meeting shall stand adjourned and will be re-scheduled to the next earliest date acceptable to all Parties. While the Management Committee will always attempt to meet in person, telephonic or online meetings shall be allowed. The Parties shall endeavor to provide five (5) days written notice to each Party of scheduled meetings (in person, online or by telephone), except in the event of an emergency or immediate need. A Party's refusal or repeated failure to attend any scheduled Management Committee meeting shall at the other Party's sole discretion, constitute of default under this Agreement subject to the review and approval of the MWBE Director or his/her designee.

4.4 _____ representative(s) shall each have one (1) vote on matters coming before the Management Committee. The primary representative(s) from _____shall each have one (1) vote each on matters coming before the Management Committee. A vote shall not be taken until each representative of a Party has communicated its position and expressed its questions, concerns, approval or disapproval of a matter. Each party agrees to work collaboratively to make decisions and solve problems in the best interest of the Joint Venture. In the event the Management Committee members cannot reach a unanimous decision on the business and operational matter(s) at hand requiring a Management Committee vote or resolution, the Chairperson will make the decision as majority partner, taking into account the risks and financial impacts to all parties and the Joint Venture. The final decision is applicable for all matters except for scope changes made by the Owner or settlement of claims and disputes. In these cases, if the Management Committee cannot develop a mutually agreeable solution, they shall submit any dispute to the Chief Executive Officer of the Joint Venture partners as provided for in Article 16. If, in the Project Manager's good faith judgment, immediate action is required in order to meet the Joint Venture's obligations under the Contract, the Project Manager may act without waiting for the resolution of the dispute,

subject to written notice and each Party's reservation of their respective right to seek recovery for the financial consequences arising from such action pending final resolution of the dispute. If any Party is in default (as defined in Article 12) under this Agreement, during the time of such default, its representative(s) shall not vote upon any issue, and such representative(s) shall not be included in the computation of eligible votes. Within one week of the Management Committee meeting, written meeting minutes regarding items discussed and actions taken at the meeting shall be prepared and distributed by the Chairperson of the Management Committee.

4.5 The Project Management Committee shall meet with the Project Manager or Senior Project Manager) and the Deputy Project Manager or Assistant Project Manager (and other project staff as mutually agreed upon by the Management Committee) quarterly or more frequently if deemed necessary.

4.6 The Project Manager shall have authority to conduct the business of the Joint Venture in accordance with the terms of this Agreement, but shall not have authority to, and shall not directly or indirectly without the unanimous consent and prior written approval of the Management Committee:

4.6.1. Enter into on behalf of the Joint Venture any third-party contractual arrangements or cause the Joint Venture to assume, incur, or become liable for any other obligations;

4.6.2. Make any investment in any other person or entity; make loans or guarantees, or otherwise extend or pledge credit to others;

4.6.3. Confess any judgment against the Joint Venture or compromise any debt due the Joint Venture except upon receipt of full payment;

4.6.4. Make any election for the Joint Venture under the then-current Internal Revenue Code, as amended, or any other applicable income tax legislation from time to time in force;

4.6.5 Commence any claim against the Owner with respect to amounts due under the Contract;

4.6.6 Commence any litigation; defend any action or claim against the Joint Venture by a third party; appeal any judgment or decision; or settle any litigation, action or claim to which the Joint Venture is a party;

4.6.7 Cause to be organized or acquired in whole or in part by the Joint Venture any corporation to carry out any activities of the Joint Venture; or

4.6.8 Exercise any of the authority vested in the Management Committee pursuant to Section 4.9 below.

4.7 In case it is necessary to settle a matter prior to the next scheduled or specially called meeting, the representatives may agree on a decision by notice to each other in accordance with the provisions of Article 23. Such decision will be included in the minutes of the next meeting of the Management Committee.

4.8 The representatives shall be deemed to be acting on behalf of his or her respective Party and no representative shall be liable to the Parties by reason of his or her actions as a member of the Management Committee, except where such representative's action constitutes gross negligence or actual fraudulent or dishonest conduct.

4.9 The Management Committee may delegate, in writing, such of its responsibilities and duties as it deems appropriate to the Project Manager, Senior Project Manager or the Managing Business Party, except that the Management Committee must act, *inter alia*, on the following matters of major consequence:

4.9.1 Timing and amount of distribution of Joint Venture profits and the Management Committee's right to demand additional cash reserves to cover potential losses;

4.9.2 Amount of revenue reserves, cash reserves, and contingent cost reserves to be retained by the Joint Venture;

4.9.3 Voluntary liquidation of the Joint Venture;

4.9.4 Third Party contractual arrangements or the incurring of other obligations in excess of $10,000 by or on behalf of the Joint Venture;

4.9.5 Designation of a successor Project Manager or Deputy Project Manager;

4.9.6 Resolution of a dispute first referred to the Management Committee pursuant to the provisions of Article 16;

4.9.7 Review and approve all contractual transactions between the Parties (and their affiliates) and the Joint Venture; and

4.9.8 Take such other action and exercise such other authority as the Management Committee deems necessary to cause the Joint Venture to achieve its purposes consistent with good business practices and in compliance with all applicable laws and regulations.

4.10 The Joint Venture shall not have employees. The Parties shall provide all necessary personnel. A Party, at its own cost and expense, may retain necessary staff on an independent consultant basis to meet its personnel needs.

Article 5: Interests of the Parties

5.1 Except to the extent that this Agreement expressly provides to the contrary, the interests of the Parties in (i) any and all gains, losses, and liabilities that may result from the performance of the Contract or the Agreement, or both, (ii) any and all property, equipment, and other assets acquired by the Joint Venture, and (iii) any and all monies received in connection with the Contract, shall be determined proportionately in accordance with the Party's Agreed Percentage of Participation as set forth below.

Agreed Percentage of Participation

_____ ____ _%

_____ _____ %

_____ _____ %

5.2 The Parties acknowledge and agree that all liabilities and risks associated with the Project shall be shared pro rata according to the Agreed Percentage of Participation unless otherwise provided for herein. The MWBE Joint Venture partners proportionate share in the ownership shall be commensurate with their capital contribution, control, management, risks and ownership interest. For the avoidance of doubt, a Party's profits and losses arising out of the performance of self-performed subcontracting services, work, or both, for which it is responsible under this Agreement shall not be considered profits and losses of the Joint Venture.

5.3 The Parties shall appoint a Project Manager or Senior Project Manager to maintain and oversee the day to day work under the Contract. The Parties shall jointly select any necessary additional Project Managers, the Assistant Project Manager (the "APM") and/or Superintendents. The selected Project Managers and Superintendents shall be available at the Project site daily to supervise the work under the Contract. The MWBE Joint Venture Partner shall be assigned staff under the Contract in proportionate share of their respective ownership interest in the Joint venture. The Project manager shall submit the final staffing matrix confirming compliance with this section including all Project managers, Assistant Project managers and Superintendents to DALLAS ISD's MWBE office within 30 days of the Notice to Proceed.

5.4 The clear and distinct portion of the Scope of Work to be performed by _____, the MWBE Joint Venture partner and the estimated value of those services commensurate with the percentage ownership interest is as follows:

A detailed delineation of the Joint Ventures duties is outlined in Exhibit "A".

[Please note that if the MWBE's scope of work is described as "participate in", "advise about", "assist in" or "consult", the work shall not be considered distinct or clearly defined for the purpose of analyzing the joint venture participation]

Article 6: Execution of Bonding and/or Guarantees

6.1 Each of the Parties agrees to execute all applications and indemnity agreements required by its sureties upon any bond or bonds required in connection with the Proposal and/or the Contract. Failure of a Party to execute any documentation necessary to effectuate the intent of this Article 6 shall constitute a default in accordance with Article 12 and entitle the non-Defaulting Party(ies) to appropriate relief as provided therein.

6.2 The Joint Venture partner(s) may provide co-surety bond or bonds in proportionate percentage to their ownership in the Joint Venture and to other Parties are applicable in a form acceptable to the Owner. The Joint Venture may also provide in a form acceptable to the Owner any bond or bonds in the name of the Joint Venture in lieu of the co-surety arrangement; provide an Up Front Joint Agreement (SAA Form #1), and an executed copy of the indemnity agreement signed by all of the Parties associated with the SAA Form #1.

Article 7: Working Capital

7.1 All necessary working capital, when and as required for the performance and prosecution of the Contract or operation of the Joint Venture as determined by the Project Manager and approved by the Management Committee, shall be furnished by the Parties in a timely manner and proportionately in accordance with their respective interests as set forth in Article 5. Each of the Parties recognizes that the failure of any Party to contribute its full proportionate share of working capital will have serious adverse consequences for the Joint Venture and imposes an unfair burden upon the other Party(ies). As to such working capital contribution, each of the Parties waives any rights of set-off it might otherwise possess and agrees to make the working capital contributions without set-off or deduction of any type. If any Party borrows funds to meet its obligation hereunder, such borrowing shall be the sole and separate obligation of the Party and shall not be the debt or obligation of the Joint Venture. No Party or its representatives shall have the power to pledge the credit of any other Party.

7.2 Any capital contributions requested by the Project Manager from the Parties shall be subject to the approval of the Management Committee. If such request is approved, the Management Committee shall give written approval thereof, with the manner of computation, to each Party. If, within thirty (30) days of receipt of such notice, either Party fails or is unable to provide its proportionate share of the funds required by the Joint Venture, such non-contributing Party shall be in default of this Agreement. In the event the non-contributing Party fails to cure its default within seven (7) days of the date of receipt of notice, the contributing Party shall be reimbursed from any profit due the non-contributing Party for the total amount of the funds contributed, but the ownership interest of the Joint Venture shall not be adjusted or changed unless the non-contributing Party is determined to be in default and fails to cure. The Management Committee has the discretion to waive a default under this Section.

Article 8: Books and Records, Accounting and Bank Accounts

8.1 Books and Records. The Parties acknowledge and agree that _____ will be the Managing Business Party and will provide at no additional costs the accounting and financial services required of the Joint Venture as approved and determined by the Management Committee. The Managing

Business Party, on behalf of the Joint Venture, shall keep proper books, records and accounts in which full, true and correct entries will be made of its transactions, on an accrual basis, in accordance with generally accepted accounting principles, showing all costs, expenditures, sales, receipts, assets and liabilities, and profits and losses of the Joint Venture, and all other records required appropriately to reflect the conduct of the Joint Venture's affairs and the distributions provided for in Article 5. Each of the Parties shall be entitled to have its representatives examine and make copies (at its own expense) of any of the books or records of the Joint Venture at any reasonable time and without notice. The Joint Venture shall permit the use of electronic copies of its books and records. The books and records of the Joint Venture are to be retained after dissolution of the Joint Venture for such period or periods as may be required by law or the Contract, whichever is greater. The costs associated with accounting and record keeping for the Joint Venture (including federal reporting under Section 9.2 and tax matters under Section 17.6) shall be a Joint Venture cost.

8.2 Fiscal Year. The fiscal year of the Joint Venture shall commence on _____ and end on _____.

8.3 Audit. If required by the Management Committee or the Owner, the Managing Business Party shall employ, at the expense of the Joint Venture, an independent auditor acceptable to the Management Committee to conduct an audit of the financial statements, including the balance sheet and statements of income and cash flows and disclosures required under generally accepted accounting principles, of the Joint Venture each year and report to the Parties within ninety (90) days after the expiration of the fiscal year its opinion on such financial statements. Further, each Party may at its option and sole expense perform an annual audit of the Joint Venture books and records.

8.4 Reports. The Managing Business Party shall deliver to each Party:

8.4.1 Within thirty (30) days after each month period, a balance sheet and statement of income of the Joint Venture for the month;

8.4.2 Within thirty (30) days after the end of each fiscal quarter, a statement of cash flow for the Joint Venture;

8.4.3 At least two (2) weeks prior to each quarterly Management Committee meeting, a summary of the monthly financial information for the most recent completed months, and projections for the next three (3) quarters; and

8.4.4 With reasonable promptness, all such other information, reports, and projections as from time to time may reasonably be requested by either Party.

8.5 Bank Accounts. A separate bank account in the name of the Joint Venture will be established by the Joint Venture. The bank account will require the signature of an authorized representative of each Party or his or her designee for withdrawal by check or documented approval of an authorized representative of each Party or his or her designee for withdrawal by electronic means. All payments due the Joint Venture for performance of the Contract will be deposited in the account and all expenses incurred under the Contract will be paid from the account. All capital contributions made in cash and all of the Parties' other cash receipts shall be deposited in such account under such terms as directed by the Management Committee. No petty cash accounts for the Joint Venture are authorized. The Managing Business Party shall reconcile the bank account monthly and deliver a report to the Management Committee.

8.6 Disbursements from Bank Accounts. All withdrawals from the Joint Venture account will require written invoices, receipts, vouchers, or other acceptable documentation. All checks, drafts, or other orders of the payment of money, and all notes or other evidence of indebtedness issued in the name of the Joint Venture shall be signed by two (2) persons, each representing one of the Parties. Each Party shall designate an individual or individuals authorized on its behalf to provide such signatures.

8.7 Closing of Bank Account in Event of Default. In case of a material default by one of the Parties

under Article 12 of this Agreement, the then-existing Joint Venture account may be closed by the non-Defaulting Party(ies) and a new account opened in the name of the Joint Venture, but under the sole direction and control of the non-Defaulting Party(ies). Funds from the closed account shall be transferred to the new account and the then-existing account shall be closed. In such an event, the defaulting Party(ies) will no longer have any rights to the operation of the new bank account, unless and until it cures its default to the satisfaction of the non-Defaulting Party(ies).

8.8 Loans. Without the prior written consent of all Parties, the Joint Venture, the Management Committee, or any Party shall not:

8.8.1 directly or indirectly, borrow money or become otherwise obligated upon, or liable for, any monies borrowed in the name of the Joint Venture or the other Party(ies);

8.8.2 guarantee or act as surety for any obligation or liability (whether for borrowed money or otherwise), for any other person, firm or corporation.

8.9 Accounting Decisions. Subject to Section 8.1 above, all decisions for the Joint Venture as to accounting principles shall be made by the Management Committee consistent with Generally Accepted Accounting Principles ("GAAP") with the concurrence of accounting or tax experts from each Party.

8.10 Final Accounting. Upon completion of the Project, payment of all sums due under any contract pertaining to the Project, and settlement of all outstanding obligations and liabilities on the part of the Joint Venture and their respective affiliated subcontractors, the Management Committee shall arrange for a final account to be prepared showing the total net profit earned, or loss incurred, by the Joint Venture. Unless otherwise agreed by the Parties, such final account shall be audited by a firm of accountants and agreed to by the Management Committee.

Article 9: Additional Obligations of the Parties

9.1 The Joint Venture shall, in good faith, commit to achieve the minority and women owned business subcontracting goals as set forth within the Contract. The Joint Venture also agrees to comply with the MWBE Program guidance, rules and regulations.

9.2 Each Party shall use good faith efforts to provide and make available its expertise, technical resources, and information to the Joint Venture to effectuate the intent herein and in furtherance of satisfying the Joint Venture's obligations to the Owner.

9.3 Contracting and Procurement. The Management Committee or its designee shall administer and manage all contracting, procurement, and financial activities for the Joint Venture and periodically update the Parties on the status of such activities. For the avoidance of doubt, the foregoing activities relate solely to the contracting, procurement, and financial activities of the Joint Venture and not such activities as undertaken by the Parties in furtherance of the Services, Work, or both, for which they are responsible under a Task Order Agreement.

9.4 Ownership Interest. Subject to the prior written approval of the District's M/WBE Department, each Party's Ownership interest may be adjusted from time to time as provided in this Agreement. For purposes of this Agreement, the term "Pro Rata" means the ratio determined by dividing the Ownership interest of a Party to whom a particular provision of this Agreement is stated to apply by the aggregate Ownership interest of all the Parties.

9.5 Reporting Requirements. The Management Committee or its designee shall administer and manage all required state, local, and federal reporting activities for the Joint Venture, including MWBE goals, all in accordance with applicable DALLAS ISD regulations and guidelines. Each Party will be responsible for providing any required reporting information to the Managing Business Party in a timely manner to allow the timely submission of the combined data from each Party to the appropriate federal agency and/or electronic reporting system.

9.6 The Parties agree that, during the term of this Contract and for a period of one year thereafter, no Party to this Contract shall in any way intentionally induce or persuade an employee of another Party to this Contract to become an employee or agent of such Party.

Article 10: Provision of Materials, Equipment, Supplies and Services

10.1 The Parties intend that all materials, equipment, supplies, and services required in connection with the Contract will be provided by the Parties and that the Joint Venture will not acquire any materials, equipment, supplies, or services directly. In the event the Joint Venture shall procure any such materials, equipment, supplies, or services, such procurement shall be in accordance with any procurement guidelines, directives, and procedures issued or approved by the Management Committee. In addition, and to the extent applicable, any procurement activities by the Parties, Joint Venture, or both shall be conducted in accordance with applicable laws and regulations, as implemented through the Contract.

10.2 If any Party provides equipment or temporary facilities to the Joint Venture, the Party shall insure or self-insure such equipment or temporary facilities and the cost of such insurance or self-insurance shall be included in the equipment or facilities rate quoted to the Joint Venture. The Joint Venture and the other Parties will be identified as an additional insured on any such insurance when appropriate, as determined by the Management Committee.

Article 11: Compensation

11.1 In accordance with the billing period provided in the Contract, unless otherwise approved by the Management Committee, each Party shall prepare and submit by the tenth (10th) of each month, for Work performed during the prior month, invoices to the Joint Venture.

11.2 Each Party shall submit invoices in the manner required under the Contract. Each invoice shall be subject to the terms of the Contract.

11.3 The Project Manager, on behalf of the Joint Venture, will in turn prepare and submit invoices to the Owner in accordance with the provisions of the Contract and any applicable task order. Unless expressly agreed to by the Parties and permitted pursuant to the terms of the Contract, the Joint Venture shall not add any profit, fee, or other amounts to the invoices submitted by the Parties. The Parties may invoice the monthly staff costs for personnel incurred directly in the management and administration of the project subject to any restrictions in the terms of the Contract.

11.4 Subject to the provisions of Section 4.6, the Joint Venture will, upon receipt of payment from the Owner, deposit same in the Joint Venture bank account and within five (5) business days issue payments against such account to each Party for the amount(s) invoiced by each Party to the Joint Venture and allowed by the Owner, less any withholdings authorized by this Agreement and directed by the Management Committee. In the event the Owner pays less than the full amount due with respect to any invoice, such shortfall shall be allocated to the Party responsible for performing the specific Services, Work, or both, for which payment was withheld or, in the absence of information reasonably sufficient to determine the basis for such short payment, any shortfall shall be allocated between the Parties in proportion to their respective shares of the applicable invoice. No Party will unreasonably restrain or refuse to authorize withdrawal of funds for payment of proper invoices relating to performance of the Services, Work, or both.

11.6 Expenses incurred by the Parties in self performing Work under a Subcontract or Task Order Agreement shall not be considered Joint Venture expenses and, to the extent allowed under the Contract, may be included by the Parties in their respective invoices to the Joint Venture for Services provided, Work performed, or both. Unless stated otherwise in this Agreement or authorized in writing by the Management Committee, personnel expenses not directly related to the performance of the Project including but not limited to back office functions such as human resources, legal counseling and tax compliance of the Parties shall not be considered a Joint Venture expense.

11.7 Each Party shall have full and sole responsibility for the payment of any taxes, duties, fees, or assessments of any nature whatsoever levied upon it individually in connection with its Services, Work, or both, under a Task Order Agreement, including any personal income taxes levied or imposed on any of its employees or personnel or any of its subcontractor's employees or personnel.

11.8 All personnel involved in the performance of the Services, Work, or both, shall be employed by the Parties and shall remain in the employ of the respective Party. Each Party shall advance and pay all payroll costs and expenses incurred by reason of their respective personnel working in connection with the performance of the Services, Work, or both, and each Party agrees to indemnify and hold the Joint Venture and each other Party harmless from any claims and liabilities arising out of the responsibilities of that Party toward its employees, any of its related companies, and any of their personnel under all applicable laws, including labor and tax laws.

11.9 If a Party, with the prior written approval of the Management Committee, maintains a Joint Venture office dedicated exclusively for the management and administration of the DISD project independent of the Parties primary business office(s) and any of the other Party's(ies) personnel are located at the office during the duration of the project, the host Party may issue a quarterly invoice directly to the visiting Party(ies) for the pro rata cost of office space and furnishings utilized by visiting Party's(ies) personnel during the time they are engaged in the performance of Services, Work, or both, for this Joint Venture at such Joint Venture office.

11.10 The basis for the calculations of such invoices under Section 11.9 above shall be determined by the Management Committee. Such invoices shall not constitute a billing to, or on behalf of, the Joint Venture, but rather a billing directly between the Parties. The visiting Party shall pay such invoices within thirty (30) days of receipt of such invoice.

11.11 When Joint Venture funds are in excess of the needs of working capital required for the operation of the Joint Venture (as determined by the Management Committee), such excess funds, if any, shall be first applied to the return of funds advanced until such advances shall have been entirely repaid, and the balance of such excess shall be distributed as provided in Section 11.13 below, to each Party in accordance with such Party's Agreed Percentage of Participation as reflected in Article 5.

11.12 The Management Committee shall quarterly review the progress of the Services, Work, or both, and the Joint Venture's financial condition to determine whether Joint Venture profits, if any, should be distributed. If the Management Committee determines that earned profits and reserves for contingencies, including cash contributions, are adequate to meet the Joint Venture's needs, it may direct the Managing Business Party to distribute earned Joint Venture profit to the Parties based upon their respective Agreed Percentage of Participation. For the avoidance of doubt, payments to a Party for self-performed services related to the construction project, Work performed, or both, pursuant to a Task Order Agreement shall not be considered distributions of Joint Venture capital or profits.

11.13 The Management Committee shall establish cash reserves and revenue reserve funds to be retained by the Joint Venture from time to time in order to assure adequate funding for all Joint Venture obligations as they relate to future profits, losses, liabilities, and contract performance. At the direction of the Management Committee, the Project Manager shall invoice each of the Parties for approved reserves and capital contributions.

Article 12: Default and Insolvency

12.1 If a Party shall be in default hereunder (as specified in Sections 4.3 (Management Committee meetings), 7.2 (capital contributions), 9.4 (Owner-issued notice of default), 25.8 (breach of covenants), or 25.9 (anti-bribery laws), or Article 15 (assignment and change of control)), and fail to promptly (but in no event more than seven (7) days thereafter) cure such default after written notice or demand; cease or otherwise fail to timely pay for goods or services (including labor), and fail to promptly (but in no event more than seven (7) days thereafter) cure such default after written notice or demand; cease to operate or terminate its business affairs; institute an insolvency proceeding under applicable law; permit the entry of

any order for relief under Chapter 7 of the Bankruptcy Code; or fail to cure a default hereunder after entry of an order for relief under Chapter 11 of the Bankruptcy Code, (such Party being hereinafter referred to as "Defaulting or Insolvent Party"), then from and after such date:

12.1.1 All acts, consents and decisions with respect to the performance of the Contract or the management of the Joint Venture shall thereafter be taken solely by the remaining Party without considering the Defaulting or Insolvent Party.

12.1.2 The participation of the Defaulting or Insolvent Party in the profits of the Joint Venture shall be limited to that proportion which the Defaulting or Insolvent Party's contributions to the working fund of the Joint Venture bear to the total of such contributions as same may be modified by and subject to the provisions of Section 7.2, but the Defaulting or Insolvent Party shall be charged with, and shall be liable for, any and all losses that may be suffered by the Joint Venture under the Contract, or any additions or supplements thereto or modifications thereof, to the full extent of the Defaulting or Insolvent Party's Percentage of Participation, set forth in Article 5.

12.1.3 The non-Defaulting Parties shall have the right to take over and complete the Services, Work, or both. Without limiting the generality of the foregoing, the non-Defaulting Parties may, for the purpose of completing the Work, enter upon the site and take possession of all materials, equipment, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the performance of the Work, all of which the Defaulting or Insolvent Party hereby transfers, assigns and sets over to the non-Defaulting Parties for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, materials, equipment and other items. The non-Defaulting Parties may complete the Services in whatever fashion it deems most efficient and shall have the right to use the existing work product for purposes of completing the Project. In such event, the non-Defaulting Parties shall receive any and all payments, including fees, which would otherwise be due for such Services, Work, or both, and apply the proceeds thereof (i) to cover all expenses incurred by the non-Defaulting Parties in taking over and completing (by use of its own forces, subcontracting or otherwise) such Services, Work, or both and (ii) to establish a contingency fund to cover any and all outstanding warranties or other obligations of the non-Defaulting Parties with respect to such Services, Work, or both, or any other uncured defect or deficiency for which the non-Defaulting Parties are responsible.

12.1.4 The non-Defaulting Party shall have the right to establish a new Joint Venture bank account in accordance with Section 8.7 of this Agreement.

12.2 If a Party is in material default of the requirements of the Contract, including (i) failure to perform or progress the Services within the timeframe specified in the Contract; (ii) serious or repeated breaches of the safety requirements; or (iii) is in breach of the requirements of the Services to be provided, the Work to be performed, or both, by that Party and fails to cure such breach within seven (7) days after written notice or demand, then from and after such date, the non-breaching Party shall have the rights afforded it under Subsections 12.1.1 through 12.1.3 above. Nothing in this Agreement shall be interpreted or construed to relieve the defaulting Party from their obligations under this Agreement or their obligations under the Contract with the Owner.

12.3 In the event of a default of this Agreement, the non-Defaulting Parties shall additionally be entitled to exercise all applicable remedies available to it, whether at law, in equity or otherwise, including an action to recover the losses sustained in excess of its proportionate share hereunder, specific performance, and the right to declare the Joint Venture dissolved and terminated without the necessity for judicial determination. Upon such dissolution, the non-Defaulting Parties shall immediately commence to wind up the Joint Venture's affairs, including completion of the aforesaid Contract, and shall liquidate the assets of the Joint Venture as promptly as reasonably possible.

Article 13: Liabilities

13.1 The liability of the Parties under this Agreement shall be joint and several. Notwithstanding the foregoing, as between the Parties, any liability (whether to the Owner or any third party) that the Joint Venture or any Party (including its parental guarantor, if any) may incur arising from or relating to the Contract or the performance of Services, Work, or both, under the Contract or this Agreement shall be allocated as between the Parties in proportion to the Agreed Percentage of Participation of each Party, except as set forth below:

13.1.1 Liability or related losses caused by the negligence, gross negligence, willful misconduct, fraud, or violation of legislation, laws, ordinances, codes or regulations of a Party (including its officers, employees, agents, representatives, and subconsultants and subcontractors at any tier), shall be assumed by such Party;

13.1.2 In the event of a default by a Party, liability or losses sustained by the Joint Venture or the non-Defaulting Parties shall be assumed solely by the defaulting Party;

13.1.3 Liability or related losses resulting from claims made by an employee of a Party against the Joint Venture or each other Party based on the employee-employer relationship, including the payment of unemployment taxes, withholding taxes, and employment benefits, will be solely assumed by the Party by whom such person is employed;

13.1.4 Liability or related losses traceable directly to and caused by a Party (including its officers, employees, agents, representatives, and subconsultants and subcontractors at any tier) shall be assumed by that Party;

13.1.5 In the event of a breach by a Party in the performance of its obligations under this Agreement, liability or losses sustained by the Joint Venture, the non-breaching Party, or both, as a result of such breach shall be assumed solely by the breaching Party; and

13.1.6 Liabilities or related losses relating to third-party claims resulting from Services provided, Work performed, or both, jointly by the Parties (including their respective officers, employees, agents, representatives, and subconsultants and subcontractors at any tier) shall be allocated to each Party in accordance with each Party's respective, relative degree of fault or responsibility, as determined by an allocation of fault pursuant to either an agreement between the Parties or a finding made by the trier-of-fact in a judicial proceeding.

13.2 With respect to the liabilities allocated in Subsections 13.1.1 through 13.1.5 above, the Party to whom such liability is allocated shall defend, indemnify, and hold harmless the Joint Venture and each other Party from any and all such claims, losses, or liabilities set forth in such subsections (including reasonable attorneys' fees). With respect to the liabilities allocated in Subsection 13.1.6 above, each Party agrees to defend, indemnify, and hold harmless the Joint Venture and each other Party from any and all such claims, losses, and liabilities (including reasonable attorneys' fees) that are in excess of such other Party's relative degree of fault or responsibility, as determined by an allocation of fault pursuant to either an agreement between the Parties or a finding made by the trier-of-fact in a judicial proceeding.

13.3 With respect to any claims, losses, and liabilities not covered by Sections 13.1.1 through 13.1.6 above, each Party agrees to defend, indemnify, and hold harmless the Joint Venture and each other Party from any and all such claims, losses, and liabilities (including reasonable attorneys' fees) arising from or related to the Contract or the performance of the Work, Services, or both, under the Contract, or this Agreement that are in excess of such other Party's Agreed Percentage of Participation, irrespective of the contributory fault, negligence, or strict liability of the indemnified Party(ies).

13.4 If a dispute arises between the Parties as to the allocation of liability and/or related losses each Party should bear, each Party shall provisionally assume a share of such liability in proportion to its Agreed

Percentage of Participation until the dispute is resolved.

13.5 For any such claims, losses, and liabilities, the indemnifying Party's obligations regarding any defense thereof include only the reimbursement of the indemnified Party's(ies) reasonable defense costs incurred to the extent of the indemnifying Party's actual indemnity obligations hereunder.

Article 14: Insurance

14.1 The Parties agree that they will acquire all necessary insurance in connection with the award and performance of a Dallas ISD Contract, including but not limited to general liability or professional liability, builder's risk, worker's compensation or any other insurance required under the Contract. [Optional provisions in the alternative, the Parties agree to provide the specific operational insurance coverage as follows:

14.1.1 Workers' Compensation for statutory limits in compliance with the applicable state and federal laws;

14.1.2 Employer's Liability with a limit of $_____;

14.1.3 Commercial General Liability, including Products and Completed Operations, Contractual Liability, and Broad Form Property and Personal Injury Liability, with a combined single limit of $_____ per occurrence and in the aggregate;

14.1.4 Automobile Liability Insurance with a combined single limit of _____ for bodily injury and property damage with respect to vehicles either owned, non-owned, and leased by a Party in the performance of Services under the Contract or this Agreement;

14.1.5 Commercial General Liability Insurance in the amount of _____ per claim and in the aggregate_____.;

14.1.6 Umbrella Liability in excess of (.2), (.3) and (.4) above, with an aggregate limit of _____ if required by the Contract. (Note: limit requirements can be satisfied by any combination of Primary and Excess coverage); and

14.17 Any insurance written on a "claims made" basis shall (a) have a retroactive date of no later than the earlier of the date of this Agreement or the earliest commencement of the Party's Services or Work in relation to the Project and (b) be maintained for at least 3 years after the latest completion of the Services or Work, or termination of the Contract, whichever is later.

14.1.8 Each Party shall endorse its Commercial General Liability, Automobile Liability, Contractor's Pollution Liability and, if applicable, Umbrella insurance policies to provide that the Joint Venture is an additional insured under its policies for that Party's interest in the Joint Venture. The other Party and, if required by the Contract, the Owner, shall also be included as an additional insured. Each Party's Professional Liability insurance policy shall, if necessary, be endorsed to include the liability of the insured arising out of the insured's interest in the Joint Venture.]

14.2 The policies and limits specified by Dallas ISD in the Contract represent the minimum coverage to be carried by each of the Parties hereunder. Notwithstanding the foregoing, if the Contract requires the Joint Venture and/or the Parties to maintain additional coverage and/or increased limits, the Parties shall be required to procure such additional insurance in accordance with the terms of the Contract.

14.3 Each Party hereby waives and shall obtain from all of its Commercial General Liability, Automobile Liability, Contractor's Pollution Liability and, if applicable, Umbrella insurance carriers a waiver of any rights of subrogation against each other Party and their directors, agents, employees, and assignees, with respect

to risks associated with the Services provided, Work performed, or both, pursuant to the Contract.

14.4 Unless noted otherwise or with the written approval of the Management Committee, the cost of any insurance required herein (including any deductibles and self-insured-retention amounts) shall be the responsibility of the Party procuring such coverage.

14.5 The Management Committee, in its discretion, shall be responsible for obtaining insurance for the Joint Venture for management risks such as Directors & Officers Liability, Fiduciary Liability, and any other insurance coverage deemed appropriate by the Management Committee, the cost of which shall be an expense of the Joint Venture.

14.6 Absent written approval from the Management Committee, all lower-tier subcontractors, whether retained directly by the Joint Venture or by a Party to the Joint Venture, shall be required to comply with the provisions of this Article 14.

Article 15: Assignment or Change in Control

15.1 Each Party is entering into this Agreement in reliance upon each other Party being and remaining a party to this Agreement. No Party to this Agreement shall, directly or indirectly, sell, assign, transfer, dispose of, pledge or hypothecate its rights, interest or obligations hereunder, or any part thereof, whether directly or by merger with or acquisition by another entity, in this Agreement, the Joint Venture, the Contract, or in any property or monies of the Joint Venture, except with the prior written consent of each other Party, and, if required by the Contract, with the prior written consent of the Owner. A "Change in Control" shall mean the sale of all or substantially all the assets of a Party; any merger, consolidation or acquisition of a Party with, by or into another corporation, entity or person; or any change in the ownership of more than fifty percent (50%) of the voting capital stock of a Party.

15.2 No Party shall, without the written consent of each other Party, assign, transfer or sublet any claims, causes of action or rights against each other Party arising from or under this Agreement; or any proceeds from claims arising from or under this Agreement or the Contract as security, collateral or the source of payment for any notes or liabilities to any third party; or any control of any claims or causes of action arising from or under this Agreement or the Contract without the written consent of each other Party.

15.3 Any such attempted sell, assignment, transfer, disposal, pledge, hypothecation, or sublet without the written consent of each other Party shall be void and confer no rights upon any third person and shall constitute a default hereunder. The provisions of this Article shall survive the completion or termination of this Agreement for any reason and shall remain enforceable between the Parties.

Article 16: Disputes

16.1 The Parties shall attempt in an amicable manner to adjust and settle any disagreement that may arise between them under or in connection with this Agreement. Any controversy or claim arising out of or relating to this Agreement will first be referred in writing to the Management Committee for its decision.

16.2 In the event any dispute between the Parties is not resolved by the Management Committee, either Party may submit such dispute to the Chief Executive Officer of each Party. Submittal of the dispute shall be in writing and summarize in detail the dispute or contested issues. Upon receipt of the dispute, the receiving Party shall designate within ten (10) days a responsible executive with authority to negotiate a settlement or resolution of any dispute. The Parties designated responsible executives for all Parties shall convene within thirty (30) days of the submittal at such location as the Parties may agree. The responsible executives shall hear such dispute at a time, place, and under such procedural rules as they may specify, and shall act only by unanimous consent. It is the intention of the Parties that the responsible parties shall mutually resolve disputes without litigation. However, nothing herein shall be deemed to require any Party to exhaust this procedure prior to exercising whatever rights it might have at law or equity and any litigation shall be stayed pending exhaustion of this dispute resolution procedure. The Parties recognize the possibility of deadlock from elevating the dispute or controversy to the Chief Executive Officer but intend

that through this mechanism, disputes may be discussed and resolved without the need of litigation.

16.3 If the dispute is not resolved in accordance with Section 16.2 above, the Parties shall submit their disputes to mediation within seven (7) days thereafter or as soon thereafter as may be arranged with the mediator. The Parties shall mutually agree to one mediator. In the event they cannot mutually agree to such a mediator, the mediator shall be selected under the Construction Industry Rules of the American Arbitration Association, unless otherwise agreed between the Parties.

16.4 If mediation is unsuccessful in resolving all disputes between the Parties or the dispute cannot be settled by mediation within sixty (60) days, then the Parties agree to consider the use of binding arbitration to resolve their dispute in the following manner or either Party may file a claim in a court of competent jurisdiction with venue in Dallas County. In the event the Parties agree to resolve their dispute by means of binding arbitration, the Parties shall mutually agree to one arbitrator. In the event they cannot mutually agree to such an arbitrator, one arbitrator shall be selected in accordance with the Construction Industry Rules of the American Arbitration Association, unless otherwise agreed between the Parties. The arbitrator thus selected shall thereafter proceed to ascertain the facts relating to such dispute and to make a determination thereof; the determination of the arbitrator shall be final, binding and conclusive upon the Parties and enforceable at law in a court having jurisdiction over the Party against whom enforcement of the arbitrator's decision is sought to be enforced. The then-current Construction Industry Rules of the American Arbitration Association will be applied.

16.5 Notwithstanding the foregoing, if and to the extent that a dispute between the Parties relates to a claim, controversy or dispute involving the Owner and/or the Contract (such that in the interest of judicial economy and to avoid the possibility of inconsistent judgments, a single dispute resolution proceeding is warranted), then the Parties agree that the dispute resolution provisions in the Contract, if any, shall apply and take precedence over the provisions of this Article 16.

16.6 The Parties shall not allow any dispute to affect or threaten the progress and completion of the Services, Work, or both. Each Party shall remain responsible for the performance of its obligations under this Agreement and the Contract and shall continue to perform and prosecute the Services, Work, or both, as directed by the Project Manager during any dispute resolution process notwithstanding any such dispute.

Article 17: Distributions and Tax Allocations

17.1 Subject to the terms and conditions of this Agreement, including Articles 11 and 12, distributions may be made to the Parties during the term of this Agreement at such times, in such amounts, and subject to such conditions as the Management Committee may from time to time determine.

17.2 Should the Joint Venture make any advances or loans to either Party, then distributions to be made pursuant to Section 17.1 above shall be applied in repayment of such advances or loans, together with interest, until repaid in full, notwithstanding the fact that such advances or loans may not then be due and payable according to the terms of any instrument evidencing such advance or loan.

17.3 No distribution shall be made pursuant to this Agreement if the making of such distribution would create an event of default under any loan agreement, any mortgage, or other security instrument to which the Joint Venture is subject, or otherwise materially adversely affect the ability of the Joint Venture to perform its obligations under any other agreement to which the Joint Venture is subject. Any distribution pursuant to this Article, to the extent not permitted by the previous sentence, shall be deferred until such time as it will not create an event of default or materially adversely affect the ability of the Joint Venture to perform its obligations. If any such distribution can at any time only be made in part, it shall be made to the Parties in proportion to the amounts that would have been paid to them but for this Article 17.

17.4 Except as provided in Section 17.1 above, and except for distributions upon termination or withdrawal as provided herein, the Joint Venture shall make no further distributions.

17.5 Tax Allocations. All gross income, gains, losses, deductions, and credits of the Joint Venture, as

determined for US federal income tax purposes, shall be allocated for such purposes among the Parties in the same proportions as the corresponding items of revenue, gains, losses, and expenses are allocated pursuant to Article 5 above.

17.6 Designation of Tax Matters Partner/Partnership Representative

17.6.1. Designation. The Management Committee shall designated an individual as the Tax Matters Partner within the meaning of IRC §6231(a)(7) as in effect for taxable years beginning on or before December 31, 2017 and the Partnership Representative within the meaning of IRC §6223(a) as in effect for taxable years beginning after December 31, 2017 and shall act in any similar capacity under applicable state, local, or foreign law (in such capacity and hereinafter, the "Tax Matters Partner").

17.6.2. Elections. Except as otherwise expressly provided to the contrary in this Agreement, all tax elections, including federal, state, local, and foreign tax elections, shall be made by the Tax Matters Partner in its sole discretion. To the extent applicable, the Tax Matters Partner will make the small partnership election as described in IRC §6221(b) as in effect for taxable years beginning after December 31, 2017.

17.6.3. Expenses of Tax Matters Partner; Indemnification. The Tax Matters Partner shall be reimbursed for all reasonable expenses, including legal and accounting fees, claims, liabilities, losses, and damages, incurred in connection with any administrative or judicial proceeding with respect to the tax liability of the Parties attributable to this Agreement. The payment of any and all such then-existing expenses shall be made before any distributions are made to each Party. Neither the Tax Matters Partner nor any Party shall have any obligation to provide funds for such purpose.

17.7 Requirement to Prepare and File Tax Return. The Tax Matters Partner shall cause the preparation and timely filing of all tax and information returns required to be filed pursuant to the Internal Revenue Code and all other tax returns deemed necessary and required in each jurisdiction in which the Joint Venture does business. Copies of the returns, or pertinent information from the returns, shall be furnished to the Parties no later than two months before the extended due date of the Joint Venture's federal income tax return. The Tax Matters Partner will direct that any tax imposed upon the partnership be paid by the partnership to federal, state, city or other municipalities as required by law.

17.8 Capital Structure of Joint Venture

Names of Party	Percentage Interests	Capital Contribution
_____	___ %	$_____
_____	___%	$_____
_____	___%	$_____

17.9 Amounts Withheld. All amounts withheld pursuant to the Internal Revenue Code or any provision of any state, local, or foreign tax law with respect to any payment, distribution, or allocation to the Parties shall be treated as amounts paid or distributed, as the case may be, to the Parties. The Joint Venture is authorized to withhold from payments and distributions, or with respect to allocations to the Parties, and to pay over to any federal, state, local, or foreign government, any amounts required to be so withheld

pursuant to the Internal Revenue Code or any provisions of any other federal, state, local, or foreign law, and shall allocate any such amounts to the Parties with respect to which such amount was withheld and shall offset amounts otherwise distributable to such Party.

Article 18: Completion of Project, Division of Profit

Upon completion of the Project, after providing for and paying all costs disbursed or incurred for its performance, and all other costs and charges required by the Contract and ordinarily and usually charged as costs in performance of such a Contract, including payment of all claims not secured by insurance, or by providing proper reserves for any such claims, which shall have either been brought against the Parties or may be reasonably anticipated, and after providing adequate reserves for any other contingency, if any, that shall be determined by the Management Committee to be reasonably necessary; and after repaying all sums advanced by the Parties for working capital, any undistributed profits thereafter remaining, resulting from the performance of the Contract, shall be distributed and divided between the Parties in accordance with their ratable proportion as determined under Articles 5, 7, and 12. Any reserves, when no longer required, or so much thereof as shall remain, shall be similarly distributed.

Article 19: Successors and Assigns

Subject to the foregoing provisions herein contained, this Agreement shall inure to the benefit of, and be binding upon the Parties, their successors, trustees, permitted assigns, receivers, and legal representatives, but shall not inure to the benefit of any other person, firm or corporation.

Article 20: Entire Agreement

20.1 This Agreement constitutes the entire understanding and Agreement between the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous representations, understandings or agreements of any kind, whether verbal or written.

20.2 This Agreement shall not be modified except by written amendment duly executed by authorized representatives of the Parties. Any such written amendments shall be forwarded to the district for review and approval. Each Party has had the opportunity to avail itself of legal advice and counsel. No Party shall be deemed to be the drafter or author of this Agreement. In the event this Agreement is subject to interpretation or construction by a court of law or panel of arbitration, such court or panel shall not construe this Agreement or any portion hereof against either Party as the drafter of this Agreement.

20.3 Failure of a Party to insist upon strict and punctual performance of any terms or conditions of this Agreement shall not be construed to constitute a waiver of, or estoppel against, any other Party later asserting the right to require such performance. Neither shall a waiver or estoppel in one instance constitute a waiver or estoppel with respect to a later default, whether similar or dissimilar in nature.

20.4 If any provision of this Agreement is held invalid or unenforceable by any court of competent jurisdiction, the other provisions of this Agreement will remain in full force and effect.

Article 21: Confidential Information

21.1 Subject to any applicable requirements of the Contract, 1) information relating to this Agreement or the Contract which is gathered, exchanged, or otherwise obtained by the Parties during the term of this Agreement shall be maintained in confidence and shall not be utilized except for purposes in furtherance of this Agreement and the exercise of rights, obligations, duties, and privileges set forth herein; and 2) such information will not be disclosed to any third parties or to a Party's own personnel except where there is good faith need to know; provided however, that no Party shall be liable for any utilization or disclosure if the information falls into any of the following categories:

21.1.1. Information which at the time of disclosure is or thereafter becomes within the public

domain other than by reason of the disclosing Party's breach of this Agreement.

21.1.2. Information that prior to disclosure hereunder was already in the recipient's possession and was not the subject of any confidentiality obligation of the disclosing Party.

21.1.3. Information which, subsequent to disclosure hereunder, is obtained by the disclosing Party from a third party lawfully in possession of such information and which information is not subject to a confidentiality obligation.

21.2 For the purposes of this Agreement, specific information disclosed shall not be deemed to be in the public domain or in the prior possession of the disclosing Party merely because it is embraced by more general information in the public domain or by more general information in the prior possession of the Party.

21.3 Nothing herein shall be construed as giving a Party any right, title, interest in, or ownership of information, or any portion thereof, that is now or is hereafter covered by any patent or license. The Parties' rights in respect thereof shall be subject to all rights of the patent owner and/or licensor.

21.4 A Party shall not be restricted in releasing information in response to a subpoena, court order, or similar legal process, but shall, if not restricted under a subpoena, court order, or similar legal process, promptly notify each other Party of the request or order for information before responding to same and provide each other Party with a copy thereof so that each other Party may take such action as it deems appropriate to protect its information.

21.5 Except as otherwise provided herein or in the Contract, engineering documents, drawings, and specifications prepared by a Party as part of the Services, Work, or both, shall be the property of the Party preparing same. A Party shall retain all right, title, and interest in its standard drawings and details, designs, specifications, databases, computer software and any other proprietary property ("Party Data"). To the extent the work product contains or requires the use of Party Data by any other Party, the owning Party hereby grants to the other Party(ies) a non-exclusive, non-transferrable and royalty free license to use such Party Data solely for the purposes for which the work product was developed under the Contract.

21.6 The confidentiality obligations provided in this Article 21 shall survive the termination or expiration of this Agreement and remain binding upon the Parties for two (2) years following the termination of this Agreement or completion of the Contract, whichever is later.

21.7 No news release, including photographs and films, public announcement, denial, or confirmation shall be made by a Party concerning the subject matter of this Agreement without first obtaining the consent of each other Party and, if applicable, the Owner.

Article 22: Applicable Law

This Agreement shall be governed and construed in accordance with the laws of the State of Texas, without reference to its conflict of laws principles.

Article 23: Miscellaneous

23.1 Records; Generally. Each Party agrees to keep accurate and complete cost, correspondence, and other records related to this Agreement. Each Party further agrees to make such records available to each other Party upon ten (10) calendar days' written notice. The joint venture parties agree to maintain records showing the subcontractor/supplier awards, subcontractor payment history, efforts to identify and award contracts to M/WBEs, and copies of executed contracts with M/WBEs. The joint venture parties agree to provide access to books, records and accounts to authorized district, state and federal officials for the purpose of verifying M/WBE participation and good faith efforts.

23.2 Financial Records.

23.2.1 All financial records and proprietary or confidential information of each Party to which the Joint Venture or the other Party(ies) has/have access shall be held and retained by the Joint Venture and such other Party(ies) in strict confidence and not be disclosed without the prior written consent of the Party to whom such records or information belong.

23.3 Other Business Activities. During the term of this Joint Venture, each of the Parties may, and shall be free to, participate and engage in any other business activities, subject to any applicable organizational and personal conflict of interest rules or regulations. Nothing in this Agreement shall restrict, or be construed as a limitation of the powers or rights of any Party hereto to pursue other unrelated opportunities or Projects at the District or enter into other joint venture arrangements for its sole benefit independent of the solicitation the subject of this Agreement.

23.4 Notice. Any notice required or permitted to be given under this Agreement shall be deemed served if sent by registered mail, personal delivery, or other means whereby receipt is acknowledged to the following addresses or such other addresses as the Parties may designate:

For _____ _____
_____
Attention: _____
Telephone: _____

For _____: _____
_____
Attention: _____
Telephone: _____

For _____: _____
_____
Attention: _____
Telephone: _____

23.5 Waiver of Consequential Damages. No Party shall be liable to the other Parties for any special, indirect, punitive, exemplary, incidental, or consequential damages of any nature, including loss of actual or anticipated profits or revenues, loss of opportunity, loss by reason of shutdown, non-operation, increased expense of manufacturing or operation, loss of use, cost of capital, damage to or loss of property or equipment, or claims of customers, regardless of whether due to or based upon contract, tort, negligence, or strict liability. The foregoing limitation of liability shall not apply to third party claims for which a Party is otherwise entitled to indemnity under this Agreement.

23.6 Nothing in this Agreement shall be deemed to create any right in anyone not a party and this Agreement shall not be construed in any respect to be a contract in whole or in part for the benefit of anyone not a party.

23.7 Counterparts. This Agreement may be executed in one or more counterparts, each of which will be deemed to be an original copy of this Agreement and all of which, when taken together, will be deemed to constitute one and the same agreement.

23.8. Recruitment of Employees. The Parties acknowledge the value of team performance and trust, both of which could be adversely impacted by movement of employees from one Party to another Party. Accordingly, the Parties agree that they will not initiate efforts aimed at hiring the other Parties personnel that are actively engaged in activities covered by this Agreement without prior consent of the other Party. Should an employee of one Party become an employee of another Party, that individual shall be barred from working on activities covered by the Agreement for a period of not less than twenty-four (24) months. The Management Committee may waive the 24-month period at its discretion. This section shall not restrict

the right of a Party to solicit generally in the media or other sources for required personnel nor prevent the hiring of an employee of one Party who independently seeks employment with another Party without personal solicitation by the other Party.

23.9 Representations, Warranties, and Covenants. Each Party represents, warrants, and covenants to each other Party, as of the Effective Date, as follows:

23.9.1 It is a duly organized and validly existing corporation in good standing under the laws of the state in which it is incorporated or formed; it is duly qualified to do business in each jurisdiction in which the nature of the business transacted by it requires such qualifications; it has all corporate powers as may be required to conduct its business and carry out the transactions contemplated hereby;

23.9.2 The execution and delivery of this Agreement and the performance by it of the transactions contemplated hereby have been duly authorized by all necessary corporate action and this Agreement constitutes a legal, valid, and binding obligation enforceable in accordance with its terms;

23.9.3 It has, and at all times during the term hereof shall maintain, all governmental authorizations necessary to perform its obligations under this Agreement and the Contract; and

23.9.4 There is no action, suit, proceeding, claim, or dispute pending or, to its knowledge, threatened against or affecting it or its assets before any governmental body that is reasonably expected to have a material adverse effect on it or its ability to perform its obligations under this Agreement or the Contract.

23.10 Marketing Efforts. The Parties acknowledge that marketing efforts related to the Contract need to be coordinated by and between the Parties. The Project Manager will be responsible for coordinating any such efforts. All marketing efforts directly associated with the Contract or this Agreement shall be coordinated through the Project Manager, who will decide whether a proposed Owner visit, or other marketing effort is necessary or appropriate.

23.11 Survival. The provisions of this Agreement which by their nature are intended to survive the termination or dissolution of the Joint Venture, including indemnities and any expressed limitations of or releases from liability, shall continue as valid and enforceable obligations of the Parties notwithstanding any such termination or dissolution.

Article 24: Compliance

24.1 Management Systems. Each Party shall use its own management systems to conduct and record its business for the Joint Venture. Such systems shall, at a minimum, include the following components: financial management, accounting, MWBE subcontractor payment tracking, procurement, property control, estimating, and contract administration. All management systems must comply with any applicable Contract requirements.

Article 25: Anti-Bribery and Anti-Corruption Laws

25.1 No Party shall, directly or indirectly, undertake nor cause nor permit to be undertaken any activity that:

25.1.1 is illegal under applicable law or regulation; or

25.1.2 would have the effect of causing the Joint Venture or the Parties or their respective subsidiaries or affiliates to be in violation of the applicable laws or regulations, including the U.S. Foreign Corrupt Practices Act or the UK Bribery Act, as applicable.

25.2 In connection with this Agreement, no Party shall give, offer, promise, or authorize, directly or indirectly, anything of value to:

25.2.1 an official, officer, employee or any other person acting in an official capacity for or on behalf of any government (including any department, agency, or instrumentality thereof), state-owned enterprise, international organization, or any subdivisions, agents or advisors thereto, whether paid or unpaid (any such person referred to collectively as "Official"), including the government(s) of the territories in which work will be performed hereunder;

25.2.2 any person(s) or party(s) while knowing or having reason to know that such thing of value is to be given, offered, or promised to an Official in order to:

25.2.2.1 influence any official act or decision, or;

25.2.2.2 induce an Official to do or omit to do any act in violation of his or her lawful duty, or;

25.2.2.3 induce an Official to use his or her influence to affect or influence a decision or act of any government, instrumentality, or international organization, or;

25.2.2.4 assist the joint venture or the Parties hereto or any other person in obtaining or retaining business for or with, or in directing business to the Parties or any other person, or;

25.2.2.5 obtain or secure an unfair or improper advantage for the joint venture or the Parties in any respect.

25.3 In connection with this Agreement, no Party shall make a contribution or give, offer, promise or authorize, directly or indirectly, anything of value to any political party, official of a political party or candidate for office on behalf of or associated with the joint venture or the Parties or in connection with the purpose of this Agreement or the contract with the Owner.

25.4 In connection with this Agreement, no Party shall engage in any acts of bribery, kickback or other improper inducement, including bribery of a person in the private sector. Without limiting the generality of the foregoing, no Party shall give, offer, promise or authorize, either directly or indirectly, a financial or other advantage to any person to induce a person to perform improperly a relevant function or activity or to reward such improper performance or where the Party knows or believes that the acceptance of the advantage in itself constitutes the improper performance of a relevant function or activity.

25.5 No Party shall subcontract any part of the Services nor retain or engage a consultant to carry out sales or marketing obligations in connection with the scope of this Agreement without obtaining the JV Management Committee's prior written consent. The Joint Venture Management Committee shall have the right, in accordance with this Agreement, to reject a request to engage or retain any such consultant.

25.6 The Parties hereby covenant that neither they nor any of their respective officers, directors, agents or representatives or employees assigned to the Project an employee of the Owner or any governing body having jurisdiction over the Project. The Parties further covenant that no Official, political party official, or candidate for political office is deriving any benefit, directly or indirectly, from this JV Agreement. The Parties agrees to notify the Joint Venture Management Committee immediately of any changes to this covenant.

25.7 In no case shall any Party be obligated to take any action or make any payment to any other Party or anyone else that would cause the Joint Venture or the Parties to suffer a penalty or contravene applicable laws or regulations, including the laws of the territories in which work will be performed and those of the United States.

25.8 Notwithstanding any other provisions of this Agreement, if any Party breaches any of the covenants contained in this section, the other Parties shall have the right to immediately terminate this Agreement without penalty. In such instance, the breaching Party shall indemnify the other Parties and the Joint Venture for any penalties, losses, and expenses resulting from such breach of the provisions of this section.

25.9 Each Party agrees to promptly notify the Management Committee and the other Parties in the event it becomes aware of or discloses any potential violation of Anti-Bribery Laws in connection with this Agreement. In addition, a Party shall be in default of this Agreement if such Party is (i) found to have violated Anti-Bribery Laws by a governmental body empowered to make such a finding, or (ii) the subject of a governmental investigation involving violations of Anti-Bribery Laws in connection with this Agreement and the other Parties (that are not a target of such investigation), in their reasonable discretion, believe that the on-going investigation materially impairs the ability of the Joint Venture to provide the Services, perform the Work, or both, and/or complete the Contract.

[SIGNATURES ON THE FOLLOWING PAGE]

NOTARY REQUIRED

IN WITNESS WHEREOF, the Parties have caused this Agreement to be signed by their duly authorized representatives, in duplicate counterparts, each having the same effect, as of the date and year first above written.

Signature: _____

Name: _____

Title: _____

Date: _____

Signature: _____

Name: _____

Title: _____

Date: _____

Signature: _____

Name: _____

Title: _____

Date: _____

EXHIBIT A

Scope of Services

Identify the distinct, clearly defined portion of the work provided by each M/WBE joint venture partner. The work must be separate, clear and distinguishable. Specify the nature of the work and what it will entail. Describe the portion of the work or elements controlled by the M/WBE joint venture partner. Provide the estimated value of those services commensurate with the percentage ownership interest.

(1) General Description of Work to be Performed by the Joint Venture:

(2) Division of Work and Allocation of Responsibilities:

EXHIBIT B

Project Management Staffing Plan

Provide a staffing plan to be determined per the established participation percentages. Provide information relating to the approximate number of employees that will be required to perform the scope of work. Specify the number of employees to be provided by the M/WBE joint venture partner(s), titles, resumes and job responsibilities.

EXHIBIT C

Letter from Financial Institution or Bonding Surety Company

6.3 Provide documentation to substantiate the financial strength or bonding capacity of each M/WBE joint venture partner(s). This document should be commensurate of each M/WBE joint venture partner(s) percentage split. *Or* Provide an Up-Front Joint Agreement (SAA Form #1), and an executed copy of the indemnity agreement signed by all Parties associated with the SAA Form #1.

Company Name: _____ **Bid/CSP No.:** _____

Small Business Enterprise Program

It is the district's goal to foster the participation of small business enterprises in all facets of the district's contracting and purchasing activities. The district's aspirational small business enterprise (SBE) goal is 30% of the total dollar value of all district contracts for goods, services, and construction. For bond-funded contracts, the district's aspirational SBE goal for construction is 30% and 35% for professional services.

Pursuant to Section 3 of the Small Business Act and Small Business Administration Regulations (13 CFR Part 121), a small business enterprise is defined as a for-profit business that is independently owned and operated and meets the size standards set by the U.S. Small Business Administration (SBA).

For more details, including SBA size standards, please visit the Small Business Office website: www.dallasisd.org/sbo.

SECTION 1. | SMALL BUSINESS CERTIFICATION INFORMATION

Is your company certified as a ☐ 8(a) Certification ☐ Service-Disabled Veteran-Owned Small Business (SDVOSB) ☐ Small Business Enterprise (SBE) ☐ Veteran-Owned Small Business (VOSB) ☐ Woman-Owned Small Business (WOSB) by one of the Dallas ISD approved certification agencies listed below?

☐ No

☐ Yes, *if yes, please provide the information below and attach a copy of your certificate.*

Certification Agency	
Certification Number	
Certification Expiration Date	
Did You Attach Your Certificate?	☐ Yes ☐ No

Approved Certifications:

- 8(a) Certification
- Service-Disabled Veteran-Owned Small Business (SDVOSB)
- Small Business Enterprise (SBE)
- Veteran-Owned Small Business (VOSB)
- Woman-Owned Small Business (WOSB)

Approved Certification Agencies:

- Cherokee Tribal Employment Rights Office
- Chickasaw Nation
- Choctaw Nation of Oklahoma
- City of Austin
- City of Houston
- Corpus Christi Regional Transportation Authority
- Dallas/Fort Worth Business Council
- Muscogee Nation
- National Supplier Development Council
- North Central Texas Regional Certification Agency
- Small Business Administration
- South Central Texas Regional Certification Agency
- Texas Department of Transportation
- Texas Comptroller of Public Accounts
- Women's Business Council Southwest
- Women's Business Enterprise National Council

SECTION 2. | SMALL BUSINESS OFFICE SCORING CRITERIA

The scoring criteria provides guidance on how your submission will be evaluated by the Small Business Office (SBO). Scores are based on the information provided in the compliance guidelines and forms. All master agreements must be signed by all parties and notarized.

A.	**SBE Enhancements and Capacity Building**	**Up to 3 Points**

The proposer demonstrates commitment to the district's Small Business Enterprise (SBE) Program by implementing processes and initiatives that support and build SBE capacity. Responses should describe current strategies and activities that promote SBE growth, development, and long-term participation in district contracts, with supporting documentation provided. Examples may include, but are not limited to:

- Expedited payments to SBEs to support cash flow
- Business development programs, such as coaching, mentoring, or mentor-protégé partnerships
- Early release of retainage to assist SBEs with project sustainability
- Expanding opportunities for certified subcontractors, particularly firms that have not conducted business with the district within the past five (5) years
- Outreach activities designed to strengthen SBE engagement, such as workshops, trainings, networking sessions, or one-on-one consultations

B.	**SBE References**	**Up to 2 Points**

The proposer has provided a list of two (2) SBE subcontractor references (*not required to be certified*) that have previously performed work for them. Please provide the most current information. Only two (2) attempts will be made to contact each reference. Section 5, Page 4

C.	**Certified SBE | Joint Venture /Prime Subcontractor Teaming Agreement**	**Up to 5 Points**

- The proposer is a certified SBE (Section 1, Page 2); **or**
- The proposer has submitted a signed, dated & notarized Dallas ISD Master Joint Venture Agreement **or** Dallas ISD Master Prime Subcontractor Teaming Agreement with a certified SBE

D.	**SBE Subcontractor Utilization**	**Up to 5 Points**

- Proposer has provided a list of certified SBE subcontractors, subconsultants, or suppliers that will be utilized to meet or exceed the district's aspirational SBE goal of 30% for goods, services and construction. Section 7, Page 5 **or**
- Good Faith Effort. Proposer has demonstrated a bona fide good faith effort to engage certified SBEs toward the 30% aspirational goal. Section 10, Page 7

Note: A Change of Subcontractor Form may be found at www.dallasisd.org/sboforms

E.	**SBE Participation Plan**	**Up to 5 Points**

Proposers intending to utilize SBE-certified subcontractors to meet the district's Small Business Enterprise participation goals may submit a detailed SBE Participation Plan. This plan should demonstrate your company's commitment to meaningful utilization of SBEs and provide clear procedures for oversight, compliance, and accountability.

The plan should address how you will implement the following:

- Engage and collaborate with your proposed SBE-certified subcontractors
- Identify the individual responsible for SBE compliance and oversight
- Ensure that all proposed subcontractors are utilized as committed
- Meet or exceed your proposed SBE commitment
- Obtain approval from the Small Business Office prior to making any changes.
- Submit proof of certified SBE subcontractor payments monthly in B2G Compliance Audit Summary

Note: A Change of Subcontractor Form may be found at www.dallasisd.org/sboforms

Total Possible Points	**Up to 20 Points**

SECTION 3. | JOINT VENTURE

Are you bidding as a Joint Venture (JV)?

☐ Yes [Visit www.dallasisd.org/sboforms for instructions on how to bid as a Joint Venture for CSP].
The Dallas ISD Master Joint Venture Agreement must be signed, dated, notarized, and attached with your response.

☐ No

SECTION 4. | PRIME-SUBCONTRACTOR TEAM

Are you bidding as a Prime-Subcontractor Team?

☐ Yes [Visit www.dallasisd.org/sboforms for instructions on how to bid as a Prime-Subcontractor Team for CSP].
The Dallas ISD Master Prime-Subcontractor Teaming Agreement must be signed, dated, notarized, and attached with your response.

☐ No

SECTION 5. | SBE REFERENCES

List two (2) small business enterprise subcontractors *(not required to be certified)* that have performed work for your company. *Provide the most current information. Only two (2) attempts will be made to contact your references.*

Company Name	
Contact Person	
Email	
Phone Number	
Project Name	

Company Name	
Contact Person	
Email	
Phone Number	
Project Name	

SECTION 6. | MENTOR PROTEGE

Does your company participate in a Mentor Protégé Program as a mentor to an SBE company?

☐ Yes [If yes, attach a signed, dated, notarized copy of the Mentor Protégé Agreement, notarized minutes, and any supporting documents. It is the responsibility of the mentor to create and provide the agreement.
The Mentor Protégé Agreement must be attached with your response.]

☐ No

SECTION 7. | SUBCONTRACTOR UTILIZATION

Will you utilize any subcontractors, subconsultants or suppliers as part of this bid/proposal?

☐ Yes [Complete Sections 8 and 9]

☐ No

SECTION 8. | SUBCONTRACTOR COMPLIANCE REPORTING

The Small Business Office utilizes B2G Now, a Contract Compliance System, to monitor monthly compliance reporting. Please identify the individual responsible for entering and maintaining subcontractor payment information in the B2G Now system and who is knowledgeable about Small Business Enterprise (SBE) utilization for this project.

Contact Person:	
Title:	
Email:	
Phone:	

SECTION 9. | SUBCONTRACTOR LISTING

List all subcontractors, suppliers, subconsultants, or sole proprietors that will be utilized in this bid/proposal. Attach a copy of the current certification for each certified subcontractor.

Only certified small business enterprises (SBE) subcontractors, suppliers, subconsultants, or sole proprietors will be counted towards the small business enterprise goals.

Need to include more subcontractors? You may make copies of Page 6 or complete a Subcontractor Utilization Listing Form, available at www.dallasisd.org/sboforms

Subcontractor/Supplier Information | Complete All Fields Below							
Company's Name							
Address							
City				State		Zip	
Contact's Name	First Name		Last Name				
Phone		Email					
SBE	☐ 8(a) ☐ SDVOSB ☐ SBE ☐ OSB ☐ WOSB			Certified SBE	☐ Yes ☐ No		
Certification Agency				Certification #			
Scope of Work							
Contract Amount	$				SBE %		%

DALLAS INDEPENDENT SCHOOL DISTRICT

Company Name: _____ **Bid/CSP No.:** _____

Subcontractor/Supplier Information | Complete All Fields Below							
Company's Name							
Address							
City			State		Zip		
Contact's Name	First Name		Last Name				
Phone		Email					
SBE	☐ 8(a) ☐ SDVOSB ☐ SBE ☐ VOSB ☐ WOSB		Certified SBE	☐ Yes ☐ No			
Certification Agency			Certification #				
Scope of Work							
Contract Amount	$				SBE %		%

Subcontractor/Supplier Information | Complete All Fields Below							
Company's Name							
Address							
City			State		Zip		
Contact's Name	First Name		Last Name				
Phone		Email					
SBE	☐ 8(a) ☐ SDVOSB ☐ SBE ☐ VOSB ☐ WOSB		Certified SBE	☐ Yes ☐ No			
Certification Agency			Certification #				
Scope of Work							
Contract Amount	$				SBE %		%

Subcontractor/Supplier Information | Complete All Fields Below							
Company's Name							
Address							
City			State		Zip		
Contact's Name	First Name		Last Name				
Phone		Email					
SBE	☐ 8(a) ☐ SDVOSB ☐ SBE ☐ VOSB ☐ WOSB		Certified SBE	☐ Yes ☐ No			
Certification Agency			Certification #				
Scope of Work							
Contract Amount	$				SBE %		%

Failure to complete, sign, date and return these forms will result in a zero numerical SBE score.

SECTION 10. | GOOD FAITH EFFORT

Vendors are not required to submit Good Faith Effort documentation if certified SBE subcontractors are listed in Section 9, Pages 5–6 of these forms.

The Good Faith Effort (GFE) Program provides an opportunity for prime vendors who plan to use only non-certified SBE subcontractors to demonstrate their collaborative efforts to engage and include Small Business Enterprises (SBEs) in the project.

To qualify, the vendor must show that a reasonable and comprehensive effort was made to identify, solicit, and engage qualified SBE subcontractors. The submission should include sufficient documentation supporting these efforts, such as outreach records, communications, or other engagement activities.

The GFE criteria allows Dallas ISD to determine whether a prime vendor has made a bona fide good faith effort to meet SBE aspirational goals. Vendors who do not demonstrate a good faith effort may forfeit up to 5 points, as outlined in Scoring Criteria Section D, Page 3 of the SBE forms.

For additional explanation view the Good Faith Elements and Required Documentation form by visiting www.dallasisd.org/sboforms.

The good faith elements and point assignments are:

Good Faith Element	**Points**
Advertising and marketing opportunities to SBEs	5 Points
Providing outreach opportunity to identify qualified SBEs	15 Points
Participating in the pre-bid meeting to engage potential SBE subcontractors	5 Points
Providing timely written notice to qualified SBEs at least two weeks before bid opening	30 Points
Providing sufficient time for SBEs to prepare and submit competitive bids	10 Points
Soliciting work scopes that are feasible for SBEs to perform	10 Points
Negotiating in good faith with qualified SBEs	15 Points
Offering help with financing, bonding, insurance, certification, or mentoring to SBEs	10 Points
Total	**100 Points**

SECTION 11. | ONLINE RESOURCES

The following forms and information can be found by visiting www.dallasisd.org/sboforms

- Certified SBE Listing Request Form
- Change of Subcontractor Form
- Dallas ISD Master Joint Venture Agreement
- Dallas ISD Master Prime-Subcontractor Teaming Agreement
- Frequently Asked Questions (FAQ)
- Good Faith Effort Explanation and Required Documentation
- Instructions on Completing the SBE Forms
- Letter of Intent to Subcontract Form *(to be submitted after contract is awarded)*
- Pay Activity Report (PAR) *(to be submitted after contract is awarded)*
- SBE Compliance Guidelines and Forms for Goods and Services - Fillable
- Subcontractor Utilization Listing Form (Section 8)

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

A101

DRAFT **AIA® Document A101™ – 2017**

Standard Form of Agreement Between Owner and Contractor
where the basis of payment is a Stipulated Sum

AGREEMENT made as of the XX day of XXXXX in the year 20XX
(In words, indicate day, month and year)

BETWEEN the Owner:
(Name, , address and other information)

The Dallas Independent School District, a political subdivision of the State of Texas
Dallas, Texas
9400 North Central Expressway
Dallas, Texas 75231

and the Contractor:
(Name, , address and other information)

<<GC Company Name>>
<<GC Address>>
<<GC City/State/Zip>>
(###) ###-#### Phone

The Work, unless otherwise expressly stated, shall be considered as a single project (whether one or more campuses or facilities) and is generally described as follows:(Name and location)

<<BP# XXX:>>
<<ORG #XXX XX Elementary School>>
<<ORG Address>>
<<Dallas, Texas 75XXX>>

The Architect is:
(Name, address and other information)

<<A/E Company Name>>
<<A/E Address>>
<<A/E City/State/Zip>>
(###) ###-#### Phone

The Program Manager is:
(Name, address and other information)
<<Insert PMF Company Name>>
3801 Herschel Avenue
Dallas, TX 75219

The Owner and Contractor agree as follows.

Version 3/25/2022 FINAL

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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ARTICLE 1 THE CONTRACT DOCUMENTS

§ 1.1 The Contract Documents consist of this Agreement between Owner and Contractor, A101-2017, as amended (hereinafter the "Agreement"); Conditions of the Contract, as amended (General, Supplementary, and other Conditions, including but not limited to A201-2017, as amended); Contractor's proof of Payment and Performance Bonds and proof of insurance; all sections of the Project Manual and Construction Documents, Drawings, Specifications, Geotechnical Reports, Addenda issued prior to receipt of bids or proposals; other documents listed in this Agreement, and Modifications issued after execution of this Agreement. The Contract Documents form the Contract for Construction (the "Contract"), and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated written agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other thanModifications, appears in Article 9. Any reference to Contract Documents or any documents included in the Contract Documents and/or supplemented for this Project, shall refer to the Contract Documents as amended for this Project. This Agreement may not be amended or revised except by written agreement signed by the Owner and Contractor.

"Construction Documents" means: all Drawings, specifications, submittals, transmittals, deliverables, instructions to Contractors, and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants and which set forth in detail the requirements for construction of the Project.

§ 1.2 This Agreement represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations or agreements, either written or oral. Any revision, amendment, or modification to the Standard Form of this Agreement shall be valid, binding, and enforceable only if said revision, amendment or modification is made conspicuous by being underlined, lined-through, or highlighted in this Agreement signed by Contractor and the authorized representative of Owner's Board of Trustees. In the event of conflict, terms and conditions contained in the Agreement shall take precedence over terms and conditions contained in the General Conditions and the terms and conditions in the General Conditions shall take precedence over all other terms and conditions contained in the other Contract Documents. If the Request for Proposals and the Proposal are included in the Contract Documents, then the Request for Proposals shall take precedence over the Proposal, unless specifically agreed otherwise herein.

§ 1.3 The Board of Trustees, by majority vote, is the only representative of the Owner, an independent school district, having the power to enter into or amend a contract, to approve changes in the scope of the Work, to approve and execute a Change Order or Construction Change Directive modifying the Contract Sum, or to agree to an extension to the date of Substantial or Final Completion or to terminate a contract. The Owner designates the following as the individual authorized to sign documents on behalf of the Board of Trustees, following appropriate Board action: *(insert name and title of designee)* _____, or other Board designee.

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§ 1.4 The Board designates the authorized representatives identified in Paragraph 8.3 to act on its behalf in other respects.

ARTICLE 2 THE WORK OF THIS CONTRACT

Unless otherwise provided in these Contract Documents, the Contractor shall be responsible for performing or causing to be performed all Work including labor and materials, necessary to build, construct, erect and equip in accordance with the Contract Documents except to the extent specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[« X »] A date set forth in a notice to proceed issued by the Owner.

The Agreement, including Conditions of the Contract, as well as all other Contract Documents that require signature of the Parties, including the A201-2017, as amended, must be signed first by the Contractor's representative. The Contractor shall have five days from receipt of the documents requiring signature from the Owner to sign the Agreement and all other Contracts requiring signature to return to the Owner the signed documents along with proof of insurance and the Payment and Performance bonds. Once Owner has approved of the Contracts and the proof of insurance and the Payment and Performance bonds, Owner shall sign the Agreement and all other Contract Documents requiring signature of the parties. When Owner has signed and approved all required documents, District shall issue a Notice to Proceed to Contractor.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

»

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute and achieve Substantial Completion of the entire Worknot later than the Substantial Completion Date. The period for reaching the Substantial Completion Date shall begin to run from the Commencement Date and shall not include the Commencement Date. For additions and renovations the Substantial Calculation Date shall be established with the number of calendar days required to substantially complete the work, unless otherwise provided. For new schools the Substantial Completion Date shall be a specific date, unless otherwise provided.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents,

Portion of Work	Substantial Completion Date
Full	<<NTP + X CALENDAR DAYS>>

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 Subject to additions and deletions and other provisions in the Contract Documents, the Owner agrees to pay the Contractor for the Contractor's performance of the contract the following amount for construction and completion of the Work: **XXXXX DOLLARS AND XX CENTS** ($ 0.00).

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§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
See Exhibit "A" attached	

§ 4.2.2 [Paragraph Deleted].

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price
See Exhibit "C" attached	

§ 4.3.1 Owner Controlled Contingency Allowance:
All construction contracts shall contain a contingency allowance. The Owner Controlled Contingency Allowance is to be used only for expenditures which do not require a Change Order. The Owner Controlled Contingency Allowance may be used to pay for changes in the Work, including but not limited to those resulting from hidden or unforeseen conditions. The Owner Controlled Contingency Allowance may be used to pay claims. Use of the Owner Controlled Contingency Allowance must be authorized in advance by the Superintendent of Schools or designee.
XXXXX DOLLARS AND XX CENTS ($ 0.00).

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)
See Exhibit "B" attached		

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)« **§ 4.5.1 Substantial Completion.** Time is of the essence in all phases of the Work. It is specifically understood and agreed by and between Owner and Contractor that time is of the essence in the Substantial Completion of the Project and Owner shall sustain damages as a result of Contractor's failure, neglect or refusal to achieve said deadlines. Such damages are, and will continue to be, impracticable and extremely difficult to determine. Execution of this Agreement under these specifications shall constitute agreement by Owner and Contractor that the amounts stated below are the minimum value of the costs and damages caused by failure of Contractor to complete the Work within the allotted or agreed extended times of Substantial Completion, that such sums are liquidated damages and shall not be construed as a penalty, and that such sums may be deducted from payments due Contractor if such delay occurs. It is expressly understood that the said sum per day is agreed upon as a fair estimate of the pecuniary damages which will be sustained by the Owner in the event that the Work is not completed within the agreed time, or within the agreed extended time, if any, otherwise provided for herein. Said sum shall be considered as liquidated damages only and in no sense shall be considered a penalty, said damages being caused by, but not limited to, additional compensation for personnel, attorneys fees, architectural fees, engineering fees, program management fees, inspection fees, storage costs, food service costs, transportation costs, utilities costs, costs of temporary facilities, loss of interest on money, and other increased costs, all of which are difficult to exactly ascertain. Failure to complete the Work within the designated or agreed extended dates of Substantial Completion, shall be construed as a breach of this Agreement. It is expressly agreed as a part of the consideration inducing the Owner to execute this Agreement that the Owner may deduct from any Payment made to the Contractor a sum equal to

XXXXX DOLLARS AND XX CENTS ($ 0.00) **/ Day)**

per day for each and every additional calendar day beyond the agreed date of Substantial Completion.

§ 4.5.2. Final Completion. Timely final completion is an essential condition of this contract. Contractor agrees to achieve final completion of the Work within 60 days of the designated or extended substantial completion date. Final completion means actual completion of the Work, including any extras or Change Orders reasonably required

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or contemplated under the Contract Documents other than warranty work as further defined in the Form of Contractor's Final Completion Notice attached hereto and incorporated herein as **Exhibit "D"**.

»

§ 4.6 Other Allowances, if any, are as follows:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

See Exhibit "C" attached

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month.

« »

§ 5.1.3 The Contractor shall concurrently submit monthly Applications for Payment to the Architect and Program Manager on AIA Form G702 for approval. Continuation sheets shall be submitted on AIA Form G703. If the Architect and Program Manager approve the application, then Architect shall submit a Certificate for Payment to the Owner. The Architect and Program Manager may require any additional information deemed necessary and appropriate to substantiate the Application for Payment. Materials that are verified to be on the jobsite or other approved location for use in the Project may also be incorporated into the Application for Payment. The Architect shall have seven (7) days from date of receipt from the Contractor of an Application for Payment to approve or reject all or any part of the Application for Payment. The Owner shall pay the undisputed amounts certified by the Architect and approved by the Program Manager and Owner to the Contractor within _____ (_30__) days of receipt of the Certificate for Payment from the Architect unless otherwise provided in the Contract Documents. Undisputed amounts unpaid after the date on which payment is due shall bear interest pursuant to Texas Government Code Section 2251.025.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum, less any unused Owner's contingency, among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect and Program Manager may require. This schedule of values, unless objected to by the Architect and Program Manager,shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, as amended, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values; and

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing.

.3

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

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.2 The amount, if any, for Work that remains uncorrected and for which the Architect and Program Manager has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017, as amended;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017, as amended, or amounts certified by the Architect and disputed by the Owner; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner shall withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«_Five Percent (__5__%) »

If Owner is entitled to deduct liquidated damages, or any other damages or amounts provided in the Contract Documents, including clean-up fees, then Owner shall be entitled to deduct such liquidated damages, amounts and fees at any time. If Contractor fails or refuses to complete the Work, or has unsettled claims with Owner, any payment to Contractor shall be subject to deduction for such amounts as the Architect, if applicable, shall determine as the cost for completing incomplete Work and the value of unsettled claims.

§ 5.1.7.1.1 [Paragraph Deleted.]

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

«NONE. »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Final Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7.

§ 5.1.8 [Paragraph Deleted.]

§ 5.1.9 Except with the Owner's prior written approval, ~~or as otherwise provided in Section 9.3.2 of the AIA Document A201-2017,~~ the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.10 If Contractor fails or refuses to complete the Work, or has unsettled claims with Owner, any payment to Contractor shall be subject to deduction for such amounts as the Architect if applicable, shall determine as the cost for completing incomplete Work and the value of unsettled claims.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, minus disputed sums, authorized deductions and liquidated damages, shall be made by the Owner to the Contractor after

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct nonconforming Work as provided in Article 12 of AIA Document A201–2017 as amended, and to satisfy other requirements, if any, which extend beyond final payment;

.2

.3 a final Certificate for Payment has been issued by the Architect and approved by the Program Manager; and

4. Dallas ISD Board of Trustees has voted to accept the Work and approve the Final Payment.

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§ 5.2.2 The Owner's final payment of undisputed sums to the Contractor shall be made no later than 30 days after Dallas ISD Board of Trustees' vote approving Final Payment.

§ 5.3 Interest
Payments due and unpaid under the Contract shall bear interest pursuant to Texas Government Code Section 2251.025.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1
All disputes relating to this Agreement shall be resolved pursuant to the terms of Article 15 of the AIA Document A201~~2017~~, as amended.

§ 6.2 [Paragraph Deleted]

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA DocumentA201-2017 as amended.

§ 7.1.1 [Paragraph Deleted]

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201- 2017 as amended.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201-2017 as amended or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative is the Superintendent of Schools or the Superintendent's designee:
(Name, address, and other information)

<<Insert DPM Name>>
Dallas Independent School District
3801 Herschel Avenue
Dallas, Texas 75219
(###) ###-#### (Phone)
<<Email: XXXXXXX @dallasisd.org>>

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

<<GC Representative Name>>
<<GC Representative Title>>
<<GC Company Name>>
<<GC Address>>
<<GC City/State/Zip>>
(###) ###-#### (Phone)
<<Email: XXXX@XXX>>

§ 8.4 The Contractor's representative may not be changed without written consent of the District, which shall not be unreasonably withheld.

§ 8.5 Insurance and Bonds
§ 8.5.1 The Contractor shall purchase and maintain insurance as set forth in Article 11 of AIA Document A201™–2017 as amended, ~~Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds,~~ and elsewhere in the Contract Documents.

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§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document ~~A101™–2017 Exhibit A~~ A201™–2017 as amended, and elsewhere in the Contract Documents.

§ 8.6 [Paragraph Deleted]

« »

§ 8.7 Other provisions:

«**§ 8.7.1** This Agreement, in its entirety, is deemed performable in Dallas County, Texas. Any litigation to construe or enforce any term or condition of the Contract Documents shall be brought in the State Courts of Dallas County, Texas. In the event of such litigation, the prevailing party shall be entitled to recover reasonable attorney fees and cost of court.

§ 8.7.2 As a material consideration of the making of this Agreement, the modifications to this Agreement shall not be construed against the maker of said modifications.

§ 8.7.3 Notwithstanding anything to the contrary in this Agreement, or in any document forming a part hereof, there shall be no mandatory arbitration for any dispute arising hereunder

§ 8.7.4 Articles 1.5 and 1.6 of AIA Document A201-2017 as amended shall govern Contractor's use of the Construction Documents

§ 8.7.5 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. As part of that responsibility, Contractor shall enforce the Owner's alcohol-free, drug-free, tobacco-free, harassment-free and weapon-free policies and zones, which will require compliance with those policies and zones by Contractor's employees, subcontractors, and all other persons carrying out the Contract

§ 8.7.6 Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, to wear identification badges on the front of their persons during all times that they are on Owner's property. Such identification badges shall contain a current photograph and the worker's full name in a typeface large enough to be seen from a reasonable distance

§ 8.7.7 Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, to park their personal motor vehicles on Owner's property only in the parking places designated by the Owner. Any vehicles not parked in the appropriate locations shall be towed at the vehicle owner's sole expense.

§ 8.7.8 Contractor shall follow, and shall require all employees, agents or subcontractors to follow, applicable ordinances of the municipality in which the Project is located. In addition, if not covered by the municipality's tree ordinance, Contractor shall barricade and protect all trees on the Project

§ 8.7.9 Contractor shall institute a theft deterrence program designed to restrict construction worker access to properties of Owner that are currently in use, to maintain supervision of Contractor's and Contractor's subcontractor's forces, and to reimburse the Owner or those persons suffering a theft loss which results from Contractor's forces or Contractor's subcontractor's forces' actions, omissions, or failure to secure the Work or connecting or adjacent property of Owner.

§ 8.7.10 The Contractor may not assign its responsibilities, duties, obligations and rights under this Agreement, without the express written consent of the Owner. This does not prevent Contractor from engaging subcontractors to perform various phases of the Project, but Contractor shall be fully responsible to Owner for the work, actions and omissions of all such subcontractors

§ 8.7.11 This Agreement, in its entirety, shall be binding upon all the parties hereto, their respective successors, heirs, executors, administrators or assigns.

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§ 8.7.12 Execution of this Agreement shall constitute approval and acceptance of all terms, covenants and conditions as modified and contained in the Contract Documents.

§ 8.7.13 This Agreement is subject to all applicable federal and state laws, rules, and regulations. Invalidity of any portion of this Agreement under the laws of the State of Texas or of the United States shall not affect the validity of the remainder of this Agreement.

§ 8.7.14 By signing this Agreement, the undersigned certifies as follows: "Under Section 231.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in the contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated, and payment may be withheld if this certification is inaccurate."

§ 8.7.15 Unless otherwise noted, terms in this Agreement shall have the same meaning as those in the edition of AIA Document A201-2017, General Conditions of the Contract for Construction, as amended for the Project.

§ 8.7.16 To the extent that any portion of the Work requires a trench excavation exceeding five (5) feet in depth, in accordance with Texas Health and Safety Code Section 756.023(a), the Contractor shall fully comply, and shall require any applicable subcontractor to comply, with:

.1 The Occupational Safety and Health Administration standards for trench safety in effect for the construction of the Work;

.2 The special shoring requirements, if any, of the Owner; and

.3 Any geotechnical information obtained by Owner for use by the Contractor in the design of the trench safety system.

.4 Trench excavation safety protection shall be a separate pay item, and shall be based on linear feet of trench excavated. Special shoring requirements shall also be a separate pay item, and shall be based on the square feet of shoring used. Said cost shall be included within the Contract Sum.

§ 8.7.17 No delay or omission by Owner in exercising any right or power accruing upon the noncompliance or failure of performance by Contractor of any of the provisions of this Agreement shall impair any such right or power or be construed to be a waiver thereof. A waiver by Owner of any of the covenants, conditions or agreements hereof to be performed by Contractor shall not be construed to be a waiver of any subsequent breach thereof or of any other covenant, condition or agreement herein contained.

§8.7.18 Contractor stipulates that Owner is a political subdivision of the State of the Texas, and, as such, enjoys immunities from suit and liability as provided by the constitution and laws of the State of Texas. By entering into this Agreement, Owner does not waive any of its immunities from suit and/or liability, except as otherwise specifically provided herein, and as specifically authorized by law.

§ 8.7.19 By executing this Agreement, Contractor verifies that it does not boycott Israel, and it will not boycott Israel during the terms of this Contract.

§ 8.7.20 Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller's list, such omission or misrepresentation will void this Contract »

§ 8.7.21 All sums due hereunder are payable in Dallas, Dallas County, Texas.

§ 8.7.22 This Agreement, in its entirety, shall be binding on all the parties hereto, their respective successors, heirs, executors, administrators or assigns.

§ 8.7.23 Execution of this Agreement shall constitute approval and acceptance of all terms, covenants and conditions as modified and contained in the Contract Documents.

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User Notes: Error! Unknown document property name. (1263290179)

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 ~~AIA Document A101™–2017,~~ This executed 2017 edition of the Standard Form of Agreement Between Owner and Contractor, AIA Document A101™–2017, as amended.

.2 ~~AIA Document A101™–2017, Exhibit A, Insurance and Bonds~~

.3 ~~AIA Document A201™–2017,~~ The General and Supplementary Conditions are the 2017 edition of the General Conditions of the Contract for Construction, AIA Document A201™–2017, as amended and attached to this Agreement.

« »

.5 Drawings are as follows and are dated MMMMM DD, 20YY unless a different date is shown below:

See Exhibit "F" attached

~~Number~~	~~Title~~	~~Date~~

.6 Specifications are those contained in the Project Manual dated as in subparagraph 9.1.8, and are as follows:

See Exhibit "E" attached

~~Section~~	~~Title~~	~~Date~~	~~Pages~~

.7 Addenda, if any:

Number	Date	Pages
Addendum #1 with associated attachments	MMMM DD, 20YY	1 through XX
Addendum #2 with associated attachments	MMMM DD, 20YY	1 through XX
Addendum #3 with associated attachments	MMMM DD, 20YY	1 through XX

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract are those contained in the Project Manual dated:

Document	Title	Date	Pages
Project Manual	Volumes X & X of X	MMMM DD, 20YY	1 through XX

.9 Other documents, if any, listed below:

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(List here any additional documents that are intended to form part of the Contract Documents. AIA Document ~~A201™–2017~~ A201™–2017 as amended provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of the Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

See Exhibit "G" attached

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201™–2017 as amended.

This Agreement is entered into as of the day and year first written ~~above.~~ above and shall be executed by the parties in one original document. The original document shall be retained by the Owner. One copy of the original shall be provided to the Contractor and one copy shall be provided to the Program Manager.

DALLAS INDEPENDENT SCHOOL DISTRICT	**<INSERT CONTRACTOR LEGAL NAME>**
OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
<<Insert DISD Signer Name & Title>>	<<Insert GC's Signer Name & Title>>
(Printed name and title)	*(Printed name and title)*

Approved As To Form:

_____

DALLAS ISD LEGAL COUNSEL*(Signature)*_____Date____

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AIA® Document A101™ – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « 2022 »
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

« »
« »

THE OWNER:
(Name, legal status and address)

«Dallas Independent School District, a political subdivision of the State of Texas »
«9400 North Central Expressway »
«Dallas, Texas 75231 »

THE CONTRACTOR:
(Name, legal status and address)

« »
« »
« »

The Architect:
(Name, legal status, address and other information)

« »
« »
« »
« »
« »

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

Version 10/27/2022

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201™–2017, General Conditions of the Contract for Construction. Article 11 of A201™–2017 contains additional insurance provisions.

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ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance

§ A.2.3.1 Contractor shall provide builder's risk insurance as required in A.3.3.2.1.

§ A.2.3.1.1 -

*(**NOT USED** Indicate below the cause of loss and any applicable sub-limit.)*

Causes of Loss	Sub-Limit
«N/A »	

§ A.2.3.1.2

*(**NOT USED** Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

Coverage	Sub-Limit
«N/A »	

§ A.2.3.1.3

§ A.2.3.1.4

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.3.3.2.1 have consented in writing to continuance or replacement of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner may purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.3.3.2, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4

*(**NOT USED** Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)*

[« »] **§ A.2.4.1**

« »

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[« »] **§ A.2.4.2**

« »

[« »] **§ A.2.4.3**

« »

[« »] **§ A.2.4.4**

« »

[« »] **§ A.2.4.5**

« »

[« »] **§ A.2.4.6**

« »

[« »] **§ A.2.4.7**

« »

§ A.2.5 Other Optional Insurance.

The Owner may purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

[« »] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

« »

[« »] **§ A.2.5.2 Other Insurance**

(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits
« »	

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) at least five business days after execution of the Contract documents and prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on all of Contractor's insurance policies, except Contractor's workers compensation insurance. These certificates and the insurance policies required by this Article shall contain a provision that coverages afforded under the policies will not be canceled, reduced, or restricted for any reason, other than nonpayment of premium, until at least 30 days' prior written notice of such cancellation, reduction, or restriction has been given to the Owner and Contractor. An additional certificate, policy, and endorsement evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 of the AIA A201-2017 General Conditions as amended for the Project, and thereafter upon renewal or replacement of such coverage. Information concerning reduction or restriction of

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coverage on account of revised limits or claims paid under the General Aggregate, or cancellation or expiration of the insurance shall be furnished by written notice to the Owner from the Contractor within three business days of the date Contractor knew or should have known of the cancellation, reduction, or restriction. At least 30 calendar days prior to the date of expiration of any required insurance policy. Contractor shall provide Owner written notice of the impending expiration. In addition, Contractor shall also provide copies of all policies, declarations, and endorsements for such insurance to Owner as required by Section 11.0.2 of the 2017 AIA A201 General Conditions as amended for this Project.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor. If the insurance required by this Section A.3.1 is subject to deductibles or self-insured retentions, the Contractor shall be responsible for all loss not covered because of such deductibles or retentions. For any claim made against the Contractor's policies of insurance, the deducible shall not exceed $2,500 for Contract Sum (or Guaranteed Maximum Price, if the Project is a Construction Manager at Risk project) of less than $4 million. For a Contract Sum (or Guaranteed Maximum Price, if the Project is a Construction Manager at Risk project), of $4 million or more, the deductible shall not exceed $5,000.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage and any other insurance required by the Agreement, with the exception of Workers' Compensation insurance, to be endorsed to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor and the Contractor's subcontractors shall purchase and maintain such insurance as will protect them and the Owner from claims which may arise out of, or result from, the Contractor's operations under the Contract whether such operations be by Contractor or by any Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them maybe liable, in the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. *(See also the insurance requirements included in Article 11 of the AIA A201-2017 General Conditions as amended for this Project).* The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions.

*(**DO NOT USE** If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

The insurance required by this Section shall be written for not less than the limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. The limits of liability for such insurance shall be in at least the following amounts as specified below.

*(NOTE: Amounts of insurance coverage have been left blank so that Districts can enter the appropriate amounts for their Projects. **DO NOT LEAVE ANY BLANK UNFILLED IF THAT COVERAGE IS REQUIRED OR CHOSEN FOR THE PROJECT**. If a particular coverage will not be used for the Project, delete the unused section. If the District has questions on the appropriate amounts or types of coverage, it is strongly suggested that the District contact its legal counsel and insurance agent.)*

« »

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§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than « One Million Dollars and no/100» ($ « 1,000,000 ») each occurrence, « Two Million Dollars and no/100 » ($ « 2,000,000 ») general aggregate, and « Two Million Dollars and no/100 » ($ « 2,000,000 ») aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person, with a sublimit not less than $5,000 for medical expenses per person for bodily injury, included within the limits noted above;

.2 personal injury and advertising injury with a limit not less than $1,000,000, $2,000,000 aggregate;

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

.4 bodily injury or property damage arising out of the Work and out of completed operations, said coverage to be maintained for five years after Final Completion (to be maintained for a period of five years after Final Payment; Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during this period and Owner shall be named by endorsement as an Additional Insured for such coverage) and must include Completed Operations coverage for Contractor, its sub-contractors, and Owner;

.5 the Contractor's contractual liability, including but not limited to, indemnity obligations under Section 3.18 of the General Conditions; and

.6 General Aggregate per Project endorsement.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.

.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.

.3 Claims for bodily injury other than to employees of the insured.

.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.

.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.

.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.

.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.

.8 Claims related to roofing, if the Work involves roofing.

.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.

.10 Claims related to earth subsidence or movement, where the Work involves such hazards.

.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

A.3.2.2.3 Coverage will include:

Independent Contractors
Premise operations
Defense costs in addition to the limits
X, C, and U coverage
Broad form property damage including products/completed operations.

Contractual Liability sufficient to cover indemnity requirements in Section 3.18.1, subject to, policy terms and conditions

Contractor's Professional Liability endorsement CG 22 79 or equivalent (policy shall not contain a professional liability exclusion for "means and methods")

Additional insured, primary and non-contributing

If the additional insured endorsement maintained by the Contractor does not include completed operations coverage then the Contractor must purchase this coverage using form CG-20-37 (latest edition) or an equivalent form providing additional insureds with coverage for "completed operations".

Waiver of subrogation in favor of Owner, Program Manager and Architect

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A standard ISO CGL 2001 occurrence coverage form or equivalent
No modification or restriction of the standard ISO CGL coverage form Paragraph I – "damage to your work" exclusion. The "subcontractor exception" will not be removed via CG 22 94.
If there is work within fifty (50) feet of a railroad, endorse with CG 2417.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned, hired, or any other vehicles used, by the Contractor, with policy limits of not less than « » ($ « ») than those stated below per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage. (*Note: Texas statutory minimum for school districts is $100,000 per person, $300,000 per occurrence, and $100,000 property damage.)* Such minimum limits shall be stated as follows, or in a combined single limit policy in the amount of at least $1,000,000.

.1	Bodily Injury (per person)	$300,000
.2	Bodily Injury (per accident)	$300,000
.3	Property Damage	$300,000

Business Automobile Liability (including owned, non-owned, hired, or borrowed vehicles);

Combined single limit $300,000

Coverage will include:
Contractual Liability
Additional insured, primary and non-contributing
Waiver of subrogation in favor of Owner, Program manager, and Architect
Pollution liability which includes upset, overturn, and collision
Motor Carrier Act Endorsement (MCS 90), if applicable.

§ A.3.2.4 The Contractor may not achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance In no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

A.3.2.4.1 Umbrella Excess Liability coverages shall be in at least the following amounts:

.1	$	each occurrence
.2	$	aggregate
.3	Aggregate Per Project Endorsement	

Limits as follows:

If Contract Sum is $1,000,000 or less
$1,000,000 each occurrence and $2,000,000 annual aggregate

If Contract Sum is greater than $1,000,000 up to $5,000,000
$5,000,000 each occurrence and annual aggregate

If Contract Sum is greater than $5,000,000 up to $10,000,000
$10,000,000 each occurrence and annual aggregate

If Contract Sum is greater than $10,000,000 to $25,000,000
$25,000,000 each occurrence and annual aggregate

If Contract Sum is greater than $25,000,000
$50,000,000 each occurrence and annual aggregate

Coverage will include:
Occurrence based form

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Follow form of the primary coverage (commercial general liability, employer's liability, auto liability) except for per project aggregate
Pay on behalf wording
Completed Operations
Waiver of subrogation to follow form of the primary
Additional insured to follow form of the primary
Annual aggregate limit
A drop down feature

§ A.3.2.5 Workers' Compensation .

.1	State:	Statutory Benefits
.2	Employer's Liability	$500,000 per accident $500,000 disease, policy limit $ 500,000 disease, each employee

Coverage will include:

Waiver of subrogation in favor of Owner, Program Manager and Architect
Alternate Employers Endorsement, if applicable
Voluntary Compensation endorsement
All States coverage on an "if any" basis

A.3.2.5.1 Texas Workers' Compensation Insurance. A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Department of Insurance (TDI), or a coverage agreement (DWC-81, DWC-82, DWC-83, or DWC-84), showing statutory worker's compensation insurance coverage for the Contractor's employees providing services on a Project is required for the duration of the Project.

A.3.2.5.1.1 Duration of the Project include the time from the beginning of the Work on the project until the Contractor's Work on the Project has been completed and accepted by the Owner.

A.3.2.5.1.2 Persons providing services on the Project ("subcontractor" in Texas Labor Code Section 406.096) include all persons or entities performing all or part of the services the Contractor has undertaken to perform on the Project, regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operations, employees of any such entity, or employees of any entity that furnishes persons to provide services on the Project.

A.3.2.5.1.3 Services include, without limitation, providing, hauling or delivering equipment or materials, or providing labor, transportation, or other services related to the Project. Services do not include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

A.3.2.5.1.4 The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code 401.011(44) for all employees of the Contractor providing services on the Project for the duration of the Project.

A.3.2.5.1.5 The Contractor must provide a certificate of coverage to the Owner prior to being awarded the Contract.

A.3.2.5.1.6 If the coverage period shown on the Contractor's current certificate of coverage ends during the duration of the Project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with the Owner showing that coverage has been extended.

A.3.2.5.1.7 The Contractor shall obtain from each person providing services on the Project, and provide to the Owner:

.1 A certificate of coverage, prior to that person beginning work on the Project, so the Owner will have, on file, certificates of coverage showing coverage for all persons providing services on the Project; and

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.2 No later than seven days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the Project.

A.3.2.5.1.8 The Contractor shall retain all required certificates of coverage for the duration of the Project and for five year thereafter.

A.3.2.5.1.9 The Contractor shall notify the Owner, in writing by certified mail or personal delivery, within ten (10) days after Contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project.

A.3.2.5.1.10 The Contractor shall post on each Project site a notice, in the text form and manner prescribed by the TDI, informing all persons providing services on the Project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

A.3.2.5.1.11 The Contractor shall contractually require each person with whom it contracts to provide services on the Project to:

.1 Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the stator requirements of Texas Labor Code 401.011(44) for all of its employees providing services on the Project for the duration of the Project:

.2 Provide to the Contractor, prior to that person beginning work on the Project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project for the duration of the Project;

.3 Provide the Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the Project;

.4 Obtain from each other person with who it contracts, and provide to the Contractor:

.1 A certificate of coverage, prior to the other person beginning work on the Project; and
.2 A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the Project.

.5 Retain all required certificates of coverage on file for the duration of the Project and for five years thereafter;

.6 Notify the Owner in writing by certified mail or persona delivery, within ten (10) days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project; and

.7 Contractually require each person with whom it contracts to perform as required by items 1 - 6, with the certificates of coverage to be provided to the person for whom they are providing services.

A.3.2.5.1.12 By signing this Contract or providing or causing to be provided a certificate of coverage, the Contractor is representing to the Owner that all employees of the Contractor who will provide services on the Project will be covered by worker's compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier, or, in the case of a self-insured, with the TDI's Division of Self-Insurance Regulation. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

A.3.2.5.1.13 The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor that entitles the Owner to declare the Contract void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

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A.3.2.5.1.14 The coverage requirement recited above does not apply to sole proprietors, partners, and corporate officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued or delivery, or renewed on or after January 1, 1996.

28 TAC § 110.110(i).

§ A.3.2.6 Employers' Liability with policy limits not less than « Five Hundred Thousand Dollars and no/100» ($ « 500,000 ») each accident, « Five Hundred Thousand Dollars and no/100 » ($ « 500,000 ») each employee, and « Five Hundred Thousand Dollars and no/100» ($ « 500,000») policy limit.

§ A.3.2.7

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than « One Million Dollars and no/100 » ($ « 1,000,000 ») per claim and « One MIllion Dollars and no/100 » ($ « 1,000,000 ») in the aggregate. Contractor's Professional Liability, if applicable:

If the Work performed by the Contractor or its subcontractors will include some responsibility for design, the Contractor will purchase or cause to be purchased and maintained a professional liability policy. The limits of coverage will not be less than:

Coverage will include:

A waiver of subrogation in favor of Owner, Program Manager and Architect
A retroactive date that is the earlier of the start of design or the Work
Coverage for negligent acts, errors or omissions arising out of design or engineering services
An extended reporting period of 5 years after final completion

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than « Three Million Dollars and no/100 » ($ « 3,000,000 ») per claim and « Three Million Dollars and no/100 » ($ « 3,000,000 ») in the aggregate

Contractors Pollution Liability, if applicable Contractor will purchase a policy covering third-party bodily injury, property damage, and loss of use claims, including clean-up costs, as a result of pollution conditions arising from contractor's operations and completed operations. Completed operations coverage will remain in effect through annual renewal for no less than 5 years after final completion of the Work. The limits of coverage will be not less than:

Coverage will include:

Mold and other fungi and bacteria
No exclusion for EIFS, if applicable
Additional insured, primary and non-contributing
A waiver of subrogation in favor of Owner, Program Manager and Architect
A retroactive date no later than the start of the Work, if applicable.
Occurrence form, if available.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than « Four Million Dollars and no/100 » ($ « 4,000,000 ») per claim and « Four Million Dollars and no/100 » ($ « 4,000,000 ») in the aggregate.

§ A.3.2.11 « » ($ « ») « » ($ « »)

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « Ten Million Dollars and no/100 » ($ « 10,000,000 ») per claim and « Ten Million Dollars and no/100 » ($ « 10,000,000 ») in the aggregate.

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§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[« X »] **§ A.3.3.2.1** Builder's Risk Property insurance in the amount of the Contract Sum which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall disclose to the Owner the amount of any deductible, and the Contractor shall be responsible for losses within the deductible. The Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(DO NOT USE) *Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

.1 **Builder's Risk.** Unless otherwise provided, Contractor shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the state of Texas, a property insurance written on builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis, including boiler and machinery insurance, Coverage, if not included in the base coverage, shall include coverage against the perils of fire, (with extended coverage) and physical loss or damage including, without limitation or duplication of coverage, lightning, collapse, earthquake, flood, wind storm, hurricane, hail, explosion, riot, civil commotion, smoke, aircraft, land vehicles, theft, vandalism, malicious mischief, falsework, testing and start-up, temporary buildings, debris removal including demolition occasioned by enforcement of any applicable legal requirements, and all other perils, and shall include materials stored on-site, off-site, and in transit. The Contractor's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Final Completion, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees. Such coverage shall be primary coverage.

.2 **Causes of Loss.** The insurance required by this Section A.3.3.2.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

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(*Indicate below the cause of loss and any applicable sub-limit.*)

.3 Causes of Loss Sub-Limit. Specific Required Coverages. The insurance required by this Section A.3.3.2.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition, occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows: (*Indicate below type of coverage and any applicable sub-limit for specific required coverages.*)

.4 Adjustment of Loss. The Owner, as a fiduciary, shall have power to adjust and settle any loss arising out of the Work, with insured, regardless of the purchaser of the insurance policy. The Contractor, upon receipt of proceeds, shall as fiduciary, pay all subcontractors their just shares of insurance proceeds received by the Contractor, and, by appropriate agreements, shall require subcontractors to make payment to their sub-subcontractors in similar manner. The Owner shall deposit, in a separate account, proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, then replacement of damaged property shall be performed by the Contractor with the insurance proceeds upon issuance of a Notice to Proceeds from the Owner.

.5 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.3.3.2.1 have consented, in writing, to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

.6 Employee Theft or Dishonesty. If this Builder's Risk policy excludes Employee Theft or Dishonesty coverage, including Third Parties, Contractor shall obtain separate coverage sufficient to protect Owner's interest and in an amount agreeable to Owner.

.7 Cancellation. The insurance policies required by this Section A.3.3.2 shall contain a provision that coverages afforded under the policies will not be canceled for any reason, other than nonpayment of premium, or reduced or restricted due to a material change in coverage until at least 30 days prior written notice of such cancellation or material change has been given to the Owner. Contractor shall provide Owner 30 days prior written notice of the expiration of any policy required by Section A.3.1.1.

.8 Construction Manager at Risk. If Contractor is a Construction Manager at Risk. Then, as specified in each AIA A133 Exhibit A Amendment, the amount of Builder's Risk insurance coverage shall be an amount equal to the Guaranteed Maximum Price; otherwise, in the total amount of the Contract Sum.

.9 Deductibles. For any claim made against the builder's risk insurance, the deductible shall not exceed $2,500 for a Contract Sum (or Guaranteed Maximum Price, if the Project is a Construction Manager at Risk project), of less than $4 million. For a Contract Sum (or Guaranteed Maximum Price, if the project is a Construction Manager at Risk project), of $4 million or more, the deductible shall not exceed $5,000. Contractor shall be responsible for losses within such deductible amounts.

« »

[« »] **§ A.3.3.2.2** « » ($ « ») « » ($ « »)

[« »] **§ A.3.3.2.3** « » ($ « ») « » ($ « »)

[« »] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the

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construction site on an "all-risks" completed value form.

[« »] **§ A.3.3.2.5**

[« »] **§ A.3.3.2.6 Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
« »	

§ A.3.4 Performance Bond and Payment Bond
The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, subject to the requirements of A201-2017, Article 11.1.2.1, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	«$ or 100% of the Contract Sum as amended
Performance Bond	$ or 100% of the Contract Sum as amended»

The form of Payment and Performance Bonds shall be subject to the requirements of Texas law, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS
Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

« See A201-2017, Article 11 »

This Agreement entered into as of the day and year first written above.

OWNER	CONTRACTOR
Dallas Independent School District	

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GENERAL AND SUPPLEMENTARY CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

A201

DRAFT

AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

BP# XXX: ORG #XXX XX Elementary School
School Address
Dallas, Texas 75XXX

THE OWNER:
(Name, legal status and address)

The Dallas Independent School District, a political subdivision of the State of Texas
9400 North Central Expressway
Dallas, Texas 75231

THE PROGRAM MANAGER:
(Name, legal status and address)

PMF Name
PMF Address
PMF City/State/Zip
«»«»
«»

THE ARCHITECT:
(Name, legal status and address)

A/E Name
A/E Address
A/E City/State/Zip

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

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10 PROTECTION OF PERSONS AND PROPERTY

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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11 INSURANCE AND BONDS

12 UNCOVERING AND CORRECTION OF WORK

13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

Version 10/27/2022

DRAFT

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents consist of the Contract between Owner and Contractor, A101- 2017, as amended, OR the Contract between the Owner and Construction Manager at Risk A133-2019, as amended, and the A133-2019 Exhibit A (hereinafter the ~~Agreement~~Contract); Conditions of the Contract as amended (General, Supplementary and other Conditions, including but not limited to A201-2017, as amended); Contractor's proof of Payment and Performance Bonds and proof of insurance, ~~are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), all sections of the Project Manual and Construction Documents (as defined in Section 1.1.3 below) including~~ Drawings, Specifications, and Addenda issued prior to receipt of bids or proposals, ~~to execution of the Contract,~~ other documents listed in the ~~Agreement~~Contract, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the ~~Agreement~~Contract, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, Contractor's bid or portions of Addenda relating to bidding requirements). All sections of the Project Manual shall be a part of the ~~Agreement~~Contract. In the event of conflict, terms and conditions contained in the ~~Agreement~~Contract, as amended, shall take precedence over terms and conditions contained in the General Conditions, as amended. The terms and conditions in the General Conditions, as amended, shall take precedence over all other terms and conditions contained in the other Contract Documents. ~~Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.~~

1.1.1.1 The Contract, represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral. Any revision, amendment, or modification to the Standard Form of the Contract shall be valid, binding, and enforceable only if said revision, amendment, or modification is made conspicuous by being underlined, lined-through, or highlighted in this Contract signed by Contractor and the authorized representative of Owner's Board of Trustees.

§ 1.1.2 The Contract

The Contract Documents form the Contract for ~~Construction~~Construction (the "Contract"). The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification signed by the Contractor, approved by Owner's Board of Trustees, and signed by the representative of the Owner's Board of Trustees who is authorized to sign contracts. As a material consideration for the making of the Contract, modifications to the Contract shall not be constructed against the maker of said modifications. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor of the Contractor;~~,~~ (3) between the Program Manager and the Contractor~~between the Owner and the Architect or the Architect's consultants~~, or (4) between any persons or entities other than the Owner and the Contractor. ~~The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.~~

The Program Manager and/or Architect shall, however, be entitled to performance and enforcement of obligations of the Contractor under the Contract intended to facilitate performance of the duties of the Architect and/or the Program Manager.

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1.1.2.1 To be effective, all Contract Documents including the A201-2017, as amended requiring signatures must be signed first by the Contractor representative and then by the Owner's authorized representative, after approval by Owner's Board of Trustees. If an approved Contact Document requiring Contractor's signature has not been signed, then the missing signature shall be provided within a reasonable period of time. Failure of Contractor to sign an approved Contract Document after notice and a reasonable opportunity to sign, shall be considered a material breach of the Contract by Contractor.

§ 1.1.3 The Work; Construction Documents

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. The Work includes all labor, parts, supplies, skill, supervision, transportation, services, and other facilities and things necessary, proper or incidental to the carrying out and completion of the terms of the Contract Documents and all other items of cost or value needed to produce, construct and fully complete the public Work identified by the Contract Documents.

"Construction Documents" means: all Drawings, Specifications, geotechnical reports, Addenda, submittals, transmittals, deliverables, instructions to Contractors, and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants and which set forth in detail the requirements for construction of the Project. The Construction Documents shall include Drawings and Specifications that establish, in detail, the quality levels of materials and systems required for the Project. The Construction Documents shall reflect all agreements between Owner and Architect concerning Owner's budgetary constraints, programmatic needs and expectations as to quality, functionality of systems, maintenance costs, and usable life of equipment and facilities. Said Construction Documents shall reflect the Owner's educational program and educational specifications, the State educational adequacy standards in 19 TAC § 61.104~~36~~, and the standards set forth in the Owner's architect agreement ~~Section 3.1.4 of AIA document B101-2017~~. The Architect shall provide Construction Documents which are sufficient for Owner to complete construction of the Project, are free from material defects or omissions, and which shall comply with all applicable laws, ordinances, codes, rules, and regulations, as of the date of issuance of Construction Documents.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner ~~and~~ or by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 ~~Instruments~~ PROJECT MANUAL ~~of Service~~

~~Construction Instru~~Documents ~~of Service are include representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Construction Instru~~Documents ~~of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.~~ The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

§ 1.1.8 PROGRAM MANAGERS ~~Initial Decision Maker~~

The Owner may use Program Managers to carry out some of the functions of administration of the Owner's construction program. The Contractor, Architect, and Program Manager (when applicable) shall cooperate with each other in the performance of their respective functions. The management and reporting systems used by the Owner and/or Program Manager, including the assignment of the Program Manager, may be changed by Owner during the Project.

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~~The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.~~

1.1.9 Addenda

Addenda are written or graphic instrument issued by the Owner ~~prior to the execution of the Contract~~, which modify or interpret the bidding or proposal documents, including Drawings and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents and Construction Documents when the Contract is executed. The Contractor and subcontractors shall include all addenda items on their copies of the Drawings and Specifications.

1.1.10 All references to "Contractor" shall include "Construction Manager at Risk" as appropriate.

1.1.11 ~~The Owner may retain Program Manager(s) to carry out some of the functions of the administration of the Owner's construction program. The Contractor, Architect, and Program Manager(s) (when applicable) shall cooperate with each other in the performance of their respective functions. The management and reporting systems used by the Owner and/or Program Manager(s) including the assignment of the Program Manager, may be changed by Owner during the Project.~~[Omitted]

1.1.11 Approved, Approved Equal, Approved Equivalents, Or Equal

The terms "Approved" and "Approved Equal" relate to the substitution of materials, equipment, or procedure in writing by the Architect prior to receipt of bids.

1.1.12 Abbreviations

AIA:	American Institute of Architects. (All references to AIA documents refer to AIA's trademarked documents. Each reference to a specific document shall refer to the documents as amended for this Project.)
AIEE:	American Institute of Electrical Engineers
ACI:	American Concrete Institute
AHERA:	Asbestos Hazardous Emergency Response Act
AISI:	American Iron and Steel Institute
AISC:	American Institute of Steel Construction
ANSI:	American National Standards Institute
ASA:	American Standards Association
ASTM:	American Society of Testing Materials
AWSC:	American Welding Society Code
CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act
EPA:	Environmental Protection Agency
FS:	Federal Specification
NEC:	National Electrical Code
OSHA:	Occupational Safety and Health Administration
SPR:	Simplified Practice Recommendation
TAS:	Texas Accessibility Standards
UL:	Underwriters Laboratories, Inc.

1.1.13 Bids or Bidding The term "Bids" or "Bidding" shall include any kind of competitive purchasing under Texas Government Code Chapter 2269.

1.1.14 Miscellaneous Other Words

1.1.14.1 Business Day

The term "business day" is a day that Owner's Administration Building is scheduled to be open for normal business purposes, unless closed by the Owner's Superintendent of Schools for inclement weather or other reason. Days on which the Administration Building is normally closed are: Thanksgiving Break, Winter Break, Spring Break, and Summer Break, as well as other federal, state, or local days specified in the calendar approved by the Owner's Board of Trustees on an annual basis. A business day does not include a day on which the Owner's Administration Building is open only for the purposes of conducting candidate filing, early voting, elections, or other special events.

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1.1.14.2 Calendar Day
A calendar day is a day on the Gregorian Calendar. The Contract Time is established in calendar days. Extensions of time granted, if any, will be converted to calendar days.

1.1.14.3 Holidays
Owner-approved holidays for Contractor's Work are limited to: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

1.1.14.4 Work Day
Work days are all calendar days except Holidays.

1.1.14.5 Anticipated Weather Days
An allowance of regular Work Days, established as anticipated Work Days lost due to weather delays; said allowance shall be included in Contractor's proposed completion time. Only lost weather days in excess of Anticipated Weather Days shall be considered by Owner for time extensions based upon weather. ~~Section 15.1.5.3 lists required Anticipated Weather Days.~~

1.1.15 Contract Sum
"Contract Sum" shall have the same meaning as in Section 5.1 of the Contract (A133-20~~09~~), for the Project when the Project is a Construction Manager at Risk Project OR the same meaning as in Article 4 of the Contract (A101-2017) for the Project.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 ~~The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.~~ The most recently issued contract document takes precedence over previously issued forms of the same document. Figures given on Drawings govern scale management, and large-scale details govern smaller scale Drawings. If an item is shown one place in the Drawings, but not another, or called for in a schedule or the specifications but not shown on the Drawings or shown on the Drawings but not in a schedule, it is to be included. Existing conditions take precedence over Drawings and Specifications for dimensions.

1.2.1.2 During the course of the Work, should any conflict be found in or between the Contract Documents, the Contractor shall be deemed to have estimated the Work on the basis of the greater quantity or better quality, or the most stringent requirement, unless he shall have obtained an interpretation in writing from the Architect as to what shall govern before the submission of his Proposal. The Architect, in case of such conflict, may interpret or construe the documents so as to obtain the most substantial and complete performance of the Work consistent with the Contract Documents and reasonably inferable therefrom, in the best interest of Owner, and the Architect's interpretation shall be final. The terms and conditions of this clause shall not relieve any part of any other obligation under the Contract Documents.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

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1.2.4 Relation of Specifications And Drawings

General Requirements in the Specifications govern the execution of all Specifications. Summary paragraphs present a brief indication of the Work, but do not limit the Work as later detailed. The Drawings and Specifications are correlative and have equal authority and priority. Should the Drawings and Specifications have internal inconsistencies, then the Contractor shall base the bids and construction on the more expensive combination of quality and quantity of work indicated. For purposes of construction, the Architect shall determine the appropriate Work, after the Contractor brings the inconsistency to the Architect's attention. Failure to report an inconsistency shall be evidence that Contractor has elected to proceed in the more expensive manner.

1.2.5 ~~Optional Materials, Equipment and Processes~~Materials, Equipment, and Processes

Exact location and arrangement of the various pieces of equipment specified shall be determined with the approval of the Architect after equipment has been selected and/or as the Work progresses. All equipment shall, insofar as possible, be installed in such a manner as will not interfere with architectural or structural portions of the building. Should changes become necessary because of a failure of the Contractor to comply with the Contract Documents which results in equipment requiring more area than shown on the Contract Documents, the Contractor shall be fully responsible for completing any required modifications or eliminating any interferences. Where in the Drawings and Specifications, certain products, manufacturer's trade names, or catalog numbers are specified, it is done for the express purpose of establishing a standard of function, dimension, appearance, and quality of design in harmony with the Work, and is not intended for the purpose of limiting competition. Materials or equipment shall not be substituted unless the Architect has specifically accepted such substitution for use on this Project. When more than one material, process, or brand is specified for a particular item of Work, the choice shall be the Contractor's. The final selection of color and pattern will be made by the Owner from the range available within the option selected by the Contractor, unless the item is specified to match a specific color or sample furnished. Where particular items are specified, products of those named manufacturers are required unless Contractor submits for consideration proposed substitutions of materials equipment, or processes from those set out in the Contract Documents. Submittals of proposed substitutions should contain sufficient information to allow the Architect and Owner to determine if the proposed substitution is in fact equal to or better than the requirements in the Contract Documents. The Architect shall review and respond to proposed substitutions within fifteen (15) days of receipt. Contractor shall bear all risk caused by submitting substitutions, including all costs. The Owner may approve substitutions only when the substitution is clearly provided by the Contract to be equal in performance characteristics to the requirements of the Contract Documents, equally compatible with the existing installations and complementary to the architectural design for the Work. Contractor shall bear all related costs associated with the substitution. Certain special construction and equipment details may not be regularly included as part of the named manufacturer's standard catalog equipment, but shall be obtained by the Contractor from the manufacturer as required for the proper evaluation and/or function of the equipment. Reasonable minor variations in equipment are expected and will be acceptable, if approved by the Architect and Owner, however, indicated and specified performance and material requirements are the minimum. The Owner and the Architect reserve the right to determine the quality of equipment and materials that deviate from any of the indicated and specified requirements.

~~1.2.5.1Product and Reference Standards~~

~~When specific products, systems or items of equipment are referred to in the Contract Documents, any ancillary devices which the Contractor knows, or in accordance with the standard of care for a General Contractor should have known, is necessary for proper functioning shall also be provided. When standards, codes, manufacturer's instructions and guarantees are required and no edition is specified by the Contract Documents, the current edition at the time of Contract execution shall apply whether or not the proper edition was set out in the Contract Documents. References to standards, codes, manufacturer's instructions and guarantees shall apply in full, except:~~

~~.1 They do not supersede more stringent standards set out in the Contract Documents, and~~
~~.2 Any exclusions or waivers that are inconsistent with the Contract Documents do not apply.~~

1.2.6 Standards And Requirements

When the Contract Documents refer to standards, building codes, manufacturers' instructions, or other documents, unless otherwise specified, then the current edition as of the date of execution of the Contract by the last party to execute said Contract shall apply. It shall be the responsibility of the Architect to address revisions or amendments to applicable codes or standards which arise after the date of execution of the Contract and until Final Completion, pursuant to the terms of the Contract between Owner and Architect. Requirements of public authorities apply as minimum requirements only and do not supersede more stringent specified requirements.

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General Requirements in the Specifications govern the execution of all Work. Summary paragraphs present a brief indication of the Work, but do not limit the Work as later detailed. Should the Drawings and Specifications have internal inconsistencies, then the Contractor shall base the bids and construction on the most expensive combination of quality and quantity of work indicated. For purposes of construction, the Architect shall determine the appropriate Work, after the Contractor brings the inconsistency to the Architect's attention. Failure to report an inconsistency shall be evidence that Contractor has elected to proceed in the more expensive manner.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs, and Clauses in the documents., or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 All ownership rights, whether common law, statutory, or other reserved rights, including copyright ownership of the Construction Documents, are controlled by the Contract between the Owner and ~~T~~the Architect ~~and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights~~. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the ~~Instruments of Service~~Construction Documents. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of any~~the Architect's or Architect's consultants'~~ reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are granted a limited license~~authorized~~ to use and reproduce the Construction Documents~~Instruments of Service~~ provided to them, subject to any protocols established pursuant to Section~~s~~ 1.7 ~~and 1.8~~, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Construction Documents~~Instruments of Service~~. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the ~~Instruments of Service~~Construction Documents on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants. All copies of the Construction Documents, except the Contractor's record set, shall be returned or suitably accounted for to the copyright holder upon completion of the Work.

1.5.3 The Drawings, Specifications and other Documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim copyright in the Drawings, Specifications and other documents prepared by the Architect or Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the written consent of the Owner, Architect and Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants copyrights or other reserved rights.

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§ 1.6 Notice

§ 1.6.1 ~~Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement~~Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; if delivered at, or sent by registered or certified mail, or by courier service providing proof of delivery to the last business address known to the party giving notice, or if sent by electronic facsimile transmission, to the last business number known to the party giving notice, with electronic confirmation of receipt; or, if sent by electronic mail, to the email address of the Owner's or Contractor's designated representative, with electronic confirmation of receipt.

§ 1.6.2 ~~Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.~~

§ 1.7 Digital Data Use and Transmission

If ~~T~~the parties intend to transmit Construction Documents or any other information or documentation in digital form, they shall endeavor to establish necessary~~shall agree upon~~ protocols governing such~~the~~ transmissions, unless otherwise already provided in the Contract or the Contract Documents ~~and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data~~.

§ 1.8 EXECUTION OF CONTRACT DOCUMENTS

1.8.1 The Contract Documents must be signed by the Owner and Contractor. The ~~Agreement~~Contract between Owner and Contractor, as amended, including Conditions of the Contract, as amended, as well as all other Contract Documents that required signature of the Parties, including the A201-2017, as amended, must be signed first by the Contractor's representative. . After signing the ~~Agreement~~Contract and all other Contract Documents requiring signature, Contractor shall return the Contract Documents along with proof of insurance and payment and performance bonds to Owner. Once Owner has approved of the Contract Documents and the proof of insurance and payment and performance bonds, Owner shall sign the ~~Agreement~~Contract and all other Contract Documents requiring signature of the parties. When Owner has signed and approved all required documents, District shall issue a Notice to Proceed to Contractor.

1.8.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. Should the Contractor find discrepancies, omissions or conflicts within the Contract Documents, or be in doubt as to their meaning, the Contractor shall at once notify in writing the Architect, the Program Manager and Owner, and Architect will issue a written Architect's Supplemental Instruction to all parties that is consistent with the Owner's Scope of the Work.

~~**Building Information Models Use and Reliance**~~

~~**Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.**~~

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the independent school district ~~oe enity~~ ~~person or entity~~ identified ~~as such in the Agreement and is referred to throughout~~ in the Contract Documents ~~as if singular in number~~. The Board of Trustees, by majority vote, is the only representative of the Owner, an independent school district, having the power to: enter into a contract; amend a contract, including but not limited to, AIA Document A133 Exhibit A; approve changes in the scope of the Work; approve and execute a Change Order or Construction Change Directive modifying the Contract Sum or Guaranteed Maximum Price; agree to an extension to the date of Substantial or Final Completion; or terminate a contract. The Board will act as soon as reasonably possible to avoid undue delays. The Board ~~shall~~

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designates authorized representatives to act on its behalf for day-to-day operations under the Contract. Unless otherwise designated in the Contract Documents, Owner's authorized ~~in writing a~~ representative ~~who~~ shall be the Superintendent of Schools, who may delegate responsibilities as appropriate. ~~have express authority to bind the Owner~~ Except as otherwise provided in the Contract Documents, the Architect does not have such authority. Neither Architect nor Contractor may rely upon the direction of any employee of Owner who has not been designated in writing by the Superintendent or Board of Trustees; Owner shall not be financially responsible for actions taken by the Architect or Contractor in reliance upon direction from unauthorized persons ~~with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority~~. ~~The term "Owner" means the Owner or the Owner's authorized representative.~~

§ 2.1.2 ~~The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein~~ It shall be distinctly understood that by virtue of this Contract, no mechanic, contractor, material person, artisan, or laborer, skilled or unskilled, shall ever in any manner have, claim, or acquire any lien upon the buildings or any of the improvements of whatsoever nature or kind so erected or to be erected by virtue of this Contract or upon any of the land on which said buildings of any of the improvements are so erected, built, or situated, such property belonging to a political subdivision of the State of Texas. It shall be further understood that this Contract is not written for the benefit of their parties.

2.1.3 The Owner shall require the Contractor and the Architect to meet periodically at mutually-agreed-upon intervals, for the purpose of establishing procedures to facilitate cooperation, communication, and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationship which may otherwise exist.

2.1.4 The Owner may require that the Contractor use and/or respond to certain Owner-furnished forms or inquiries during the course of the Project. From time to time, there may be future revisions, changes, additions, or deletions to these forms. The fact that the Owner modifies and increases reasonable reporting requirements shall not serve as the basis for a claim for additional time or compensation by the Contractor.

2.1.5 The Contractor stipulates and agrees that the Owner has no duty to discover any design errors or omissions in the Drawings, Plans, Specifications, and other Construction Documents, and has no duty to notify Contractor of same. By entering into the Contract Documents or any Contract with any Architect, Owner does not warrant the adequacy and accuracy of any Drawings, Plans, Specifications, or other Construction Documents.

§ 2.2 ~~Evidence of the~~ Owner's Financial Arrangements

§ 2.2.1 ~~Prior to commencement of the Work and upon written request by the Contractor, t~~The Owner, being a public body under the laws of the State of Texas, must have adequate funds and/or financing as provided by law prior to award and execution of ~~shall furnish to~~ the Contract~~or~~ Documents~~reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately~~.

§ 2.2.2 At any time prior to the Owner's receipt of the executed ~~Agreement~~Contract with the required bonds and insurance, the Owner may, at its sole option and without cause, reject the offer described in this ~~Agreement~~Contract by delivering to the Contractor a written notice stating so. Such notice shall be signed by the Owner's Director of Purchasing or designee and shall be effective on receipt by the Contractor. The rejection of the offer described in this ~~Agreement~~Contract shall cause no obligation or duty to the District save return of bid or proposal security, if any, if rejection is without cause. This paragraph does not pertain to rejection for cause by the Owner, or for the Contractor's failure to provide required bonds or insurance ~~Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until~~

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~~reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.~~

§ 2.2.3 ~~After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

§ 2.2.4 ~~Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.~~

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The "Architect" is the person ~~Owner shall retain an architect~~ lawfully licensed to practice architecture, or an entity lawfully practicing architecture, ~~in the jurisdiction where the Project is located. That person or entity is identified as the Architect~~ identified as such in the ~~Agreement~~Contract and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor ~~to whom the Contractor has no reasonable objection and~~ whose status under the Contract Documents shall be that of the Architect. Owner shall notify Contractor if successor architect has been employed by Owner. The term "Architect" means the Architect or the Architect's authorized representative.

§ 2.3.4 If requested to do so, in writing, by Contractor, prior to start of the Work, ~~T~~the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. ~~The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.~~ The survey shall not relieve Contractor from its obligations to examine the site, or exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 Information or services reasonably necessary for the Work and under the Owner's control shall be furnished by the Owner with reasonable promptness where requested in writing by the Contractor. Under normal circumstances, fourteen (14) District Business days will be considered a reasonable time for Owner response. In any circumstance where information or services from the Owner, Program Manager or Architect is required, Contractor shall promptly notify in writing the Architect, with copy to the Program Manager, of the particular need. Absent such notification, any Claim based upon lack of such information or services shall be waived.~~The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services. Absent such timely notification, any Claim based upon lack of such information or services shall be waived.~~

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Construction~~act~~ Documents, as provided for in the Project Manual, for purposes of making reproductions pursuant to Section 1.5.2.

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§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to fails to correct non-conforming or defective Work, fails to correct Work which is not in accordance with Contract Documents, or ~~correct defective Work, fails to correct Work that is not in accordance with the requirements of the Contract Documents or the Construction Documents as required by Section 12.2 or repeatedly~~ fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity~~, except to the extent required by Section 6.1.3~~. The authorized Owner's representative having the legal right to stop the Work shall be limited to the Owner's Superintendent of Schools or designee.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. ~~Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and t~~The Architect ~~may~~shall, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's, Program Manager and other consultants' additional services, if any, made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, then the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, then the Contractor may file a Claim pursuant to Article 15.

2.5.1 After the Work is complete the Owner may make emergency repairs to the Work if necessary to prevent further damage, or if the Contractor does not promptly respond to a notice of a condition requiring repairs. Contractor shall be responsible to Owner for this cost if the reason for the repairs is defects in Contractor's Work. If payments then or thereafter due the Contractor are not sufficient to cover such costs, the Contractor shall pay the difference to the Owner.

2.6 OWNER'S OCCUPANCY

Contractor agrees that the Owner may place and install as much equipment and furnishings during the progress of the building as is possible before completion of various parts of the Work, or may occupy portions of the Work before substantial completion of the entire Work, and further agrees that such placing and installing of equipment and furnishings or occupancy of portions of the Work shall not in any way evidence the substantial completion of the entire Work, or signify Owner's acceptance of the Work, nor does it affect claims for liquidated damages in case Substantial Completion is not achieved as required unless the failure to reach Substantial Completion is the result of the early move-in or occupancy. Owner will accept the responsibility for any damages to the Work caused by such occupancy.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the ~~Agreement~~Contract and is referred to throughout the Contract Documents as if singular in number. ~~The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract.~~ The term "Contractor" means the Contractor or the Contractor's authorized representative, and includes the Construction Manager at Risk, if applicable.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect or Program Manager in the ~~Architect's~~ administration of the Contract, activities of the Owner (or Owner's Program Manager, if applicable), or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

3.1.4 The Contractor represents and warrants the following to the Owner (in addition to the other representations and warranties contained in the Contract Documents), as an inducement to the Owner to execute this Contract, which

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representations and warranties shall survive the execution and delivery of the Contract and the Final Completion of the Work:

.1 that it is financially solvent, able to pay its debts as they mature, and possessed of sufficient working capital to complete the Work and perform its obligations under the Contract Documents;

.2 that it is able to furnish the tools, materials, supplies, equipment, and labor required to timely complete the Work and perform its obligation hereunder and has sufficient experience and competence to do so;

.3 that it is authorized to do business in the State where the Project is located and properly licensed by all necessary governmental, public, and quasi-public authorities having jurisdiction over it, the Work, or the site of the Project; and

.4 that the execution of the Contract and its performance thereof are within its duly-authorized powers.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 ~~Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.~~ The Contractor represents and warrants by submission of a Proposal that he has carefully examined the Contract Documents, any soil test reports, drainage studies, geotechnical or other reports, and the site of the Work, and that, from his own investigations, he has satisfied himself as to the nature and location of the Work, the character, quality and quantity of surface and subsurface materials likely to be encountered, the character of equipment and other facilities needed for the performance of the Work, the general and local conditions and all other materials which may in any way affect the Work or its performance. Should the Contractor find discrepancies, omissions or conflicts within the Contract Documents, or be in doubt as to their meaning, the Contractor shall at once notify in writing the Architect and Owner, and Architect will issue a written addendum to all parties that is consistent with the Owner's Scope of the Work The Contractor shall not be entitled to any additional time or compensation for any additional work caused by the Contractor's fault, improper construction, or by Contractor's failure to carefully study and compare the Contract Documents to actual observable site conditions prior to execution of the Work.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are ~~not~~ for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; ~~however,~~ the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. ~~It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.~~ Contractor shall not perform any Work involving an error, inconsistency, or omission without further instructions to Contractor or revised Construction Documents from the Architect.

§ 3.2.3 Neither the Owner nor ~~T~~the Contractor is ~~not~~ required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

3.2.3.1 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents

§ 3.2.4 If the Contractor has knowledge that any of the products or systems specified will perform in a manner that will limit the Contractor's ability to satisfactorily perform the Work or to honor his warranty, or will result in a limitation of or interference with the Owner's intended use, then the Contractor shall promptly notify the Architect and Owner in writing, providing substantiation for his position. Any necessary changes, including substitution of

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materials, shall be accomplished by appropriate Modification. If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2, ~~or~~ 3.2.3, or 3.2.3.1, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2, ~~or~~ 3.2.3, or 3.2.3.1, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. Contractor shall take field measurements, verify field conditions, and shall carefully compare them to the Construction Documents. ~~If t~~The Contractor ~~performs those obligations, the Contractor~~ shall ~~not~~ be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities when the Contractor recognized or should have recognized such error, inconsistency, omissions or difference, and failed to report it to the Architect. Contractor shall not be entitled to additional compensation or additional Work caused by Contractor's failure to carefully study and compare the Construction Documents prior to the execution of the Work.

3.2.5 Prior to performing any Work, and only if applicable, Contractor shall locate all utility lines as shown and located on the plans and specifications, including the telephone company lines and cables, sewer lines, water pipes, gas lines, electrical lines, including, but not limited to, all buried pipelines and buried telephone cables, and shall perform any Work in such a manner so as to avoid damaging any such lines, cables, pipes, and pipelines. In addition, Contractor shall independently determine the location of same. Contractor shall be responsible for any damage done to such utility lines, cables, pipes, and pipelines during its Work, and shall be responsible for any loss, damage, or extra expense resulting from such damage. Repairs shall be made immediately to restore all service. Any delay for such break shall be attributable to Contractor. In addition, and only if applicable, Contractor shall review the appropriate AHERA and hazardous materials surveys for the particular campuses involved in the Project, and shall notify all Subcontractors and Sub-subcontractors of the necessity to review said surveys. Contractor shall perform any Work in such a manner as to avoid damaging, exposing, or dislodging any asbestos-containing materials that are clearly identified and located in AHERA and other hazardous material surveys. Before performing any portion of the Work, the Contractor shall fully investigate all physical aspects of the Project Site and verify all dimensions, measurements, property lines, grades and elevations, existing improvements, and general suitability of existing conditions at the Project site. If applicable, Contractor shall comply with U.S. Environmental Protection Agency rules concerning renovating, repairing, or painting work in schools built prior to 1978 involving lead-based paint.

3.2.6 The Owner shall be entitled to deduct from the Contract Sum, amounts paid to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, Owner provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation. If, in the reasonable opinion of the Architect, the Contractor does not make reasonable effort to comply with any of the above requirements of the Contract Documents, and this causes Architect or his Consultants to expend an unreasonable amount of time in the discharge of the duties imposed by the Contract Documents, then the Contractor shall bear the cost of compensation for the Architect's additional services made necessary by such failure.

3.2.7 The Contractor shall arrange meetings prior to commencement of the Work of all major Subcontractors to allow the Subcontractors to demonstrate an understanding of the Construction and Contract Documents to the Architect and to allow the Subcontractors to ask for interpretations, when necessary. The Contractor and each Subcontractor shall be evaluated and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including:

.1 The location, condition, layout, drainage, and nature of the Project site and surrounding areas;
.2 Generally prevailing climatic conditions;
.3 Anticipated labor supply and costs;
.4 Availability and cost of materials, tools, and equipment; and
.5 Other similar issues.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract

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Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects, in writing, to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

Contractor shall attend weekly, or as otherwise directed by Owner, job site progress meetings. Program Manager shall conduct such meetings; and, shall manage Architect's recording, transcribing and distributing minutes to attendees, Architect, and other appropriate parties

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent Contractor. Nothing contained herein or inferable here from shall be deemed or construed to (1) make Contractor the agent, servant or employee of the Owner, or (2) to create any partnership, joint venture, or other association between the Owner and Contractor. Any direction or instruction by Owner or any of its authorized representatives in respect to the Work shall relate to the results the Owner desires to obtain from the Work, and shall in no way affect Contractor's independent Contractor status described herein. As part of that responsibility, Contractor shall enforce the Owner's alcohol-free, drug-free, tobacco-free, harassment-free, and weapon-free policies and zones, which will require compliance with those policies and zones by Contractor's employees, subcontractors, and all other persons carrying out the Contract. Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, while on Owner's property to refrain from committing any criminal conduct, using tobacco products, possessing or drinking alcoholic beverages, possessing or using illegal drugs or controlled substances, carrying or possessing weapons, speaking profane and/or offensive language, or engaging in any inappropriate interactions of any nature whatsoever with students and employees, including talking, touching, staring or otherwise contributing to a hostile or offensive environment for Owner's students and employees. All areas of campus, other than the defined construction area, shall be off limits to Contractor's forces, unless their work assignment specifies otherwise. Contractor shall also require adequate and appropriate dress and identification of Contractor's employees, subcontractors, and all other persons carrying out the Work. Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, to wear identification tags on the front of their persons during all times that they are on Owner's property. Such identification tags shall contain a current photograph and the worker's full name in a typeface large enough to be seen from a reasonable distance. The Contractor shall further ensure that no on-site fraternization shall occur between personnel under the Contractor's and Subcontractor's direct or indirect supervision and Owner's students or employees and the general public. Failure of an individual to adhere to these standards of conduct shall result in the immediate removal of the offending employee from all construction on any of Owner's property. Repeated removal of Contractor's or Contractor's subcontractor's forces, or one serious infraction, shall constitute a substantial breach of the Contract justifying the immediate termination by Owner pursuant to Article 14. Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractor, to park their personal motor vehicles on Owner's property only in the parking places designated by the Owner's campus principal. Any vehicles not parked in the appropriate locations shall be towed at the vehicle owner's sole expense. Contractor shall follow, and shall require all employees, agents, or subcontractors to follow, the tree ordinance of the municipality in which the Project is located. In addition, if not covered by the municipal tree ordinance, Contractor shall barricade and protect all trees on the Project, which shall be included in the Cost of the Work. Contractor shall institute a theft deterrence program designed to restrict construction worker access to properties of Owner that are currently in use, to maintain supervision of Contractor's and Contractor's subcontractor's forces, and to reimburse the Owner or those persons suffering a theft loss which results from Contractor's forces or Contractor's subcontractor's forces' actions, omissions, or failure to secure the Work connecting or adjacent to property of Owner.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work. Contractor shall execute the Work in a good and workmanlike manner, continuously and diligently in accordance with generally accepted standards of construction practice for construction of projects similar to the Project, using qualified, careful and efficient workers and in conformity with the provisions of the Contract Documents.

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3.3.4 The Contractor shall properly and efficiently coordinate the timing, scheduling, and routing of all Work performed by all sub-contractors and sub-subcontractors.

3.3.5 To the extent that any portion of the Work requires a trench excavation exceeding five (5') feet in depth, in accordance with Texas Health and Safety Code § 756.023(a), Contractor shall fully comply, and shall require any applicable subcontractor to comply, with:

.1 The Occupational Safety and Health Administration standards for trench safety in effect for the Construction of the Work;
.2 The special shoring requirements, if any, of the Owner;
.3 Any geotechnical information obtained by Owner for use by the Contractor in the design of the trench safety system; and
.4 Trench excavation safety protection shall be a separate pay item, and shall be based on linear feet of trench excavated. Special shoring requirements shall also be a separate pay item, and shall be based on the square feet of shoring use.

3.3.6 The Contractor shall review Subcontractor safety programs, procedures, and precautions in connection with performance of the Work. However, the Contractor's duties shall not relieve any Subcontractor(s) or any other person or entity (e.g. a supplier), including any person or entity with whom the Contractor does not have a contractual relationship, of their responsibility or liability relative to compliance with all applicable federal, state, and local laws, rules, regulations, and ordinances which shall include the litigation to provide for the safety of their employees, persons, and property and their requirements to maintain a work environment free of recognized hazards. The foregoing notwithstanding, the requirements of this Paragraph are not intended to impose upon the Contractor any additional obligations that the Contractor would not have under any applicable state or federal laws, including, but not limited to, any rules, regulations, or statutes pertaining to the Occupations Safety and Health Administration.

3.3.7 It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor. Nothing contained in this Contract or inferable from this Contract shall be deemed or construed to: 1) make Contractor the agent, servant or employee of the Owner; or 2) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner or any of its authorized representatives in respect of the Work, shall relate to the result the Owner desires to obtain from the Work, and shall in no way affect Contractor's independent contractor status. Pursuant to Texas Labor Code § 214.008, the Contractor and any subcontractor on the Project, shall properly classify, as an employee or an independent contractor, in accordance with Texas Labor Code Chapter 201, any individual the Contractor or subcontractor directly retains and compensates for services performed in connection with this Contract. Any Contractor or subcontractor who fails to properly classify such an individual, may be subject to penalties of Texas Labor Code § 214.008(c).

§ 3.4 Labor and Materials

§ 3.4.1 These Contract Documents shall not be construed to deny or diminish the right of any person to work because of the person's membership or other relationship status with respect to any organization. Texas Government Code § 2269.054. These Contract Documents shall also not prohibit, require, discourage or encourage a person, or discriminate against a person bidding on this contract from entering into or declining to enter into, or adhering to, an agreement with a collective bargaining organization relating to this Project. Texas Government Code § 2269.0541. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for qualified, careful, and efficient workers and labor, eligible to work in accordance with state and federal law. Contractor shall appropriately classify all workers in accordance with the Fair Labor Standards Act, its implementing regulations, and Texas Labor Code § 214.008. In addition, unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Before ordering any material or doing any Work, Contractor shall verify all dimensions and check all conditions in order to assure Contractor that they are the same as those in Drawings, Specifications, and other Construction Documents. Any inconsistency shall be brought to the attention of the Architect. In the event that discrepancies occur between ordered material and actual conditions and Architect was not notified beforehand, then costs to correct such discrepancies shall be borne by Contractor.

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§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the prior written consent of the Owner, after evaluation by the Architect and Program Manager ~~and~~ in accordance with a Change Order or Construction Change Directive.

3.4.2.1 After evaluation by the Architect, substitutions and alternates may be rejected by the Architect or Program Manager without explanation and will be considered only under one or more of the following conditions: (i) the proposal is required for compliance with interpretation of code requirements or insurance regulations then existing; (ii) specified products are unavailable through no fault of the Contractor; (iii) and when, in the judgment of the Architect, a substitution would be substantially in the Owner's best interests, in terms of cost, time, or other considerations.

3.4.2.2 The Contractor must submit to the Architect: (i) a full explanation of the proposed substitution and submittals of all supporting data, including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation for the substitution: (ii) a written explanation of the reasons the substitution should be considered, including the benefits to the Owner and the Work in the event the substitution is acceptable; (iii) the adjustment, if any, in the Contract Sum; (iv) the adjustment, if any, in the time of completion of the Contract and the construction schedule; and (v) an affidavit stating (a) the proposed substitution conforms to and meets all requirements of the pertinent Specifications and the requirements shown on the Drawings, and (b) the Contractor accepts the warranty and will coordinate the Work to be complete in all respects, as if originally specified by the Architect. Proposals for substitution shall be submitted in writing to the Architect in sufficient time to allow the Architect no less than fifteen (15) working days for review. No substitutions will be considered or allowed without the Contractor's submittals of complete substantiating data and information.

3.4.2.3 Whether or not the Architect accepts any proposed substitution, the Contractor shall reimburse the Owner for any fees charged by the Architect or other consultants for evaluating each proposed substitution.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. THE CONTRACTOR RELEASES, INDEMNIFIES AND HOLDS HARMLESS THE OWNER FOR CONTRACTOR'S FORCES' NON-COMPLIANCE WITH OWNER'S DRUG-FREE, ALCOHOL-FREE, WEAPON-FREE, HARASSMENT-FREE, AND TOBACCO-FREE ZONES, CONTRACTOR'S FORCES' NON-COMPLIANCE WITH CRIMINAL LAW, OR CONTRACTOR'S OR CONTRACTOR'S FORCES' NON-COMPLIANCE WITH IMMIGRATION LAW OR REGULATIONS. Any individual found by Owner to have violated these restrictions is subject to permanent removal from the Project, at the Owner's request. Contractor shall place similar language in its subcontract agreements, requiring the Subcontractors and Sub-subcontractors to be responsible for their own forces, and Contractor shall cooperate with the Owner to ensure Subcontractor and Sub-subcontractor compliance.

3.4.4 Including, but not limited to, the specific requirement of Article 10, Contractor, its subcontractors and vendors shall bear responsibility for compliance with all federal, state, and local laws, regulations, guidelines, and ordinances pertaining to work safety and applicable to the Work. Contractor further recognizes that the Owner and Architect do not owe the Contractor any duty to supervise or direct his work so as to protect the Contractor from the consequences of his own conduct.

3.4.5 Pursuant to Texas Education Code § 44.034, Contractor must give advance written notice to the Owner if the Contractor or an owner or operator of the Contractor has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony. The Owner may terminate this Contract if the Owner determines that the Contractor failed to give such notice or misrepresented the conduct resulting in the conviction. This paragraph requiring advance notice does not apply to a publicly-held corporation.

3.4.6 CRIMINAL HISTORY CHECKS

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3.4.6.1 So that Owner can obtain the national criminal history record information required by Texas Education Code Section 22.08341 on all "covered employees" (as defined in Section 3.4.6.3) of Contractor, its subcontractors, or any subcontracting entities who will perform the Work, Contractor shall submit to Owner the name and all necessary identifying information necessary to enable Owner to obtain the national criminal history information on those covered employees before they begin the Work. Contractor's submission will include the employee's written authorization for Owner to obtain such criminal history information. Owner may, in its sole discretion, prohibit the use of any employee to perform the Work after its review of the criminal history information, but cannot disclose the criminal history information to Contractor. Contractor shall reimburse Owner for Owner's costs incurred in obtaining the criminal history information. Contractor's violation of this section shall constitute a substantial failure under Article 14.

3.4.6.2 Contractor will not assign any "covered employee" with a "disqualifying criminal history," as those terms are defined below, to work on the Project. If Contractor receives information that a covered employee has a reported disqualifying criminal history, then Contractor will immediately remove the covered employee from the Project and notify the Owner in writing within three (3) business days. If the Owner objects to the assignment of any covered employee on the basis of the covered employee's criminal history record information, then Contractor agrees to discontinue using that covered employee to provide services on Owner's Project. If Contractor has taken precautions or imposed conditions to ensure that the employees of Contractor and any subcontractor will not become covered employees, Contractor will ensure that these precautions or conditions continue throughout the time the contracted services are provided.

3.4.6.3 For the purposes of this Section, "covered employees" means employees, agents, or applicants of Contractor who has or will have continuing duties related to the services to be performed on Owner's Project and has or will have direct contact with Owner's students. The Owner will decide what constitutes direct contact with Owner's students. "Disqualifying criminal history" means: any conviction or other criminal history information designated by the Owner; any felony or misdemeanor conviction that would disqualify a person from obtaining educator certification under Texas Education Code § 21.060, and 19 Texas Administrative Code § 249.16; or one of the following offenses, if at the time of the offense, the victim was under 18 years of age or enrolled in a public school; a felony offense under Texas Penal Code Title 5 Offense Against Persons; an offense for which a defendant is required to register as a sex offender under Texas Code of Criminal Procedure Chapter 62; or an equivalent offense under federal law or the laws of another state.

3.4.7 OWNER'S ADDITIONAL REQUIREMENTS RELATED TO CRIMINAL HISTORIES

In addition, as provided in Section 3.4.6.1 above, Owner or Contractor will at least annually obtain criminal history record information that relates to any employee, agent, or applicant of the Contractor, if the person has or will have duties related to the Project, and the duties are or will be performed on Owner's Project, or at another location where students are likely to be present. Contractor shall assume all expenses associated with the background checks and shall immediately remove any employee, agent, or subcontractor who was convicted of a felony or a misdemeanor involving moral turpitude from Owner's property, or other location where students are likely to be present. Owner shall determine what constitutes "moral turpitude" or a "location where students are likely to be present."

3.4.7.1 If the Contractor is the person or owner or operator of the business entity, that individual may not self-certify regarding the criminal history record information and its review, and must submit original evidence acceptable to the Owner with this ~~Agreement~~Contract showing compliance

3.4.8 PREVAILING WAGE RATES

3.4.8.1 Contractor, Contractor's Subcontractors and Sub-subcontractors shall pay all workers not less than the general prevailing rate of per diem wages for work of a similar character where the project is located as detailed in the "Minimum Wage Schedule" attached to this Contract. Wages listed are minimum rates only. However, no claims for additional compensation above the Contract Sum shall be considered by the Owner because of payments of wage rates in excess of the applicable rate provided herein. Texas Government Code § 2258.001 *et seq*.

3.4.8.2 Contractor shall forfeit, as a penalty to the Owner, $60 for each laborer, worker, or mechanic, employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the Contract Documents.

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3.4.8.3 Owner reserves the right to receive and review payroll records, payment records, and earning statements of employees of Contractor, and of Contractor's Subcontractors and Sub-subcontractors.

3.4.8.4 In executing the Work under the Contract Documents, Contractor shall comply with all applicable state and federal laws, including but not limited to, laws concerned with labor, equal employment opportunity, safety and minimum wages.

3.4.8.5 If no schedule is attached to the Contract, Contractor shall use the wage rates contained in the Project Manual for the Project. If no wage rates are in the Project Manual, then the parties shall use the wage rate determined by the U.S. Department of Labor in accordance with the Davis-Bacon Act, 40 U.S.C. § 276a, (which can be accessed on the internet at https://www.wdol.gov/or https://beta.sam.gov/) effective as of the date of this Contract.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require, ~~or permit~~ and that the Work will conform to the requirements of the Contract Documents.~~permit~~. The Contractor further warrants that Contractor shall perform the Work in a good and workmanlike manner, continuously and diligently in accordance with generally accepted standards of construction practice for construction of projects similar to the Project, except to the extent the Contract Documents expressly specify a higher degree of finish or workmanship, in which case the standard shall be the higher standard. All material shall be installed in a true and straight alignment, level and plumb; patterns shall be uniform; and jointing of materials shall be flush and level, unless otherwise directed in writing by the Architect. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance (unless such maintenance is Contractor's responsibility), improper operation, or normal wear and tear and normal usage, but such exclusions shall only apply after Owner has taken occupancy of the damaged or defective portion of the Project. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Notwithstanding anything in the Contract Documents to the contrary, Owner and Contractor expressly agree that the warranties stated herein shall mean the individual warranties associated with each particular Work within the Project, and each such individual warranty shall run from the applicable Work's Final Completion date (unless otherwise expressly provided in the applicable Contract Documents for that particular Work.) Contractor's express warranty is in addition to, and not in lieu of, Owner's other available remedies. All required warranties on equipment, machinery, materials, or components shall be submitted to the Architect on the manufacturer's or supplier's approved forms for delivery to the Owner. The warranties set out in this Subparagraph are not exclusive of any other warranties or guarantees set out in other places in the Contract Documents or expressed or implied under applicable law.

§ 3.5.2 ~~All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4~~Contractor shall certify that the ~~Project~~Work has been constructed in general conformance with the Architect's or Engineer's plans, specifications, and Construction Documents, as modified from time to time pursuant to the terms of the Contract Documents. Contractor shall fully complete a "Certification of Project Completion" as required by 19 Texas Administrative Code § 61.1040~~36~~.

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3.5.3 In the event of failure of materials, products, or workmanship, either during construction or the warranty period, the Contractor shall take appropriate measures to ensure correction of defective Work or replacement of the defective items, without cost to the Owner. Such warranty shall be maintained notwithstanding that certain systems may be activated prior to Substantial Completion as required for the satisfactory completion of the Project. Upon written notice from the Owner or Architect, the Contractor shall promptly remedy defects as covered by Contractor's warranty. If Contractor does not respond to the written notice, either by beginning corrective work or notifying Owner in writing regarding when corrective work will begin, within ten (10) days of Contractor's receipt of the written notice, then the Owner may take measures to correct the Work and Contractor will be obligated to reimburse Owner's costs. The provisions of this subparagraph shall be in addition to, and not in lieu of, any other rights and remedies available to the Owner.

3.5.3.1 All required warranties on equipment, machinery, materials, or components shall be submitted to the Architect on the manufacturer's or supplier's approved forms at the time of Substantial Completion

3.5.4 When deemed necessary by the Owner and prior to installation of any item specifically made subject to a performance standard or regulatory agency standard under any provision of the Contract Documents, Contractor shall furnish proof of conformance to the Architect. Proof of conformance shall be in the form of:

.1 an affidavit from the manufacturer certifying that the item is in conformance with the applicable standards; or

.2 an affidavit from a testing laboratory certifying that the product has been tested within the past year and is in conformance with the applicable standards; or

.3 such further reasonable proof as is required by the Architect.

3.5.5 The Contractor agrees to issue the warranty (or warranties) in the name of the Owner, or assign the warranty (or warranties) to the Owner at Final Completion of the Work, such assignment to be effective no later than Final Completion, for any and all material, equipment, fixtures, and furniture (if supplied or installed by Contractor or its subcontractor), or other special warranties, and manufacturers' warranties relating to materials and labor used in the Work. Contractor further agrees to perform the Work in such manner so as to preserve any and all manufacturer's warranties. All forms will be required to be submitted prior to Final Payment.

3.5.6 The warranties of Contractor provided in Section 3.5 shall in no way limit or abridge the warranties of the suppliers of equipment and systems which are to comprise a portion of the Work and all such warranties shall be in form and substance as required by the Contract Documents. Contractor shall take no action or fail to act in any way which results in the termination or expiration of such third party warranties or which otherwise results in prejudice to the rights of Owner under such warranties. Contractor agrees to provide all notices required for the effectiveness of such warranties and shall include provisions in the contracts with the providers and manufacturers of such systems and equipment whereby Owner shall have a direct right, but not a duty, of enforcement of such warranty obligations.

3.5.7 Contractor shall maintain a complete and accurate schedule of the date(s) of Substantial Completion, the date(s) of Final Completion, and the dates upon which the warranty under Section 12.2 herein on each phase or building will expire. Contractor shall provide a copy of such schedules to Owner and Architect. Prior to termination of the warranty period under Section 12.2 herein, Contractor shall accompany Owner and Architect on re-inspection of each Work in the Project and Contractor shall be responsible from correcting any warranty items which are observed or reported during the warranty period under Section 12.2 herein. Contractor shall prosecute such warranty work under Section 12.2 herein without interruption until accepted by Owner and Architect, even though such work shall extend beyond the warranty period under Section 12.2 herein. If Contractor fails to provide the schedules to Owner and Architect, Contractor's warranty obligation described herein shall continue until such inspection is conducted and deficiencies are corrected.

3.5.8 Prior to receipt of Final Payment, Contractor shall:

.1 Obtain duplicate original warranties, executed by all subcontractors, making the dates of beginning of the warranties the Date of Final Completion; and the warranties of suppliers and manufacturers, making the dates of beginning of the warranties no later than the Date of Final Completion;

.2 Verify that the documents are in proper form and contain full information;

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.3 Co-sign warranties when required;

.4 Bind all warranties in commercial quality 8-1/2 X 11 inch three-ring binder, with hardback, cleanable, plastic covers;

.5 Label the cover of each binder with a typed or printed title labeled "WARRANTIES", along with the title of the Project, name, address, and telephone number of Contactor, and name of its responsible principal;

.6 Include a Table of Contents, with each item identified by the number and title of the specification section under which the product is specified;

.7 Separate each warranty with index tab sheets keyed to the Table of Contents listing; and

.8 Deliver warranties and bonds in the form described above, to the Architect who will review same prior to submission to the Owner.

3.5.8.1 Contractor and Owner acknowledge that the Project may involve construction work on more than one school building for the Owner. Each building, or approved phase of each building, shall have its own, separate, and independent date of substantial completion, dates upon which the one-year warranty on each phase or building, which is substantially complete, will expire, and dates of final completion. Contractor agrees to provide notice of the warranty expiration date to Owner and Architect at least one month prior to the expiration of the one (1) year warranty period on each building or each phase of the building that has been substantially completed. If Owner, Architect or Program Manager discovers during the warranty period, deficiencies not previously reported, Contractor shall accompany the Owner, Architect and Program Manager on an inspection of such deficiencies and Contractor shall be responsible for correcting any such deficiencies not caused by the Owner or the use of the building. For extended warranties required by various sections, i.e., roofing, compressors, mechanical equipment, Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within fifteen (15 days of initial notification from Owner. Contractor shall prosecute the work without interruption until accepted by the Owner and the Architect, even though such prosecution should extend beyond the limit of the warranty period. If Contractor fails to provide notice of the expiration of the one (1) year warranty period at least one month prior to the expiration date, Contractor's warranty obligation described in this paragraph shall continue until such inspection is conducted and any deficiencies found in the inspection corrected Contractor shall certify that the Work has been constructed in accordance with the Contract Documents. Any work performed by the Contractor that is not in accordance with the Contract Documents is defective and a breach of this agreement unless the Owner has agreed in writing to waive the defect. The Contractor shall provide all reasonable assistance in achieving compliance with building code specifications, accessibility standards, and Texas Education Agency Commissioner's rules in the Work.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect. Owner is an exempt entity under the tax laws of the State of Texas. Texas Tax Code § 151.309; 34 TAC § 3.322. The Owner represents that this Project is eligible for exemption from the State Sales Tax on tangible personal property and material incorporated in the Project, provided that the Contractor fulfills the requirements of the Texas Tax Code § 151.309; § 151.310; § 151.311, and 34 TAC § 3.291 and § 3.287. For the purpose of establishing exemptions, it is understood and agreed that the Contractor may be required to segregate materials and labor costs at the time a Contract is awarded. Contractor will accept a Certificate of Exemption from the Owner, pursuant to Texas Tax Code § 151.054(e), § 151.155, and 34 TAC § 3.287. Contractor shall obtain Certificates of Resale from Contractor's suppliers. Texas Tax Code § 151.154; 34 TAC § 3.285. Failure of Contractor or any Sub-Contractor to obtain Certificates of Resale from their suppliers shall make the Contractor or Sub-Contractor responsible for absorbing the tax without compensation from Owner. Contractor shall pay all necessary local, county, and state taxes, income tax, compensation tax, social security, and withholding payments, as required by law. CONTRACTOR HEREBY RELEASES, INDEMNIFIES, AND HOLDS HARMLESS OWNER FROM ANY AND ALL CLAIMS AND DEMANDS MADE AS A RESULT OF THE FAILURE OF CONTRACTOR OR ANY SUBCONTRACTOR TO COMPLY WITH THE PROVISIONS OF ANY OR ALL SUCH LAWS AND REGULATIONS.

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3.6.2 ~~1~~ The Dallas Independent School District is an exempt organization as defined by the Limited Sales and Excise Use Tax Act of Texas. The Contractor may issue an exemption certificate in lieu of sales tax on the purchase, rental or lease of all materials, supplies, equipment used or consumed and other tangible personal property incorporated into the property being improved by virtue of this Contract, as well as all materials, supplies, equipment and other tangible personal property used or consumed by the Contractor in performing this Contract with the Dallas Independent School District. The Contractor may issue exemption certificate(s) to its suppliers in lieu of said sales tax for all of said materials and supplies. The uses of said materials and supplies for which an exemption from the said sales tax is claimed and any such exemption certificate(s), shall comply with the applicable rulings of the State Comptroller.

3.6.3 ~~2~~ The Contractor shall be held to have studied all tax laws for the State of Texas, the County of Dallas, Texas and the City of Dallas, Texas, and shall pay all taxes for which he may be liable as a consumer or user of goods, or otherwise without addition to the contract price. The Contractor shall pay all sales, consumer, use and other similar taxes required by law.

3.6.4 ~~3~~ Title to all goods or materials purchased under a~~s~~ resale certificate shall vest in the District at the time of initial possession by the Program Manager and shall be used only in performance of Services under this ~~Agreement~~Contract. Program Manager shall cause such items to promptly be marked, labeled or otherwise physically identified as the District's property. Program Manager shall cause items purchased under a resale certificate to send the receiving ticket to the District to be added to inventory before use by the Program Manager. Any tangible personal property purchased under a resale certificate as described above not fully used up in the Services shall remain with the District

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 ~~Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded~~After Architect has filed the plans and specifications with the Texas Department of Licensing and Regulation, Architect shall notify Contractor that Contractor may make and submit the applications for the building permit. The ~~Owner~~Contractor shall pay the municipality directly for the building permit and all other development "impact" fees, if any. The Contractor shall continue to be responsible for payment of other permits, governmental fees, licenses and inspections necessary for proper execution of the Contract and which are legally required when bids or proposals are received. Such fees and expenses shall only be reimbursable to Contractor if expressly agreed to herein.

Architect shall assist Contractor in obtaining an Occupancy Permit by accompanying governing officials during inspections, including the architectural barrier inspection and correction, of the Project, if requested to do so by the Program Manager or the Owner. Architect shall assist the Contractor in obtaining the Certificate of Occupancy prior to the issuance of the Certificate of Substantial Completion.

3.7.1.1 The Owner shall pay directly to the governing authority the cost of all permanent property utility assessments and similar connection charges.

3.7.1.2 The Contractor shall pay directly all temporary utility charges, tap charges, and water meter charges, without reimbursement from Owner. After consultation with the Owner, the Contractor shall also obtain all permits and approvals, and pay all fees and expenses, if any, associated with National Pollutant Discharge Elimination System (NPDES) regulations administered by the Environmental Protection Agency (EPA) and local authorities, if applicable, that require completion of documentation and/or acquisition of a "Land Disturbing Activities Permit" for the Project. Also after consultation with the Owner, the Contractor shall obtain all permits and approvals, and pay all fees and expenses, if any, associated with Storm Water Pollution Prevention and Pollution Control Plan (SWPPP) regulations administered by the Texas Commission on Environmental Quality (TCEQ) and local authorities. Contractor's obligations under this Section may or may not require it to obtain or perform engineering services during the pre-construction phase to prepare proper drainage for the construction sites. Any drainage alterations made by Contractor during the construction process, which require the issuance of a permit, shall be at Contractor's sole cost. Reimbursable expenses shall not include any fines or penalties assessed against the Contractor, Contractor's subcontractors, the Project, or the Owner.

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§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. In addition, Contractor shall authorize posting of any notices required of Owner pursuant to Texas Business and Commerce Code, Section 116.0001, or any notices concerning the Workers Compensation insurance carried by other parties involved in the Project, including without limitation, Architect, at the same location where Contractor posts notices regarding Workers Compensation. If applicable, the Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or by any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary back-up material, and furnish the surety with any required personal undertakings. The Contractor shall also obtain and pay all charges for all approvals for street closings, traffic control, parking meter removal, and other similar matters as may be necessary or appropriate from time to time for the performance of the Work.

§ 3.7.3 If the Contractor performs Work when Contractor knows~~ing~~ or reasonably should have known it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, the Contract Documents, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 [*Intentionally deleted*] ~~Concealed or Unknown Conditions~~

~~If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than three 14(3) business days after first observance of the conditions. Contractor agrees that this is a reasonable notice requirement. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially, report findings and a recommended resolution in writing to Owner and Contractor. If Owner's Board of Trustees and Contractor cannot agree on an equitable adjustment to the Contract Sum or Contract Time, then either party may pursue alternative dispute resolution as provided for in Article 15, within ninety (90) days of the Architect's recommendation. If such conditions will cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, the Architect will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.~~

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect in writing. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

3.7.6 The Contractor shall be responsible for timely notification to and coordination with all utility companies regarding the provision of services to the Project. The Contractor shall inform the Architect and Program ~~at~~Manager at once when the Owner's participation is required, and the Architect shall immediately notify the Owner. Connections for temporary and permanent utilities and payment for temporary utilities services required for the Work, whether the Work is new construction or renovation of an existing facility, are the responsibility of the Contractor unless otherwise agreed. If the Work is new construction, the payment for temporary and/or permanent utility services shall be the responsibility of the Contractor until Substantial Completion.

3.7.6.1 The Owner shall pay directly to the relevant jurisdiction those fees presently called "Storm Water Disposal Fees" to the water and sewage departments. Contractor shall ascertain amounts and advise Architect. Water meter charges shall be paid by the Contractor

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§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, unless required to do so by the terms of the Construction Documents.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site ~~and all required taxes~~, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, bonds, insurance, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum or the Owner's Contingency, at Owner's discretion, unless required to do so by the terms of the Construction Documents, shall be adjusted accordingly ~~by Change Order~~. The amount of the adjustment~~Change Order~~ shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner ~~with reasonable promptness~~ , to avoid delay in the Work, provided that if a decision is needed to avoid delay, Contractor shall notify Architect and Program Manager in writing sufficiently in advance of needed date to allow reasonable time for selections to be made

3.8.4 When performing Work under allowances, Contractor shall solicit and receive not less than three (3) written proposals and shall provide the Work as directed by the Architect, upon Owner's written approval, on the basis of the best value to the District.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. In addition, the Contractor may employ a project manager and necessary assistants who may supervise several Project sites. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communication shall be similarly confirmed in writing. Other communications shall be similarly confirmed on written request in each case. Questions about plan interpretation or directions shall be submitted to the Architect in the form of a written request for information and the Architect shall respond to such request for information in a reasonable and timely fashion. Contractor's selection of project manager or superintendent(s) shall be approved by Owner, and Contractor shall not replace the project manager or superintendent(s) without Owner's consent or until a replacement project manager or superintendent(s) has been selected in accordance with this Section. The Owner may reject or require removal of any job superintendent, project manager, or employee of the Contractor, Subcontractor, or Sub-Subcontractor involved in the Project. Contractor shall provide an adequate staff for the proper coordination and expedition of the Work. Owner reserves the right to require Contractor to dismiss from the Work any employee or employees that Owner may deem incompetent, careless, insubordinate, or in violation of any provision in these Contract Documents. This provision is applicable to Subcontractor, Sub-Subcontractor, and their employees.

§ 3.9.2 ~~The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.~~

§ 3.9.3 ~~The~~ Contractor's superintendent shall be present full-time on the site as soon as possible after commencement of the Work, and shall remain~~ed~~ assigned to this Work and present on the site during performance of the Work, throughout the course of the Work, until items requiring completion or correction, identified at Substantial Completion pursuant to Section 9.8, have been completed or corrected. From Substantial Completion until Final Completion, the superintendent shall be on the site as necessary to ensure that Final Completion occurs within 30 days of Substantial Completion~~not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed~~.

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3.9.4 Owner shall be notified not less than 24 hours before any time that superintendent will not be present at the site for any reason except periodic illness. If the reason is due to illness, then Owner shall be notified at the beginning of that day. Owner shall be notified of the identity of the acting superintendent. In the event the superintendent is absent from the site and notice has not been provided nor has an acting superintendent been assigned to the Work, then an amount equal to the superintendent's daily rate shall be deducted for the amount owed to the Contractor under general conditions for such day.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare for and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The schedule shall not interfere with the operation of Owner's existing facilities and operations without Owner's prior written approval.

3.10.1.2 In the event that the Contractor is entitled to an extension of the Substantial Completion Date or any required interim completion date under the Contract Documents, Owner shall be entitled to direct the acceleration or re-sequencing of the Work in order to achieve the prior scheduled Substantial Completion Date or interim completion dates, and Contractor shall be reimbursed for the amount of the premium portion of overtime actually incurred in respect thereto and shall be entitled to an increase adjustment to the Contract Sum to the extent of the premium portion of overtime so incurred. Before proceeding with any such Owner-directed acceleration plan under this subparagraph, the Contractor shall have received the Owner's prior written approval of the plan and its anticipated not-to-exceed cost.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall prepare and submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect and Program Manager reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in ~~general~~ accordance with the most recent schedules submitted to the Owner and Architect.

3.10.4 The Contractor shall hold weekly progress meetings at the Project Site, or at such other time and frequency as are acceptable to the Owner. Program Manager shall conduct such meetings; and, shall manage Architect's recording, transcribing and distributing minutes to attendees, Architect, and other appropriate parties. Progress of the Work shall be reported at said meeting with reference to Contractor's construction schedule. The Contractor shall submit to the Architect, with each monthly application for payment, a copy of the progress schedule showing all modifications required, and shall take whatever corrective action is necessary to assure that the project completion schedule is met at no additional cost to Owner, except as allowed herein. In the event that Contractor shall fall behind schedule at any time, Contractor shall develop and deliver a recovery plan to the Owner with a recovery schedule and a program describing the additional manpower, overtime, material expediting, resequencing of the Work, and other steps Contractor shall take to meet the requirements of the Contract. Contractor shall not be entitled to compensation from the Owner or any increase in the Contract Sum for the schedule recovery efforts. No approval or consent by the Owner of any plan for resequencing or acceleration of the Work submitted by Contractor shall constitute a waiver by Owner of any damages or losses which Owner may suffer by reason of such resequencing or the failure of Contractor to meet the Substantial Completion Date or the Final Completion Date.

3.10.5 The process of approving Contractor's schedules and updates to Contractor's schedule shall not constitute a warranty by the Owner that any non-Contractor milestones or activities will occur as set out on Contractor's schedule. Approval of a Contractor's schedule does not constitute a commitment by the Owner to furnish any Owner-furnished information or material any earlier than Owner would otherwise be obligated to furnish that information or material under the Contract Documents. Failure of the Work to proceed in the sequence scheduled by

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Contractor shall not alone serve as the basis for a Claim for additional compensation or time. In the event there is interference with the Work, which is beyond its control, Contractor shall attempt to reschedule the Work in a manner that will hold resulting additional time and costs to a minimum. The construction schedule shall be in a detailed format satisfactory to the Owner, the Architect and Program Manager. If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner, Program Manager and Architect and re-submitted for acceptance. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner of any delays or potential delays. The accepted construction schedule shall be updated to reflect actual conditions (sometimes referred to in these Supplementary Conditions as progress reports) as set forth in Subparagraph 3.10.1 or if requested by either the Owner or the Architect.

3.10.6 The Owner shall have the right to reschedule the time of day for the performance of any part of the Work that may interfere with the operation of the Owner's premises or any tenants or invitees thereof. The Contractor shall, upon the Owner's request, reschedule any portion of the Work affecting operation of the premises during hours when the premises are not in operation. Any rescheduling of performance of the Work under this Subparagraph 3.10.6 may be grounds for an extension of the Contract Time, if permitted under Subparagraph 8.3.1, and an equitable adjustment in the Contract Sum, if: 1) the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents, 2) such rescheduling is required for the convenience of the Owner and is not attributable to any act or omission of Contractor.

3.10.7 The Owner's need for delivery of completed work, or portions thereof, is largely controlled by the necessities of the school calendar and operations of school programs within that calendar. These needs are reflected in any scheduled completion dates and milestone dates set out in the Contract Documents. The Contractor shall perform the work in such a way as to not interfere with school operations, the importance of meeting milestones and completion dates, and Contractor acknowledges and agrees that if these dates are not met, there may be a relaxation in the needed delivery dates because of the school calendar. When it appears to Owner or Contractor that a Contract milestone or completion date cannot be met for reasons not the fault of the Contractor, Contractor will develop with the Owner, Program Manager and Architect a plan and a budget under the Change Order provision of the Contract Documents to meet such a situation either (at Owner's option) by accelerating the Work to overcome the delays, or suspending or otherwise slowing the Work to efficiently take advantage of any relaxation in Owner's need for the completed Work.

§ 3.11 Documents and Samples at the Site

The Contractor shall maintain and make available, at all times, at the Project site, the Construction~~act~~ Documents, including Change Orders, Construction Change Directives, field test records (including environmental inspection and test records), inspection certificates or records, manufacturers' certificates, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner at all times, and delivered to the Architect for completion of record drawings.

3.11.2 In addition to any other requirement in the Contract Documents and prior to installation, Contractor shall furnish or cause a subcontractor to furnish for the Owner's and Architect's written approval, a physical sample of each specified item, product, fixture, or device which is visible by the general public and/or attached to an architecturally-finished surface. Samples shall be suitably labeled, adequately protected, and properly stored at the site. Samples which are approved and undamaged will be considered to be suitable for incorporation into the Work.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

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§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents and ~~Their purpose is to demonstrate~~ how the Contractor proposes to conform to the ~~information given and the design concept expressed in the~~ Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents~~, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule~~, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By approving and submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents ~~to the Owner and Architect~~ that the Contractor has ~~(1) reviewed and approved them, (2)~~ determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and ~~(3)~~ checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. Specific dimensions, quantities, installation and performance of equipment and systems in compliance with the Construction Documents and the Contract Documents remain the Contractor's responsibility.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. ~~The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents.~~ The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, completeness, and accuracy of the services, certifications, and approvals performed or provided by such design professionals~~, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy~~. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. A registered architect must prepare

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plans and specifications for all the Work, as governed by the Texas Occupations Code Chapter 1051; and a registered engineer must prepare plans, specifications, and estimates for all Work governed by Texas Occupations Code Chapter 1001. In the event that Contractor retains a licensed design professional under the terms of this paragraph, Contractor shall require that the licensed design professional carry commercial general liability and errors and omissions insurance coverage in the same amounts and forms as required by the Architect on this Project. In the event that the licensed design professional retained by the Contractor will be conducting on-site services or observations, the licensed design professional shall also carry worker's compensation insurance and comprehensive automobile liability in the same amounts and form as required of the Architect to this Project.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

3.12.11 The Contractor shall submit complete drawings, data, and samples to the Architect at least fifteen (15) days prior to the date the Contractor needs the reviewed submittals and samples returned. The Contractor shall be prepared to submit color samples on any key items (such as quarry tile, vinyl wall covering, etc.) within fifteen (15) days of the award of Subcontract(s). All color samples required for the Work shall be received within sixty (60) days of the date of the approval of the Contract Sum, if the Project is an A101 project; or Guaranteed Maximum Price, if the Project is an A133 project. Once samples of all key items are received, the Architect will finalize color selections.

3.12.12 The Contractor shall submit the number of copies of product data and samples which the Contractor and subcontractors need for their use, plus two (2) additional sets for the Architect, one (1) additional set for the Owner, and one (1) additional set for each of the Architect's consultants involved with the particular section of Work. Where shop drawings are involved, the Contractor shall submit one (1) high quality reproducible transparency, and one (1) opaque print of the shop drawing for the Architect, plus one (1) additional opaque print for each of the Architect's consultants involved with the particular section of Work. The reproducible transparency will be marked by the Architect and/or his consultants. After final review and correction of the submittal, the Contractor shall send one corrected set to the Architect and each of the Architect's consultants involved with the particular section of the Work.

3.12.13 The Architect's review of Contractor's submittals shall be limited to examination of an initial submittal and one (1) re-submittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to reimbursement from the Contractor of amounts paid to the Architect for evaluation of such additional re-submittals.

3.1.2.14 The Contractor represents and warrants that all shop drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the shop drawings are prepared and, if required by the Architect or applicable law, by a licensed engineer.

§ 3.13 Use of Site

3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. When the Work is to be performed at an existing school location, Contractor shall schedule and perform the Work in a manner that does not compromise the safety to school students, faculty and staff, and does not unreasonably disrupt or interfere with the continuing normal routine of the school. If a School Operations Parameters Statement is a part of the Contract Documents, Contractor will comply with its terms, at no increase in price.

3.13.2 Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be properly removed from the Project site. Protection of construction material and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor.

3.13.3 The Contractor and its subcontractor shall not erect any sign on the Project site without the prior written consent of the Owner.

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3.13.4 Contractor shall ensure that the Work, at all times, is performed in a manner that affords Owner reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed in such a manner that the public area adjacent to the Site of the Work shall be free from all debris, building material, and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Construction Documents, Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of any area or building adjacent to the site of the Work, or the building, in the event of partial occupancy.

3.13.5 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrance and parking areas other than those designated by the Owner. The Contractor shall comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly provided, however, that any such cutting, fitting, or patching can only be performed if the cutting, fitting, or patching results in Work that is in accordance with the Construction Documents and Contract Documents. ~~All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.~~

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

3.14.3 No cutting of structural elements will be permitted unless specifically approved in writing by Architect. Fitting and patching shall only be done with new products, and shall only be performed by those skilled in performing the original Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall, on a daily basis, keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. Contractor shall provide on-site containers for the collection of waste materials, debris and rubbish, and shall periodically remove waste materials, debris and rubbish from the Work and dispose of all such materials at legal disposal areas away from the site. All cleaning operations shall be scheduled so as to ensure that contaminants resulting from the cleaning process will not fall on newly-coated or newly-painted surfaces. Immediately after unpacking materials, all packing case lumber or other packing materials, wrapping or other like flammable waste shall be collected and removed from the building and premises. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project. Care shall be taken by all workers not to mark, soil, or otherwise deface any finish. In the event that any finish becomes defaced in any way by mechanics or workers, the Contractor or any of his Subcontractors shall clean and restore such surfaces to their original condition.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the ~~Owner shall be entitled to reimbursement from~~from the cost thereof shall be charged to the Contractor.

3.15.3 The Contractor shall be responsible for the protection of the Work. Prior to the Architect's inspection for Substantial Completion, the Contractor shall clean exterior and interior surfaces exposed to view; remove temporary labels, stains, putty, soil, paint and foreign substances from all surfaces, including glass and painted surfaces; polish transparent and glossy surfaces; clean equipment and fixtures to a sanitary condition; replace air filters in mechanical equipment; clean roofs, gutters, and downspouts; remove obstructions and flush debris from drainage systems; clean site; sweep paved areas, and rake clean other surfaces; remove trash and surplus materials from the site; clean and polish all floors; clean and polish all hardware; and repair all Work damaged during cleaning.

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3.15.4 After construction is complete, Contractor shall: (1) employ skilled workers for final cleaning; (2) remove grease, mastic adhesive, dust, dirt, stains, fingerprints, labels and other foreign materials from all sight-exposed interior and exterior surfaces; (3) wash and shine glazing and mirrors; (4) polish glossy surfaces to a clear shine; (5) vacuum clean carpet and similar soft surfaces; (6) clean (damp mop with clean mop and water) resilient and hard surface floors, repeating as necessary until no visible residue remains on floors; (7) clean plumbing fixtures to a sanitary condition; (8) clean surfaces of all equipment and remove excess lubrication; (9) clean permanent filters and replace disposable filters in ventilating system if units are operated during construction and clean ducts, blowers, and coils; (10) clean light fixtures; (11) remove waste, foreign matter, and debris from roofs, gutters, area ways, and drainage ways; (12) remove waste, debris, and surplus materials from the site; (13) remove stains, spills, and foreign substances from paved areas; and (14) broom clean exterior concrete and paved surfaces, and rake clean the grounds.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Program Manager and Architect and their designated representatives with access to the Work in preparation and progress wherever located. The presence of the Owner, Program Manager or Architect at the Work site does not imply acceptance or approval of the Work. ~~The presence of the Owner, Architect, or their representatives does not constitute acceptance or approval of the Work.~~

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. THE CONTRACTOR SHALL DEFEND SUITS OR CLAIMS FOR INFRINGEMENT OF COPYRIGHTS AND PATENT RIGHTS AND SHALL WAIVE AND RELEASE CLAIMS AGAINST THE OWNER, PROGRAM MANAGER AND ARCHITECT, AND SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND ARCHITECT ~~HARMLESS~~ FROM LOSS ON ACCOUNT THEREOF, PROVIDED, HOWEVER, CONTRACTOR ~~BUT~~ SHALL NOT BE RESPONSIBLE TO ARCHITECT FOR SUCH DEFENSE OR LOSS WHEN A PARTICULAR DESIGN, PROCESS, OR PRODUCT OF A PARTICULAR MANUFACTURER OR MANUFACTURERS IS REQUIRED BY THE CONTRACT DOCUMENTS, OR WHERE THE COPYRIGHT VIOLATIONS ARE CONTAINED IN DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS PREPARED BY THE ~~OWNER OR~~ ARCHITECT, AND SHALL NOT BE RESPONSIBLE TO OWNER IF OWNER REQUIRES A PARTICULAR DESIGN, PROCESS, OR PRODUCT THAT CONSTITUTES A COPYRIGHT VIOLATION. However, if the Contractor has reason to believe that the required design, process, or product is an infringement of a copyright or patent ~~is discovered by, or made known to, the Contractor,~~ the Contractor shall be responsible for ~~the~~such loss unless such~~the~~ information is promptly furnished to the Owner and Architect in writing.

§ 3.18 Indemnification

§ 3.18.1 TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL WAIVE AND RELEASE CLAIMS AGAINST AND SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER, ARCHITECT, ARCHITECT'S CONSULTANTS, OWNER'S TRUSTEES, CONSULTANTS, -PROGRAM MANAGER, AND OFFICERS, AGENTS AND EMPLOYEES OF ANY OF THEM FROM AND AGAINST CLAIMS, DAMAGES, LOSSES, CAUSES OF ACTION, SUITS, JUDGMENTS AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, ARISING OUT OF OR RESULTING FROM PERFORMANCE OF THE WORK, PROVIDED THAT SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE IS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH, OR TO INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY (INCLUDING THE WORK ITSELF), INCLUDING LOSS OF USE RESULTING THEREFROM, BUT ONLY TO THE EXTENT CAUSED IN WHOLE OR IN PART BY THE WILLFUL OR NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM, ANYONE THEY CONTROL OR EXERCISE CONTROL OVER OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE IS CAUSED IN PART BY A PARTY BY ANY WILLFUL OR NEGLIGENT ACTS OR OMISSIONS OF OWNER OR OWNER'S CONSULTANTS OR OTHER INDEMNIFIED PARTIES. SUCH OBLIGATION SHALL NOT BE CONSTRUED TO NEGATE, ABRIDGE, OR REDUCE OTHER RIGHTS OR OBLIGATIONS OF INDEMNITY THAT WOULD OTHERWISE EXIST AS TO A PARTY OR PERSON DESCRIBED IN THIS SECTION 3.18. ALL COSTS AND EXPENSES SO INCURRED BY ANY OF THE INDEMNIFIED PARTIES IN THAT EVENT SHALL BE REIMBURSED BY CONTRACTOR TO THE INDEMNIFIED PARTIES, AND ANY COST AND EXPENSES SO INCURRED BY INDEMNIFIED PARTIES SHALL BEAR INTEREST UNTIL REIMBURSED BY CONTRACTOR, AT THE RATE OF INTEREST PROVIDED TO BE PAID BY THE JUDGMENT UNDER THE LAWS OF THE STATE OF TEXAS.

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3.18.2 IN CLAIMS AGAINST ANY PERSON OR ENTITY INDEMNIFIED UNDER THIS SECTION 3.18 BY AN EMPLOYEE OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM, OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION UNDER SECTION 3.18.1 SHALL NOT BE LIMITED BY A LIMITATION ON AMOUNT OR TYPE OF DAMAGES, COMPENSATION, OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR A SUBCONTRACTOR UNDER INSURANCE POLICIES, WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS, OR OTHER EMPLOYEE BENEFIT ACTS.

3.18.3 THE OBLIGATIONS OF THE CONTRACTOR UNDER THIS SECTION 3.18 SHALL NOT EXTEND TO THE LIABILITY OF THE ARCHITECT. THE ARCHITECT'S CONSULTANTS, AND AGENTS, AND EMPLOYEES OF ANY OF THEM, CAUSED BY OR RESULTING FROM: (1) DEFECTS IN PLANS, DESIGNS, OR SPECIFICATIONS PREPARED, APPROVED, OR USED BY THE ARCHITECT OR ENGINEER; OR (2) NEGLIGENCE OF THE ARCHITECT OR ENGINEER IN THE RENDITION OR CONDUCT OF PROFESSIONAL DUTIES CALLED FOR OR ARISING OUT OF THE CONSTRUCTION CONTRACT AND THE PLANS, DESIGNS, OR SPECIFICATIONS THAT ARE A PART OF THE CONSTRUCTION CONTRACT; AND (3) ARISING FROM: (A) PERSONAL INJURY OR DEATH; (B) PROPERTY DAMAGE; OR (C) ANY OTHER EXPENSES THAT ARISE FROM PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE OR AS OTHERWISE LIMITED BY TEXAS CIVIL PRACTICE & REMEDIES CODE SECTION 130.001 ET SEQ.

3.18.4 THE OWNER MAY CAUSE ANY OTHER CONTRACTOR WHO MAY HAVE A CONTRACT WITH THE OWNER TO PERFORM CONSTRUCTION OR INSTALLATION WORK IN THE AREAS WHERE WORK WILL BE PERFORMED UNDER THIS AGREEMENT, TO AGREE TO INDEMNIFY AND TO HOLD THE OWNER AND THE CONTRACTOR HARMLESS FROM ALL CLAIMS FOR BODILY INJURY AND PROPERTY DAMAGE TO THE SAME EXTENT AS IS PROVIDED IN SECTION 3.18.1 ABOVE. LIKEWISE, CONTRACTOR AGREES TO INDEMNIFY AND TO HOLD THE OWNER'S OTHER CONTRACTORS HARMLESS FROM ALL CLAIMS FOR BODILY INJURY AND PROPERTY DAMAGE TO THE SAME EXTENT AS PROVIDED IN SECTION 3.18.1 ABOVE.

3.18.5 THE PROVISIONS OF SECTION 3.18 IN ITS ENTIRETY SHALL SURVIVE THE COMPLETION, TERMINATION, OR EXPIRATION OF THIS CONTRACT.

3.18.6 It is agreed with respect to any legal limitations now or hereafter in effect and affecting the validity or enforceability of the indemnification obligations under Paragraph 3.18, such legal limitations are made a part of the indemnification obligation and shall operate to amend the indemnification obligation to the minimum extent necessary to bring the provision into conformity with the requirements of such limitations, and as so modified, the indemnification obligations shall continue in full force and effect.

3.18.7 It is understood and agreed that Subparagraph 3.18.1 above is subject to, and expressly limited by, the terms and conditions of Texas Civ. Prac. & Rem. Code Ann. Sec. 130.001 to 130.005, as amended.

3.18.8 THE OWNER MAY CAUSE ANY OTHER CONTRACTOR WHO MAY HAVE A CONTRACT WITH THE OWNER TO PERFORM CONSTRUCTION OR INSTALLATION WORK IN THE AREAS WHERE WORK WILL BE PERFORMED UNDER THIS AGREEMENT, TO AGREE TO INDEMNIFY AND TO HOLD THE OWNER AND THE CONTRACTOR HARMLESS FROM ALL CLAIMS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE, OR DEATH OR TO INJURY TO, OR DESTRUCTION OF TANGIBLE PROPERTY (INCLUDING THE WORK ITSELF) INCLUDING LOSS OF USE, TO THE SAME EXTENT AS PROVIDED IN SUBPARAGRAPH 3.18.1 ABOVE.

3.19 ANTITRUST VIOLATION. To permit the Owner to recover damages suffered in antitrust violations, Contractor hereby assigns to Owner any and all claims for overcharges associated with this Contract which violate the antitrust laws of the United States, 15 U.S.C.A. Section 1 *et seq*. The Contractor shall include this provision in its agreements with each subcontractor and supplier. Each subcontractor shall include such provisions in agreements with sub-subcontractors and suppliers.

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ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the ~~Agreement~~Contract.

§ 4.1.2 Owner shall notify Contractor when the duties, responsibilities or limitation of authority of the Architect have been modified

4.1.3 Except as expressly provided herein, the Contractor shall not be relieved of Contractor's obligation to perform the Work in strict accordance with the Construction Documents and the Contract Documents by the duties, responsibilities, or activities of the Architect.

§ 4.2 Administration of the Contract

§ 4.2.1 Certain portions of the administration of the Contract will be performed by the Architect, others by the Program Manager. Both the Architect and the Program Manager will be treated as the Owner's representatives to the extent set out in the Contract Documents. Neither the Architect nor the Program Manager shall have the authority to act on behalf of ~~the Owner only to the extent provided in the Contract Documents.~~ Owner unless such authority is expressly granted in the Contract Documents, nor shall such authority be implied from any act or representation of the Architect or Program Manager. ~~The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction, until the date the Architect issues the final~~ This period shall extend until payment is due, and, with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2.2~~Certificate for Payment~~. ~~The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, or as they may be amended in the future.~~

§ 4.2.2 The Architect, as a representative of the Owner, ~~will~~shall visit the site at least twice per week (or more per week when deemed necessary by the Owner's Superintendent or when necessary to protect Owner's interests) and at any other intervals appropriate to the stage of construction, to inspect ~~or as otherwise agreed with the Owner, to become generally familiar with~~ the progress, ~~and~~ quantity and quality of the ~~portion of the~~ Work completed, to reject any observed nonconforming Work, and to determine ~~in general~~ if the Work ~~observed~~ is being performed in a manner indicating that the Work, when ~~fully~~ completed, will be in accordance with the Construction Documents and the Contract Documents and on time. Furthermore, a minimum of two job site meetings per month from commencement of construction through Final Completion will be initiated by the Architect and attended by the Contractor. Attendees will include Owner, the Contractor's project manager and/or superintendent, Architect's project representative, and Architect. The Architect, Owner and their representatives shall at all times have access to the Work. Architect, or its structural consultant will provide on-site observation prior to and during all concrete pours that contribute to the structural integrity of the building, including all pours of concrete piers, footings, grade beams, floor slabs, and concrete superstructure components, if applicable. In addition, Architect or its structural consultant will provide on-site observation prior to covering up or closing up of portions of the construction, which if covered, would conceal problems with the structural integrity of the Project. Contractor shall not close or cover said Work until said observations have occurred. Contractor or Architect will advise Owner of the need for any third party laboratory or testing services to assist the Architect and Owner. On the basis of the on-site observations by Architect, Architect shall keep Owner and Contractor informed of the progress and the quality of the Work, through Architect's field reports, and shall guard Owner against defects and deficiencies in the Work. Architect shall promptly notify Owner and Contractor, orally, regarding any defect or nonconforming Work, which shall be followed by notice in writing of defects or nonconforming Work noted and corrective action taken or recommended. ~~However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work.~~ The Architect, however, ~~will~~shall not have control over~~, charge of~~, or responsibility for the Contractor's construction means, methods, techniques, sequences, ~~or~~ procedures, or ~~for the~~ safety ~~precautions and~~ programs, but this does not relieve Architect of Architect's responsibilities under this Contract. Any services by Contractor made necessary by Contractor's construction defect or nonconforming Work, shall be performed at no additional cost to Owner ~~in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents~~.

§ 4.2.3 ~~On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work.~~ The Architect will not be responsible for the Contractor's

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failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work. The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect, or request of the Contractor.

§ 4.2.4 Communications

~~Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, T~~the Owner and Contractor shall ~~endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. However, Owner reserves the right to communicate directly with Contractor and Subcontractors include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project.~~ Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. ~~The Contract Documents may specify other communication protocols.~~

§ 4.2.5 As further provided in the Contract Documents, ~~B~~based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect ~~has authority to~~ shall reject Work that does not conform to the Construction Documents and the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will ~~have~~recommend to Owner additional ~~authority to require~~ inspection or testing of the Work in accordance with ~~Sections 13.4.2 and 13.4.3~~the provision of the Contract Documents, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Owner to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work. Architect and/or Contractor shall promptly notify, orally and in writing, the other party and Owner of any fault or defect in the Project or nonconformance with Construction Documents or the Contract Documents they may respectively discover, and each, upon discovery of the defect or nonconformance, shall be responsible for notifying the other party and Owner of those corrective actions they respectively take; provided, however, Contractor shall have no duty to notify Owner of discoveries made or actions taken by Architect. Testing or inspection required by this subparagraph shall be conducted subject to the requirements of Chapter 2269 of the Texas Government Code.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Construction Documents and the Contract Documents. The Architect's action will be taken ~~in accordance~~ with ~~the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with~~ reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor, or Separate Contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation ~~or performance~~ of equipment or systems, ~~all of which~~ remain the responsibility of the Contractor as required by the Construction Documents and the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component. If any submittal does not comply with the requirements of the Construction Documents or the Contract Documents, then Architect shall require Contractor to come into compliance. The Architect shall promptly report, in writing, to the Contractor, Program Manager and Owner any errors, inconsistencies, and omissions discovered by the Architect in the Shop Drawings, Product Data, and Samples.

§ 4.2.8 The Architect ~~will~~shall review, prepare, and make recommendations to Owner regarding all Change Orders and Construction Change Directives for the Owner's approval and execution in accordance with the Construction Documents and the Contract Documents, accompanied by all supporting documentation. The Architect~~, and~~ may ~~order~~authorize minor changes in the Work not involving any adjustment in Contract Sum or Guaranteed Maximum

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Price, or an extension of the Contract Time which are consistent with the intent of the Contract Documents. If necessary, the Architect shall prepare, reproduce, and distribute Drawings and Specifications to describe Work to be added, deleted, or modified, as provided in Section 7.4. The Architect shall accept requests by the Owner, and Owner shall review properly prepared, timely requests by the Contractor for change in the Work, including adjustments to the Contract Sum or Guaranteed Maximum Price, or Contract Time. A properly prepared request for a change in the Work by the Contractor shall be accompanied by sufficient supporting data and information to permit the Architect ~~will investigate and~~to make a reasonable determination~~s~~ without extensive investigation or preparation of additional drawings or specifications. If the Architect determines that requested changes in the Work are not materially different from the requirements of the Construction Documents or the Contract Documents, and do not change the Contract Sum or Guaranteed Maximum Price, or Contact Time, then the Architect may issue an order for a minor change in the Work, with prior written notice to the Owner or recommend to the Owner that the requested change be denied. The Architect is not authorized to approve changes involving major system such as: Heating, Ventilation and Air Conditioning ("HVAC"); roof, foundation; outward appearance, color scheme, floor plans, building materials; drainage or mechanical equipment with Owner's prior written consent ~~and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4~~.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; ~~issue Certificates of Substantial Completion pursuant to Section 9.8;~~ will receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor ~~pursuant to Section 9.10~~; and will issue a final Certificate for Payment ~~pursuant to Section 9.10~~upon compliance with the requirements of the Contract Documents.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the ~~Project representatives~~ Architect have been ,modified.

§ 4.2.11 The Architect will interpret and ~~decide matters~~make recommendations concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Paragraph 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

§ 4.2.12 Interpretations ~~and decisions~~or recommendations of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and ~~decisions~~recommendations, the Architect will endeavor to secure faithful performance by both Owner and Contractor~~, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith~~.

§ 4.2.13 The ~~Architect's~~ Owner's decisions on matters relating to aesthetic effect ~~wi~~shall be final ~~if consistent with the intent expressed in the Contract Documents~~.

§ 4.2.14 The Architect will review and respond to requests for information about the Construction Documents and the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information, at no additional cost to the Owner.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract

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Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner, ~~and~~ Architect and Program Manager, in writing, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect ~~ma~~or ~~ys~~Program Manager shall notify, in writing, the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Owner or Architect to provide notice ~~within the 14-day period~~promptly shall constitute notice of no reasonable objection. All subcontractors shall be procured in accordance with Texas Education Code Chapter 44, Subchapter B, and Texas Government Code Chapter 2269, as applicable. A notice of no reasonable objection shall in no way relieve the Contractor from full responsibility for performance and completion of the Work and its obligations under the Contract Documents. The Contractor shall be fully responsible for the performance of its subcontractors, including those recommended or approved by the Owner.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Program Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Program Manager ~~-~~or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. When~~If~~ the parties agree on a proposed substitute ~~but rejected~~ Subcontractor ~~was reasonably capable of performing the Work~~, then the Contract Sum and Contract Time ~~sh~~may~~ll~~ be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not change a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitute.

5.2.5 Each Contractor or Subcontractor shall be required to completely familiarize itself with the plans and specifications, to visit the Work site to completely familiarize itself with existing conditions, and to conduct any other appropriate investigations, inspections, or inquiries prior to submission of a bid or proposal. No increases in Contract Sums or Guaranteed Maximum Price shall be allowed for failure to so inspect or investigate.

The Contractor shall disclose to the Owner any ownership interest or affiliation between the Contractor and any potential subcontractor prior to entering into a subcontract and the Owner shall have the right, in its sole discretion and pursuant to 5.2.3., to reject any such affiliated subcontractor. Further, Contractor shall not subcontract the work as a whole.

The approval of Subcontractors in no way relieves the Contractor from full responsibility for performance and completion of the Work and its obligations under the Contract Documents. The Contractor shall be fully responsible for the performance of its Subcontractors, including those recommended or approved by the Owner

5.2.6 The Contractor agrees to utilize Subcontractors that are historically underutilized businesses in accordance with the Minority and Women Owned Business Enterprise (M/WBE) forms and guidelines attached hereto as Exhibit "C".

No changes to the Plan may be made unless approved in writing by the Owner. The Contractor, prior to the execution of this Contract, shall report their M/WBE participation goal as a percent of the Contract Sum. During the performance of all Work under this ~~Agreement~~Contract, the Contractor and its agents shall comply with all M/WBE policies of the Owner. The information shall be identified per firm, discipline and participation. While this ~~Agreement~~Contract is in effect and until the expiration of one year after final completion, the Owner may require information from the Contractor, and may conduct audits, to assure that the Plan is being, and was, followed,. With each Contractor's application for payment, the Contractor shall report their updated M/WBE Plan and actual M/WBE participation information.

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5.2.7 Contractor shall promptly notify the Owner, Architect and Program Manager of any material defaults by any subcontractor

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. The terms and conditions of the Contract Documents shall be incorporated by reference into each subcontract agreement, included as provided below. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. ~~,~~ Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Each subcontractor shall provide proof of insurance to Contractor consistent with the Contractor's insurance to Owner and in an amount commensurate with the Work to be performed by the Subcontractor.

5.3.2 Neither the Owner nor the Architect shall be obligated to pay or to ensure the payment of any monies to subcontractors due to any non-payment to the Contractor or non-payment of subcontractors by the Contractor.

5.3.3 The Contractor shall require any potential subcontractor to disclose to the Contractor any ownership interest or familial relationship between the Contractor, the Architect, or the Owner, and the potential subcontractor prior to entering into a subcontract. Contractor shall report to Owner all such disclosures and the Owner shall have the right, in its sole discretion, to reject any such affiliated subcontractor.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for any unperformed portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to ~~Section~~Article 14~~.2~~ or abandonment of the Project by the Contractor; and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights and obligations of the surety, if any, obligated under bond relating to the Contract; and

.3 The Subcontractor provides bonds as required by law of prime contractors and by Owner.

~~When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.~~

§ 5.4.2 ~~Upon~~ ~~s~~Such assignment shall not constitute a waiver by Owner of its rights against Contractor, including, but not limited to, claims for defaults, delays or defects for which a subcontractor or material vendor may also be liable~~, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension~~.

§ 5.4.3 ~~Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the~~ Owner shall only be ~~assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally~~ responsible for compensating subcontractors for Work performed or materials furnished from and after the date on which the Owner gives written notice of its acceptance of the subcontract agreement. Owner shall not be responsible for any Work performed or materials furnished by subcontractors prior to the date of Owner's written notice of acceptance.~~all of the successor contractor's obligations under the subcontract~~.

5.4.4 Each subcontract shall specifically provide that the Owner shall only be responsible to the Subcontractor after written notice for undisputed amounts not previously paid to Contractor subsequent to the Owner's exercise of any rights under this conditional assignment.

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5.4.5 Contractor shall be fully responsible for the performance of its Subcontractors, including those selected or approved by the Owner

5.5 NOTICE OF SUBCONTRACTOR DEFAULT

Contractor shall promptly notify Owner and Architect of any material defaults by any Subcontractor or Sub-subcontractor. Notwithstanding any provision contained in Article 5 to the contrary, it is hereby acknowledged and agreed that Owner has in no way agreed, expressly or implicitly, nor will Owner agree, to allow any Subcontractor, Sub-subcontractor or other materialman or worker employed by Contractor the right to obtain a personal judgment or to create a mechanic's or materialman's lien against Owner for the amount due from the Owner or the Contractor.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation. The Owner reserves the right to perform other non-Project-related construction work, maintenance and repair work, and school program operations at the site and near the site during the time period of the Work. Owner shall have access to the building on the site at all times.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor ~~Agreement~~Contract.

§ 6.1.3 The ~~Owner~~ Contractor shall ~~provide for~~ coordinat~~e~~ion ~~of~~ the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor to ensure that the Work remains on schedule~~, who shall cooperate with them~~. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement between the Owner and Contractor. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 It shall be the responsibility of the Contractor to assist, review, coordinate, and schedule work performed by any of Owner's separate contractors including the hazardous materials abatement contractor. Contractor shall not be required to contract directly with the hazardous materials abatement contractor or Owner's separate contractor's however, Contractor shall coordinate all aspects of the hazardous materials abatement contractor's and Owner's separate contractor's work, including required monitoring, testing and inspections by independent firms, with the Work under this ~~Agreement~~Contract. The Contractor shall be totally responsible for coordination between its Subcontractors and the hazardous materials abatement contractor and any other Owner's separate contractors. Contractor will cooperate with the Owner to allow site access and staging areas for hazardous materials abatement contractor and Owner's separate contractors and consultants. Contractor shall review Owner's contract with the hazardous materials abatement contractor and Owner's separate contractors and become familiar with the requirements and scope of services contained therein. Contractor shall continually review the work performed by the hazardous materials abatement contractor and Owner's separate contractors and immediately notify the Owner and Program Manager if at any time during the performance of Contractor's work, the hazardous materials abatement contractor or any of Owner's separate contractors fail, in any way, to provide sufficient, competent manpower or timely perform its services. In addition, the Contractor shall be responsible for coordinating and providing all construction administration necessary for the Work and the work of the hazardous materials abatement contractor and any of Owner's separate contractors ~~Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.~~

§ 6.2 ~~Mutual~~Contractor's Responsibility

§ 6.2.1 It shall be the responsibility of the Contractor to assist, review, and coordinate the scheduling of work performed by any of the Owner's Separate Contractors including the hazardous materials abatement contractor.

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Contractor shall not be required to contract directly with the hazardous materials abatement contractor or Owner's separate contractor's however, Contractor shall coordinate all aspects of the hazardous materials abatement contractor's and Owner's separate contractor's work, including required monitoring, testing and inspections by independent firms, with the Work under this ~~Agreement~~Contract. The Contractor shall be totally responsible for coordination between its Subcontractors and the hazardous materials abatement contractor and any other Owner's separate contractors. Contractor will cooperate with the Owner to allow site access and staging areas for hazardous materials abatement contractor and Owner's separate contractors and consultants. Contractor shall review Owner's contract with the hazardous materials abatement contractor and Owner's separate contractors and become familiar with the requirements and scope of services contained therein. Contractor shall continually review the work performed by the hazardous materials abatement contractor and Owner's separate contractors and immediately notify the Owner and Program Manager if at any time during the performance of Contractor's work, the hazardous materials abatement contractor or any of Owner's separate contractors fail, in any way, to provide sufficient, competent manpower or timely perform its services In addition, the Contractor shall be responsible for coordinating and providing all construction administration necessary for the Work and the work of any of Owner's Separate Contractors. The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents. Contractor shall be responsible for coordination between Contractor's subcontractors and Owner's Separate Contractors. Contractor shall review Owner's contract with Owner's Separate Contractors and become familiar with the requirements and scope of services contained therein.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify, in writing, the Architect and Owner of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work, and shall promptly report, in writing, to the Architect and Owner if Owner's Separate Contractors fail in any way to timely perform their services or negatively impact Contractor's schedule or ability to perform the Work. Failure of the Contractor to notify, in writing, the Architect and Owner of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper, and is performed in a timely manner, to receive the Contractor's Work. The Contractor shall not be responsible for latent discrepancies or defects in the construction or operations by the Owner or Separate Contractor ~~that are not apparent~~.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. ~~The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.~~

6.2.3.1 If the Architect or Program Manager is required to provide additional services, as provided in the Contract between the Owner or Program Manager ~~-~~and the Architect, specifically relating to additional compensation for the Architect for evaluating an excessive number of claims submitted by the Contractor or others in connection with the Work in accordance with Owner's Contract with the Architect, then such services shall be paid for by the Contractor through the Owner, unless the additional services result from negligence of or an omission by the Architect and Program Manager.~~-~~

6.2.3.2 If the Architect provides services in connection with a legal proceeding, except when the Architect is a party thereto, and the Owner requests the Architect, in writing, to provide such services, then the cost of such services shall be paid for by the party whose act or omission was a proximate cause of the problem that led to the requirement to provide such services. Such services shall be paid for by such party through Owner, who upon receipt of same shall reimburse the Architect.

6.2.3.3 All construction costs resulting from the Contractor's negligence, lack of oversight, inattention to details, failure to investigate, or failure to follow the Construction Documents or Contract Documents, will be borne by the Contractor.

§ 6.2.4 The Contractor shall promptly remedy damage wrongfully caused by~~that~~ the Contractor ~~wrongfully causes~~ to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

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§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Owner~~Architect~~ will allocate the cost among those responsible.

6.3.1 Job site cleanup will be performed on a daily basis. The Owner and/or Program Manager will periodically check the site to see that all construction areas, nearby roads, walkways and/or grounds are maintained in a clean and safe manner. The cost to clean up the site will be assessed to the Contractor each time the Owner is required to clean the area due to failure of the Contractor or his designee to satisfactorily perform or enforce this site clean-up requirements. The Owner will assess the cost. Before assessing the cost, the Contractor shall be given notice of the failure to clean the site and one business day after the date of the notice to clean up the site. If the Contractor fails to clean up the site, after notice, the Owner may assess the cost for cleanup.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive, Contingency Authorization or order for a minor change in the Work~~.~~. A properly prepared written request for a change in the Work by Contractor shall be accompanied by sufficient supporting data and information to permit the Architect to make a recommendation to Owner. The Contract Sum and/or Contract Time may be increased for changes in the Work if the provisions of Article 7 have been met.

Architect shall review properly prepared, timely requests by Contractor for a proposed change in the Work, including but not limited to adjustments to the Contract Sum or Contract Time. A properly prepared request for a proposed change shall be accompanied by sufficient supporting data and information to permit Architect to make a reasonable determination without extensive investigation or preparation of additional drawings or specifications

§ 7.1.1.1 No changes in the Contract Sum and/or Contract Time will be allowed for a change in the Work unless prior to performing the changed Work the Contractor has provided the Owner in writing with a proposal for any change in price and/or change in Contract Time caused by the change in Work, and a Change Order is subsequently executed. A field directive or field order shall not be recognized as having any impact upon the Contract Sum or the Contract Time, and Contractor shall have no Claim therefore, unless it shall, prior to complying with the directive and in any event within ten (10) days of receiving the directive, submit a change proposal to the Owner, and a Change Order is subsequently executed, or Contractor satisfies the requirements of Paragraph 15

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone. A change in the work that does not require a change in Contract Sum or Contract Time may be paid from the Contingency Allowance. A Contingency Allowance Expenditure Authorization (CAEA) is a written order prepared by the Architect and signed by the Owner, Contractor and Program Manager directing a change in the Work. A CAEA shall not be used for minor changes in the Work. Note: If the Construction Manager Percentage Fee was not previously included in the approved GMP, the approved additions or deductions for authorized amounts for Contingency Expenditures will also include an appropriate adjustment for the Construction Manager Fee at the percentage approved in Article 5.1.1 and 5.1.2 of the modified AIA Document A133.

7.1.2.1 Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the Work or supply additional labor, services, or materials beyond that actually required by the terms of the Contract Documents, unless made pursuant to a written order from Owner authorizing Contractor to proceed with the change. No claim for an adjustment of the contract price will be valid unless so ordered.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Construction Documents or the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in

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Paragraph 7.3 or 15, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. -Contractor shall not make any claim for an adjustment to time, Contract Sum, or Guaranteed Maximum Price due to: a change in the materials used; a change in the specified manner of constructing and/or installing the Work; or additional labor, services, or materials beyond that actually required by the terms of the Construction Documents or the Contract Documents, unless made pursuant to a written order or directive from Owner authorizing Contractor to proceed with a change in the Work. No claim for an adjustment to time, Contract Sum, or Guaranteed Maximum Price shall be valid unless so ordered or directed.

7.1.4 The total Contractor mark-up for overhead, profit, or fee for work performed by the Contractor's own forces shall not exceed 10% of the cost of the change in the Work. The total Contractor mark-up for overhead, profit, or fee for supervision of work performed by subcontractors' forces shall not exceed 4% of the cost of the change in the Work. The total subcontractor mark-up for overhead, profit, or fee for work performed by the subcontractor's forces shall not exceed 10% of the cost of the change in the Work. In no event shall total mark-up for overhead, profit, or fee in any work which involves a subcontractor or one or more sub-subcontractors, regardless of who performs the Work, exceed 14% of the total cost of the change in the Work.

7.1.5 The Contractor, upon receipt of written notification by the Architect of a proposed item of change in the Work, shall prepare as soon as possible a Change Proposal in such form or forms as directed by the Architect.

.1 Each separate Change Proposal shall be numbered consecutively and shall include materials, costs, labor costs, fees, overhead and profit. The Proposal shall specify all cost related to the proposed Change in the Work, including any disruption or impact on performance;

.2 The Subcontractor's itemized accounting shall be included with the Change Proposal;

.3 If a Change Proposal is returned to the Contractor for additional information or if the scope of the proposed change in the Work is modified by additions, deletions or other revisions, the Contractor shall revise the Change Proposal accordingly and resubmit the revised Change Proposal to the Architect and Program Manager;

.4 A revised Change Proposal shall bear the original Change Proposal number suffixed by the letter "R" to designate a revision in the original Change Proposal. If additional revisions to a revised Change Proposal are necessary, each subsequent revision shall be identified by an appropriate numeral suffix immediately following the "R" suffix;

.5 Upon written approval of a Change Proposal by the Owner, the Architect and the Program Manager; the Architect will prepare a Change Order authorizing such change in the Work; and

.6 The Contractor shall request extensions of Contract Time due to changes in the Work only at the time of submitting its Change Proposal. Contractor's failure to do so shall represent a waiver of any right to request a time extension

7.1.5.1 The combined overhead and profit included in the total cost to the Owner of a change in the Work shall be based on the following schedule:

.1 For approved additions or deductions to the Cost of the Work (not including preconstruction or general condition costs), the Construction Manager's Fee will be increased or decreased at the same percentage approved in Section 5.1.1 and 5.1.2 in the approved A133 contract document.

.2 For approved additions or deductions to any of the Construction Manager's subcontracts for self-performed work paid in accordance with the Section 2.3.2.2 of the A133 contract document, the self-performed work fee will be the same as approved in Section 2.3.2.2 of the A133 contract document.

.3 For approved additions or deductions to approved Subcontracts, the maximum markup on changed Work performed by the Subcontractor's own forces will be ten (10%) percent of the approved allowable Change Order costs.

.4 For approved additions or deductions to approved Subcontracts, the maximum markup on changes for Work performed by the Subcontractor's Sub-subcontractors will be four (4%) percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7

.6 In order to facilitate checking of quotations for extras or credits, all proposals except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also.

7.1.6 ~~5~~ Allowance balances may be used to fund changes in the Work. The Contractor will not be allowed an

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overhead, profit, or fee mark-up when changes in the Work are funded by one of the Allowances. The combined overhead and profit included in the total cost to the Owner of a change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, ten (10%) percent of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor's, four (4%) percent of the amount due the subcontractors.

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, ten (10%) percent of the cost.

.4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, four (4%) percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.76.

.6 In order to facilitate checking of quotations for extras or credits, all proposals except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also

7.1.7 ~~6~~ If the Contract Sum is $1,000,000.00 or more, or if the Contract Sum is less than $1,000,000.00, and any Change Order, Construction Change Directives, or other Changes in the Work would increase the Contract Sum to $1,000,000.00 or more, the total of all Change Orders, Construction Change Directives, or other Changes in the Work, may not increase the Contract Sum by more than 25% of the original Contract Sum. Any Change Order, Construction Change Directive, or other Change in the Work that would exceed that limit is void and of no effect. Texas Education Code § 44.0411.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;

.2 The amount of the adjustment, if any, in the Contract Sum or Guaranteed Maximum Price; and

.3 The extent of the adjustment, if any, in the Contract Time.

7.2.2 Methods used in determining adjustments to the Contract Sum or Guaranteed Maximum Price may include those listed in Section 7.3.3.

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation. Sufficient substantiating data shall include a proposal itemized for the various components of work added or deleted, segregated by labor, material and equipment. Details to be submitted will include detailed line item estimates showing detailed material quality takeoffs, material prices by item, and of related labor hour pricing information and extension by line item by drawings as applicable);

.2 Unit prices stated in the Contract Documents or subsequently agreed upon and supported by sufficient substantiating data to permit evaluation;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually-acceptable fixed or percentage fee or the percentage fee established at 7.1.5; or;

.4 As provided in Subparagraph 7.3.7.

7.2.3 Contractor stipulates that acceptance of a Change Order by the Contractor constitutes full accord and satisfaction for any and all Claims, whether direct or indirect, arising from the subject matter of the Change Order.

7.2.4 In no event shall a single change, or the aggregate of all changes, result in the total costs, reimbursements, and fees exceeding the Contract Sum or the Guaranteed Maximum Price, unless agreed to in writing by Owner prior to the commencement of such modified or changed Work.

7.2.5 Agreement on any Change Order shall constitute a final settlement of all claims by the Contractor directly or indirectly arising out of or relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs and impact costs associated with such change and any and all adjustments to the Contract Sum and the Contract Time

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§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Guaranteed Maximum Price, or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum or Guaranteed Maximum Price, and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 The Construction Change Directive shall include a unilateral change in the Contract Sum and/or Contract Time reflecting the Owner's reasonable view of the appropriate change in the Contract Sum and/or Contract Time for the change in the work covered by the Construction Change Directive. Until agreement is reached by the Owner and Contractor on these issues, the change in Contract Sum and Contract Time set out in the Construction Change Directive shall be used for schedule of values, payment, and scheduling purposes.

~~If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:~~

- ~~.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation; Sufficient substantiating data shall include a proposal itemized for the various components of work added or deleted, segregated by labor, material and equipment. Details to be submitted will include detailed line item estimates showing detailed material quality takeoffs, material prices by item and of related labor hour pricing information and extension (by line item by drawings as applicable.~~
- ~~.2 Unit prices stated in the Contract Documents or subsequently agreed upon; and supported by sufficient substantiating data to permit evaluation.~~
- ~~.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or~~
- ~~.4 As provided in Section 7.3.4.~~

§ 7.3.4 [*Not used*] ~~If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:~~

~~.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;~~

~~.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;~~

~~.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;~~

~~.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and~~

~~.5 Costs of supervision and field office personnel directly attributable to the change.~~

§ 7.3.5 ~~If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.~~

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Guaranteed Maximum Price, or Contract Time.

§ 7.3.7 In the absence of agreement between Owner and Contractor on the proper change to the Contract Sum or Contract Time because of a change in the Work, Contractor may treat the matter as a Claim under Paragraph 15. In

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such event, the Contractor shall be entitled to recover only the amount by which its direct costs have been reasonably increased over the direct cost of performing the Work without the change in the work, plus three percent (3%) on Subcontractor's Work) of direct cost to cover home office overhead, profit, and all other costs. Direct costs shall be limited to the following:
~~A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.~~

.1 Reasonable Cost of Labor, including Social Security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
.2 Materials, supplies and equipment, equipment including cost of transportation, whether incorporated or consumed;
.3 Rental cost of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others at rates that are no greater than market rates in the locale of the Work at the time of the Work. Unless otherwise established in the Contract, the rental value of the Contractor's own equipment shall not be more than normal local rental rates for contractor-owned equipment;
.4 Premiums for all bonds and insurance permit fees and sales, use or similar taxes related to the Work; and
.5 Cost of Subcontractor for performing the change in the Work. The amount allowable for Subcontractors shall be calculated using the same standards set out herein for direct Work by the Contractor.
.6 Additional cost of supervision and field office personnel directly attributable to the change.

Contractor and each Subcontractor involved shall furnish evidence of costs such as copies of original invoices for materials, payroll vouchers for labor, etc., upon request by the Architect, Owner, or Program Manager. Any increase in Contract Time shall be limited to the amount of time by which activities critical to overall completion of the Project are delayed by the change in the Work. If it is reasonably possible to perform the change in the Work concurrently with Work that is critical to overall completion, no time extension shall be granted by reason of a change in the Work.

§ 7.3.8 [*Not Used*] ~~The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that which results in a net decrease in the Contract Sum shall be actual net cost of the work deleted, including all profit and overhead, plus the Contractor's allocated percentage of three (3%) percent on Subcontractor's work of direct cost to cover supervision, field office and home office overhead, profit and all other costs cost When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.~~

§ 7.3.9 [Not Used] ~~Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.~~

§ 7.3.10 ~~When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.~~

§ 7.4 Minor Changes in the Work

With prior written notice to the Owner's representative, ~~T~~the Architect may order minor changes in the Work that are consistent with the ~~intent of the~~ Construction Documents or the Contract Documents and do not involve an adjustment in the Contract Sum or Guaranteed Maximum Price, or an extension of the Contract Time, nor requiring any payment from the Contingency Allowance. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Guaranteed Maximum Price, or Contract Time, or requiring a payment from the Contingency Allowance, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect

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the Contract Sum or Guaranteed Maximum Price, or Contract Time, or the Contingency Allowance, the Contractor waives any adjustment to the Contract Sum or Guaranteed Maximum Price, or extension of the Contract Time or the Contingency Allowance. The Contractor shall carry out such written orders promptly. Minor changes in the Work shall not include changes that involve the outward appearance of the structure, color schemes, floor plans, building materials, landscaping, or mechanical equipment

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for ~~Substant~~Final Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the ~~date established in the Agreement~~ first business day after Contractor's receipt of the written Notice to Proceed. The Notice to Proceed shall not be issued by Architect until the Contract (or Amendment, if Contractor is a Construction Manager at Risk) has been signed by the Contractor, approved by Owner's Board of Trustees, signed by the Owner's authorized representative, and Owner and Architect have received, and approved as to form, all required payment and performance bonds and insurance, in compliance with Article 11. Issuance of the Notice to Proceed shall not relieve the Contractor of its responsibility to comply with Article 11.

8.1.2.1 If the Notice to Proceed is delayed due to delays in issuance of the building permit by municipal authorities or other unanticipated delays, *and* if building materials are expected to increase in price due to that delay, Contractor may, if Owner expressly agrees in writing, purchase such materials before receiving the Notice to Proceed from Owner. Contractor shall store and insure such building materials until use. In the event the project is cancelled, Contractor's contract is terminated, or the materials are not used (in whole or in part) on the Project, Contractor shall sell the unused materials to Owner at Contractor's actual cost, or reduce its billing to Owner in that amount, if Contractor retains the material.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. The date of Final Completion is the date certified by the Architect in accordance with Paragraph 9.10. Unless otherwise agreed in writing by Owner, Contractor agrees that Final Completion shall occur not more than 30 days after the date of Substantial Completion.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the ~~Agreement~~Contract, the Contractor ~~confirm~~stipulates that the Contract Time is a reasonable period for performing the Work.

If Contractor fails to achieve Substantial Completion of the Work on or before the date(s) specified for Substantial Completion in this Contract and the other Contract Documents, Contractor shall pay to the Owner, as liquidated damages, the sum set out in the Contract between Owner and Contractor for each calendar day that Substantial Completion is delayed after the date(s) specified for Substantial Completion. The total liquidated damage claim is determined by multiplying daily-liquidated damage amounts stated in the Contract by the number of days late. A fraction of a day shall be counted as a full day. It is hereby agreed that the actual damages which Owner will suffer by reason of late completion would be difficult to ascertain, and the liquidated damages to which Owner is entitled hereunder are a reasonable forecast of just compensation for the harm that would be caused by Contractor's failure to achieve Substantial Completion of the Work on or before the date(s) specified for Substantial Completion, and not a penalty. Liquidated damages shall be paid as they accrue and may be adjusted from any progress payment due.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, ~~,~~ prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a Notice to Proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five (5) days or other agreed period.

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§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial and Final Completion within the Contract Time.

8.2.4 The Contractor is subject to liquidated damages, as specified in the Contract, if the Work is not completed by the date of Substantial Completion or the date of Final Completion.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress in performing work that is critical to overall completion of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of or Program Manager, or a Separate Contractor; (2) by changes ordered in the Work; (3) by ~~labor disputes,~~ fire, governmental actions~~unusual delay in deliveries~~, ~~unavoidable casualties,~~ or adverse weather conditions documented in accordance with Section 15.1.6.2~~, or other causes beyond the Contractor's control~~; (4) by delay authorized, in writing, by the Owner ~~pending mediation and binding dispute resolution~~; or (5) by other causes that the Contractor asserts, and the Owner and Architect determine~~s~~, may justify delay, then the Contract Time ~~sh~~may~~ll~~ be extended for such reasonable time as the Owner, ~~and~~ Architect or Program Manager may determine. Adjustments in the Contract Time will be permitted for a delay only to the extent such delay is not caused or could not have reasonably been anticipated by the Contractor, and could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, and only if Contractor satisfies the conditions of this Paragraph 8.3. Contractor has the burden to prove that any of the foregoing alleged causes of delay significantly impacted construction progress on the critical path, as a condition precedent to any extension of the Contract Time.

The Contractor shall anticipate and include in the construction schedule lost time due to adverse weather conditions in accordance with the number of Lost Time Workdays per month in the Dallas area in accordance with the following schedule:

January – 5
February – 4
March – 5
April – 6
May – 6
June – 4
July – 4
August – 4
September – 5
October – 4
November – 4
December – 4

A request for a time extension based on unusually adverse weather conditions will not be permitted unless the cumulative actual days of Lost Time Workdays for the period when the critical path of the project is subject to impact from Lost Time Workdays exceeds the cumulative number of expected Lost Time Workdays for the same period. The final calculation of entitlement to a time extension cannot be made until at least sixty (60) days prior to the agreed date for Substantial Completion of the Project ~~is completed~~ and the time extensions for unusually adverse weather may not be made until that time. However, Contractor will submit claimed Lost Time Workdays in accordance with the submission times provided in 8.3.2. No day on which substantial Contractor forces are able to perform the work on the Project for more than fifty percent (50%) of the usual workday will be counted as a Lost Time Workday. Lost Time Workdays will not be calculated for any period when the critical path of the project is not subject to impact from adverse weather conditions.

§ 8.3.2 ~~Claims relating to time shall be made in accordance with applicable provisions of Article 15.~~ On or before the fifteenth (15th) day of each month of the Work, Contractor shall submit in writing a request for all time extensions to which it believes itself to be entitled for the preceding month, other than time extensions for changes in the Work, which are to be submitted in accordance with the requirements of Article 7. If Contractor's request for time extension for Changes in the Work is denied and Contractor wishes to pursue the matter, Contractor shall submit in writing a request for that extension by the fifteenth (15th) day of the month following the denial. Any claim for time extension not submitted under the terms of this Subparagraph shall be waived.

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8.3.2.1 Owner, after consultation with the Architect and Program Manager, shall grant time extensions to the extent it believes them to be proper. Time extensions granted by the Owner may be incorporated into schedules for completion of the Work. In the event that Contractor believes that it is entitled to additional time extensions beyond those granted by the Owner, it may make a claim for them provided it can meet the requirements of Paragraph 15.1.

§ 8.3.3 This Contract ~~Section 8.3~~ does not permit~~reclude~~ the recovery of damages, including, without limitation, extended home office overhead expenses, general conditions, or other consequential damages, by the Contractor for delay or disruption or for extensions of time due to bad weather or acts of God. Contractor agrees that the only possible compensation for any delay is an extension of time ~~by either party under other provisions of the Contract Documents~~.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the ~~Agreement~~Contract and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. In the event that the Project is a Construction Management at Risk Project, the Contract Sum shall not exceed the Guaranteed Maximum Price.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices ~~shm~~ay~~ll~~ be equitably adjusted by prior written agreement.

§ 9.2 Schedule of Values

9.2.1 Before the first Application for Payment, ~~,~~ the Contractor shall submit a schedule of values to the Architect and Program Manager before the first Application for Payment, allocating the entire Contract Sum or, in the case of a Guaranteed Maximum Price, within 15 days after establishing the Guaranteed Maximum Price, to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect or Program Manager may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment. The schedule of values shall be prepared in such a manner that each major item of work, whether done by Contractor's own forces or subcontracted, is shown as a single line item on AIA Document G702 and G703, Application and Certificate for Payment and Continuation Sheet. If the Contractor is a Construction Manager at Risk, then the Contractor's fee and general conditions shall be specifically shown, and AIA Documents G702CMa and G703 shall be used.

9.2.2 ~~.~~If the Project is a Construction Manager at Risk project, in order to facilitate the review of Applicants for Payment, the Schedule of Values shall be submitted on AIA Documents G702 and G703, and shall include the following:

.1 Contractor's cost for Contractor's fee (if applicable) bonds and insurance, mobilization, or general conditions, etc. shall be listed as individual line item.

.2 Contractor's costs for various construction items shall be detailed. For example, concrete work shall be subdivide into footings, grade beams, floor slabs, or paving, etc.

.3 On major subcontracts, such as mechanical, electrical, and plumbing, the schedule shall indicate line items and amounts in detail (for example: underground, major equipment, fixtures, installation fixtures, or start-up, etc.)

.4 Costs for subcontract work shall be listed without any additional mark-up of Contractor's costs for overhead, profit, or supervision.

.5 If payment for stored materials is requested prior to installation, then material and labor shall be listed as separate line items.

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.6 Contractor shall provide a report of actual versus projected reimbursable expenses (general conditions), updated monthly.

§ 9.3 Applications for Payment

§ 9.3.1 At ~~least ten days before the date established for each progress payment~~, the time specified in the Contract, the Contractor shall submit to the Architect and Program Manager an itemized Application for Payment for operations completed prepared in accordance with the schedule of values~~, if required under Section 9.2, for completed portions of the Work~~. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage ~~if provided for in the Contract Documents~~.

§ 9.3.1.1 As provided in Section 7.3.8, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, but not yet included in Change Orders. Contractor agrees that, for purposes of Texas Government Code Sections 2251 and 2251.042, receipt of the Application for Payment by the Architect shall not be construed as receipt of an invoice by the Owner. Contractor further agrees that Owner's receipt of the Certificate for Payment shall be construed as receipt of an invoice by the Owner, for purposes of Texas Government Code Sections 251.021 and 2251.042~~As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders~~.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor ~~doe~~has not ~~intend~~ been invoiced by~~to pay~~ a Subcontractor or supplier, unless ~~such~~Contractor has self-performed the Work ~~has been performed by others whom the Contractor intends to pay~~.

9.3.1.3 Until Final Completion of the Work, the Owner shall withhold retainage as provided in the Contract Documents, except that Owner shall not pay amounts for which the Architect refuses to certify payment, or the Owner refuses to pay, as provided herein Section 9.4 or 9.5 as amended. The remaining retainage shall be paid with the Final Payment, unless there is a bona fide dispute between Owner and Contractor and the reason for the dispute is that labor, services, or materials provided by Contractor, or a person under Contractor's direction or control, failed to comply with the express terms of the Contract, or if the surety on any surety bond does not agree to the release of retainage. Written notice of the basis for withholding retainage under Texas Government Code Sections 2252.031 – 2252.032 must be provided to Contractor. If there is no bona fide dispute and neither party is in default, Contractor may cure any noncompliant labor, services, or materials, or offer Owner reasonable compensation for such noncompliant labor, services, or materials that cannot promptly be cured. Owner is not required to accept such offer.

§ 9.3.2 ~~Unless otherwise provided in the Contract Documents, p~~Payments ~~shaw~~ill be made on the basis of invoices for specific ~~account of~~ materials ~~and~~or equipment ~~delivered and suitably stored at the site for subsequent~~ incorporated~~ion~~ in the Work, and ~~. If approved in advance by the Owner, payment may similarly be made for~~ specific materials ~~and~~or equipment (1) suitably stored the site or (2) suitably stored at some off~~-the~~ site ~~at a~~ location, provided the following conditions are met for ~~agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored~~ off~~-the~~ site storage:

.1 The location must be agreed to, in writing, by Owner and Surety.
.2 The location must be a bonded warehouse.
.3 The Contractor's Surety must agree, in writing, to the amounts included in each Application for Payment.
.4 The Contractor must bear the cost of the Owner's and Architect's expenses related to visiting the off-site storage area and reviewing the stored contents. Contractor acknowledges that Architect's time may be an Additional Service and shall compensate Architect directly for same upon request.
.5 Payment shall not include any charges for overhead or profit on stored materials.
.6 Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other documentation satisfactory to the Owner to establish the

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Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance (naming the Owner as insured and naming the specific materials or equipment stored and their location) and proof of delivery to the site for those materials and equipment stored off the site. Under no circumstances will the Owner reimburse the Contractor for down payment, deposits, or other advance payment for materials or equipment until the materials or equipment are delivered to Owner's site or the agreed-upon off-site storage. Failure to follow these procedures shall result in nonpayment for storage of or insurance on stored materials and equipment. Failure to follow these procedures shall also result in nonpayment of materials and equipment until said materials and equipment are incorporated into the Work.

CONTRACTOR AGREES TO INDEMNIFY OWNER FROM ANY LOSS RESULTING FROM A BREACH OF THIS SECTION. Any off-site storage shall be in a bonded warehouse, suitably marked for the individual project, in addition to the requirements above

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work. Neither Contractor nor any of its materialmen, laborers, or Subcontractors shall have any lien rights against the Owner's lands, building funds, materials or other property. No materialmen, laborers or Subcontractor of the Contractor shall have any enforceable rights against the Owner of this Contract. Materialmen, laborers and Subcontractors of the Contractor may have rights under any Payment Bond provided by the Contractor, but cannot look to the Owner for any help in enforcement of those rights. CONTRACTOR SHALL WAIVE, RELEASE, INDEMNIFY, AND HOLD OWNER HARMLESS FROM ANY LIENS, CLAIMS, SECURITY INTERESTS OR ENCUMBRANCES FILED BY THE CONTRACTOR, SUBCONTRACTORS, OR ANYONE CLAIMING BY, THROUGH, OR UNDER THE CONTRACTOR OR SUBCONTRACTOR FOR ITEMS COVERED BY PAYMENTS MADE BY THE OWNER TO CONTRACTOR.

9.3.4 Contractor shall submit Applications for Payment, in quadruplicate, using AIA Documents G702 and G703 Application and Certificate of Payment (or G702CMa, if applicable) and Continuation Sheet or electronically, if acceptable to Owner. All blanks in the form must be completed and signatures of Contractor and Notary Public must be original on each form. Incomplete or inaccurate Applications for Payment shall be returned to the Contractor by the Architect for completion and/or correction. Owner shall have no responsibility for payment of same if the Application for Payment is incomplete or inaccurate.

9.3.5 By signing each Application for Payment, the Contractor stipulates and certifies to the following; that the information presented is true, correct, accurate, and complete; that the Contractor has made the necessary detailed examinations, audits, and arithmetic verifications; that the submitted Work has been completed to the extent represented in the Applications for Payment; that the materials and supplies identified in the Applications for Payment have been purchased, paid for, and received; that the subcontractors have been paid as identified in the Applications for Payment or that Contractor has been invoiced for same; that Contactor has made the necessary on-site inspections to confirm the accuracy of the Applications for Payment; that there are no known mechanics' or materialmens' liens outstanding at the date of the Applications for Payment; that all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current Payment Application; that, except for such bills not paid but so included, there is no known basis for the filing of any mechanics' or materialmens' liens on the Work; that the Payment Application includes only Work self-performed by Contractor or for which Contractor has been invoiced; and that releases from all Subcontractors and materialmen have been obtained in such form as to constitute an effective release of lien under the laws of the State of Texas, covering all Work performed and for which payment has been made by the Owner to the Contractor. Contractor understands that documents submitted to Owner become government documents under the laws of the State of Texas. Contractor further understands that falsification of Contractor's Applications for Payment may constitute a violation of the penal laws of the State of Texas, including, but not limited to, Texas Penal Code Sections 32.46; 37.09, and 37.10, and may justify termination of Contractor's Contract with Owner. Contractor further understands and agrees that falsification of documents may entitle Owner to restitution as permitted by Texas law and these Contract Documents.

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§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, carefully evaluate and review the Applications for Payment and, when appropriate, return the Applications for Payment to the Contractor as provided in Section 9.3.4. If the Applications for Payment are complete, then the Architect shall sign and either (1) certify and issue to the Owner a Certificate for Payment in the full amount of the Applications for Payment, with a copy to the Contractor; or (2) certify and issue to the Owner a Certificate for Payment for such amount as the Architect and Program Manager determines is properly due, and notify the Contractor and Owner in writing of the Architect's or Program Manager reasons for withholding certification and disputing in part certification as provided in Section 9.5.1; or (3) withhold certification of the entire Applications for Payment, and notify the Contractor and Owner in writing with a detailed statement of the Architect's reason for withholding certification in whole in accordance with Texas Government Code Section 2251.042(a), and as provided in Section 9.5.1. Architect's written reason for withholding certification shall be submitted in accordance with, and construed as the notice required by Texas Government Code Section 2251.042 *et. seq.* Owner may not withhold from payments more than 110% of the disputed amount.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect or Program Manager to the Owner, ~~based on the Architect's evaluation of the Work and the data in the Application for Payment,~~ that the Architect has observed the progress of the Work and determined that, in the Architect's professional opinion, ~~to the best of the Architect's knowledge, information, and belief,~~ the Work has progressed to the point indicated, and the quality of the Work is in accordance with the Contract Documents. Further, the issuance of the Certificate for Payment will constitute a representation by the Architect or Program Manager to the Owner that the Architect or Program Manager has carefully evaluated and certified that the amounts requested in the Applications for Payment are valid and correct and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect or Program Manager in writing to the Owner. However, the issuance of a Certificate for Payment will not be a representation that the Architect and Program Manager has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data unless requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum. Examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's accountants or other representatives of the Owner acting in the sole interest of the Owner.

9.4.3 The issuance of a Certificate for Payment shall constitute a recommendation to the Owner regarding the amount to be paid. This recommendation is not binding on the Owner if Owner knows of other reasons under the Contract Documents why payment should be withheld.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect or Program Manager may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's or Program Manager's opinion the representations to the Owner ~~required by Section 9.4.2 cannot be made~~. If the Architect or Program Manager is unable to certify payment in the amount of the Application, the Architect or Program Manager will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect or Program Manager cannot agree on a revised amount, the Architect or Program Manager will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect ~~t~~ or Program Manager may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's or Program Manager's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;

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.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; ~~or~~

.7 repeated failure to carry out the Work in accordance with the Contract Documents; or

.8 failure to submit a written plan indicating action by the Contractor to regain the time schedule for completion of Work within the Contract time.

§ 9.5.2 When ~~either party~~the Contractor disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, ~~that party~~the Contractor may submit a Claim in accordance with Article 15.

§ 9.5.3 Architect's written reason for withholding certification shall be construed as the notice required by Texas Government Code Section 2251.042 *et seq*~~When the reasons for withholding certification are removed, certification will be made for amounts previously withheld~~.

§ 9.5.4 Notwithstanding any provision contained within this Article, if the Work has not attained Substantial Completion or Final Completion by the required dates, subject to extensions of time allowed under the Contract Documents, ~~If~~ then Architect or Program Manager may withhold~~s~~ any further ~~c~~Certificate~~ion~~ for ~~p~~Payment ~~under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the~~ from Contractor to the extent necessary to preserve sufficient funds to complete construction of the Project and to cover liquidated damages. ~~failed to make payment for Work properly performed or material or equipment suitably delivered. If t~~The Owner shall not be deemed in default by reason of withholding ~~makes~~ payment~~s~~ as provided in Sections 9.3.4, 9.4.3, 9.5.1, or this Section ~~by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment~~.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment for undisputed amounts in the manner and within the time provided in the Contract Documents, and shall so notify the Architect. Owner shall notify Contractor within 21 days if Owner disputes the Architect's Certificate of Payment pursuant to Texas Government Code Section 2251.042 *et seq*, listing the specific reason for nonpayment. Payments to the Contractor shall not be construed as releasing the Contractor or his Surety from any obligations under the Contract Documents.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than ~~seven~~ ten days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. In compliance with Texas Government Code Section 2251.022, the Contractor shall, within ten (10) days following receipt of payment from the Owner, pay all bills for labor and materials performed and furnished by others in connection with the Work, and shall, if requested, provide the Owner with evidence of such payment. Contractor shall include a provision in each of its subcontracts imposing the same payment obligations on its Subcontractors as are applicable to the Contractor hereunder, and if the Owner so requests, shall provide to the Owner copies of such Subcontractor payments. If the Contractor has failed to make payments promptly to the Contractor's Subcontractors or for materials or labor used in the Work for which the Owner has made payment to the Contractor, then the Owner shall be entitled to withhold payment to the Contractor, in part or in whole, to the extent necessary to protect the Owner. This Section is subject to the provisions of Texas Business and Commerce Code Chapter 56.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Program Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier~~, except as may otherwise be required by law~~. Any action taken by Owner to require the Contractor to pay a Subcontractor shall not impose any liability on Owner to the Subcontractor or supplier.

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§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 ~~Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision~~. Payments received by the Contractor from the Owner for Work properly performed by Subcontractors, or materials properly provided by suppliers, shall be held in trust by the Contractor for the benefit of those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor. Texas Property Code § 162.001.

§ 9.6.8 ~~Provided the Owner has fulfilled its payment obligations under the Contract Documents, t~~THE CONTRACTOR SHALL DEFEND AND INDEMNIFY THE OWNER FROM ALL LOSS, LIABILITY, DAMAGE OR EXPENSE, INCLUDING REASONABLE ATTORNEY'S FEES AND LITIGATION EXPENSES, ARISING OUT OF ANY LIEN CLAIM OR OTHER CLAIM FOR PAYMENT BY ANY SUBCONTRACTOR OR SUPPLIER OF ANY TIER. UPON RECEIPT OF NOTICE OF A LIEN CLAIM OR OTHER CLAIM FOR PAYMENT, THE OWNER SHALL NOTIFY THE CONTRACTOR. IF APPROVED BY THE APPLICABLE COURT, WHEN REQUIRED, THE CONTRACTOR MAY SUBSTITUTE A SURETY BOND FOR THE PROPERTY AGAINST WHICH THE LIEN OR OTHER CLAIM FOR PAYMENT HAS BEEN ASSERTED.

9.6.9 Contractor shall not withhold as retainage a greater percentage from Subcontractors or materialmen than the percentage that Owner withheld as retainage from payments to Contractor.

§ 9.7 Failure of Payment

9.7.1 ~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or~~ Pursuant to Texas Government Code Section 2251.051, if the Owner does not pay the Contractor any payment certified by the Architect and Program Manager, which is undisputed, due and owing ~~within seven days~~ after the date the payment is due under the Contract Documents ~~established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution~~, then the Contractor ~~may~~, upon ~~s~~ten~~ven~~ (10) additional days' written notice to the Owner, Program Manager and Architect, that payment has not been made and the Contractor intends to suspend performance for nonpayment, may stop the Work until payment of the amount owing has been received. ~~The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents~~If the Owner provides written notice to the Contractor that: 1) payment has been made; or 2) a bona fide dispute for payment exists, listing the specific reasons for nonpayment, then Contractor shall be liable for damages resulting from suspension of the Work. If a reason specified is that labor, services, or materials provided by the Contractor are not provided in compliance with the Contract Documents, then the Contractor shall be provided a reasonable opportunity to cure the noncompliance or to compensate Owner for any failure to cure the noncompliance. No amount shall be added to the Contract Sum as a result of a dispute between Owner and Contractor unless and until such dispute is resolved in Contractor's favor.

9.7.2 ~~If the Architect does not issue a Certificate for Payment within seven (7) days after receipt of the Contractor's Application for Payment, through no fault of the Contractor, then the Contractor shall provide written notice to the Owner, and the Owner shall have fourteen (14) business days after receipt of such notice to provide or obtain a Certificate for Payment. If Owner fails to provide or obtain the Certificate for Payment, then the Contractor may, upon fourteen (14) additional business days' written notice to the Owner and Architect, stop the Work until payment of the undisputed amount owing has been received.~~[*Intentionally deleted*]

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9.7.3 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, then such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due to Owner, pursuant to the Contractor, or if the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, then the Owner shall have an absolute right to offset such amount against the Contract Sum and, in the Owner's sole discretion and without waiving any other remedies, may elect either to:

.1 deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due to Contractor form the Owner, or

.2 issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use; all Project systems included in the Work or designated portion thereof have been successfully tested and are fully operational; all required governmental inspections and certifications required by the Work have been made, approved, and posted; designated initial instruction of Owner's personnel in the operation of Project systems has been completed; and all the required finishes set out in the Construction Documents are in place. The only remaining Work shall be minor in nature so that the Owner can occupy the Work or the applicable portion of the Work for all of its intended purposes on that date; and the completion of the Work by the Contractor will not materially interfere with or hamper Owner's, or Owners' tenant normal school operations, or other intended use. As a further condition of a determination of Substantial Completion, the Contractor shall certify that all remaining Work with respect thereto will be completed within the time specified by the Contract Documents for Final Completion. As provided in the Contract Documents, Owner may occupy a portion of the facility prior to Substantial Completion.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Architect and Program Manager shall prepare ~~shall prepare~~ and a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect and Program Manager will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, then the Architect shall so notify the Contractor, Program Manager and Owner in writing, and the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. Except with the consent of the Owner, the Architect shall perform no more than five (5) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will timely prepare, sign and issue Owner's ~~a~~ Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of ~~Substantial~~ Final Completion of the Work or designated portion ~~thereof unless otherwise provided in the Certificate of Substantial Completion~~.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. ~~Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.~~

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9.8.6 The Contractor shall keep all required insurance in full force, and utilities on, until the Certificate of Substantial Completion is issued, and accepted by the Owner in writing, regardless of the stated date of Substantial Completion, subject to 11.2.2. Acceptance shall not be unreasonably withheld.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when ~~such portion is designated by separate agreement with~~agreed to by the Owner and the Contractor ~~in writing, provided such occupancy or use is consented to by the insurer and~~ authorized by public authorities having jurisdiction over the ~~Project~~Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided that the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work resulting from such occupancy, use or installation, and property and liability insurance, ~~and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2.~~ Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect. Contractor agrees that the Owner may place and install as much equipment and furnishings as is possible before completion or partial completion of portions of the Work.

§ 9.9.2 Immediately prior to such partial occupancy, ~~or~~ use, or installation, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless ~~otherwise~~ expressly agreed upon in writing, partial occupancy or use of a portion or portions of the Work or installation of furnishings and equipment shall not constitute acceptance of Work not complying with the requirements of the Contract Documents, nor shall it constitute evidence of Substantial Completion or Final Completion.

9.9.4 In the event that Owner takes partial occupancy or installs furnishings and equipment prior to Substantial Completion of the Project. Contractor shall obtain an endorsement to Contractor's Builder's Risk Policy to provide extended coverage for partial occupancy if Contractor's Builder's Risk Coverage required by Article 11 would not otherwise provide such coverage.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect and the Program Manager finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect and the Program Manager will promptly prepare, sign, and issue Owner's Certificate of Final Completion and a final Certificate for Payment ~~stating that to the best of the Architect's knowledge, information and belief,~~ certifying to the Owner that, ~~and~~ on the basis of the Architect's and the Program Manager's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance, including all retainages, found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's and the Program Manager final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. Final payment shall be made by the Owner in accordance with Owner's regular schedule for payments. Architect is not required to perform more than two inspections to determine whether a designated portion of the Work has attained Final Completion in accordance with the Contract Documents. One inspection may require multiple visits and more than one day to complete The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections cause by act or commission of Contractor.

9.10.1.1 Final Completion means actual completion of the Work, including any extras or Change Orders reasonably required or contemplated under the Contract Documents other than warranty work as further defined in the Form of Contractor's Final Completion Notice attached hereto and incorporated herein as Exhibit "D

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) using AIA Document G706, an affidavit that payrolls, bills for materials and equipment, and

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other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) ~~a certificate~~ evidencing satisfactory to Owner that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) using AIA Document G707, consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) ~~if required by the Owner,~~ except for amounts previously withheld by the Owner, other data establishing payment or satisfaction of obligations, such as AIA Document G706A, notarized subcontractor's lien releases, receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees. In addition, the following items must be completed and received by the Owner before Final Payment will be due:

.1 Written certifications required by Sections 10.5, 10.6, and 10.7;
.2 Final list of subcontractors (AIA Document G705);
.3 Contractor's certification in Texas Education Agency's Certification of Project Compliance, located at www.tea.state.tx.us/school.finance/facilities/cert_2004.pdf;
.4 Contractor's warranties, organized as required elsewhere in the Contract Documents;
.5 Maintenance and Instruction Manuals;
.6 Owner's Final Completion Certificate; and
.7 "As-constructed record drawings." At the completion of the Project, the Contractor shall submit one (1) complete set of "as-constructed" record drawings, with all changes made during construction, including concealed mechanical, electrical, and plumbing items. The Contractor shall submit these as electronic, sepia, or other acceptable medium, in the discretion of the Owner. The "as-constructed" record drawings shall delete the seal of the Architect and/or the Engineer and any reference to those firms providing professional services to the Owner, except for historical or reference purposes.

Documents identified as affidavits must be notarized. All manuals will contain an index listing the information submitted. The Index section will be divided and identified by tabbing each section as listed in the index. Upon request, the Architect will furnish the Contractor with blank copies of the forms listed above. Final payment shall be paid by the Owner to the Contractor within thirty (30) days after Owner's Board of Trustees has voted to accept the Work and approve Final Payment.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, ~~except that~~and it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall not constitute a waiver of any Claims by the Owner~~, except those arising from~~

~~.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;~~
~~.2 failure of the Work to comply with the requirements of the Contract Documents;~~
~~.3 terms of special warranties required by the Contract Documents; or~~
~~.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.~~

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously asserted pursuant to Article 15~~made in writing~~ and identified by that payee as unsettled at the time of final Application for Payment.

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ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract and shall conform to all provisions of the "Manual of Accident Prevention in Construction," published by the Associated General Contractors of America, Inc., latest edition, and the Contractor further agrees to fully comply with all safety standards required by the Occupational Safety and Health Administration ("OSHA") 29 U.S.C. Section 651 *et seq*., and all amendments thereto. However, the Contractor's duties herein shall not relieve any Subcontractor or any other person or entity, including any person or entity required to comply with all applicable federal, state, and local laws, rules, regulations, and ordinances from the obligation to provide for the safety of their employees, persons, and property and their requirements to maintain a work environment free of recognized hazards. Contractor shall provide reasonable fall protection safeguards and provide approved fall protection safety equipment for use by all exposed Contractor employees.

10.1.2 Contractor's employees, agents, Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, shall not perform any service for Owner while under the influence of any amount of alcohol or any illegal controlled substance; or use, possess, distribute, or sell alcoholic beverages while on Owner's premises. No person shall: use, possess, distribute, or sell illegal or nonprescribed controlled drugs or drug paraphernalia; misuse legitimate prescription or over-the-counter drugs; or act in contravention of warnings on medications while performing the Work or while on Owner's premises. Contractor's employees, agents, Subcontractors, or anyone directly or indirectly employed by any of them, shall not distribute or sell alcohol or drugs of any kind to Owner's students or staff, regardless of the location of the distribution or sale.

10.1.3 Contractor will comply with all applicable federal, state, and local drug and alcohol-related laws and regulations (e.g., Department of Transportation regulations, Drug-Free Workplace Act). Contractor has adopted or will adopt its own policy to assure a drug-free and alcohol-free workplace while on Owner's premises or performing the Work. Contractor will remove any of its employees, agents, subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, from performing the Work any time there is suspicion of alcohol and/or drug use, possession, or impairment involving such person, and at any time an incident occurs where drug or alcohol use could have been a contributing factor. Owner has the right to require Contractor to remove any person from performing the Work any time cause exists to suspect alcohol or drug use. In such cases, the person so removed may only be considered for return to work after the Contractor certifies, as a result of a for-cause test, conducted immediately following removal, that said person was in compliance with this Contract. Contractor will not use any person to perform the Work who fails or refuses to take, or tests positive on, any for-cause alcohol or drug test.

10.1.4 Owner has also banned the presence of all weapons on the Project site, whether or not the owner thereof has a permit for a weapon, and Contractor agrees that Contractor's representatives, employees, agents, and subcontractors will abide by same. Weapons may only be permitted in Owner's parking lots if weapons are locked in personal vehicles in Owner's parking lot.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work, school personnel, students, and other persons on Owner's premises, and other persons who may be affected thereby, including the installation of fencing between the Work site and any connecting or adjacent property of Owner, when required by Texas Education Code Section 22.08341;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as other buildings, and their contents, fencing, trees, shrubs, lawns, walks, athletic fields, facilities and tracks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

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§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including installing fencing, posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any personal or real property adjacent to the project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor.

§ 10.2.4 When use or storage of ~~explosives or other~~ hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel and shall only conduct such activities after giving reasonable advance written notice of the presence or use of such materials, equipment, or methods to Owner and ~~Architect~~. The storage of explosives on Owner's property is prohibited. The use of explosive materials on Owner's property is prohibited unless expressly approved in advance in advance by authorities having jurisdiction, in writing, by Owner and Architect. When use or storage of hazardous materials or equipment or unusual construction methods are necessary, the Contractor shall give the Owner, Program Manager and the Architect reasonable advance notice of the presence or use of such materials, equipment or methods.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, ~~.~~ except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. ~~The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor.~~ The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect. Additionally, Contractor shall submit a Safety Plan for the Owner's approval prior to commencing the Work.

Unless otherwise specified in the Contract Documents, Contractor shall be responsible for initiating, maintaining, supervising, and enforcing all safety precautions and programs in connection with the Work. It shall be the duty and responsibility of the Contractor and all of its Subcontractors to be familiar and comply with all requirements of ~~Public Law 91-596,~~ 29 U.S.C. §§ 651 *et. ~~S~~seq.*, the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto, and to enforce and comply with all of the provisions of the Act. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and shall erect and maintain all necessary safeguards for such safety and protection. However, the Contractor's duties shall not relieve any subcontractor(s) or any other person or entity (e.g., a supplier) including any person or entity with liability relative to compliance with all applicable federal, state and local laws, rules, regulations, and ordinances which shall include the obligation to provide for the safety of their employees, persons, and property and their requirements to maintain a work environment free of recognized hazards.

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

10.2.8 The Contractor shall do all things reasonably necessary to protect the Owner's premises and all persons from damage and injury when all or a portion of the Work is suspended for any reason.

10.2.9 The Contractor shall promptly report, in writing, to the Owner, Program Manager and Architect all accidents arising out of or in connection with the Work which causes death, bodily injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious bodily injuries, or serious property damages are caused, then the accident shall be reported immediately by any means necessary to give actual notice to the Owner's representative, Program Manager and the Architect.

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10.2.10 Contractor's obligations under Section 10.2 as to each portion of the Project shall continue until Owner takes possession of and occupies that portion of the Project.

§ 10.2.11~~8~~ Injury or Damage to Person or Property

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The written notice shall provide sufficient detail to enable the other party to investigate the matter. Contractor understands and acknowledges that, under Texas law, Owner has sovereign and/or governmental immunity as to all torts except as to the Owner's permitted use or operation of Owner's motor vehicles, subject to any defenses under law.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify, in writing, the Owner and Architect of the condition. In the event the Contractor encounters polychlorinated biphenyl (PCB), and the specifications require the PCB's removal, the Contractor shall remove the PCB and store it in marked containers at the jobsite provided by the Owner. If PCBs are found which are leaking, then Contractor shall stop work on the affected fixture and shall contact Owner for removal and disposal of the leaking PCBs.

10.3.1.1 In the event Contractor encounters on the Project site any Hazardous Substance, or what Contractor may reasonably believe to be a Hazardous Substance, and which is being introduced to the Work, or exists on the Project site, in a manner in violation of any applicable Environmental Laws, Contractor shall immediately stop work in the area affected and report the condition to Owner, Program Manager and Architect in writing

§ 10.3.2 The Work in the affected area shall not thereafter be resumed except by written authorization of Owner if in fact a Hazardous Substance has been encountered and has not been rendered harmless. Contractor shall be responsible for the consequences of any failure to stop work under this Subparagraph 10.3. ~~Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up~~The Contractor may be entitled to an equitable adjustment regarding the Date of Substantial Completion and/or Final Completion.

§ 10.3.3 IF THE CONTRACTOR IMPORTS HAZARDOUS MATERIALS ONTO THE PROJECT SITE, THEN CONTRACTOR HEREBY ~~TO THE FULLEST EXTENT PERMITTED BY LAW, THE OWNER SHALL~~ INDEMNIFIES~~Y~~ AND HOLD HARMLESS THE OWNER, ITS ~~CONTRACTOR, SUBCONTRACTORS, ARCHITECT, ARCHITECT'S~~ CONSULTANTS, TRUSTEES, OFFICERS, ~~AND~~ PROGRAM MANAGER, AGENTS AND EMPLOYEES ~~OF ANY OF THEM FROM AND~~ AGAINST ANY CLAIMS~~, DAMAGES, LOSSES, AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES~~, ARISING OUT OF OR RELATING TO ~~RESULTING FROM~~SUCH IMPORTATION, INCLUDING BUT NOT LIMITED TO ~~PERFORMANCE OF THE WORK IN THE AFFECTED AREA IF IN FACT THE MATERIAL OR SUBSTANCE PRESENTS THE RISK OF BODILY INJURY OR DEATH AS DESCRIBED IN SECTION 10.3.1 AND HAS NOT BEEN RENDERED HARMLESS, PROVIDED THAT SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE IS~~

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~~ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH, OR TO INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY (OTHER THAN THE WORK ITSELF), EXCEPT TO THE EXTENT THAT SUCH DAMAGE, LOSS, OR EXPENSE IS DUE TO THE FAULT OR NEGLIGENCE OF THE PARTY SEEKING INDEMNITY~~COSTS AND EXPENSES THE OWNER INCURS FOR REMEDIATION OF A MATERIAL OR SUBSTANCE THE CONTRACTOR BRINGS TO THE SITE, AS PROVIDED FOR IN SUBPARAGRAPH 3.18.

~~For purposes of this Agreement, the term "Hazardous Substance" shall mean and include any element, constituent, chemical, substance, compound, or mixture, which are defined as a hazardous substance by any applicable local, state or federal law, rule, ordinance, by-law, or regulation pertaining to environmental regulation, contamination, clean-up or disclosure, including, without limitation, The Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), The Resource Conservation and Recovery Act ("RCRA"), The Toxic Substance Control Act ("TSCA"), The Clean Water Act ("CWA"), The Clean Air Act ("CAA"), and the Marine Protection Research and Sanctuaries Act ("MPRSA"). The Occupational Safety and Health Act ("OSHA"), The Superfund Amendments and Reauthorization Act of 1986 ("SARA"), or other state superlien or environmental clean-up or disclosure statutes including all state and local counterparts of such laws (all such laws, rules and regulations being referred to collectively as "Environmental Laws"). It is the Contractor's responsibility to comply with this Paragraph 10.3 based on the law in effect at the time its services are rendered and to comply with any amendments to those laws for all services rendered after the effective date of any such amendments.~~

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site ~~unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances~~.

§ 10.3.5 For purposes of this ~~Agreement~~Contract, the term "Hazardous Substance" shall mean and include any element, constituent, chemical, substance, compound, or mixture, which are defined as a hazardous substance by any applicable local, state or federal law, rule, ordinance, by-law, or regulation pertaining to environmental regulation, contamination, clean-up or disclosure, including, without limitation, The Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), The Resource Conservation and Recovery Act ("RCRA"), The Toxic Substance Control Act ("TSCA"), The Clean Water Act ("CWA"), The Clean Air Act ("CAA"), and the Marine Protection Research and Sanctuaries Act ("MPRSA"). The Occupational Safety and Health Act ("OSHA"), The Superfund Amendments and Reauthorization Act of 1986 ("SARA"), or other state superlien or environmental clean-up or disclosure statutes including all state and local counterparts of such laws (all such laws, rules and regulations being referred to collectively as "Environmental Laws"). It is the Contractor's responsibility to comply with this Paragraph 10.3 based on the law in effect at the time its services are rendered and to comply with any amendments to those laws for all services rendered after the effective date of any such amendments.~~The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.~~

§ 10.3.6 In those instances in which the presence of a Hazardous Substance was set forth in the AHERA documents or In which the Contractor has other written notice of such through information given to Contractor by Owner or its representative prior to execution of the ~~Agreement~~Contract, Contractor shall not be entitled to a Claim for any delays, disruption or interference it encounters. In those instances of Work stoppage due to the existence of such Hazardous Substances which were not set forth in the AHERA plans and of which the Contractor has no other prior notice, Contractor may be entitled to a Claim for delay or Work stoppage if the requirements of Article 15 are not met. ~~If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.~~

§ 10.4 Emergencies

10.4.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.~~Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.~~

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10.4.2 The performance of the foregoing services by the Contractor shall not relieve the subcontractors of their responsibility for the safety of persons and property and or compliance with all federal, state, and local statutes, rules, regulations, and orders of any governmental authority applicable to the conduct of the Work.

10.5 ASBESTOS OR ASBESTOS-CONTAINING MATERIALS

10.5.1 Contractor shall submit to the Architect a written certification addressed to the Owner that all materials used in the construction of this Project contain less than 0.10% by weight of asbestos and for which it can be demonstrated that, under reasonably foreseeable job site conditions, will not release asbestos fibers in excess of 0.1 fibers per cubic centimeter. The written certification shall further state that, should asbestos fibers be found at this Project in concentrations greater than 0.1 fibers per cubic centimeter, then Contractor shall be responsible for determining which materials contain asbestos fibers and shall take all necessary corrective action to remove those materials from the Project, at no additional cost to the Owner. The written certification shall be dated, shall reference this specific Project, and shall be signed by not less than two (2) officers of the Contractors.

10.5.2 Final Payment shall not be made until this written certification has been received.

10.6 LEAD-FREE MATERIAL IN POTABLE WATER SYSTEM

10.6.1 Prior to payment of retainage and final payment, the Contractor and each subcontractor involved with the potable water system, shall furnish a written certification that the potable water system is "lead-free."

10.6.2 The written certification shall further state that should lead be found in the potable water system built under this Project, then Contractor shall be responsible for determining which materials contain lead and shall take all necessary corrective action to remove lead from the Project, at no additional cost to the Owner. The written certification shall be dated, shall reference this specific Project, and shall be signed by not less than two (2) officers of the Contractor.

10.7 HAZARDOUS MATERIALS CERTIFICATION

The Contractor shall provide written certification that no materials used in the Work contain lead or asbestos materials in them in excess of amounts allowed by federal, state, or local standards, laws, codes, rules and regulations; the Federal Environmental Protection Agency (EPA) standards; and/or the Federal Occupational Safety and Health Administration (OSHA) standards, whichever is most restrictive. The Contractor shall provide this written certification as part of submittals under the Section in the Project Manual related to Contract Closeout.

ARTICLE 11 INSURANCE AND BONDS

11.0.1 No Work will be commenced, and no equipment or materials can be shipped, until all requirements of this Article have been satisfied, satisfactory evidence of insurance has been provided, and all insurance is in full force and effect. Contractor shall notify Owner, Program Manager and Architect, in writing, of any proposed nonconformity with these requirements, and shall notify Owner, Program Manager and Architect, in writing, of any insurance changes which occur during the terms required under the Contract Documents. Any deviation from these requirements can only be approved by Owner's Board of Trustees. Any nonconformity may be grounds for termination or modification of the Contract. To the extent that Contractor is unable to procure the insurance designated herein because the insurance is not reasonably available or is cost-prohibitive, then Contractor shall provide written notice to Owner's Board of Trustees. Said lack of insurance may then be grounds for termination or modification of this Contract.

11.0.2 Satisfactory evidence of insurance required by this Article shall be provided to Owner, Program Manager and Architect not later than five (5) business days after execution of the Contract by Contractor. Satisfactory evidence shall include copies of all required insurance policies, declarations, and endorsements themselves. In addition, Contractor shall also provide a duly-executed ACORD Form 25 Certificate of Liability Insurance naming Owner as a certificate holder and additional insured (except as noted in Section 11.0.4) and attaching all endorsements required herein. The Contractor shall furnish Owner all insurance amendments, renewals, notices, cancellations, and additional endorsements, as they are provided to Contractor.

11.0.3 All insurance required herein shall be obtained from a company licensed to do business with the State of Texas by the Texas Department of Insurance, and shall be underwritten by a company rated no less than "A-" X in A.M. Best's Key Rating Guide, Property-Casualty, according to the latest posted ratings available on A.M. Best's website, www.ambest.com, and that permits waivers of subrogation.

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11.0.4 ~~All insurance required herein shall name the Owner, its officers, employees, representatives, or agents, as an additional insured, except Contractor's Worker's Compensation insurance.~~ All liability insurance required herein shall name Dallas ISD, it's officers, employees, volunteers, elected officials, Program Managers, Architects and their officers, employees, representatives, risk management consultants, or agents, as additional insureds, except Contractor's Worker's Compensation insurance and Professional Liability insurance.

11.0.5 ~~All insurance required herein shall, by endorsement, be primary and non-contributory insurance with respect to the Owner, its officers, employees, representatives, or agents. All insurance shall be written on an occurrence basis, if available, and shall contain a waiver of subrogation in favor of Owner as provided for in Section 11.3.~~ All insurance required herein shall be primary insurance as respects the additional insured required by 11.0.4. Any insurance maintained by an additional insured shall be in excess of such insurance and shall not contribute with such primary insurance. All insurance shall be written on an occurrence basis where reasonably available, with the exception of professional liability policies, and shall contain a waiver of subrogation in favor of- the Owner, Program Manager, and Architect on all claims arising out of the Project. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, or did not pay the insurance premium directly or indirectly; and whether or not the person or entity had an insurable interest in the property damaged.

11.0.6 Any failure of Contractor to comply with the reporting provision of the policies shall not affect the coverage provided to the Owner, its officers, employees, representatives, or agents.

11.0.7 All workers on the Project must be covered by the required insurance policies of the Contractor or a Subcontractor. Contractor shall be responsible for all policy deductibles and self-insured retentions.

11.0.8 Nothing contained in this Article shall limit or waive Contractor's legal or contractual responsibilities to Owner or others. Contractor will cooperate with Owner or its designated representative to expeditiously resolve claims involving injuries to third parties, damage to the Work, or project delays. This cooperation will include providing Owner with monthly insurance carrier summary reports of builder's risk, general liability, professional liability and pollution liability claims pertaining to the Owner's projects. Contractor will provide Owner with Contractor and insurance carrier contact names and phone numbers. Contractor will be responsible for timely reporting of all claims and regulatory requirements, including MMSEA Section 111.

11.0.9. Maximum Allowable Charges for CMAR CCIP Programs

In the event that the Contractor elects to utilize a Contractor Controlled Insurance Program (CCIP) the maximum to be considered reimbursable costs under this Contract will be 2% of the final Cost of the Work (including general conditions costs) but not including Contractor Fee or CCIP charges and not including the costs of any subcontracts that included the cost of insurance covered by CCIP.

This 2% cost factor will cover all insurance required to be carried by the prime contractor and all applicable subcontractors covered by this Contract (specifically 1% for worker's compensation insurance, and 1% total for general liability insurance, excess liability insurance, and umbrella liability insurance combined).

Any contractor costs incurred in connection with the Contractor's elected CCIP program that exceeds the amount reimbursed by the Owner under the formula in this section, will be considered to be covered by the Contractor's Fee. Note: Contractor will not be reimbursed for any deductible stated in the CCIP policy. The deductible is considered covered by the CCIP percent and/or the Contractor Fee.

11.0.10 Maximum Allowable Charges for CMAR Liability Insurance Required by Contract

For jobs not covered by Owner Controlled Insurance Programs (OCIP) or Contractor Controlled Insurance Programs (CCIP), the amount to be reimbursed to the Contractor for all contractually required liability insurance (professional liability, general liability, umbrella liability, excess liability, and auto liability will be actual costs not to exceed a total of .~~65~~% of the net reimbursable Cost of Work (not including liability insurance and not including Contractor Fee.) If the Contractor's cost of contractually required liability insurance is greater than the amount agreed to be reimbursed per this Contract provision, the difference shall be considered to be covered by the Contractor's Fee. For

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jobs covered by CCIP or OCIP, the costs of any other liability insurance will be considered to be covered by the Contractor's Fee.

11.0.11 Maximum Allowable Charges for Subcontract Default Insurance provided by CMAR in lieu of Subcontract Performance Bonds

In the event that Contractor elects to utilize a subcontractor default insurance program (sometimes referred to as SUBGUARD), the maximum amount to be considered reimbursable costs under this Contract will be .75% of the total amount of subcontracts enrolled in such an insurance program. Reimbursement for enrollment in any such program will be limited to subcontracts in excess of $~~2~~500,000.

Any Contractor costs incurred in connection with the Contractor's elected subcontractor default insurance program that exceeds the amount reimbursed by the Owner under the formula in this section, will be considered to be covered by the Contractor's Fee. In the event that Contractor elects to bond selected subcontractors rather than enroll them in the subcontractor default insurance program, the net cost to purchase any such bonds will be reimbursed in lieu of the .75%. Note: Contractor will not be reimbursed for any deductible stated in the Subguard policy. The deductible is considered covered by the .75% and/or the Contractor Fee.

In the event that the Contractor elects to provide Subguard or a similar program of subcontractor default insurance, then the program and the coverage provided by the Contractor shall extend to any additional costs incurred by the Contractor to replace or supplement the forces of a subcontractor to provide the Work, and such circumstances shall include, but not be limited to, any partial or full termination of the contract of a subcontractor for convenience or otherwise, unless the Owner specifically directs the Contractor, in writing, to terminate the contract of a subcontractor for convenience.

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor and the Contractor's Subcontractors shall purchase and maintain, in a company or companies with a "Best Rating" of "A minus" or better, and licensed to do business in the State of Texas, such insurance as will protect, the Contractor, them and the Owner, Program Manager and Architect~~the Owner~~, from claims that may arise out of, or result from, the Contractor's operations under the Contract, whether such operations be by Contractor or by any Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, at a minimum of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in this Section 11.1, in the ~~Agreement~~Contract or elsewhere in the Contract Documents. ~~The Contractor shall purchase and maintain the required~~ Such insurance shall include the following:~~from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.~~

.1 Claims under workers' compensation, disability benefit, and other similar employee benefit acts that are applicable to the Work to be performed, including private entities performing work at the site, and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limit specified for mandatory coverage for the duration of the Project (see Exhibit A).

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person, or property damages arising out of ownership, maintenance, or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations;

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under the Contract Documents, including under Section 3.18;

.9 Claims for Products, Premises and Operations; and

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.10 Claims for damages to the Work itself, through builder's risk insurance, pursuant to AIA A101-2017, Exhibit A, or AIA A133-2019, Exhibit ~~B~~A.

§ 11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment, and with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.~~The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~

~~8. Contractor's Professional Liability, if applicable~~

~~If the Work performed by the Contractor or its subcontractors will include some responsibility for design, the Contractor will purchase or cause to be purchased and maintained a professional liability policy. The limits of coverage will not be less than:~~

~~$1,000,000 each claim and annual aggregate~~

~~Coverage will include:~~
~~A waiver of subrogation in favor of Owner, Program Manager and Architect~~
~~A retroactive date that is the earlier of the start of design or the Work~~
~~Coverage for negligent acts, errors or omissions arising out of design or engineering services~~
~~An extended reporting period of 5 years after final completion~~

9. All Risk Builder's Risk Insurance, if applicable

If Contractor is a Construction Manager-at-Risk, then, as specified in Amendment Number One, in a total amount equal to the Guaranteed Maximum Price; otherwise, in the total amount of the Contract Sum. See Section 11.4 for Builder's Risk Insurance requirements.

11.1.2.1 The Contractor shall furnish separate payment and performance bonds covering faithful performance of the Contract and payment of obligations arising thereunder, each bond to be in a total amount equal to 100% of the Contract Sum or Guaranteed Maximum Price, if the Project is a Construction Manager at Risk project, whichever is applicable. Provided, however, no limitation herein shall limit Contractor's liability under the Contract Documents. Except as provided below, such bond shall be furnished to Owner before any work begins and not later than five (5) business days after execution of the Contract by Owner. (If the Guaranteed Maximum Price is not known at the time that a Construction Manager at Risk contracts is awarded, then the sum of the payment and performance bonds must each be in an amount equal to the Project budget. The Construction Manager at Risk shall deliver the bonds not later than the tenth (10th) day after the date of the Construction Manager at Risk executes the Contract, unless the Construction Manager at Risk furnished a bid bond or other financial security acceptable to the Owner to the District to ensure that the Construction Manager will furnish the required payment and performance bonds when the Guaranteed Maximum Price is established.) All bond shall be issued by a surety company licensed, listed and authorized to issue bonds in the State of Texas by the Texas Department of Insurance, and shall fully comply with Texas Insurance Code Section 3503.001 *et seq*. and Texas Government Code Chapter 2253, or their successors. The surety company shall have a rating of not less than "A-"X according to the latest posted ratings on the A.M. Best website, www.ambest.com. The surety company shall provide, if requested, information on bonding capacity and other projects under coverage and shall provide proof to establish adequate financial capacity for this Project. Should the bond amount be in excess of ten (10%) percent of the surety company's capital and surplus, then the surety company issuing the bond shall certify that the surety company has acquired reinsurance, in a form and amount acceptable to the Owner, to reinsure the portion of the risk that exceeds ten (10%) percent of the surety company's capital and surplus with one or more insurers who are duly authorized and admitted to do business in Texas and that amount reinsured by a reinsurer does not exceed ten (10%) percent of the reinsurer's capitals and surplus. Contractor shall immediately notify the Owner and Architect in writing if there is any change in: the rating; insolvency or receivership in any State; bankruptcy; right to do business in the State; or status of Contractor's sureties at any time until Final Completion.

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If the Contract amount is $100,000 or more, the Contractor shall furnish a Performance Bond equal to one hundred percent (100%) of the Contract Sum. If the Contract amount is $25,000 or more, the Contractor shall furnish a Payment Bond equal to one hundred percent (100%) of the Contract Sum. There shall be separate bonds, the terms of which and the sureties of which are satisfactory to the Owner and which comply with Chapter 2253, Texas Government Code, Title 10 (Vernon Supp. 1999), and all other applicable law. Contractor shall furnish a copy of the Payment Bond to each of its Subcontractors upon request. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be furnished.

11.1.2.2 Certificates of insurance acceptable to the Owner, Program Manager and Architect shall be filed with the Owner and Architect prior to commencement of the Work. These certificates and the insurance policies required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Subparagraph 9.10.2. Information concerning a fifty percent or greater reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both shall be furnished by the Contractor to the Owner, Program Manager and Architect in writing within five (5) business days of Contractor's information and belief.

Contractor's insurance shall apply separately to each insured against whose claim is made or suit is brought, except with respect to the limits of the insurer's liability

11.1.2.3 ~~2~~ The Contractor shall deliver the required bonds to the Owner and Architect not later than five (5) business days after execution of the Contract by Owner. All bonds will be reviewed by the Architect for compliance with the Contract Documents. In the event that the Architect has any questions concerning the sufficiency of the bonds, the bonds will be referred to the Owner or the Owner's representative with Architect's recommendation.

11.1.2.3 4 All bonds shall be originals. The Contractor shall require the attorney-in-fact who executes the required Bonds on behalf of the Surety to affix thereto a certified and current copy of the power-of-attorney. The name, address, and telephone number of a contact person for the bonding company shall be provided.

11.1.2.5 4 Bonds shall guarantee the faithful performance of all of the covenants, stipulations, and agreements of the Contract. Bonds shall be signed by an agent, resident in the State of Texas. If at any time during the continuance of the Contract, the Owner determines that the Contractor is unable to complete the Work in accordance with the Contract Documents, any of the Contractor's bonds become insufficient, the surety becomes insolvent, or the surety's rating drops below the required level, then the Owner shall have the right to require from the Contractor additional and sufficient sureties or other security acceptable to the Owner, which the Contractor shall furnish to the satisfaction of the Owner within ten (10) days after notice to do so. These contractual remedies are in addition to all remedies available by law. In default thereof, all payment or money due to the Contactor may be withheld until the Contractor provides additional surety or security.

11.1.2. ~~.~~5 TEXAS WORKERS' COMPENSATION INSURANCE

A copy of a Certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-83, or TWCC-84), showing statutory worker's compensation insurance coverage for the person's or entity's employees providing services on a project is required for the duration of the Project.

Duration of the Project includes the time from the beginning of the Work on the Project until the Contractor's/person's work on the Project is required for the duration of the Project, including any Warranty Period.

Persons providing services on the Project ("subcontractor") in Texas Labor Code 406.096:
includes all persons or entities performing all or part of the services the Contractor has undertaken to perform on the Project, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity that furnished persons to provide services on the Project.

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Services include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. Services do not include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

The contractor shall provide coverage, based on proper reporting of classification codes and payroll amount and filing of any coverage agreements, which meets the statutory requirements of Texas Code 401.011 (44) for all employees of the contractor providing services on the project for the duration of the Project.

The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

If the coverage period shown on the contactor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

1. A certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

2. No later than seven (7) days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

The Contractor shall retain all required certificate of coverage for the duration of the project and for five (5) years thereafter.

The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within ten (10) days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

The Contractor shall post on each project site a notice, in the text, form, and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

The Contractor shall contractually require each person with whom it contracts to provide services on a project, to:

1. Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code 401.011 (44) for all its employees providing services on the project for the duration of the project.

2. Provide to the contractor, prior to that person beginning work on the project, a certificate of coverage
showing that coverage is being provided for all employees of the person providing services on the project for the duration of the project;

3. Provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing
extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project:

4. Obtain from each other person with whom it contracts, and provide to the contractor:

   a. A certificate of coverage, prior to the other person beginning work on the project; and

   b. A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project:

5. Retain all required certificates of coverage on file for the duration of the project and for five years

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thereafter;

6. Notify the governmental entity in writing by certified mail or personal delivery, within ten (10) days
after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project; and

7. Contractually require each person with whom it contracts to perform as required by items 1-6, with the
Certificates of coverage to be provided to the person for whom they are providing services.

By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor that entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the governmental entity.

The coverage requirement recited above does not apply to sole proprietors, partners, and corporate officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996.

28 T.A.C. Section 110.110(i).

11.1.2.6 BUILDER'S RISK INSURANCE

Contractor shall obtain, at its expense, a builder's risk "all-risk" or equivalent insurance policy, including boiler and machinery insurance if applicable, In the amount of the initial Contract Sum, or if applicable, Guaranteed Maximum Price, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Work at the site on a replacement cost basis. Policy shall contain no co-insurance clause. Coverage shall insure against the perils of fire, lightning, wind storm, hurricane, hail, explosion, riot, civil commotion, smoke, aircraft, land vehicles, vandalism, malicious mischief, flood, earthquake, cold testing, collapse, subsidence, sinkhole, damage resulting from faulty workmanship or faulty materials, terrorism for certified and non-certified acts, law and ordinance coverage for renovations, and all other perils, and shall include materials stored on-site, off-site, and in transit. Owner shall be a named insured under the policy, and the insurance shall also include the interests of the Contractor, subcontractors, and sub-contractors. Contractor shall be responsible for maintaining said builder's risk insurance until the date of Substantial Completion

§ 11.1.2.7 ~~.3~~ Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.2.8 ~~.4~~ Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor ~~becomes aware~~knows or should know of an impending or actual cancellation ~~or expiration~~ of any insurance required by the Contract Documents, the Contractor shall provide written notice to the Owner of such impending or actual cancellation ~~or expiration~~. Upon receipt of written notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of written notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage. At least 30 calendar days prior to the date of expiration of any policy required by Section 11.1.1, Contractor shall provide Owner written notice of the impending expiration.

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§ 11.2 Owner's and Architect's Insurance~~Owner's Insurance~~

§ 11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. The Owner shall be responsible for purchas~~ing~~e and maintaining property and casualty insurance no later than the date of Substantial Completion and such dates of Owner responsibility shall be documented in the Certificate of Substantial Completion. ~~of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The~~If Owner occupies or uses any completed or partially-completed potion of the Work at any stage, then such occupancy or use must be consented to by the insurer and authorized by public authorities having jurisdiction over the Work. To the extent of overlap between Owner's property insurance and Contractor's builder's risk insurance, if any, Contractor's builder's risk shall be primary and non-contributory.~~shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located~~.

§ 11.2.2 ~~Failure to Purchase Required Property Insurance.~~ ~~If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.~~ Partial occupancy or use shall not commence until the insurance company providing this insurance has consented, in writing, by endorsement or otherwise. Owner and Contractor shall take reasonable steps to obtain such consent and shall take no action without written mutual consent that would cause cancellation, lapse, or reduction of this insurance.

§ 11.2.3 Architect shall be responsible for purchasing and maintaining the Architect's liability insurance, worker's compensation insurance, and errors and omissions insurance as provided in the Owner-Architect ~~Agreement~~Contract ~~Notice of Cancellation or Expiration of Owner's Required Property Insurance.~~ ~~Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.~~

§ 11.3 Waivers of Subrogation

§ 11.3.1 ~~The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.~~ All insurance required herein shall contain a waiver of subrogation in favor of Owner, Program Manager

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and Architect on all claims arising out of the Project. The policies shall provide such waivers of subrogation by endorsement or otherwise.

§ 11.3.2 ~~If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.~~ The Owner, as fiduciary, shall have power to adjust and settle any loss arising out of the Work, with insurers regardless of the purchaser of the insurance policy. The Contractor upon receipt of proceeds shall, as a fiduciary, pay all subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements shall require subcontractors to make payment to their sub-subcontractors in similar manner. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor with the insurance proceeds upon issuance of a Notice to Proceed from the Owner.

11.3.3 Partial occupancy or use shall not commence until the insurance company providing this insurance has consented in writing, by endorsement or otherwise. Owner and Contractor shall take reasonable steps to obtain such consent and shall take no action without written mutual consent that would cause cancellation, lapse, or reduction of this insurance.

§ 11.4 Loss of Use~~,~~ and Business Interruption~~, and Delay in Completion~~ Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. ~~The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.~~

~~**11.4.3 WAIVERS OF SUBROGATION**~~

~~The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors, if any, and any of their subcontractors, sub-subcontractors, agents and employees, and (3) Program Manager for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section 11.4, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The foregoing waiver afforded the Architect, his agents, and employees, shall not extend the liability imposed by Section 3.18.3. The Owner or Contractor, as appropriate, shall require of the Architect, Separate Contractors, Subcontractors, Sub-subcontractors, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated in this Section 11.4.3. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, any separate contractors, subcontractors, sub-subcontractors, agents, and employees of any of them by appropriate agreements, similar waivers each in favor of the other parties enumerated herein.~~

~~11.4.4 The Contractor shall pay all subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements shall require subcontractors to make payment to their sub-subcontractors in similar manner.~~

~~11.4.5 Contractor's builder's risk insurance shall be endorsed to allow partial occupancy (permission to occupy) by Owner. Contractor shall ensure that such partial occupancy will not cause cancellation, lapse, or reduction of this insurance.~~

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the ~~Agreement~~Contract shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of ~~any applicable mortgagee clause and of~~ Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor and Architect of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor and the Architect shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor and/or the Architect do~~es~~ not object, the Owner shall settle the loss and the Contractor and Architect shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor and/or Architect timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's or Owner's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect or Owner, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect or Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor ~~sh~~may~~ll~~ be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 CORRECTION OF WORK

12.2.1 Before Or After Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, ~~the cost of uncovering and replacement,~~ and compensation for the Architect's and Program Manager's services and expenses made necessary thereby, shall be at the Contractor's expense.

12.2.1.1 The Owner may make emergency repairs to the Work or take such other measures necessary under the circumstances, if the Contractor does not promptly respond to a Notice of Defect or nonconforming Work. Contractor shall be responsible to Owner for this cost if the reason for the repairs is attributable to the Contractor. If payments then or thereafter due to the Contractor are not sufficient to cover such costs, then the Contractor shall pay the difference to the Owner on demand

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof ~~or after the date for commencement of warranties established under Section 9.9.1,~~ or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such written notice promptly after discovery of the condition. ~~During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty.~~ If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of written notice from the Owner or Architect, the Owner may correct the Work as provided in 12.2.2.1.1. Nothing contained in this Section 12.2 is intended to limit or modify any obligations under the law or under the Contract Documents, including any warranty obligations, expressed or implied~~it in accordance with Section 2.5~~.

12.2.2.1.1 If the Contractor fails to perform the corrective Work, then Owner may perform corrective Work, at Contractor's cost. If Owner performs corrective Work, then Owner may also remove nonconforming Work and store

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the salvageable materials or equipment at Contractor's expense. If the Contractor does not pay all costs incurred by Owner within ten (10) days after written notice, then Owner may, upon ten (10) additional days' written notice, sell the removed materials and equipment in accordance with Owner's policies, and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contactor should have borne, then the Contractor shall pay the difference to the Owner.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall be extended by corrective Work performed by the Contractor pursuant to this Section 12.2, but only as to the corrected Work. Any corrective work performed or to be performed under or pursuant to Paragraph 12.2 shall be warranted to the same extent as the Work is warranted hereunder for the greater of the remainder of the applicable warranty (corrective) period or ninety (90) days from the date such corrective work has been completed.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction by the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

12.2.4.1 Where nonconforming Work is found, the entire area of Work involved shall be corrected unless the Contractor can completely define the limits to the Architect's satisfaction. Additional testing, sampling, or inspecting needed to define nonconforming work shall be at the Contractor's expense, and performed by the Owner's testing laboratory if such services are reasonably required by the Architect. All corrected work shall be retested at the Contractor's expense. Reasonable Architectural or Program Manager Services required to analyze nonconforming Work shall be paid for by the Contractor.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work. Nothing contained in this Paragraph 12.2 is intended to limit or modify any obligations under the law or under the Contract Documents, including any warranty obligations, expressed or implied.

12.2.6 Contractor shall replace, repair, or restore any parts of the Project or furniture, fixtures, equipment, or other items placed therein (whether by Owner or another party) that are destroyed or damaged by any such parts of the Work that do not conform to the requirements of the Contract Documents or by defects in the Work.

12.2.7 The provisions of this Section 12.2 apply to Work done by Subcontractors of the Contractor as well as Work done directly by employees of the Contractor. The provision for this Section 12.2.7 shall not apply to corrective work attributable solely to the acts or omissions of any separate contractor of Owner (unless Contractor is acting in such capacities). The cost to Contractor for performing any of its obligations under this Section 12.2.7 to the extent not covered by insurance shall be borne by Contractor.

12.2.8 If, however, Owner and Contractor deem it inexpedient to require the correction of Work damaged or not done in accordance with the Contract Documents, then an equitable deduction from the Contract Sum shall be made by written agreement between Contractor and Owner. Until such settlement, Owner may withhold such sums as Owner deems just and reasonable from moneys, if any, due Contractor. The settlement shall not be unreasonably delayed by the Owner and the amount of money withheld shall be based on estimated actual cost of the correction to Owner.

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§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

~~13.1.1 The Contract shall be governed by the laws of the State of Texas, and any litigation shall be conducted in state district court. Mandatory and exclusive venue for any disputes shall be in Dallas , county in place whichere the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~ The Contract and any disputes related to the Work shall be governed by the laws of the State of Texas. The Contract is deemed performable entirely in Dallas, Dallas County, Texas. Any litigation to enforce or interpret any terms of the Contract, or any other litigation arising out of or as a result of the Contract or the Work, shall be brought in the State District courts of Dallas County, Texas. In the event of litigation, the substantially prevailing party shall be entitled to its reasonable and necessary attorney's fees that are equitable and just.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. ~~Except as provided in Section 13.2.2, Nneither party to the Contract shall assign the Contract, as ain whole or in part, without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.~~ The Contractor shall not assign the Contract as a whole, or in part, without written consent of the Owner.

§ 13.2.2 The invalidity of any part or provision of the ~~Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the~~ Contract Documents shall not impair or affect in any manner whatsoever the validity, enforceability, or effect of the remainder of the Contract Documents. The Owner may, without consent of the Contractor, assign the Contract in whole or in part. In such event, the assignee shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignments. ~~The Contractor shall execute all consents reasonably required to facilitate the assignment.~~

§ 13.3 Rights and Remedies

§ 13.3.1 Written notice shall be deemed to have been duly served only if the writing is delivered in person to the office of the party set out ~~O~~on the first page of the Standard Form of ~~Agreement~~Contract Between Owner and Contractor, or to such other address as has been previously clearly identified in writing by the addressee, or sent by registered or certified mail to that address. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner~~,~~ or Architect~~, or Contractor~~ shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing. The application of a time-is-of-the-essence clause as to any action or duty required of Contractor by the Contract Documents shall not be waived by course of performance or course of dealing by Contractor.

13.3.3 ~~4~~ Neither Contractor nor any of its materialmen, laborers or Subcontractors shall have any lien rights against the Owner's lands, building funds, materials or other property. No materialmen, laborers or Subcontractors of the Contractor shall have any enforceable rights against the Owner on this Contract. Materialmen, laborers and Subcontractors of the Contractor may have rights under any Payment Bond provided by the Contractor, but cannot look to the Owner for any help in enforcement of those rights.

13.3.4 The invalidity of any part or provision of the Contract Documents shall not impair or affect in any manner whatsoever the validity, enforceability or effect of the remainder of the Contract Documents.

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§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made at appropriate times as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities having jurisdiction. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity employed by the Owner for this purpose ~~acceptable to the Owner,~~ or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals which shall be included in the Cost of the Work. Provided, however, per Texas Government Code Chapter 2269, Owner shall bear all costs of construction materials, engineering, testing, and inspection services, and the verification testing services necessary for acceptance of the facility by the Owner. Owner shall bear the normal costs of these services, but not any excess costs attributable to Contractor caused scheduling problems, other Contractor error or retesting. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may observe be present for such procedures. ~~The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded.~~ The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Owner shall provide or contract ~~the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements~~ for such additional testing, inspection, or approval~~, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures.~~ Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense. Architect, Owner, and Contractor shall cooperate for the timely scheduling of such tests and inspections.

§ 13.4.3 If such procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including, but not limited to, those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect, with a copy to the Owner.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Undisputed ~~P~~payments due and unpaid under the Contract Documents shall bear interest from the date payment is overdue at the rate provided by Texas Government Code Section 2251.025~~the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~ Any such payment shall be deemed overdue on the thirty-first (31st) day after Owner received Architect's invoice or Contractor's completed Application for Payment for the Architect, whichever is later, if Owner's Board of Trustees meet more than once per month. Any such payment shall be deemed overdue on the forty-sixth (46th) day after Owner receives Architect's invoice or Contractor's Certificate for Payment from the Architect, if Owner's Board of Trustees meet once a month or less frequently. No interest shall be due on sums properly retained by Owner, except ~~expect~~ as provided by law, or on disputed sums unpaid by Owner.

13.6 EQUAL OPPORTUNITY IN EMPLOYMENT

13.6.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, age, disability, sex, national origin, or any class otherwise protected by District policy or law. The Contractor agrees to post in conspicuous places, available to employees and applicants, notices setting forth the Contractor's nondiscrimination policies.

13.6.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment

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without regard to race, religion, age, disability, sex, national origin, or any class otherwise protected by District policy or law.

13.7 RECORDS

13.7.1 Contractor shall at all times through the date of Final Completion, maintain Job Records, including, but not limited to, invoices, Construction Documents, payment records, payroll records, daily reports, diaries, logs, instructions, drawings, receipts, subcontracts, purchase orders, vouchers, memoranda, other financial data and job meeting minutes applicable to the Project, in a manner which maintains the integrity of the documents. Job Records must be retained by Contractor for a least twelve (12) years, after the date of Final Completion of the Project. Within five (5) days of Owner's request, Contractor shall make such Job Records available for inspection, copying, and auditing by the Owner, Architect, or other respective representatives, at Owner's central office.

13.7.2 If Contractor is a Construction Manager at Risk, then Contractor shall also maintain, in accordance with the provisions of Section 13.7.1, the following: subcontract files, including proposals of successful and unsuccessful bidders, bid recaps, and subcontractor payments; original estimates; estimating work sheets; general ledger entries detailing cash and trade discounts received; insurance rebates and dividends; and any other supporting evidence deemed necessary by the Owner to substantiate charges related to the Contract.

13.7.3 Contractor shall keep a full and detailed financial accounting system and shall exercise such controls as may be necessary for property financial management under this Contract; the accounting and control systems shall be satisfactory to the Owner and shall be subject to the provisions of Section 13.7.1.

13.7.4 Contractor shall keep all Contract Documents related to the Project, subject to the provisions of Section 13.7.1, provided, however, Contractor shall not destroy said documents until Contractor has confirmed with Owner in writing, that Owner has obtained a copy of all as-built drawings.

13.7.5 In the event that an audit by the Owner reveals any errors/overpayments by the Owner, then the Contractor shall refund to the Owner the full amount of such overpayments within thirty (30) days of such audit findings, or the Owner, at its option, reserves the right to deduct such amounts owed to the Owner from any payments due to the Contractor.

13.7.6 Commencement of Statutory Limitation Period, As between the Owner and Contractor; after Final Certificate for Payment.

13.7.7 At any time during the term of this ~~Agreement~~Contract and for a period of ten ~~four~~ (~~4~~10) years thereafter, the Owner or a duly authorized audit representative of the Owner, or the State of Texas, at its expense and at reasonable times, reserves the right to audit the Contractor's records and books relevant to all services provided under this ~~Agreement~~Contract. In the event such an audit by the Owner reveals any errors/overpayments by the Owner, the Contractor shall refund the Owner the full amount of such overpayments within thirty (30) day of such audit findings, or the Owner, at its option, reserves the right to deduct such amounts owing the Owner from any payments due the Contractor.

13.8 NONDISCRIMINATORY EMPLOYMENT

13.8.1 In connection with the execution of this Contract, the Contractor shall fully comply with the District non-discrimination requirement cited below.

"The Dallas Independent School District, as an equal opportunity educational provider and employer, does not discriminate on the basis of race, color, religion, sex, national origin, disability, sexual orientation and/or age in educational programs or activities that it operates or in employment decisions. The District is required by Title VI and Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act, and the Age Discrimination Act of 1975, as amended, as well as board policy not to discriminate in such a manner. (Not all prohibited bases apply to all programs.)"

During the performance of this Contract, the Contractor further agrees as follows:

.1 The Contractor will not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or age;

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.2 The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, sex, religion, national origin or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the requirements of these non-discrimination provisions.

Submittal to Owner of reasonable evidence of discrimination will be grounds for termination of the ~~Agreement~~Contract.
This policy does not require the employment of unqualified persons.

13.9 CERTIFICATION OF NONSEGREGATED FACILITY

13.9.1 This Subparagraph is applicable to Contracts and Subcontracts exceeding $10,000.00 which are not exempt from the provisions of the Equal Opportunity Clause.

13.9.2 By the signing of this Contract, the Contractor signifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. It certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The undersigned agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this proposed Contract. As used in this certification, the term 'segregated facilities' means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. It further agrees that (except where it obtained identical certifications from proposed consultants for specific time period), it will obtain identical certification from proposed Subcontractors prior to the award of a Contract exceeding $10,000.00 which are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed Subcontractors (except where the proposed Subcontractors have submitted identical certifications for specific time periods): Notice to Prospective Subcontractors of requirement for certification of non-segregated facilities, as required by the May 19, 1967 Order (32 FR.7439, May 19, 1967) on elimination of segregated facilities, by the Secretary of Labor, must be submitted prior to the award of a Contract exceeding $10,000.00 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.11.

13.10 PREVAILING WAGE RATES

13.10.1 In compliance with laws of the State of Texas relating to labor Texas Government Code Section 2258.001 *et seq.* the building construction wage rates listed in the Contract Documents have been ascertained and determined by the Owner as the general prevailing rates in the locality of Dallas Independent School District for the classifications listed. The Contractor and each Subcontractor shall pay to all laborers, workers and mechanics employed by them in the execution of this Contract not less than such rates for each craft or type of worker or mechanic needed to execute the Contract. If it becomes necessary to employ any person in a trade or occupation not herein listed, such person shall be paid not less than an hourly rate fairly comparable to the rates shown hereinafter.

13.10.2 This determination of prevailing wages shall not be construed to prohibit the payment of more than the rates named.

13.10.3 In compliance with the above cited law the Contractor shall forfeit, as a penalty to the Owner, Sixty Dollars ($60.00) for each laborer, worker or mechanic employed, for each calendar day, or portion thereof, such laborer, worker or mechanic is paid less than the rates stipulated hereinafter for any work done under this Contract by him or any Subcontractor under him.

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13.10.4 Owner reserves the right to receive and review payroll records, payment records, and earning statements of employees of Contractor, and of Contractor's Subcontractors and Sub-subcontractors.

13.10.5 In executing the Work under the Contract Documents, Contractor shall comply with all applicable state and federal laws, including but not limited to, laws concerned with labor, equal employment opportunity, safety and minimum wages.

13.11 CERTIFICATION OF ASBESTOS-FREE PROJECT

13.11.1 Contractor shall submit to the Architect a letter addressed to the Owner certifying that all materials used in the construction shall be asbestos free. The General Contractor shall provide certification for himself, all subcontractors, vendors, suppliers, and other entities, stating that materials and/or equipment used in the construction of the project do not contain asbestos in any form or concentration. Certification letters shall be dated, shall reference this specific Project, and shall be signed by not less than two officers of the construction company.

13.11.2 Final Payment shall not be made until this letter of certification has been received.

13.12 CERTIFICATION OF LEAD-FREE POTABLE WATER SYSTEM

13.12.1 Contractor shall submit to the Architect a letter, addressed to the Owner, stating that any components of the potable water system installed by the Contractor are lead-free as defined by the Safe Drinking Water Act Amendment of 1986 and the Lead Contamination Control Act of 1988.

13.13 Responsibility For Contractor's Forces. The Contractor shall be responsible for the actions of Contractor's forces, and Subcontractor's forces to enforce the Owner's drug-free, alcohol-free, and tobacco-free zone. Contractor agrees to abide by Owner's policies prohibiting the use of tobacco, alcohol or illegal drugs in any form on any property owned, operated, or maintained by the Owner. Contractor agrees to require all subcontractors and sub-subcontractors to abide by these policies,. Violation of this provision shall constitute a material breach of this agreement.

13.14 FAMILY CODE CHILD SUPPORT CERTIFICATION

By signing this ~~Agreement~~Contract, the Contractor certifies as follows: "Under Section 321.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

13.15 NON-COMPENSATION REQUIREMENT

The Owner may not accept a bid or award a contract that includes proposed financial participation by a person who received compensation from the Owner to participate in preparing the specifications or request for proposals on which the bid or contract is based. The Contractor is described as vendor in the statutory quote below:

"Under Section 2155.004, Government Code, the vendor certifies that the individual or business entity named in this bid or contract is not ineligible to receive the specified contract and acknowledges that this contract may be terminated and payment withheld if this certification is inaccurate."

13.16 ~~8~~ PROPRIETARY INTERESTS AND CONFIDENTIAL INFORMATION

13.16.1 ~~8~~ Neither Architect nor Contractor shall use the image or likeness of Owner's Project or Owner's official logo or emblem and any other trademark, service mark, or copyrighted or otherwise protected information of Owner, without Owner's prior written consent. Contractor and Architect shall not have any authority to advertise or claim that Owner endorses Architect or Contractor's services, without Owner's prior written consent.

13.16.2 Neither Architect nor Contractor shall disclose any confidential information of Owner which comes into the possession of Architect or Contractor at any time during the Project, including but not limited to: pending real estate purchases, exchange, lease, or value; information related to litigation; the location and employment of security devices, security access codes; student likenesses; student record information; employee information; or any other information deemed confidential by law.

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13.16.3 The parties acknowledge that, as a public entity in the State of Texas, Owner is subject to, and must comply with, the provisions of the Texas Public Information Act, Texas Government Code Section 552.001, *et seq.*, and the Texas Open Meetings Act, Texas Government Code, Section 551.001. *et seq.*

13.16.4 All information owned, possessed, or used by Owner which is communicated to, learned, developed or otherwise acquired by Contractor in the performance of services for Owner, which is not generally known to the public, shall be confidential and Contractor shall not, beginning on the date of first association or communication between Owner and Contractor and continuing through the term of this ~~Agreement~~Contract and at any time thereafter, disclose, communicate or divulge, or permit disclosure, communication or divulgence, to another or use for Contractor's own benefit or the benefit of another, any such confidential information, unless required by law. Except when defined as part of the Project, Contractor shall not make any press releases, public statements, or advertisement referring to the Project or the engagement of Contractor as an independent contractor of Owner in connection with the Project, or release any information relative to the Project for publications, advertisement or any other purpose without prior written approval of Owner. Contractor shall obtain assurances similar to those contained in this Subparagraph from persons, agents, and subcontractors retained by Contractor. Contractor acknowledges and agrees that a breach by Contractor of the provisions hereof will cause Owner irreparable injury and damage. Contractor, therefore, expressly agrees that Owner shall be entitled to injunctive and/or other equitable relief to prevent or otherwise restrain a breach of this ~~Agreement~~Contract.

.1 Contractor acknowledges and agrees that the Owner has an interest in maintaining and otherwise protecting the image and reputation of the Owner's official logo or emblem and any other trademarks, copyrighted or otherwise protected materials of the Owner (hereinafter referred to as the "Owner's Protected Materials"), and that in order to accomplish this purpose, the Owner must in all cases assure itself that the Owner's Protected Materials are at all times used in a manner consistent with the Owner's policies, administrative regulations, and this ~~Agreement~~Contract.

.2 Contractor agrees that the Owner must, therefore, have the right to examine and approve or disapprove such use in writing in advance of use, the contents, appearance and presentation of any and all advertising, promotional or other similar materials proposed by the Contractor to be used in connection with any advertising or promotion utilizing Owner's Protected Materials.

13.17 ~~8~~ The Contractor shall ~~have~~ bear full responsibility for utilizing means and methods that may result in an overstress of any structure or any part or member of it during construction. The Contractor shall fully check the effect of his
operations in this regard, and shall provide all temporary support and connections required.

13.18 ~~9~~ The Contractor shall protect and be responsible for any damage to or loss of its (his/her) work, tools, equipment, or material, from the date of the Contract until the acceptance of the Work and shall make good without cost to the Owner, any damage or loss that may occur during this period. All material affected by weather shall be covered and protected to keep it from damage while being transported to the site, as well as when it is stored on the site. The Contractor at its (his/her) own expense and option shall employ watchmen or erect fencing at such time as necessary to protect his work, tools, equipment or material by the Contractor and the fact that the Owner has a watchman, if any, shall not mean that the Owner has undertaken, nor does the Owner undertake, to protect work, tools, equipment and materials from theft or mysterious disappearance.

13.19 The Contractor should only take direction on any issues regarding the Project when provided by the Owner's Office of Construction Services or the Program Manager or Architect.

13.20 The Contractor and subcontractor shall ensure that on-site fraternization shall not occur between personnel under the Contractor's or subcontractor's direct or indirect supervision and students, school employees and the general public.

13.21 PARTNERING
Contractor will participate in a partnering process if requested by Owner.

13.22 AS-BUILT DRAWINGS
Prior to issuance of the Certificate of Final Completion by Architect and Program Manager, the Contractor shall submit to Architect a complete set of as-built drawings, with all changes made during construction, including

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concealed mechanical, electrical and plumbing items clearly shown. The Contractor shall submit these drawings in a medium acceptable to the Architect. Based upon the as-built drawings received from Contractor, Architect shall, within thirty days after receipt of the as-built drawings from Contractor, complete Record Drawings.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of ninety ~~3~~90 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, under direct or indirect contract with the Contractor, for any of the following reasons, which are the sole grounds for termination under this Subparagraph 14.1.1.~~:~~;

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or

.3 ~~Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the~~ Owner has not made payment of undisputed sums due on an approved Certificate for Payment within the time stated in the Contract Documents. ~~; or~~

~~.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, under direct or indirect contract with the Contractor, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 ~~If one of the reasons described in Section 14.1.1 or 14.1.2 exists, then, after the applicable time period, the Contractor may, upon seven (10) days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, and for proven unrecoverable loss with respect to materials, equipment, tools, and construction equipment and machinery incurred to the date of termination as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination~~If the Work is stopped for ninety (90) consecutive days for any reason described in Subparagraphs 14.1.1 or 14.1.2, the Contractor may, upon fourteen (14) days written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages to date of termination.

14.1.4 If the Work is stopped for a period of ninety (~~6~~90) consecutive days through no act or fault of the Contractor, or a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has ~~repeatedly~~ persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon ~~twenty~~ fourteen (~~20~~14) additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

14.1.5 Notwithstanding anything to the contrary contained herein or in the other Contract Documents, neither the Owner or any other party shall be responsible for damages for loss of anticipated profits on Work not performed on account of any termination described in Subparagraphs 14.1.1, 14.1.2 and 14.1.3.

14.2 Termination by the Owner for Cause

14.2.1 The Owner may terminate the Contract if the Contractor

.1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or ~~s~~Suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or ~~s~~Suppliers;

.3 ~~repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or~~ persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or

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.4 otherwise is guilty of ~~substantial breach of a provision of~~ a material breach of provision of the Contract Documents;

.5 fails to furnish the Owner, upon written request, with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents; ~~or~~

.6 engages in serious or repeated worker misconduct in violation of Article 3.3.2;

.7 engages in conduct that would constitute a violation of state or federal criminal law, including but not limited to, the laws prohibiting certain gifts to public servants, or engages in conduct that would constitute a violation of the Owner's ethics or conflict of interest policies; or

.8 fails to proceed continuously and diligently with the construction and completion of the Work, except as permitted under the Contact Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, subject to any prior rights of the surety, ~~and upon certification by the Architect that sufficient cause exists to justify such action,~~ the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 ~~Exclude the Contractor from the site and t~~Take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Any further payment shall be limited to amounts earned to the date of Contractor's removal.

§ 14.2.4 If the ~~unpaid balance of the Contract Sum exceeds~~ costs of finishing the Work, including compensation for the Architect's and Program Manager's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, exceed the unpaid balance of the Contract Sum or Guaranteed Maximum Price (if the Project is a Construction Manager at Risk project), ~~such excess shall be paid to~~ then the Contractor and/or its Surety shall pay the difference to the Owner. ~~If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner.~~ The amount to be paid to the ~~Contractor or~~ Owner, ~~as the case may be,~~ shall be certified by the Architect ~~the Initial Decision Maker~~, upon application, and this obligation for payment shall survive termination of the Contract.

14.2.5 The parties hereby agree that: 1) if an order for relief is entered on behalf of the Contractor, pursuant to Chapter 11 of the U.S. Bankruptcy Code; 2) if any other similar order is entered under any debtor relief laws; 3) if Contractor makes assignments for the benefit of one or more of its creditors; 4) if a receiver is appointed for the benefit of its creditors; or 5) if a receiver is appointed on account of its insolvency, any such event could impair or frustrate Contractor's performance of the Contract Documents. Accordingly, it is agreed that upon occurrence of any such event, Owner shall be entitled to request of Contractor or its successor in interest, adequate assurance of future performance in accordance with the terms and conditions of the Contract Documents. Failure to comply with such request within ten (10) days of delivery of the request shall entitle Owner to terminate the Contract and to the accompanying rights set forth in Subparagraphs 14.2.1 through 14.2.6. In all events, pending receipt of adequate assurance of performance and actual performance in accordance with the Contract Documents, Owner shall be entitled to proceed with the Work with Owner's own forces or with other Contractors on a time and material or other appropriate basis, the cost of which will be charged against the Contract Sum.

If a Performance Bond has been furnished and the Contractor is declared by the Owner to be in default under the Contract, the Surety shall promptly remedy the default by completing the Contract in accordance with its terms and conditions, or by obtaining a bid or bids in accordance with its terms and conditions. At Owner's election, upon determination by the Owner and the Surety of the lowest responsible bidder, the Surety will complete the Work or will arrange for a Contract between such bidder and the Owner, and make available as Work progresses sufficient funds to pay the cost of completion less the balance of the Contract Sum, but not exceeding the Penal Sum of the bond and other costs and damages for which the Surety may be liable under the bond. The phrase 'balance of the Contract Sum' as used herein shall mean the total amount payable by the Owner to the Contractor under the Contract and amendments thereto less the amount previously paid by the Owner to the Contractor.

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14.2.6 As required by Texas Government Code Chapter 2253, if a Performance Bond has been furnished and the Contractor is declared by the Owner to be in default under the Contract, then the Surety shall promptly perform the Work, in full accordance with the plans, specifications, and Contract Documents. Unless otherwise agreed in writing between the Surety and the Owner, the Surety shall complete the Work by the Surety entering into a Contract acceptable to Owner, with a Contractor acceptable to Owners, and shall obtain new Payment and Performance Bonds as required by law.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 ~~The Contract Sum, Guaranteed Maximum Price, and Contract Time shmayll be adjusted, by mutual written agreement, for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit~~. An adjustment shall be made to the Contract Sum calculated under Article 7. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. Furthermore, if this Contract is a multi-year contract funded through Owner's current general funds that are not bond funds, then the Owner's Board of Trustees has the right to not appropriate adequate monies for the next fiscal year and to terminate this Contract at the end of each fiscal year during the term of the Contract, without the Owner incurring any further liability to Contractor as a result of such termination.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; and for proven unrecoverable loss with respect to materials, equipment, tools, and construction equipment and machinery incurred to the date ~~costs incurred by reason~~ of ~~the~~ termination~~, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement~~. Such payment shall not cause the Contract Sum, or Guaranteed Maximum Price, if the Project is a Construction Manager at Risk Project, to be exceeded. Such payment shall not include overhead and profit for Work not executed.

14.4.4 Upon determination by a Court of competent jurisdiction that termination of the Contractor pursuant to Section 14.2 was wrongful, such termination will be deemed converted to a termination for convenience pursuant to Section 14.4, and Contractor's remedy for wrongful termination shall be limited to the recovery of the payments permitted for termination for convenience as set forth in Section 14.4.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is ~~any demand or assertion by one of the Contractor parties seeking, as a matter of right, payment of additional compensation under the Contract Documentsmoney, interpretation of the Contract Document terms, a change in the Contract Time;, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the partyContractor making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.~~ any demand or assertion by the Contractor that it should be paid more money than the

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Contract Sum or granted more contract time by the Owner because of action or inaction on the part of Owner, any Owner representative, Architect, or any party for whom Owner is responsible, or any party with whom Owner has separately contracted for other portions of the Project, including, but not limited to, any demand or assertion that Contractor's performance has been delayed, interrupted or interfered with, that Contractor's performance has been accelerated, constructively accelerated, or suspended, that Contractor's performance has been wrongfully terminated, that there has been a failure of payment, that Contractor has encountered concealed or unknown conditions, that Contractor has encountered hazardous materials, that actions or omissions of the Owner have been wrongful related in any way to the Work, that a time extension grant was inadequate, that there has been a breach of contract, or that Contractor is entitled to any other relief, on any legal or equitable theory, related to the Work or the Contract. This definition of Claim is not intended to create any right of action where the right of action does not otherwise exist under applicable law or other provisions of this Contract.

§ 15.1.2 Notice Requirement ~~Time Limits on Litigation~~Claims

~~The Owner and Contractor shall commence all Claims~~litigation and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in anythe case of the Owner, not more than 120 years after the date of Final~~Substantial~~ Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2. Within fourteen (14) calendar days of the first occurrence of an event that Contractor has any reason to believe might result in a Claim, or within fourteen (14) calendar days of Contractor's discovery of the first occurrence of an event that Contractor has any reason to believe might result in a Claim if the first occurrence of the event was willfully hidden from the Contractor, the Contractor shall file a written document clearly captioned "Notice of Claim" with Owner, Program Manager and the Architect. The Notice shall clearly set out the specific matter of complaint, and the impact or damages, which may occur or have occurred as a result thereof, to the extent the impact or damages can be assessed at the time of the Notice. If the impact or damages cannot be assessed as of the date of the Notice, the Notice shall be amended at the earliest date that is reasonably possible. It is imperative that Owner have timely, specific Notice of a potential problem in order that the problem can be mitigated promptly.

15.1.2.1 In addition to the Notice required by Subparagraph 15.1.2, the Contractor shall also file a document captioned "Claim" with the Owner, Program Manager and Architect within ninety-one (91), days of occurrence of any event resulting in a Claim for damages, giving notice of the Claim. Contractor agrees that this is a reasonable Notice requirement. Any Claim or portion of a Claim that has not been made the specific subject of a Notice strictly in accordance with the requirements of this section is waived.

§ 15.1.3 ~~Notice of Claims~~ Continuing Contract Performance

After receipt of a Notice of Claim, the Architect shall have fourteen (14) calendar days to render a decision, which shall be stated in writing and delivered to the Contractor, the Owner and the Program Manager via facsimile, regular mail or hand delivery. If the Architect fails to render a decision in writing with the fourteen (14) days, the Claim shall be deemed accepted. Within five (5) calendar days of receipt of the Architect's written decision, Contractor may file a written appeal of the decision to the Program Manager. The Program Manager shall have ten (10) calendar days to render a decision, which shall be stated in writing and delivered to the Contractor, Architect and the Owner via facsimile, regular mail or hand delivery. If the Program Manager fails to render a decision in writing within the ten (10) days, the claim shall be deemed accepted. Within five (5) calendar days of receipt of the Program Manager's written decision, Contractor may file a written appeal of the decision with the Deputy Superintendent of Business Services. Within fourteen (14) calendar days of the receipt of an appeal, an Appeals Board consisting of the Deputy Superintendent of Business Services, Chief Operations Officer, and a representative of the offices of Legal Services shall render a written decision. Any Claim determination requiring a Change Order must be approved by the Board of Trustees. The filing, or rejection of a Claim does not entitle Contractor to stop performance of the Work. The Contractor shall proceed diligently with performance of the Contract during the pendency of any Claim, excepting termination or under Owner's direction to stop the Work. Any Claim that would require expenditure in excess of $10,000.00, or that would require a Change Order, must be reviewed by the Program Manager and the Appeals Board using the appeals process described in this section.

15.1.3.1 Claims by ~~either~~ the ~~Owner or~~ Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by written notice to the ~~other party~~Owner and to the ~~Initial Decision Maker with a copy sent to the~~ Architect~~, if the Architect is not serving as the Initial Decision Maker~~. Claims by Contractor~~either party~~ under this Section 15.1.3.1 ~~shall~~must be

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initiated within 21 calendar days after occurrence of the event giving rise to such Claim or within 21 calendar days after the ~~e~~Contractor~~laimant~~ first knew or should have known~~recognizes~~ the condition giving rise to the Claim, whichever is ~~lat~~earlier. Claims must be initiated by written notice titled: "Notice of Claim" ("Notice") and sent to the Architect and Owner's designated representatives. The Notice shall clearly set out the specific matter of complaint, and the impact which may occur or have occurred as result thereof, to the extent that the impact can be assessed at the time of the Notice. If the impact cannot be assessed as of the date of the Notice, then the Notice shall be amended at the earliest date that is reasonably possible. It is imperative that Owner receive timely specific Notice of any potential problem identified by Contractor in order that the problem can be mitigated or resolved promptly. Claims not filed as required by this Section shall be waived.

§ 15.1.3.2 Claims by ~~either~~ the ~~Owner or~~ Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by written notice to the other party. In such event, no decision by the Initial Decision Maker is required.

15.1.3.3 When Owner has an applicable claim for construction defects, Owner shall comply with the provisions of Texas Government Code Chapter 2272 related to the provision of notice of defects and the Contractor's or Architect's opportunity to cure.

§ 15.1.4 ~~Continuing Contract Performance~~ Claims Handling Following Construction

The acceptance of final payment shall constitute a waiver of Claims by the Contractor, which have not previously been identified in a Notice of Claim under 15.1.2 and a Claim under 15.1.2.1 and specifically reserved in the final Application for Payment.

§ 15.1.4.1 Time Limits on Litigation. The Owner and Contractor shall commence all litigation whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the dispute resolution method selected in the Contract and within the period specified by applicable law, but in the case of the Owner, not more than eight (8) years after the date of Final ~~Substantial~~ Completion of the Work, unless extended in accordance with Texas Civil Practice and Remedies Code Section 16.009. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

15.1.4.2 Pre-Litigation Mediation

~~.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7, as amended, and Article 14, as amended, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make undisputed payments for Work performed in accordance with the Contract Documents.~~ Except as to claims for injunctive relief, neither party may commence litigation relating to any Claim arising under this ~~Agreement~~Contract without first submitting the Claim to Mediation. The parties shall share the mediator's fee and any filing fees equally, and the mediation shall be held in Dallas, Texas. ~~Agreement~~Contracts reached in mediation must be approved by the Board of Trustees and shall thereafter be enforceable as settlement agreements in any court having jurisdiction thereof. Mediation shall be conducted by a mediator selected jointly by the Owner and Contractor.

15.1.4.3 ~~The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.~~

§ 15.1.5 Claims For Concealed Or Unknown Conditions. Only if conditions are encountered at the site which are (a) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, (b) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents or (c) in the case of renovation Work, any condition of the pre-existing construction to be renovated, that is materially different from any of the conditions that could reasonably have been expected to be present in preexisting construction of the age and type encountered on the Project, then Contractor shall be entitled to make a Claim if it can satisfy all of the requirements of Paragraph 15.1.

15.1.5.1 No adjustment in the Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition which does not differ materially from those conditions disclosed or which reasonably should have been disclosed by Contractor's (1) prior inspections, tests, reviews and preconstruction services for the Project, or (2) inspections, tests, review and preconstruction services which were given to Contractor

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by Owner, Architect or Owner's representative or which Contractor had the opportunity to make or should have performed in connection with the Project.

15.1.6 Calculating Claim Amount

In calculating the amount of any Claim, the following standards will apply:

.1 No indirect or consequential damages will be allowed;

.2 No recovery shall be based on a comparison of planned expenditures to total actual expenditures, or on; Estimated losses of labor efficiency, or on a comparison of planned man loading to actual man loading, or any other analysis that is used to show damages indirectly;

.3 Damages are limited to extra costs specifically shown to have been directly caused by a proven wrong;

.4 The maximum daily limit on any recovery for delay shall be the amount originally estimated by the Contractor for job overhead costs divided by the total number of calendar days of Contract Time called for in the original Contract;

.5 No damages will be allowed for home office overhead or other home office charges, or any Eichlay formula calculation; and

.6 No profit will be allowed on any Claim.

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of ~~cost and of~~ probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and prevented the execution of major items of work on normal working days ~~had an adverse effect on the scheduled construction~~.

15.1.6.3 4 Time extensions may be granted for rain days in any month when the cumulative number of rain days during that month exceeds the number scheduled, provided that the rainfall prevented the execution of major items of work on normal working days. No day will be counted as a rain day when substantial Contractor forces are able to perform Work on the Project for more than fifty percent (50%) of the usual workday or when the stage of the Work on the Project is not adversely impacted. The number of rain days shown in the above schedule for the first and last months of the Contract will be prorated in determining the total number of rain days expected during the period of the Contract. No delays or extensions shall be granted for mud conditions.

15.1.6.4 ~~5~~ No extension of time shall be made to the Contractor because of hindrances or delays from any cause which is the fault of Contractor or Contractor's Subcontractors or under Contractor's control. Claims for extension of time may only be considered because of rain delays, or because of hindrances or delays which are the fault of Owner and/or under Owner's control, but only to the extent that Substantial Completion of the Project is adjusted beyond the original Substantial Completion date. Only claims for extension of time shall be considered because of hindrances or delays not the fault of either Contractor or Owner, but only to the extent that Substantial Completion of the Project exceeds the Substantial Completion date established for the Work. Board approval shall be required for any extension of time. No damages shall be paid for delays. Contractor shall only be entitled to time extensions per the terms of the Contract Documents.

15.1.6.5 6 Requests for time extension shall be submitted on a monthly basis and shall specify the time delay, the cause of the delay, and the responsible party for the delay, whether Contractor, Owner, rain day, or other. No claims for damages for delay shall be made by Contractor. Any claim not submitted under the terms of this Section shall be waived.

§ 15.1.7 Waiver of Claims for Consequential Damages

~~The Contractor and Owner waives all Claims against Ownereach other for consequential damages arising out of or relating to this Contract, including, but not limited to, any amount owed as compensation for the increased cost to perform the Work as a direct result of Owner-caused delays or acceleration. This mutual waiver includes~~

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.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

15.1.8 Injury Or Damage To Person Or Property

If either party to the Contract suffers injury or damage to persons or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party as provided herein. The Notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 15.2 ~~Initial Decision~~ Resolution of Claims and Disputes

§ 15.2.1 ~~Claims by the Contractor against the Owner, including~~excluding those alleging an error or omission by the Architect, ~~where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initially Decision Maker for initial decision. to tThe Architect for written recommendationwill serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If An initial recommendation by the Architect shall be required as a condition precedent to mediation or litigation of all Claims by the Contractor arising prior to the date final payment is due, unless decision has not been rendered within 30 days have passed after the Claim has been referred to the Architect with no recommendation having been rendered by the Architectafter the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.~~

§ 15.2.2 ~~The Architect shall Initial Decision Maker will review Claims and within ten (10) days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the Contractorclaimant or a response with supporting data from the other party, or (2) make a written recommendation to the Owner, with a copy to the Contractor. reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.~~

§ 15.2.3 ~~In evaluating Claims, the ArchitectInitial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the ArchitectInitial Decision Maker in making a written recommendationrendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.~~

§ 15.2.4 ~~Owner, Architect, or their respective agents, within five (5) working days of request by Owner, Architect, or their respective agents. Job records must be retained by Contractor and all subcontractors for a least twelve (12) years after the date of Final Completion of the Project. If the ArchitectInitial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the ArchitectInitial Decision Maker 1when the response or supporting data will be furnished, or (3) advise the ArchitectInitial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.~~

§ 15.2.5 ~~The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision~~

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~~Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution~~ Following receipt of the Architect's written recommendation regarding a Claim, the Owner and Contractor shall attempt to reach agreement as to any adjustments to the Contract Sum or Guaranteed Maximum Price and/or Contract Time. If no agreement can be reached, then either party may request mediation of the dispute pursuant to Section 15.3.

§ 15.2.6 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy ~~Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~

§ 15.2.6.1 ~~Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

§ 15.2.7 ~~In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.~~

§ 15.2.8 ~~If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.~~

§ 15.3 ~~Mediation~~Alternative Dispute Resolution

§ 15.3.1 ~~Claims arising out of or related to the Contract, except those waived shall, be subject to mediation~~ Owner and Contractor expressly agree that mediation shall be a condition precedent to the initiation of any litigation out of such Claims. Claims for injunctive relief shall not be subject to this Section.

§ 15.3.2 ~~The parties shall endeavor to resolve their Claims by mediation Requests for mediation shall be filed in writing, with the other party to the Contract.Mediation shall be subject to and in accordance with Chapter 154 of the Texas Civil Practice & Remedies Code. Mediation shall be conducted by a mutually agreed upon mediator. In the event that the parties are unable to agree on a mediator, then the parties shall jointly request the appointment of a neutral mediator by a District Judge in the county in which the Project is located~~

§ 15.3.3 ~~The parties shall share the mediator's fee equally and, if any filing fee is required, shall share said fee equally. Mediation shall be held within the county where the Owner's main administrative office is located, unless another location is mutually agreed upon by the parties. Agreements reached in mediation shall be reduced to writing, considered for approval by the Owner's Board of Trustees, signed by the parties, if approved by the Board of Trustees, and if signed, shall thereafter be enforceable as provided by the laws of the State of Texas.~~

§ 15.3.4 Any claim not resolved in mediation shall be subject to litigation pursuant to Section 13.1.

§ 15.4 No Arbitration

§ 15.4.1 Notwithstanding anything to the contrary in the Contract Documents or in any document forming a part hereof, there shall be no mandatory arbitration for any dispute arising hereunder.

§ 15.4.1.1 ~~A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~

§ 15.4.2 ~~The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

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§ 15.4.3 ~~The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

§ 15.4.4 ~~**Consolidation or Joinder**~~

§ 15.4.4.1 ~~Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~

§ 15.4.4.2 ~~Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~

§ 15.4.4.3 ~~The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~

15.5 Contractor stipulates that Owner is a political subdivision of the State of Texas, and, as such, enjoys immunities from suit and liability provided by the Constitution and laws of the State of Texas. By entering into this Contract, Owner does not waive any of its immunities from suit and/or liability, except as otherwise specifically provided herein and as specifically authorized by law.

15.6 In any adjudication under this Contract, reasonable and necessary attorneys' fees may be awarded to the prevailing party.

ARTICLE 16 CONTRACTOR ACCOUNTS, RECORDS, AND INSPECTION

16.1 Contractor, and all subcontractors, shall at all times maintain job records, including, but not limited to, invoices, payment records, payroll records, daily reports, logs, diaries, and job meeting minutes, applicable to the project. Contractor, and all subcontractors, shall make sure reports and records available to inspection by the Owner, Architect, or their respective agents, within five (5) working days of request by Owner, Architect, or their respective agents. Job Records must be retained by Contractor and all subcontractors for at least twelve (12) years after the date of Final Completion of the Project.

16.2 Contractor~~'s~~ and all subcontractors' records, which shall include but not be limited to accounting records (hard copy, as well as computer readable data if it can be made available), written policies and procedures; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating work sheets; correspondence; back charge logs and supporting documentation; general ledger entries detailing cash and trade discounts earned; bond and insurance rebates and dividends; and any other supporting evidence deemed necessary by the Owner to substantiate charges related to any matters related to the Contract (including interviews with Contractor's personnel and Subcontractor's personnel) shall be open to inspection and subject to audit and/or reproduction by Owner's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of (a) Contractor compliance with Contract requirements, (b) compliance with Owner's business ethics policies, and (c) compliance with provisions for pricing or claims submitted by the Contractor or any of its payees. The Owner or its designee shall be afforded access to all of the Contractor and all subcontractors'~~s~~ records pursuant to the provisions of this Article throughout the term of this Contract and for a period of twelve (12) years after final payment or longer if required by law.

ARTICLE 17 BUSINESS ETHICS

17.1 During the course of pursuing contracts, and the course of Contract performance, Contractor and its Subcontractors and vendors will maintain business ethics standards aimed at avoiding real or apparent impropriety or conflicts of interest. No substantial gifts, entertainment, payments, loans or other considerations beyond that which would be collectively categorized as incidental shall be made to any personnel of the Owner, its Program Managers, or its Architects, or to family members of any of them. At any time Contractor believes there may have

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been a violation of this obligation, Contractor shall notify Owner of the possible violation. Owner is entitled to request a representation letter from Contractor, its Subcontractors or vendors at any time to disclose all things of value passing from Contractor, its Subcontractors or vendors to Owner's personnel, its Program Managers and its Architects

17.2 The Owner may, by written notice to the Contractor, cancel the Contract for Construction without liability to the Contractor if it is determined by the Owner that gratuities, in the form of entertainment, gifts, or anything of monetary value, were offered or given by the Contractor, or any agent, or representative of the Contractor, to any officer or employee of the Dallas Independent School District with a view toward securing a contract or securing favorable treatment with respect to the awarding, amending, or making of any determinations with the respect to the performing of such a contract. In the event the Construction ~~Agreement~~Contract is cancelled by the Owner pursuant to this provision, Owner shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by the Contractor in providing such gratuities.

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Executed this day of , .

OWNER:	**CONTRACTOR:**
	By:
Title:	**Title:**
DALLAS INDEPENDENT SCHOOL DISTRICT	**GENERAL CONTRACTOR NAME**
OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Dwayne Thompson, Chief Business Officer	GC Signer's Printed Name, Title
(Printed name and title) Date	*(Printed name and title)* Date

Approved As To Form:

SCHOOL ATTORNEY *(Signature)* Date

DRAFT

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SECTION 00 55 00 – NOTICE TO PROCEED FORM

Name of Contractor	

The following form will be used by the District as a formal notice to proceed with pre-construction and construction activities, respectively.

The "Notice to Proceed" is the authorization to proceed with the work in accordance with said Construction Contract and the Contract Documents. This form shall be executed after issuance of the executed contract and purchase order.

NOTICE TO PROCEED

Date

GENERAL CONTRACTOR FULL NAME OF COMPANY
General Contractor Rep.
Address
City, State Zip

PROJECT: School Name, TEA Org, associated with CSP Package

OWNER: Dallas Independent School District

ATTENTION:

This notice shall be your authorization to proceed with the work in accordance with the terms and conditions as referenced in the Construction Contract and the Contract documents as enumerated therein.

Furthermore, the date of (fill in date here) is hereby established as day "0" (zero) of the stated Construction Schedule and establishes (fill in substantial completion date here), as the date of Substantial Completion unless modified in accordance with the General and Supplementary Conditions of the Contract.

FOR DALLAS INDEPENDENT SCHOOL DISTRICT

By _____

Title _____

BOND NO. _____

TEXAS STATUTORY PERFORMANCE BOND
(PUBLIC WORKS)

THE STATE OF TEXAS)
COUNTY OF DALLAS)

KNOW ALL BY THESE PRESENTS

That, _____
(Legal Name of Contractor)

(hereinafter called the Principal), as Principal, and

_____
(Legal Name of Surety)

a corporation organized and existing under the laws of the State of _____, with its principal office in the city of _____, licensed to do business in the State of Texas and admitted to write bonds, as surety, (hereinafter called the Surety), are held and firmly bound unto the Dallas Independent School District, (hereinafter called the Obligee), in the amount of

$_____
(Numeric)

(_____**)**
(Words)

for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the

_____ of _____, 20____, generally described as:

_____

_____

_____

_____

_____

(List Project Description From Agreement)

to do and perform certain construction work as provided in said contract and the related plans, specifications, general conditions and other contract documents, all of which are by reference made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, the conditions of this Obligation is such that if the Principal shall faithfully perform all of the work in accordance with the plans, specifications, general conditions and contract documents, and shall faithfully perform each, every and all other obligations incumbent upon him under the terms of said written contract referred to, and shall fully indemnify and save harmless the Obligee from all costs, expense and damage which it may suffer or incur because of Principal's default, or failure so to do, then this obligation shall be void, otherwise it shall remain in full force and effect.

BOND NO. _____

In the event Principal shall default in the faithful performance of the work called for by said written contract, plans, specifications and contract documents, the Surety shall within 15 days of the determination of default (determined as provided in said contract, general conditions and contract documents) take over and assume completion of said contract, or within such 15 day period make other arrangements satisfactory with the Obligee for completion of the contract, and said Surety shall become entitled thereupon to the payment or benefit of the balance of the contract price as the same matures according to its terms.

The Surety, for the protection of the Obligee herein, waives notice of, and hereby consents to any subsequent modification or alteration both in the work to be performed by the Principal, and the consequent price or sums to be paid by the Obligee, as well as any other change, or amendment, addition or deletion in the contract documents during the progress of the work, including but not limited to all extensions of time or other indulgences permitted the Principal.

Notwithstanding any other provision; the liability of the Surety on this bond shall never exceed the penal sum stated in first paragraph.

This Performance Bond is given in compliance with the terms and provisions of Chapter 2253 of the Texas Government Code as amended by the Acts of Legislature, and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter, to the same extent as if it were copied at length herein. This bond and all of the provisions herein contained shall be solely for the protection of the named Obligee which has awarded the contract referred to.

The undersigned, corporate Surety, does by the execution of this Bond solemnly warrant and represent that it is duly authorized to do business in Texas.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this ____ day of _____, 20_____.

CONTRACTOR AS PRINCIPAL:

_____
Name of Company (Please print or type)

Seal: *(if any)*

_____
Signature of Authorized Company Representative

_____
Name & Title of Authorized Company Representative (Please print or type)

_____
Witness

_____
Attest

SURETY:

_____
Name of Company (Please print or type)

_____
Signature of Attorney-In-Fact

_____
Name & Title (Please print or type)

BOND NO. _____

(Performance Bond Continued from Page 2)

NOTE:

1) This Performance Bond applies to all contracts in excess of $100,000.00 involving a contract for construction, alteration or repair of any public building or the completion or prosecution of any public work.

2) This bond must be payable to the awarding authority, Dallas Independent School District, as the named Obligee, and it must be approved as to form by such awarding authority.

3) This bond must be furnished before any work is commenced.

4) Surety must be a corporate surety duly authorized to do business in Texas.

5) This PERFORMANCE BOND must be in the full amount of the contract which it secures.

6) Power of Attorney from Corporate Surety must be attached to this Performance Bond.

BOND NO. _____

TEXAS STATUTORY PAYMENT BOND
(PUBLIC WORKS)

THE STATE OF TEXAS)
COUNTY OF DALLAS)

KNOW ALL BY THESE PRESENTS

That, _____
(Legal Name of Contractor)

(hereinafter called the Principal), as Principal, and

_____
(Legal Name of Surety)

a corporation organized and existing under the laws of the State of _____, with its principal office in the city of _____, licensed to do business in the State of Texas and admitted to write bonds, as surety, (hereinafter called the Surety), are held and firmly bound unto the Dallas Independent School District, (hereinafter called the Obligee), in the amount of

$_____
(Numeric)

(_____**)**
(Words)

for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the

_____ of _____, 20____, generally described as:

_____

_____

_____

_____

_____

(List Project Description From Agreement)

to do and perform certain construction work as provided in said contract and the related plans, specifications, general conditions and other contract documents, all of which are by reference made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, the conditions of this Obligation is such that if the Principal shall promptly make payment to all claimants supplying labor and material (as hereafter defined) in the prosecution of the work provided in said contract, the related plans, specifications, general conditions and contract documents, then this obligation shall be void, otherwise it shall remain in full force and effect.

BOND NO. _____

This Payment Bond is given in compliance with the terms and provisions of Chapter 2253 of the Texas Government Code as amended by the Acts of Legislature, and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter, to the same extent as if it were copied at length herein. The claimants referred to in this bond are those defined by such Chapter 2253, and this bond shall be solely for the protection of all such claimants supplying labor and material as defined in such Chapter, in the prosecution of the work provided for in said contract, and shall be for the use of such claimant and none other.

The undersigned, corporate Surety, does by the execution of this Bond solemnly warrant and represent that it is duly authorized to do business in Texas.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

CONTRACTOR AS PRINCIPAL:

_____
Name of Company (Please print or type)

Seal: *(if any)*

_____
Signature of Authorized Company Representative

_____
Name & Title of Authorized Company Representative (Please print or type)

_____
Witness

_____
Attest

SURETY:

_____
Name of Company (Please print or type)

_____
Signature of Attorney-In-Fact

_____
Name & Title (Please print or type)

(Payment Bond Continued from Page 2)

NOTE:

1) This Payment Bond applies to all contracts in excess of $25,000.00 involving a contract for construction, alteration or repair of any public building or the completion or prosecution of any public work.

2) This bond must be payable to the awarding authority, Dallas Independent School District, as the named Obligee, and it must be approved as to form by such awarding authority.

3) This bond must be furnished before any work is commenced.

4) Surety must be a corporate surety duly authorized to do business in Texas.

5) This PAYMENT BOND must be in the FULL amount of the contract which it secures.

6) Power of Attorney from Corporate Surety must be attached to this Payment Bond.

DALLAS INDEPENDENT SCHOOL DISTRICT CONSTRUCTION MINIMUM SAFETY PROGRAM GUIDELINES MANUAL

Construction Services
Minimum Safety Program Guidelines

2023 Revision

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DALLAS ISD DISCLAIMER

The purpose of the Construction Minimum Safety Program Guidelines Manual, developed for the Dallas Independent School District, is to assist in the development and implementation of appropriate safety standards. This manual is prepared for use as a minimum guideline for safety during the construction, renovation, and expansion activities to be completed by independent contractors. The program is based on applicable government regulations; insurance related safety/risk management requirements, accepted safety practices within the construction industry and common sense.

The maintenance of safe premises, operations and equipment, protection of the faculty, students, and community, and the avoidance of unsafe conditions and practices (during all construction phases) are the responsibility of the General Contractors and Subcontractors performing the construction work. The Program Manager will provide safety oversight of the Contractor's Safety Program. While mandatory, compliance with the provisions of this Construction Minimum Safety Program Guidelines Manual will not guarantee or ensure compliance with the requirements of the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910). This manual is intended to provide a working, uniform minimal level of program guidelines to assist or provide direction to the Contractors. This manual is not intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

The Dallas Independent School District, and its Agents, Consultants, etc., assume no liability for the manual's contents or for any safety related service(s) that may be provided during the course of the project.

This Manual is intended to provide a working, uniform minimal level of program guidelines to assist or provide direction to Contractors. This Manual is not intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

References to "Bond Program" must refer to the Dallas Independent School District 2020 and 2015 Bond Programs and other projects managed by the Dallas Independent School District's Construction Services Department as appropriate for the project for which work is to be performed.

Note: If a situation arises that is not covered by the Contractor's Safety Manual or the Construction Minimum Safety Guidelines Manual, please discuss it with your project manager and/or call the Owner's Representative. For additional information regarding the guidelines set forth within this manual, please contact:

Dallas ISD Bond Program Safety Manager, Alvaro Meza
Direct (972) 925-7219 | Mobile (214) 435-2204 | Email almeza@dallasisd.org

2. FOREWORD

This Manual has been compiled to present Loss Control activities and guidelines. Contractors are expected to meet or exceed these minimum guidelines.

The information and suggestions summarized in this Manual were compiled from sources believed to be reliable. It cannot be assumed that this material includes every loss potential, code violation or exception to good practice and, therefore, we cannot guarantee its completeness.

It is solely the Contractor's responsibility to conform to the provisions of this Manual and standards set forth under the William-Steiger Occupational Safety and Health Act of 1970 and, as amended, other Federal Regulations, Environmental Nuisances Considered Hazardous as they apply to state, and local regulations. The General Contractor must ensure that each of its Subcontractors comply with the requirements of this Manual.

We should also emphasize that, as with all other aspects of the work, the Contractor's selection of means and methods is his own, and that any and all suggestions contained in this Manual are only representative of the types of techniques and practices which the Contractor may choose to employ on this project.

3. POLICY STATEMENT

The principles of safety and loss control reflect a determination by Dallas Independent School District to prevent injuries to the general public and workers, as well as to prevent damage to property and equipment.

The District considers no phase of construction or administration of greater importance than accident prevention and asserts that accidents which result in personal injury and damage to property and equipment represent needless waste and loss. It must be the policy of the District for Contractors to conduct all operations safely and thereby prevent injuries to persons and damage to property.

Planning for safety must start with the design and continue through purchasing, fabrication, and construction in all phases of the Bond Program. All practical steps must be taken to maintain a safe place to work. The Contractor must accept the responsibility for safety and loss prevention and must be responsible for thorough safety and loss control training and instruction of its employees.

The objective of this policy is to establish throughout the entire Dallas Independent School District Bond Program Construction Projects the concept that the prevention of accidents and protection of property is most important and, therefore, must receive top priority, support, and participation.

4. PROGRAM OBJECTIVES

The Dallas Independent School District Construction Minimum Safety Program Guidelines Manual has been created to supplement the General Contractor's own program to eliminate or reduce hazards and risks associated with the construction projects, prevent accidents, reduce employee injury, prevent damage to property, promote maximum efficiency and effective savings by the reduction of unplanned business interruption.

4.1 Active Participation of All Contractors

Supervisory staff and employees must make the program not only effective, but also successful by coordinating the participants' efforts in performing the following tasks:

a) Provide a safe environment for employees to perform high quality work.
b) Use safety planning as a tool to reduce bodily injury and property damage.
c) Provide inspections to locate and abate unsafe conditions and practices.
d) Protect the public and property immediately adjacent to all construction sites.
e) Educate and train employees through:
    (1) New hire orientation
    (2) Safety meetings
    (3) Safety training, i.e., hazard communication, trenching safety, confined space, etc.
    (4) Mandatory personal protective equipment programs
    (5) Injury reporting and record keeping up to date
    (6) Incident tracking and trends analysis
    (7) Using accident investigation information to abate deficiencies and eliminate any additional losses
f) Contractors of any tier must comply with all Federal, State, and local laws, ordinances, regulations, and the National Fire Protection Association (NFPA) Standards including the Life Safety Code.

NOTE: The Construction Minimum Safety Program Guidelines Manual is to work in conjunction with the Contractor's individual Safety Program. All Contractors are required to implement their own written Safety Program and/or the Construction Minimum Safety Program Guidelines Manual prior to construction activities.

5. LOSS CONTROL RESPONSABILITIES

The effectiveness of this program depends upon the active participation and cooperation of all Engineers, Project Managers, Inspectors, Supervisors, General Contractors, their employees, and Subcontractors. The primary goals of this program are to increase safety awareness, raise safety standards in the work environment, and increase management involvement in the safety process.

5.1 Local Laws and Requirements

Each contractor and each Subcontractor of any tier must comply with the most stringent OSHA, City, County, or Federal regulations governing where the project site resides.

NO FELONY CONVICTION REPRESENTATION

All contractors of any tier must comply with the following:

Sec 44.034, Subsection (a) of the Texas Education Code subparagraph (a) requires that a person or business entity that enters a contract with a school district must give advance notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.

A school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract. This section does not apply to a publicly held corporation.

All contracts must comply with the requirements for criminal background checks. All vendors must give advance notice to the District if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony. The district may terminate any resulting agreement if the District determines that the person or business entity failed to provide notice as required by this paragraph or misrepresented the conduct resulting in the conviction. This paragraph requiring advance notice does not apply to a publicly held corporation. This paragraph is required by state law, and exceptions permitted in this advance notice do not limit the following requirements.

All vendors will obtain criminal background history record of information that relates to an employee, applicant for employment, or agent of the contractor or consultant if the employee, applicant, or agent has or will have continuing duties related to the contracted services: and the duties are or will be performed on school property or at another location where students are regularly present. The General Contractor or consultant must certify to the District before beginning work and at no less than an annual basis thereafter that criminal history record information has been obtained. General Contractors or consultants must assume all expenses associated with the background checks and must immediately remove any employee or agent who was convicted of a felony, or misdemeanor involving moral turpitude, as defined by Texas law, from District property or other location where students are regularly present.

The District must be the final decider of what constitutes a "location where students are regularly present." General Contractors' or consultants' violation of this section must constitute a substantial failure under any resulting agreement and be grounds for termination.

Unless waived in writing by the Superintendent of Schools or designee, all District vendors must be identified by a photographic identification badge, issued by a District-approved third-party company at the vendor's expense. The third-party company, as detailed in the Purchasing and Financial Activities Manual, must verify the criminal record history information, and may be used to verify compliance with the federal Drug Free Workplace Act of 1988 or its successor, and the federal Education Department General Administrative Regulations, current edition, in its testing and review process.

Employee or agent includes as example, but not by way limitation, persons providing services on the project including all persons or entities performing all or part of the services the General Contractor has undertaken to perform on the project regardless of whether that person has employees. This includes, without limitation, independent contractors, Subcontractors, owner-operators, employees of any such entity, or employees of any entity that furnishes persons to provide services on the project.

Services include, without limitation, providing the hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. Services do not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets. The District must have sole discretion to determine what constitutes a "location where students are regularly present." General Contractor's violation of this section must constitute a default under the General Terms and Conditions of the contract.

5.2 Dallas ISD Safety Orientation and Badging

Prior to working on any Dallas ISD property/project, all General Contractors and Subcontractor employees of any tier must obtain a Dallas ISD Bond Program Photographic Identification badge issued by a District approved third-party company at the General Contractor's or Subcontractor's expense. Any replacement for a lost badge should be obtained by the issuing third-party company.

A Dallas ISD Bond Program Safety Orientation Sticker (to be placed on the I.D. badge) required prior to working on any Dallas ISD property/project. The Safety Orientation sticker is obtained after completion of the required Dallas ISD Bond Program's Safety Orientation provided by the Bond Program's Safety Department. Replacement of the safety orientation sticker must be requested through the Dallas ISD Bond Safety Director or designee. Please see Attachment I for the Dallas ISD Orientation location and schedule.

5.3 Campus Readiness

Campus Readiness is a checkpoint/documented safety inspection that must be completed prior to the start and/or return of campus staff and students to ensure the sustainability of proper separation of all areas and conditions affected by construction activities.

The effectiveness of this checkpoint depends heavily upon the active participation and cooperation of all General Contractors, their employees, engineers, project managers, inspectors, supervisors, and Subcontractors of any tier.

The General Contractor must submit a completed copy of the Campus Readiness Form as EXHIBIT A to the Owner's Representative one (1) working day prior to the return or arrival of campus staff and students, as made part of the Construction Minimum Safety Program Guidelines. Campus Readiness Forms must include photographs as confirmation of existing site-conditions. Guidelines for ensuring a consistent approach to this checkpoint are as follows:

(1) Ensure all areas affected by construction are properly separated from staff, students, and the general public.
(2) A completed copy of the Campus Readiness Form, along with photographs of each affected area must be provided to the Owner's Representative one (1) working day prior to the return of staff and students.
(3) Communicate the significance of adequate separation of construction activities to all contractors of any tier.
(4) A follow-up inspection must be conducted to ensure proper separation of construction activities remain constant.

5.4 Protecting the General Public

Every precaution must be taken to prevent injury to pedestrians or damage to the property of others. The public must be considered as any person not employed by the General Contractor or Subcontractor of any tier.

Among the precautions to be taken are the following:

a) Work must be performed in a public area only when specified by the Contract or the District in writing
b) Every step necessary must be taken to protect and maintain work areas that interface with public sidewalks, building entrances (lobbies, corridors, aisles, etc.), stairways, and roadways.
c) This protection must include but not be limited to installing and maintaining the appropriate barricades, fences, guardrails, overhead protection, partitions, signs, shields, which must be adequately visible. Protection against any additional harmful exposure must also be provided.
d) All travel ways, access, emergency exits, and egress points must always be maintained clear of obstructions.
e) Warning signs are to be conspicuously positioned and a flag person must be assigned when moving equipment that may encounter pedestrians or private vehicles.

f) Overhead protection must be in accordance with the laws of the jurisdiction where the project resides.

g) Each project work area must be protected by a fence constructed of wood or metal and stand at least six (6) feet high to prevent incidental public entry.

h) Fences from construction areas should separate all playgrounds.

i) All fencing must be inspected daily, and repairs made where necessary to prevent unauthorized access.

j) Guardrails must be made of rigid materials and comply with OSHA regulations.

k) Barricades for the general public and/or public roadways must always be secured against accidental displacement and in place, except when temporary removal is required. At such times, a trained flag person must be assigned to control the unprotected area.

l) Should a permanent sidewalk require obstruction or removal, a temporary alternative pedestrian walkway must be provided. Guardrails must be installed on both sides of any temporary walkway that has a fall exposure.

m) When emergency exits must be re-routed, the General Contractor must provide the necessary signs, maps etc. that will show where the nearest emergency exits are located.

5.5 Work Performed Near Existing District Right-of-Way

For any construction equipment (such as cranes, concrete pump trucks, and back hoes) that could encroach on the District's operating right-of-way, the General Contractor must submit and obtain approval from the District for a plan describing the use of such equipment, and the necessary precautions to be taken to preclude any accidental encroachment on the right-of-way.

5.6 General Contractors

The Contractor is responsible for accident prevention and job-site safety. The extent to which these program objectives are met depends upon active management promotion and support of the Construction Minimum Safety Program Guidelines and the complete cooperation of Subcontractors, job site supervisors, and construction personnel in carrying out the following basic procedures:

a) All work must be pre-planned to minimize personal injury, property damage, and loss of production time.

b) General Contractors must maintain a system of prompt detection and correction of unsafe practices and conditions.

c) All Contractor and Subcontractor employees of any tier must successfully complete a site-specific orientation and indoctrination program as described in Section 5.9 of this manual.

d) Site records must be maintained to assure compliance with all OSHA, Federal, and State Regulations and the Construction Minimum Safety Program Guidelines. Site records must include, but not be limited to, the following:

(1) Weekly Toolbox Talk Meeting Agenda/Sign-in Sheets
(2) Incident Investigations
(3) Corrective Action Plan
(4) Worker Training Documentation
(5) Hazard Communication Program
(6) Fire Prevention Plan
(7) Silica Control Plan
(8) Campus Readiness
(9) OSHA 300 Logs
(10) Safety Inspection Reports
(11) Substance abuse program
(12) Site-Specific Orientation
(13) Daily Job hazard analysis (JHA)
(14) Daily Sign-in Sheets

e) General Contractor and Subcontractor safety representatives of any tier must attend at minimum one (1) documented monthly safety committee meeting.

f) Each General Contractor must send a company representative to attend monthly safety committee meetings, or more frequently, as may be required for unusual circumstances and situations.

g) General Contractors must ensure all Subcontractors of any tier comply with the established policies and procedures to ensure adequate compliance with all applicable Federal and/or State Laws and Standards.

h) The General Contractor must maintain a paper copy of the "Construction Minimum Safety Program Guidelines Manual" at each project site.

i) In the event of a conflict and/or ambiguity between various statutes or safety provisions, the stricter provision must apply.

j) The General Contractor must provide additional training when necessary for all its employees and must assure that each Subcontractor provides additional training when necessary for all of its employees. All training must be documented.

k) General Contractors must maintain a Daily Sign-in Sheet for the tracking of its construction workers in and out of the project each day.

NOTE: No requested advice from the representatives of Marsh Inc., Architect, Engineer, or the District must in any way relieve, alter, change, or amend any of the General Contractor's expressed, implied, or inherent legal and/or contractual obligations. Furthermore, the authority vested in the District and its designated representatives, including Marsh Inc. to act on matters regarding safety, must not in any way reduce the General Contractor's responsibility for safety and accident prevention. The District and its representatives, including Marsh Inc. are obligated only to notify the General Contractor of observed instances in which the General Contractor failed to fulfill their own obligations.

5.7 Site-Specific Safety Plan

Within fourteen calendar (14) days after the Notice of Award, but not later than the Preconstruction Conference, the General Contractor must submit a copy of the Site-Specific Safety Plan together with a letter of Management's Statement of Policy, signed by an officer of the company in relation to its contract, to the Owner's Representative and include all applicable criteria as listed in Attachment II (Site-Specific Safety Plan Guidelines) of this manual.

5.8 Work Areas

The General Contractor must provide a safe work area for its employees, Subcontractors of any tier, campus occupants, and the general public. The General Contractor may seek the District's assistance to resolve complex construction safety problems.

5.9 Site-Specific Safety Orientation

Prior to the start of work, each General Contractor and Subcontractor employee of any tier must receive a Site-Specific Safety Orientation. This orientation must be conducted by the General Contractor's Safety Representative and include project-specific safety requirements, protection of school children, public safety, proper use of personal protective equipment, and safe work practices.

a) Site-specific orientations must be no less than thirty **(30) minutes**.
b) To verify that the employee has received and understands this indoctrination, the employee must sign a "sign-in sheet", which the General Contractor must keep on file.
c) It is the responsibility of the General Contractor to ensure that non-English speaking employees receive these same instructions in a language they understand.

5.10 Jobsite Trailer Postings

On a weekly basis, the General Contractor must plan and execute its work with the utmost care and in coordination with the campus principal to not endanger the students' safety and to provide its Subcontractors with the most up to date project information available. To this end, the below items must be updated weekly and posted for Subcontractor's ready reference:

(1) The number of weeks remaining until Substantial Completion must be posted on the door.
(2) The Project Team's Contact List (phone numbers and email) must be posted on the door.
(3) A complete copy of the Operations Parameters must be posted on the wall.
(4) A colored copy of the General Contractor's GPR Report must be Posted on the wall and redlined anytime changes to utility locations are made.
(5) A Site Map showing the location of each utility shutdown valve must be posted on the wall.
(6) A copy of the project 's Baseline Schedule must be posted on the wall.
(7) A copy of the Three (3) Week Lookahead Schedule must be posted on the wall.
(8) A copy of the project's Phasing Plan must be posted on the wall.
(9) A hard copy of the last OAC Hand Outs must be posted on the wall.

(10) The Construction Drawings must be posted at the jobsite trailer and red lined weekly.

(11) A copy of the DISD Crisis Communication Guidelines Poster (Attachment III) must be posted on the wall.

5.11 General Contractor Project Manager

Responsibilities of the Project Manager must include, but are not limited to:

a) Plan and execute all work to comply with the stated objectives of the Construction Minimum Safety Program Guidelines Manual.

b) Comply with all the provisions of the contract dealing with safety and accident prevention requirements.

c) Require project and job superintendents, safety representatives, and project foremen to enforce the federal, state, and local safety codes and regulations.

d) Cooperate with the Owner's Representative.

e) Authorize necessary action to correct sub-standard safety conditions reported or observed.

f) Review and take necessary action with respect to safety matters through directives or personal interviews with superintendents, project foreman, and/or Subcontractors' management.

g) Share project related experiences (i.e., insight, questions, incidents, etc.) with other participants and attendees present at monthly Bond Safety Committee Meetings.

5.12 General Contractor Safety Representative

At the General Contractor's discretion, the Site-Superintendent or Project Foreman may serve in the capacity of Safety Representative if the individual selected to serve can perform the minimum criteria listed below for Safety Representative.

The designated Site Safety Representative must hold an OSHA 30hr (within five (5) years of completion) and a valid First Aid/CPR certification, and minimum of 3 years of experience managing on site safety responsibilities. The Site Safety Representative must not have any other duties than monitor all Subcontractor's compliancy with Federal, State, Local ordinances, in addition to the Minimum Construction Safety Guidelines and the Contractor's Safety Manual. Moreover, the Site-safety Representative must ensure all non-compliant conditions or unsafe behavior is immediately corrected.

NOTE: If the person designated is not able to successfully perform the minimum criteria listed for safety representative, an on-site full-time site safety may be required.

Responsibilities of the designated Safety Representative must include, but are not limited to:

a) Ensure that the Construction Minimum Safety Program Guidelines are carried out.
b) Monitor employee compliance with all jobsite rules and regulations and ensuring that the rules are improved as necessary.
c) Make daily safety inspections of jobsites and take necessary immediate corrective action to eliminate unsafe acts and conditions.
d) Ensure the OSHA 300 Form Accident Report is properly completed and distributed.
e) Review and assist when necessary, accidents and incidents to ensure that injured employees follow proper reporting procedures, and that Accident Investigation Reports are completed accurately. Where appropriate, recommend immediate corrective action to the project manager or superintendent.
f) Provide project foremen with appropriate material for use in conducting weekly "toolbox" safety meetings.
g) Periodically attend project foreman's "toolbox" safety meetings and evaluate their effectiveness.
h) Implement safety-training programs, for supervisors and employees as they apply to their specific responsibilities where the Safety Representative identifies a need.
i) Encourage programs for recognition of individual employee's safety efforts and their contribution toward improved work methods.
j) Responsible for the control and availability of the necessary safety equipment, including employee's personal protective equipment.
k) Coordinate safety activities with those of the District's personnel, the Safety Representatives of Subcontractors, and the Owner's Representative.
l) Share project related experiences (i.e., insight, questions, incidents, etc.) with other participants and attendees present at monthly Bond Safety Committee Meetings.

5.13 General Contractor Site-Superintendent

It is the responsibility of superintendents to provide constant and thorough supervision of ongoing activities including safety of its employees and the employees of all Subcontractors. The Contractor's Superintendent must hold an OSHA 30hr (within five (5) years of completion) and a valid First Aid/CPR certification.

Responsibilities of the Superintendent include, but are not limited to:

a) At minimum, one General Contractor representative who has been designated as Competent Person must be present while contractors of any tier are on-site.
b) Planning and executing all work as to comply with stated objectives of the Minimum Safety Program Guidelines Manual, and work with the Safety Representative to assure the effectiveness of the program.
c) Plan all work far enough in advance so that proper safety procedures and equipment can be provided before work begins.

d) Ensure that no unsafe conditions are created, i.e., poor housekeeping, removal of guardrails, etc.
e) Take immediate action to eliminate, correct, or resolve any unsafe conditions or unsafe acts, which are observed or discovered.
f) Ensure that periodic inspections of safety equipment and personal protective equipment is conducted and enforce the use of such equipment.
g) Ensure that injured employees obtain prompt medical attention.
h) Participate in the completion of supervisory accident investigation of all accidents and suggest ways to prevent similar accidents.
i) Periodically attend foreman's weekly “toolbox” safety meetings and evaluate their effectiveness.
j) Share project related experiences (i.e., insight, questions, incidents, etc.) with other participants and attendees present at monthly Bond Safety Committee Meetings.

5.14 Subcontractor Competent Person

Subcontractor Foremen/Competent Person(s) are an integral part of an effective safety program and the amount of effort they put into accident prevention on their daily assignments helps determine whether or not a good accident record is maintained. The Subcontractor’s designated Competent Person must hold an OSHA 10hr (within five (5) years of completion) and a valid First Aid/CPR certification.

In accordance with 29 CFR 1926.32(f), a "Competent Person" is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has **authorization** to take prompt corrective measures to eliminate them."

Responsibilities of the Subcontractor Competent Person shall include, but are not limited to:

a) At minimum, one Subcontractor representative who has been designated as Competent Person must be present while work is being performed (work includes self-performing and/or its contractors of any tier).
b) Instruct employees, under their supervision, on safe work practices and work methods at the time of work assignments.
c) Competent Person(s) must be trained and certified in First Aid/CPR and possess an OSHA 10-hour certification within 5 years of the issuing date.
d) Report immediately to the Safety Representative and superintendent of any violations of project safety that cannot be immediately corrected.
e) Supply and enforce the use of proper protective equipment and suitable tools for the project.
f) Verify that no unsafe practices or conditions are allowed on any part of their job.
g) Acquaint their workers with all applicable safety requirements and enforce them.
h) Set a good example for their workers. Lead by example.

i) Participate in the investigation of accidents and incidents to determine facts necessary to take corrective action.

j) Supply information for completion of the Accident Report and Investigation Form (directed by the General Contractor's Safety Representative and/or project Superintendent).

k) See that prompt first aid is administered to injured employees.

l) Hold weekly "Toolbox Talk" safety meetings with their employees

m) Weekly "toolbox" safety meetings must include:

   (1) Discuss observed unsafe work practices or conditions and corrective action taken to prevent a similar incident or condition.

   (2) Review the accident experience of their crew.

   (3) Encourage safety suggestions from their employees and report them to the Safety Representative.

   (4) All safety meetings are to be documented and kept in job trailer for review if requested.

n) Share project related experiences (i.e., insight, questions, incidents, etc.) with other participants and attendees present at monthly Bond Safety Committee Meetings.

5.15 Safety Committee

Under the direction of the District, a safety committee will be appointed from the selected company safety representatives and management. This committee will meet on a monthly basis for review of any safety issues needing attention as well as for investigation of serious accidents that result in loss of life, injury to several workers or pedestrians, or a major property loss. All employees of any tier must cooperate when necessary with any safety committee investigation. The committee will submit a report to the District at the conclusion of the investigation.

5.16 Bond Safety Committee Meeting

Bond Safety Committee Meetings are held monthly at the Dallas ISD Bond Office and must consist of the General Contractor's Project Manager, Superintendent, Safety Representative, Insurance Carriers' Representative (when available), and a Safety Representative from each Program Manager and Contractor currently working on the Bond Program.

The purpose of the meetings must be to create awareness, improve communications, encourage feedback, and solve problems. The Contractor's Safety Representative must share project related experiences (i.e., insight, questions, incidents, etc.) with other participants and attendees present at such meetings.

5.17 Weekly Site-Safety "Toolbox Talk" Meetings

Toolbox talks are weekly project safety meetings used to reinforce safety basics, focus on high-risk scenarios, and to inform workers about changes to the jobsite and working conditions that may have occurred. General Contractors must discuss any near miss, accidents, or injuries that have occurred and how they could have been prevented.

a) The General Contractor and all Subcontractors are required to hold a minimum of **one 15-minute site-safety Toolbox Talk meeting per week**.
b) All workers on the project site, including site Project Management team members, must attend a weekly safety Toolbox Talks, which must be presented in English and all other languages that are natively spoken at the project.
c) The General Contractor's safety representative may deliver each talk to the entire project population or each Subcontractor's safety representative may deliver individual meetings to their specific trade and/or group.
d) The General Contractor's safety representative must periodically participate and review individual meetings to ensure effectiveness.
e) The General Contractor must collect and maintain copies of all sign-in sheets for every meeting.
f) Meetings must address appropriate topics for the current and future work operations and current site conditions. In addition, the General Contractor must communicate information discussed during the Monthly Bond Safety Committee Meeting, inspection results, and other project safety-related topics.

5.18 First Aid and Medical Treatment

Emergency "911" telephone number must be used for all accidents requiring the response of Emergency Medical Services, Fire Department or Police.

"First Aid" can be defined as the immediate or temporary care given to a person who is ill or who has been injured. Any person trained in first aid should be able to recognize life (or other physical) threatening conditions and take some effective action to help keep the victim alive and in the best possible condition until professional medical help arrives. CFR-1926.50

For each shift of operation, all General Contractors must have on-site supervisors who are formally trained and current on basic first aid and CPR. These supervisors will be expected to provide emergency medical first aid on their jobs for all employees but in no case will be designated as the "First Responder" for the project

a) First aid supplies must be readily accessible on each project site. The first aid cabinet/kit must always be adequately stocked.
b) All injuries are to be reported to the immediate supervisor, no matter how minor. Treatment will be administered, and a report made of the injury. The employee's supervisor is responsible for making arrangements to transport the employee to and from the closest medical clinic/hospital.

c) Under no circumstances must the employee be allowed to drive him or herself to the medical clinic/hospital. All seriously injured personnel will be transported by ambulance to the nearest hospital.
d) All employees must notify their supervisor prior to leaving the site because of illness or injury.
e) If any employee obtains medical treatment without prior notification to the superintendent, the employee must notify the superintendent at the start of the next scheduled workday.
f) Prior to returning to work after treatment by a physician for a work-related injury, the employee must present a return-to-work form from the treating physician.

5.19 Incident Investigations

When an accident or near miss with major potential for a loss occurs, the supervisor of the crew(s) involved must perform an accident investigation. After the root cause has been identified and recommendations for corrective action have been determined, a procedure may be implemented to prevent a similar incident from occurring again.

5.20 Substance Abuse

Dallas Independent School District (Dallas ISD) is committed to the establishment and maintenance of a safe and efficient work environment for all personnel, free from the effects of alcohol, illegal drugs, and other controlled substances.

5.20.1 Policy:

District prohibits on their property, the use, possession, concealment, transportation, promotion, or sale of any of the following:

(1) Alcoholic beverages.
(2) Marijuana and other illegal drugs
(3) Look-a-likes and designer drugs
(4) Drug paraphernalia
(5) Controlled substances such as medications when usage is abused or when the substance is possessed without proper prescription labeling.

All person(s) directly or indirectly involved with the 2015 or 2020 Bond program, must not be under the influence of any of the above substances while on Dallas ISD property or to use, possess, conceal, transport, promote or sell any of the above substances will be grounds for disciplinary action, up to and including removal from the Bond program.

5.20.2 Other Controlled Items

Dallas ISD prohibits the use, possession, concealment, transportation, promotion, or sale of the following controlled items:

(1) Firearms, weapons, and ammunition (except when authorized for security reasons)
(2) Switchblades

(3) Unauthorized explosives including fireworks

(4) Stolen Property

5.20.3 General Contractor Requirements

General Contractors, including its Subcontractors of any tier, must employ a workforce free of the influence or possession of illegal drugs or alcohol while on District's property.

a) As a condition of employment, employees must submit to substance abuse screening (five-panel drug screening) and breath alcohol testing for Pre-employment, Post-accident/Incident, Just-cause, Random selection, and Return to work.

b) The Contractor must pay for all costs associated with a NIDA-approved laboratory to conduct substance abuse testing and breath alcohol testing.

c) All General Contractors and Subcontractors are responsible for reporting to the Bond Program Safety Manager any incidents in violation of the substance abuse program and the disposition of the violation. The Owner or its designee must reserve the right, but not the obligation, to order the Contractor to send a worker home for the day, or to remove a worker from any Bond Program Project, for his/her failure to comply with anti-substance abuse policies, and the Contractor must promptly comply with all such orders.

d) General Contractors and Subcontractors of any tier must declare one (1) or more employees to be its designated Competent Person.

e) The designated Competent Person must be dedicated to the Project for on-site safety responsibilities and must be on the project site when any part of the applicable General Contractor's or Subcontractor's work is being performed.

5.20.4 Definitions:

Property must refer to all land owned by the District, to all property thereon; buildings, structures, facilities, platforms, fixtures, tunnels, installations, and to all project vehicles, stationary or mobile equipment, whether owned or leased. This definition may also include other work locations while in the scope and course of employment on the District's Construction Projects.

5.21 Site Visitors and Group Tours

Normally there are no tours during a construction project. However, it is particularly important that a high degree of protection be afforded to all persons on authorized tours of construction worksites.

In the event a tour is authorized, the following instructions must be complied with, as applicable, by the General Contractor and those responsible for arranging such tours:

a) Tours must be scheduled prior to the start or after the end of the workday.

b) In all cases, the Program Manager and the Owner's Representative must be advised of any tour in a timely manner prior to the tour taking place.

c) Group tours must be cleared through the District, allowing maximum advance notice and in compliance with the District's policies and procedures. The District will coordinate the tour arrangements.

d) The General Contractor will coordinate the following with the individual or organization requesting the tour:

(1) Clothing: Visitors will be required to wear pants or slacks, shirt or blouse, and leather or work shoes. Sneakers, high-heeled shoes, and open toed shoes are prohibited.

(2) Minors: Persons under 18 years of age are not permitted on project tours.

(3) Protective Equipment: Hard hats, eye protection, earplugs, and other protective devices will be required, as necessary.

(4) Release and Hold Harmless Agreement: Each visitor must be required to sign a release and hold harmless agreement prior to the commencement of the tour. A sample Visitor's Release and Hold Harmless Agreement is contained in this Manual as Attachment IV.

(5) All visitors must comply with Contractor safety requirements.

(6) All visitors must be escorted by the job-site superintendent, Bond Program Safety Director, or their designated representatives.

e) Designated escorts must familiarize their group(s) with the hazards to be encountered on the tour prior to entering the project site.

f) District representatives, who visit or escort technical and official visitors in hazardous work areas, must notify the General Contractor in advance and must comply with all established construction safety procedures.

6. MINIMUM CONSTRUCTION SAFETY GUIDELINES

6.1 Safe Plan of Action (SPA) Guidelines

A Safe Plan of Action (SPA) is a site-specific comprehensive safety program which outlines what methods, procedures, and equipment will be used when engaged in any of the following nine (9) critical phases of work:

(1) Excavation
(2) Elevated Work
(3) Crane Operations
(4) Steel Erection
(5) Confined Space
(6) Pier Drilling
(7) Demolition
(8) Utility Shutdown
(9) Electrical Shutdown

It is critical that Contractors understand the importance of developing an effectively functioning Safe Plan of Action (SPA) that is pro-active and addresses the potential hazards and exposures to their employees, campus occupants, the public, and other trades within the affected areas.

a) SPA Documentation must be submitted to the Owner's Representative within **5-7 days** of any planned critical phases of work.
b) The General Contractor must assemble all criteria as listed on the SPA Cover Letter checklist for all critical phases of work.
c) The SPA Cover Letter checklist and its supporting documentation must be combined into a single PDF so that it is an exact electronic version of the physical document that must kept on-site.
d) The General Contractor Safety Manager must review, evaluate, and approve of the SPA for adherence to all applicable federal regulations and the DISD Construction Safety Program Guidelines prior to submitting a copy to the Owner's Representative and the commencement of work.
e) The Owner's Representative may review and respond. Any issues or deficiencies will require the General Contractor to revise and resubmit the document. If no deficiencies are noted, The General Contractor must then schedule the Pre-Work SPA Meeting.
f) The Pre-Work SPA Meeting will be a final review of the complete Cover Letter checklist criteria before proceeding with any planned work. SPA Pre-Work Meetings must be held in-person and on-site. At a minimum, the following persons must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

6.2 Repeating Scopes of Work

For repeating types of work that have already gone through the SPA review process, a separate submittal and review will not be required **ONLY** if **ALL** the following conditions have been met:

(1) The General Contractor Safety Manager has reviewed and approved the safety plan
(2) The work performed will be substantially similar to the scope of work as previously approved
(3) The Competent Person(s) listed on the documents has not changed
(4) The Sub Contractor crew list, training records, and certifications have not changed or expired

6.3 Job Hazard Analysis

Planning for the safety of personnel and equipment being used must begin with each phase of construction and continue through project completion. Contractors must plan the safety procedures to be followed for each phase of construction.

a) JHA's must be implemented on any task which may cause bodily injury, damage to property, or equipment e.g., crane lifts, redirecting of foot and or vehicle traffic, use of scaffolding, use of mobile aerial work platforms, and or any other task which pose a high risk.
b) A Job Hazard Analysis (JHA) is required prior of starting any work shift, equipment, or procedure that poses a significant potential for bodily injury and/or property damage.
c) The Job Hazard Analysis must be written by the performing Contractor and submitted to the General Contractor for approval.
d) Contractors must use EXHIBIT B (Job Hazard Analysis Worksheet) or its approved equivalent.
e) The General Contractor's Safety Representative in conjunction with the job site Supervisor is directly responsible for the development and implementation of Job Hazard Analysis (JHA).
f) Daily JHA Meetings must include the General Contractor and/or Subcontractors, their responsible job site supervisors (including the craft supervisor and craft Safety Representative), and any other responsible party who may contribute to the safety of the operation.
g) Employees involved with the project must be instructed of the hazards involved and methods required in eliminating those hazards, including emergency actions to be taken in the event of an accident.
h) Employees must be made aware of the procedures to be used and requirements of the JHA.
i) The JHA serves as an operating procedure and living documents that must be available to all personnel performing the work.
j) The General Contractor and Subcontractor's Safety Representative must retain a copy of all JHAs.

6.4 Personal Protective Equipment

Personal Protective Equipment (PPE) must be required for all persons on any construction site. The construction site is defined as any area within the project perimeter fence and interior renovation areas, excluding offices and office trailers.

PPE includes but is not limited to:

6.4.1 Hard Hats

All persons working, walking, or transiting the construction site must always wear an ANZI-Z-89 approved hardhat. Bump caps are prohibited. Any operation that requires an employee to wear face protection does not preclude the use of head protection. The face protection must be selected so that it can be used in conjunction with the required head protection.

6.4.2 Safety Vest

High visibility vests or high visibility upper body clothing (equivalent to ANSI Class 2 or greater as applicable) must be worn in the construction area. Primary work activities such as traffic control, excavations, rigging from ground level, exterior work at ground level or sub-ground level, earth moving operations, may require ANSI Class 3.

6.4.3 Eye Protection

Employees must wear ANZI Z-87 approved eye protection must be required when construction activities present a potential eye injury from flying debris, physical, chemical, or radiation agents.

6.4.4 Face protection

Face protection must be required when construction activities present a potential face injury from flying debris, physical, chemical, or radiation agents. Any operation that requires an employee to wear face protection does not preclude the use of eye protection. The eye protection must be selected so that it can be used in conjunction with the required face protection.

Any person working near or observing operations requiring additional or specialty eye protection must be equipped with the same type of eye protection that is required for that operation.

6.4.5 Hearing Protection

All contractors of any tier must implement a hearing conservation program when noise exposure is at or above 85 decibels averaged over 8 working hours, or an 8-hour time-weighted average.

6.4.6 Footwear

All employees and vendors in active work areas must wear substantial leather work shoes or work boots. Tennis shoes, sneakers, or other athletic footwear, flipflops, heels (1" +) or any open toe shoes are not acceptable footwear.

6.4.7 Clothing

All employees must be required to wear such additional protective clothing or equipment as required by the hazards involved with the tasks being performed.

a) All clothing should be in good repair, and not loose fitting or dragging in such a manner to pose a hazard from becoming entangled in equipment or machinery.
b) All button shirts will be buttoned or t-shirts with at least 4" sleeves must be worn at all times while on the jobsite. Tank tops, mesh shirts, sweatpants, shorts nor clothing displaying pornographic, or profanity will be allowed.
c) Long hair will be neatly kept under a hardhat as to prevent serious injury caused by entanglement.

6.4.8 Jewelry

No dangling jewelry must be permitted on work sites. Necklaces will be kept inside shirts to prevent possible entanglement in moving equipment and rotating machinery.

6.5 Hazard Communication

The General Contractor's Hazard Communication (Haz-Com) Program must be submitted to the Owner's Representative and made part of the General Contractor's Construction Safety Program and maintained on-site.

a) Contractors must provide all required training, control methods, personal protective equipment, and medical surveillance for its employees as required by OSHA 1926 Subpart Z. Training programs must ensure all employees can at a minimum:
    (1) Understand the program and can identify with hazardous chemicals.
    (2) Understand product-warning labels.
    (3) Know where Safety Data Sheets (SDS) are kept and can interpret them.
b) The General Contractor must maintain copies of Safety Data Sheets (SDS) for all chemicals to be used, stored, and/or maintained on any DISD Project prior to arrival or use.
c) All hazardous materials must be properly labeled per GHS and stored in accordance with applicable laws.
d) Contractors are responsible for proper disposal of hazardous waste in accordance with applicable laws and Environmental Requirements.
e) The General Contractor is responsible for ensuring work zones and potentially affected occupied areas are properly monitored for exposure to toxic and hazardous substances that workers or building occupants may be exposed to. Some examples include but are not limited to the following:
    (1) Asbestos
    (2) Lead
    (3) Hexavalent chromium
    (4) Beryllium
    (5) Silica
    (6) Mold

NOTE: It is the General Contractor's responsibility to monitor for these substances and to communicate with and protect building occupants if exposure is possible.

6.6 Respiratory Protection

When respirators are deemed necessary, the Contractor must have a respiratory program that complies with OSHA regulations. A copy of the Contractor's Respiratory Program must be submitted to the Owner's Representative and made part of the General Contractor's Construction Safety Program and maintained on-site.

a) Contractors of any tier must take all actions necessary to ensure air quality standards are met on the project and in its work areas. The employer shall evaluate emissions caused by their work processes (e.g., welding, running vehicles, etc.) and/or by the materials used.
b) When deemed necessary, employees must be fitted for and instructed in the proper use of respirators that will afford them the maximum protection for the environmental hazard in which they are working. Because of the extensive use of waterproofing, fireproofing, paints and welding processes, these areas may require constant monitoring

6.7 Fire Prevention

All Dallas ISD Schools Are Smoke and Tobacco Free.

The Fire Prevention and Protection Program will be determined for each project by the size and conditions at each project. The project superintendent must be responsible for the proper implementation and administration of the program giving due consideration to the availability of public Fire Departments and the type of work to be performed on the job.

The General Contractor's Site Fire Prevention and Protection Program must be submitted to the Owner's Representative made part of the General Contractor's Construction Safety Program and maintained on-site.

a) Ignition sources are not permitted in areas where flammable or explosives are stored or may be present and must be conspicuously posted: "NO SMOKING, MATCHES OR OPEN FLAMES."
b) Examples of ignition sources include, but are not limited to:
    (1) Smoking
    (2) Electrical cords that are damaged
    (3) Welding, torch cutting, and brazing
    (4) Vehicle engines and electric motors
    (5) Asphalt kettles
    (6) Hotplates
c) Fire Extinguishers of the appropriate type (A: B: C) must be provided, be placed conspicuously and sign posted.
d) Fire extinguishers will be maintained and inspected as required by Federal, State, and local regulations.

e) Fires and open flame devices must not be left unattended. Open burning for personal warming or trash disposal is prohibited.
f) All temporary heating devices must comply with all requirements of CFR 1926.154
g) All flammable liquids, e.g., gasoline, diesel, mixed gas, etc., must be labeled, stored, and dispensed from U.L. approved safety cans. The use or storge of plastic fuel containers is strictly prohibited.
h) Compressed gas cylinders, when not in use, will be secured in an upright position. Fuel and nonfuel cylinders must be separated by a minimum of 20 feet.
i) Flammables or Combustible liquids must not be stored in areas used for exits, stairways, or normally used for the safe passage of people.
j) Outdoor Flammable Storage areas must not be within 20 feet of any building. Minimum distance will also be maintained between storage areas, property lines, streets, alleys, or public ways.
k) Outdoor Portable Tanks must not be stored within 20 feet of any building.
l) Each tank must be labeled: "(Contents of Tank) – Flammable, No Smoking"
m) At least one portable fire extinguisher will be located no less than 25 feet, and no further than 75 feet, from any flammable liquid storage area located outside.
n) All areas of the project must be kept free of accumulations of wood scraps, paper, and other combustible debris.
o) Trash dumpsters must be maintained a minimum of 50 feet away from buildings or other structures.
p) In areas where welding, torching, or any open flame activity is being conducted, a trained fire watch will be posted, and he/she will have no other duties. The fire watch will remain in the hot work location for a minimum of 30 minutes after hot work activities are completed to ensure that no hot areas are present.

6.8 Housekeeping

Housekeeping is a basic requirement to construction safety and must be of primary concern to every superintendent, supervisor, and foreman on the project. The maintenance of a safe, clean work area contributes not only to worker safety, and the elimination of fire hazards, but also to efficient low-cost production.

a) All General Contractor and Subcontractor employees of any tier must collect trash, construction debris, and dispose of daily.
b) All trash and debris must be placed in proper containers, properly stacked, or removed from the jobsite daily.
c) Walking aisles, roadways, and high foot-traffic areas must be kept clear at all times.
d) All welding leads, electrical cords, and torch hoses must be strung a minimum of 7 feet high or positioned so as not to create a tripping hazard.
e) Oily rags and any flammable debris must be placed in closed covered containers at the end of each shift, or otherwise properly disposed of.
f) Tools and materials must not be left where they will create a hazard for others.

g) Spilled liquids should be cleaned up immediately.
h) Toilets, wash-up facilities, and drinking water dispensers are to be kept clean and sanitary.
i) Protruding nails must be bent down or removed from boards, plywood, construction materials, etc.
j) Surplus materials must be returned to storage areas.

6.9 Silica Control

Contractors must reduce unacceptable dust levels either through engineering controls or other means. In either case, the Contractor must provide maximum protection for those exposed to dust. Contractors of any tier are responsible for controlling dust that:

(1) Might endanger the health of children, school staff, and employees.

(2) Creates a nuisance to the general public

6.10 Sanitation

The General Contractor is responsible for obtaining and maintaining an adequate number of portable toilets on the project, as well as areas for hand washing.

a) The total number and gender of all employees working on the jobsite must determine the number of portable toilets required.
b) The General Contractor must also provide or require its Subcontractors to provide potable water.
c) Toilets, wash-up facilities, and drinking water dispensers are to be kept clean and sanitary at all times.

6.11 Demolition and Site Clearance

The General Contractor must ensure the establishment of a written Demolition Procedure that adheres to OSHA, Federal, State, and local regulations. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT C, and maintained on-site.

a) Prior to commencement of work, a competent person must conduct an engineering survey. This written survey will be considered the basis for an operational work plan.
b) All structures needing support must be braced.
c) All utilities including gas, water, electricity, etc. must be shut down. All pipe work must be purged of any hazardous materials, e.g., flammable, explosive, toxic, etc.
d) All debris chutes will be manufactured of appropriate materials and must be adequately guarded and/or protected.
e) Removal of asbestos, lead, and PCBs must only be conducted by licensed contractors.
f) Remediation activities must adhere to all OSHA, Federal, State, and local regulations.

6.12 Demolition Safe Plan of Action (SPA)

A Demolition Safe Plan of Action (SPA) is a site-specific comprehensive Demolition Program which outlines what methods, procedures, and equipment will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any demolition activity. Review and acceptance by the General Contractor Safety Manager is required prior to submission, the start of work, or any demolition activity.

a) General Contractor must coordinate and conduct an on-site Demolition SPA pre-work meeting one week prior to any planned demolition activity. The Cover Letter (EXHIBIT C) must be submitted along with a Safe Plan of Action (SPA). The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.
b) The Demolition SPA pre-work meeting agenda must include discussion about the scope and review of any conditions that may pose a hazard to workers and/or campus occupants as it relates to the planned demolition activity.
c) To hold a Demolition SPA pre-work meeting, at a minimum, the following parties must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

6.13 Confined Space Entry

General Contractors must ensure the establishment of a written Confined Space Entry Procedure (when applicable) that adheres to OSHA Regulations. A copy of this procedure (when applicable) must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT D, and maintained on-site.

a) All personnel connected with any confined space operation must be adequately trained and confirmation of this training must be documented.
b) Confined Space Entry Permits must be used where necessary.
c) Air monitors, rescue tripods, full body harnesses, ventilation equipment, etc. must be available and used when deemed necessary by the General Contractor.

6.14 Confined Space Safe Plan of Action (SPA)

A Confined Space Safe Plan of Action (SPA) is a site-specific comprehensive Confined Space Entry Program which outlines what methods, procedures, and equipment will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any confined space entry. Review and acceptance by the General Contractor Safety Manager is required prior to submission, the start of work, or any confined space entry.

a) The General Contractor must coordinate and conduct an on-site Confined Space SPA pre-work meeting 5-7 days prior to any planned confined space entry. The Cover Letter (EXHIBIT D) must be submitted along with a Safe Plan of Action (SPA). The safety

plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

b) The Confined Space SPA pre-work meeting agenda must include discussion about the scope and review of any conditions that may pose a hazard to workers and/or campus occupants as it relates to the planned confined space work.

c) To hold a Confined Space SPA pre-work meeting, at a minimum, the following parties must be present:

   (1) Sub-Contractor Competent Person

   (2) General Contractor Safety Representative

   (3) Owner's Representative [Optional]

6.15 Trenching and Excavations

The General Contractor must ensure the establishment of a written Trenching and Excavation Procedure that adheres to OSHA Regulations. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT E, and maintained on-site.

a) The General Contractor must ensure trenching and/or excavation activities are not performed during regular school hours or near occupied school areas.

b) Prior to any excavation activity, the General Contractor Safety Representative or Superintendent must ensure the following:

   (1) Contact Texas811 (1-800-344-8377) for confirmation number.

   (2) Ground penetrating radar (GPR) **and** review of exiting plans must be performed as part of the underground utility locating methods. GPR reports must include an Underground Utility Location Survey/Utility Map which shows the positioning and identification of underground utilities in relation to any planned excavation activity.

   (3) Potholing/hand digging is required within three (3) horizontal feet of "located" centerlines, and in areas where knowledge is lacking.

c) The review of existing plans and any other reasonable efforts must be made to determine if any underground utilities (power lines, water lines, fuel lines, etc.) are present within the boundaries of the proposed work area.

d) As the excavation work approaches the location of any known utilities, the lines must be uncovered, using extreme caution not to disturb the lines, and adequate measures must be taken to protect the lines from damage while the work progresses.

e) All utilities known but not identified must be exposed by hand.

f) All excavation must be inspected daily by a competent person, or after heavy rain, or other change that may have caused a change in ground stability conditions. Any excavation greater than 20 feet must be designed by an engineer and a copy forwarded to the Bond Program Safety Manager for review.

g) Any personnel at the edge of a well, pit, shaft, and similar excavation six (6) feet or more in depth must be protected from falling by guardrail systems, barricades, or covers.

h) Where a guardrail system or barricade is infeasible, the use of personal fall arrest systems are required.

i) Any disturbed areas must be returned to existing and safe condition prior to departure.

j) If the Contractor must make a cut, cavity, trench, or depression in the Earth's surface formed by earth removal, it must comply with the applicable OSHA Regulations.

k) General Contractors must train, or require to be trained, those employees who will work in and around the excavation about the hazards, as required by OSHA, in the areas of daily inspections, soil testing, soil classifications, and protective or support systems.

6.16 Trenching and Excavation Safe Plan of Action (SPA)

A Trenching and Excavation Safe Plan of Action (SPA) is a site-specific comprehensive Trenching/Excavation Program which outlines what methods, procedures, and utility strike prevention efforts will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any Trenching/Excavation work. Review and acceptance by the Contractor Safety Manager is required prior to submission and the start of work.

a) General Contractor must coordinate and conduct an on-site Trenching and Excavation SPA pre-dig meeting one week prior to any planned excavation or trenching (hand digging included). The Cover Letter (EXHIBIT E) must be submitted along with a Safe Plan of Action (SPA). The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

b) The Trenching and Excavation SPA pre-work meeting agenda must include discussion about the scope and review of the existing underground utilities as it relates to the planned trenching/excavation. At the pre-dig meeting, the General Contractor must present a contingency plan regarding any utility struck during execution of such work.

c) To hold a Trenching and Excavation SPA pre-work meeting, at a minimum, the following parties must be present:

   (1) Sub-Contractor Competent Person

   (2) General Contractor Safety Representative

   (3) Owner's Representative [Optional]

NOTE: As defined by OSHA, an excavation as any man-made cut, cavity, trench, or depression in the Earth's surface formed by earth removal. A trench is defined as a narrow excavation (in relation to its length) made below the surface of the ground.

6.17 Pier Drilling

The General Contractor must ensure the establishment of a written Pier Drilling Procedure that adheres to OSHA Regulations. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT F, and maintained on-site.

a) The Contractor must at no time perform any pier drilling activities during regular school hours or near occupied school areas.

b) Prior to any pier drilling activity, the General Contractor Safety Representative or Superintendent must ensure the following:

   (1) Contact Texas811 (1-800-344-8377) for confirmation number.

   (2) Ground penetrating radar (GPR) **and** review of exiting plans must be performed as part of the underground utility locating methods. GPR reports must include an Underground Utility Location Survey/Utility Map which shows the positioning and identification of underground utilities in relation to any planned excavation activity.

   (3) Potholing/hand digging is required within three (3) horizontal feet of "located" centerlines, and in areas where knowledge is lacking.

c) The review of existing plans and any other reasonable efforts must be made to determine if any underground utilities (power lines, water lines, fuel lines, etc.) are present within the boundaries of the proposed work area.

d) As the excavation work approaches the location of any known utilities, the lines must be uncovered, using extreme caution not to disturb the lines, and adequate measures must be taken to protect the lines from damage while the work progresses.

e) All utilities known but not identified must be exposed by hand.

f) Any personnel at the edge of a well, pit, shaft, and similar excavation six (6) feet or more in depth must be protected from falling by guardrail systems, barricades, or covers.

g) Where a guardrail system or barricade is infeasible, use of personal fall arrest systems are required.

h) Pier Drilling equipment must remain barricaded at all times and NOT be operated in occupied school areas.

i) Any disturbed areas must be returned to existing and safe condition prior to departure.

j) If the Contractor must make a cut, cavity, trench, or depression in the Earth's surface formed by earth removal, it must comply with the applicable OSHA Regulations.

k) General Contractors must train, or require to be trained, those employees who will work in and around the pier drilling operation about the hazards, as required by OSHA, in the areas of daily inspections, soil testing, soil classifications, and protective or support systems.

6.18 Pier Drilling Safe Plan of Action (SPA)

A Pier Drilling Safe Plan of Action (SPA) is a site-specific comprehensive Pier Drilling Program which outlines what methods, procedures, and utility strike prevention efforts will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any Pier Drilling work. Review and acceptance by the General Contractor Safety Manager is required prior to submission and the start of work.

a) When working adjacent to any Pier six (6) feet in depth or greater, an appropriate means of fall protection must be provided.
b) General Contractor must coordinate and conduct an on-site Pier Drilling SPA pre-work meeting one week prior to any planned pier drilling. The Cover Letter (EXHIBIT F) must be submitted along with a Safe Plan of Action (SPA). The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.
c) The Pier Drilling SPA pre-work meeting agenda must include discussion about the scope and review of the existing underground utilities as it relates to the planned pier drilling operation. At the pre-work meeting, the General Contractor must present a contingency plan regarding any utility struck during the pier drilling of such work.
d) To hold a Pier Drilling SPA pre-work meeting, at a minimum, the following parties must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

6.19 Locating Utilities

Prior to any underground work being performed, all utilities within the area of work must be located. Safety representative must ensure that Texas811 (1-800-344-8377) has been notified, and Ground Penetrating Radar (GPR) **and** review of exiting plans is be performed as part of the underground utility locating methods and a confirmation number has been issued prior to any excavation.

a) The General Contractor must coordinate with the Program Manager Network or the Architect to have all utilities within the area of work located.
b) The contract specifications and drawings must be reviewed by the General Contractor for notations of utility companies that may not be a member of an underground service alert group. Those not members of an underground service alert group must be contacted directly.
c) All calls to the utility companies must be logged and retained by the General Contractor.
d) The General Contractor must visually check the area for signs indicating the possibility of recent underground relocation work by an outside entity.
e) The General Contractor must take all necessary steps to protect the utilities from damage.
f) Ground penetrating radar (GPR) must be performed as part of the underground utility locating methods prior to any excavation activity.

g) GPR reports must include an Underground Utility Location Survey or Utility Map which shows the positioning and identification of underground utilities in relation to any planned excavation activity.

h) "Potholing" and/or hand digging must be required within three (3) horizontal feet of "located" centerlines, and in areas where knowledge is lacking, prior to any planned excavation activity.

6.20 Utility and Electrical Shutdowns

Prior to any type of shutdown, re-energizing, re-pressurizing, or tie-in activities, the General Contractor is responsible for completing the Shutdown Notification Guidelines as outlined in Attachment V, along with the applicable safety submittal requirements outlines in this section.

a) The General Contractor or Subcontractor of any tier must at no time perform any type of power or other utility shutdown activities during regular school hours. Shutdowns are to be scheduled during weekends or extended breaks.

b) **10-Day Notice of Shutdown** – General Contractor must provide Dallas ISD with notification of power or other utility shutdown no less than ten (10) calendar days in advance of the shutdown. Notification includes Dallas ISD Central Maintenance Office, A/E, Program Manager, and the Principal at each affected school.

c) Shutdown Authorization Form (EXHIBIT I) must be submitted to the Dallas ISD Bond Program Manager and Dallas ISD Project Manager for signatures of approval.

d) The General Contractor must ensure confirmation of readiness from affected Dallas ISD Departments (Including but not limited to HVAC, Kitchen, Fire Suppression, etc.) prior to any power or other utility shutdown activities.

e) When adding HVAC units, the General Contractor must notify the Project AE for approval of increased load

f) Prior to relocating any utility, Dallas ISD Sustainability Department must be notified.

6.21 Utility and Electric Shutdown Safe Plan of Action (SPA)

A Utility or Electrical Shutdown Safe Plan of Action (SPA) is a site-specific comprehensive Shutdown Program which outlines what methods, procedures, and contingency efforts will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any power or other utility shutdown activities. Review and acceptance by the General Contractor Safety Manager is required prior to submission, and utility shutdown activities.

a) General Contractor must coordinate and conduct an on-site Shutdown pre-work meeting prior to any planned Utility or Electrical Shutdown. The applicable Cover Letter (EXHIBIT G **or** EXHIBIT H) must be submitted along with a Utility or Electrical Shutdown SPA. The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

b) The Utility or Electrical Shutdown SPA pre-work meeting agenda must include discussion about the scope and review of any existing or potential hazards and contingency efforts as it relates to the planned shutdown.

c) To hold an Electrical or Utility Shutdown SPA pre-work meeting, at a minimum, the following parties must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

6.22 Electrical Work

All electrical work for and throughout the course of any construction project must be provided and performed in accordance with the National Electric Code (NEC), and OSHA, 29 CFR 1926 Subpart K, 29 CFR 1926 Subpart V, NFPA 70E and NFPA 70.

a) All 120-volt single-phase 15 and 20 ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, must have approved ground fault circuit interrupters (GFCI) for personal protection.
b) Receptacles on a two-wire single-phase portable or vehicle-mounted generator rated not more than 5 kw, when the circuit conductors are insulated from the generator frame and all other grounded surfaces, need not be protected with ground fault circuit interrupters.
c) Employees must be instructed to visually inspect each cord set, plug, and receptacle of cord sets, temporary lighting and all equipment connected by the cord and plug before each day's use for external defects and/or damage. When there is evidence of damage, the damaged item must be taken out of service, tagged until tested, and required repairs made or the item is replaced.
d) No work must not be performed on any energized electrical circuit, busbars, equipment, or panels unless an approved written work plan in accordance with NFPA 70E and submittal for review prior to performance of work. If energized work is required during commissioning, troubleshooting, and/or maintenance work must be performed under an energized electrical permit and the requirements of NFPA 70E.
e) Panel Covers must be kept in place whenever any panel is energized.
f) All Electrical Systems must be inspected and maintained on a regular basis.

6.23 Lockout/Tagout (LOTO)

A Lockout/Tagout procedure must be in place in accordance with OSHA 29 CFR 1926.417 and 1910.147 whenever performing inspections, maintenance, repairs, and modifications to equipment, machinery or electrical systems where unexpected release of energy or stored energy could create an injury. A Site LOTO log must be maintained and posted within the GC trailer and/or jobsite officing area.

Electrical box panels, even during breaks, must not be left exposed. Exposed boxes must be physically covered with the panel cover, and areas must be protected with barricades if necessary.

6.24 Electrical Power Lines

All electrical power line must be considered energized until the person owning such line or operating official of the electrical utility supplying the line assures that it is not energized, and it has been visibly grounded.

a) Operations adjacent to power lines are prohibited unless at least one of the following conditions is satisfied:
   (1) Power has been shut off and positive means taken to prevent the lines from being energized (Lock out/Tag out).
   (2) Equipment, or any part, should not have the capability of coming within the minimum clearance of energized overhead lines. As specified in OSHA Regulations, the equipment must be positioned and blocked to ensure no part, including cables, can come within the minimum clearances. A notice of the minimum required clearance must be posted at the operator's position.

6.25 Fall Prevention and Protection

General Contractors are responsible for implementing the requirements to achieve fall protection in accordance with all OSHA, Federal, State, and local regulations, this Manual, and must ensure each Subcontractor meets those requirements. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as, EXHIBIT J and maintained on-site.

a) All personnel regardless of craft working at a height of six (6) feet or greater above a lower level, and not protected by standard guardrails or other means must use an appropriate means of fall protection. The fall protection system selected should provide the employees the best means of protection while allowing the employees as much mobility as possible.
b) All employees working where there is a danger of falling must use approved fall protection equipment or devices. Fall protection is required.
c) The employer must prepare a written training program to ensure that each employee who might be exposed to a fall hazard is knowledgeable of the Fall Protection Program requirements. Training documentation must be retained and kept on file at the jobsite.
d) The Fall Protection Program must detail in writing when fall protection is required and exactly how this protection is to be provided. Sketches may be used to assist in the fall protection definition. This written program is required for any General Contractor or Subcontractor of any tier exposing workers to falls six (6) feet or greater above a lower level.
e) Employees must also be trained on the proper wearing, use, and limitations of personal Fall Protection and Arresting Device Systems. Training documentation must be retained and kept on file at the jobsite.
f) Fall arrest systems must be rigged such that an employee can neither free fall more than six (6) feet, nor contact any lower level.
g) Connecting two snap hooks together, as the possibility of a "roll-out" exists, must not be used to lengthen lanyards.

h) All harnesses and lanyards must be inspected frequently by the General Contractor and/or Subcontractor Competent Person. Regular inspections for wear, damage, or corrosion is a daily requirement. Damaged or defective equipment must be removed from service by the responsible Contractor or General Contractor and be destroyed to eliminate the possibility of using at a later date.

i) The employer must assure that a Competent Person, qualified in the following areas, has trained each employee as necessary:

   (1) Complete understanding of all Federal, State, and Local Fall Protection Regulations.

   (2) The nature of fall hazards in the work area.

   (3) The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems to be used.

   (4) The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used.

   (5) The role of each employee in the safety monitoring system (when this system is used).

6.26 Elevated Work Safe Plan of Action (SPA)

An Elevated Work Safe Plan of Action (SPA) is a site-specific comprehensive Fall Protection Program which outlines what methods, procedures, and equipment will be used in its program. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any employee exposure at an elevation of six (6) feet or greater. Review and acceptance by the General Contractor Safety Manager is required prior to submission, the start of work, or employee exposure.

a) General Contractors must coordinate and conduct an on-site Elevated Work SPA pre-work meeting one week prior to any planned elevated work six (6) feet or more from a lower level. The Cover Letter (EXHIBIT J) must be submitted along with an Elevated Work SPA. The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

b) The Elevated Work SPA pre-meeting agenda must include discussion about the scope and review of any existing and/or potential fall hazards as it relates to the planned elevated work.

c) To hold an Elevated Work SPA pre-work meeting, at a minimum, the following parties must be present:

   (1) Sub-Contractor Competent Person

   (2) General Contractor Safety Representative

   (3) Owner's Representative [Optional]

6.27 Roofing

No roofing work, regardless of the extent, is to be done over an occupied area. No other work will be allowed over an occupied area if it requires access to the roof. This includes, but is not limited to coring, drilling, or installation of electrical and plumbing pipe, Roof blocking, curb construction or reconstruction, flashing etc.

The intent is to restrict the activity that may cause a hazard to the occupants below. Inspections and maintenance activities are allowed as long as it does not involve significant work that might fall into the realm of the aforementioned hazard.

NOTE: An Elevated Work SPA (EXHIBIT J) may be required for roof work six (6) feet or grater in height or above a lower level.

6.28 Melting Kettles

Before firing a kettle (following the manufacturer's instructions), employees must check hoses, gauges, fuel tanks, bumpers, and other equipment for defects and make sure the lid fits tightly. Burners should not be ignited near fuel or flammable materials. All kettles must be equipped with after-burner devices.

a) Other workers who may be working on the roof should keep clear of the kettle workers and their equipment.
b) Work areas where melting kettles are in use will be barricaded off at a minimum distance of twenty-five (25) feet from other work areas.
c) No combustible materials, including insulation and bitumen, should be stored near the kettle.
d) Kettles should not be placed directly on combustible roofs. When it is necessary to place a kettle on such roofs, noncombustible surfaces must be placed under the kettle.
e) Heating devices or melting kettles should be placed on a level, firm foundation and protected against traffic, accidental tipping, or similar hazards.
f) A minimum of three (3) 20 lb. (A: B:C) dry chemical fire extinguishers must be provided for each kettle and tanker operation, each open flame torching operation, and each work crew using mechanical equipment, power tools, hot bitumen, or flammable liquids.
g) Travel distance from the kettle work area to the nearest fire extinguisher must be located within twenty-five (25) feet, on opposite sides of the kettle. These extinguishers shall be readily accessible at all times in case of an emergency.
h) Hot kettles should never be left unattended, **even during lunch periods**. The kettle covers should be readily available and fit tightly. All kettle workers should know how to put out a kettle fire.
i) Before refueling, burners and engines must be safely shut down and allowed to cool.
j) A non-combustible surface must be available on which to put a burner when removed from the kettle.
k) Enclosed areas in which hot substances are being heated or applied should be properly ventilated.

l) Hoisting equipment should be used to raise bitumen to the roof. Hot bitumen should never be carried up ladders. The hoisting equipment must be strong enough to hoist the load and be properly secured.

m) Employees must know the proper way to pick up a bucket and not jerk or kick a bucket that is stuck to a roof.

n) At the conclusion of work, roofing mops should be "fanned out" onto a noncombustible surface to minimize the chance of spontaneous ignition.

6.29 Scaffolding

The erection, alteration or moving, of any scaffolding system or work platform must be performed under the direction of a designated "Competent Person."

a) Guardrails, mid-rails, and toe-boards must be installed on all open sides of scaffolds. This guardrail system should be constructed from components furnished by the manufacturer.

b) Unauthorized personnel must not alter scaffolds or work platforms.

c) Guardrails are required for all scaffolding greater than six (6) feet in height. All employees working on scaffolds 6 ft. or higher must have adequate means of fall protection.

d) Where uplift may occur, scaffold planks must be cleated or secured and must extend over the end supports by at least 6 inches but not by more than 12 inches.

e) A competent person must visually inspect all scaffold members before each use. Damaged scaffold members must be removed from service immediately.

f) Access ladders must be provided for each scaffold in accordance with OSHA 1926.450.

g) Adequate mudsills and/or base plates or other rigid footing, capable of withstanding the maximum intended load, must be provided.

h) Scaffolds must be tied off to the building or structure at intervals in accordance with OSHA 1926.450.

i) Scaffolds must not be overloaded. Materials shall be brought up as needed. Excess materials and scrap must be removed from the scaffold when work is completed.

j) Barrels, boxes, kegs, horses, ladders, loose tile blocks, loose piles of bricks, or other unstable objects must not be used as work platforms or mounted on top of other work platforms.

k) Where persons are required to work or pass under a scaffold, a screen of 18 gauges, 1/2-inch wire mesh or equivalent protection is required between the toe boards and the guardrail.

l) Overhead protection is required if employees working on scaffolds are exposed to overhead hazards.

NOTE: An Elevated Work SPA (EXHIBIT J) may be required for scaffolding systems six (6) feet or grater in height or above a lower level.

6.30 Floor and Wall Openings

As defined by OSHA, a hole constitutes as any gap or void two (2) inches or more in its least dimension, in a floor, roof, or other walking/working surface. Hole covers must be capable of supporting without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

6.30.1 General

a) All floor holes and openings into which persons can accidentally walk or fall through must be guarded by a physical barrier or cover, secured, and labeled, "HOLE COVER – DO NOT REMOVE", or protected by a standard guardrail system.

b) Wall openings, from which there is a drop of more than 6 feet, and where the bottom of the opening is less than 42 inches above the working surface, must be guarded with a top rail, mid-rail, and toe board.

c) A standard guardrail system or perimeter cable must guard every open-sided floor or platform 6 feet or more above the adjacent floor or ground level.

d) When it is necessary to work inside the barricade around a floor opening, or building edge, workers must wear and use a Personal Fall Arrest System, which must be tied off.

6.30.2 Guardrails

a) Top rails and mid-rails protecting all work areas 4 feet or more in height must be smooth surfaced throughout their length and have a vertical height of 42 inches. Midrails must be halfway between the toprails and the floor, platform, runway, or ramp. Synthetic or natural fiber ropes must not be used as top-rails or mid-rails.

b) Wire rope, when used as top-rails or mid-rails, must be free of sharp edges, burrs, or projections which may be a hazard. The maximum deflection of the top rail when a load of 200 pounds is applied in any direction at any point on the top rail must not exceed 3 inches in one direction, which includes the free hanging sag in the wire rope. Support posts must not be positioned more than eight (8) feet apart.

c) Wood top railing must be at least 2 x 4-inch stock or equivalent. Wood railing posts must be of at least 2 x 4-inch lumber spaced not to exceed 8 feet. Mid-rails must be at least 1 x 6-inch stock or equivalent. Toe boards must be 1 x 4-inch lumber or equivalent and securely fastened.

d) When materials are piled to such a height that a standard toe board does not provide protection, paneling, or screening from the floor to top-rail or mid-rails must be provided.

e) All guardrails and handrails must be inspected daily and repaired immediately, as needed.

6.31 Stairways and Ladders

6.31.1 Ladders

a) Manufactured ladders must be at minimum Type 1A rated (300lb.)

b) Portable aluminum ladders shall be prohibited.

c) All job-made wooden ladders and stairs, regardless of height, must be constructed according to OSHA and ANSI specifications.

d) Extension ladders must not exceed forty-four (44) feet in length.

e) Stepladders must not exceed twenty (20) feet in length.

f) Single cleat ladders must not exceed thirty (30) feet in length.

g) Double cleat ladder must not exceed a maximum length of twenty-four (24) feet.

h) Workers must maintain three points of contact, with the ladder, while ascending or descending and always face the ladder; Hands must be free of tools and materials.

i) Fixed Ladders: Fall protection must be provided for employees climbing or working from fixed ladders above twenty-four (24) feet. A fixed ladder is a ladder that cannot be readily moved or carried because it is an integral part of a building, structure, or scaffolding system.

6.31.2 Stairways

a) Stairs having 4 or more risers must have its sides protected by a standard handrail system.

b) All job-made wooden ladders and stairs, regardless of height, must be constructed according to OSHA and ANSI specifications.

c) On temporary stairways, for every 12 feet of vertical riser, there must be a landing platform, and:

   (1) Stairs must be at least 24 inches wide and equipped with treads and handrails.

   (2) Temporary stairs must have a 30-inch-wide landing for every 12 feet of vertical rise.

   (3) Stairs must be properly illuminated (5 footcandles).

   (4) Stairways, ramps, or ladders must be provided at all points where a break in elevation of 19 inches or more occurs in a frequently traveled passageway, entry, or exit.

d) Where permanent stairways are not installed, concurrently with the construction of each floor, a temporary stairway must be provided to the work level. Joints must be locked together by lock pins, bolts, or equivalent fastenings.

e) Handrails must be of construction similar to a standard guardrail. All handrails and railings must be provided with a clearance of approximately 3 inches between the handrail or railing and any other object.

f) Handrails must be not more than 37 inches or less than 30 inches from upper surface of handrail to surface of tread. Handrails must also be in line with the face of the riser, or to the surface of the ramp.

6.32 Crane Operations

A Crane Operations Safe Plan of Action (SPA) pre-operational meeting is required to review the appropriate lift plan prior to making any Critical lift, Major lift, or Standard lift. It should never be assumed that any member of the crew is aware of all aspects of the lift, and therefore all aspects of the lift plan should be reviewed.

a) The General Contractor must ensure that its Subcontractors meet the requirements set forth by ASME B30.5.2011 and OSHA 29 CFR Subpart CC.

b) The following documentation must be available inside of the cab, before crane is placed into service:

   (1) current monthly inspection

   (2) Manufacturer's load chart

   (3) Manufacturer's operating manual.

c) All cranes must receive regular, thorough, and periodic inspections, in accordance with the manufacturer's recommendations or applicable governing standards. All defects noted during any crane inspection must be corrected, prior to use.

d) All cranes must be used in accordance with manufacturer guidelines.

e) Cranes must never be operated in excess of its rated capacity.

f) Contractors must not use a crane to lift/lower and/or suspend personnel in man baskets or work platforms. Any exception to this rule must be cleared through the Contractor's project manager or superintendent.

g) All rigging equipment (i.e., slings, softeners, bridles, blocking cables, etc.) must be inspected prior to use and documented monthly.

h) The General Contractor must ensure that crane and wire rope inspections are performed and that daily, monthly, quarterly, and annual logs are maintained. Crane Inspection Record is included as EXHIBIT K (equivalent form(s) may be utilized).

i) All rigging must be kept in good condition, working load limit capacities properly identified, and properly stored when not in use.

j) All Rigging work must only be done by qualified riggers.

k) Booms and/or suspended loads must not be allowed to pass over playground or other school property when students and/or staff are present in these areas.

l) Safety hooks must be used on all operations where loads are being handled.

m) All suspended loads must be controlled by tag lines of enough length to control the load.

n) All signal persons must:

   (1) Receive proper signaling training.

   (2) Never allow a suspended load to pass over or come within ten (10) feet of power lines.

   (3) Never allow a suspended load to pass over, nor any individual to pass under, a suspended load.

   (4) Be in constant view and communication with the crane operator. Constant communications include proper hand signals and/or radio communications.

(5) Make daily general inspections of the crane prior to use and maintain a log of these inspections. The Operator, or other qualified person may also conduct the daily inspection.

o) All crane operators must:
   (1) Be thoroughly trained and must have related experience,
   (2) Be familiar with safe crane practices and procedures.
   (3) Have a complete understanding of all manuals, including maintenance and operating instructions provided for the specific crane in use.
   (4) Have no physical, visual, or mental reactions or impairments that will affect the safe operations of the assigned crane.

p) The crane operator and crew must not engage in any practice such as cell phone usage during crane operations that could divert their attention.

q) For all Dallas ISD property that lies within an Airport Control Zone (within 5 miles of any airport) the General Contractor will ensure that the crane's boom lighting, flagging, raising, and lowering comply with FFA rules.

r) To provide clearance for air traffic, all booms must be below 175 feet above ground level (AGL) during the hours of sunset to sunrise. However, if this is not possible and temporary construction cranes are left up during this time period or utilized in support of construction activities, then all cranes must have lighting in accordance with FFA Advisory Circulation 70/7460-1, "Obstruction Marking and Lighting."

6.33 Crane Operations Safe Plan of Action (SPA)

A Crane Operations Safe Plan of Action (SPA) is a site-specific comprehensive crane lift plan which outlines what methods, procedures, and equipment will be used in its plan. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any crane activity. Review and acceptance by the General Contractor Safety Manager is required prior to submission.

a) Any changes in site conditions that could affect the safe operation of the crane must be evaluated and included within the SPA; this plan must be approved by a qualified person.

b) General Contractor must coordinate and conduct an on-site Crane Operations SPA pre-work meeting one week prior to any planned crane activity. The Cover Letter (EXHIBIT K) must be submitted along with a Crane Operations SPA. The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

c) Prior to any crane activity, the General Contractor must submit, to the Bond Program Safety Director, or designee:
   (1) A copy of the crane certification and documentation of the most recent annual inspection prior to crane use.
   (2) Crane certificate of insurance
   (3) A copy of the annual crane inspection as well as current maintenance reports.
   (4) Crane Operator certification
   (5) Crane Operator medical card

(6) Crane Location plan that identifies known hazards for underground and overhead crane operations, and where the crane is approved or not approved to operate.

(7) Any changes in site conditions that could affect the safe operation of the crane; this plan must be approved by a qualified person.

(8) Rigger and/or Signal Person's training records

(9) Job Hazard Analysis

d) To hold a Crane Operations SPA pre-work meeting, at a minimum, the following parties must be present:

(1) Sub-Contractor Competent Person

(2) General Contractor Safety Representative

(3) Owner's Representative [Optional]

6.34 Steel Erection

Structural stability must be maintained at all times during the steel erection process. The General Contractor must ensure the establishment of a written Steel Erection Procedure that adheres to OSHA, Federal, State, and local regulations. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT L, and maintained on-site.

6.34.1 Site Layout and Construction Sequence

General Contractors must provide erectors with a site layout/map which includes, but is not limited to:

(1) Pre-planned routes for hoisting loads

(2) Pre-planned routes for delivering material, equipment, etc.

(3) Material staging area(s)

(4) Known hazards that may affect underground and/or overhead operations.

6.34.2 Structural Steel Assembly

In addition to the items listed in this section, all contractors of any tier must comply with all federal, state, and local requirements, including those in other sections of this safety manual. All contactors must be required to comply with all parts of these requirements based on their scope of work.

a) Contractors of any tier must not erect steel until receiving a written certification of proper curing of the concrete in the footings, piers, walls, etc. is of sufficient strength to support the loads imposed during steel erection.

b) Prior to the erection of any column, the General Contractor must provide written notification to the steel erector if there has been any repair, replacement, or modification of the anchor rods (anchor bolts) of that column.

6.34.3 Hoisting and Rigging

Contractors of any tier must use qualified riggers during hoisting activities for assembly and disassembly work (29 CFR 1926.1404(r)(1)). Additionally, qualified riggers are required

whenever workers are within the fall zone and hooking, unhooking, or guiding a load, or doing the initial connection of a load to a component or structure (29 CFR 1926.1425(c)).

a) All Rigging and Signal person(s) must be properly trained in accordance with all Federal, State, and local regulations.
b) Free rigging is the practice of attaching ropes, chains, or slings to a telehandler/forklift tine(s) for the purpose of lifting and moving. Free rigging must not be permitted without the telehandler/forklift manufacturer's letter of approval.
c) Exposure to overhead loads must be minimized through pre-planned routes for hoisting loads and/or other contracting personnel who may be transiting the jobsite.
d) Any procedure(s) for multiple rigging lifts (Christmas-treeing) is prohibited.
e) General Contractors must pre-plan site-specific work practices regarding safely landing loads while maintaining proper protection from fall hazards.

6.34.4 Column Anchorage and Double Connections

Columns must be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim packs which are adequate to transfer the construction loads.

a) All columns must be evaluated by a competent person to determine whether guying or bracing is needed; if guying or bracing is needed, it must be installed.
b) All columns must be anchored by a minimum of 4 anchor rods (anchor bolts).
c) Anchor rods (anchor bolts) must not be repaired, replaced, or field-modified without the approval of the project structural engineer of record.
d) When two structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, at least one bolt with its wrench-tight nut must remain connected to the first member unless a shop-attached or field-attached seat or equivalent connection device is supplied with the member to secure the first member and prevent the column from being displaced (See Appendix H of 29 CFR 1926 subpart R for examples of equivalent connection devices).

6.34.5 Falling Object Protection

a) All materials, equipment, and tools, which are not in use while aloft, must be secured against accidental displacement.
b) The General Contractor must bar any construction processes below steel erection activities unless overhead protection for the employees below is provided.

6.34.6 Fall Protection

Each employee engaged in any steel erection activity who is on a walking/working surface with an unprotected side or edge more than six (6) feet above a lower level must be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems, or fall restraint systems.

a) A safety railing of 1/4-inch wire rope, or equal, must be installed approximately 42 inches high, around the periphery of a temporary planked or metal deck floor during structural steel erection. This wire rope must be flagged every six (6) feet.

b) Wire rope should be securely fastened yet allow for temporary removal in order to land materials.

6.34.7 Controlled Decking Zone (CDZ)

A controlled decking zone may be established in the area of the structure over fifteen (15) feet and up to thirty (30) feet above a lower level where metal decking is initially being installed and forms the leading edge of a work area. In each CDZ, the following must apply:

a) Each employee working at the leading edge within a CDZ must be protected from fall hazards six (6) feet or greater above a lower level.
b) Access to a CDZ must be limited to only those employees engaged in leading edge work.
c) The boundaries of a CDZ must be designated and clearly marked. The CDZ must not be more than ninety (90) feet wide and ninety (90) feet deep from any leading edge. The CDZ must be marked by the use of control lines or the equivalent. (Examples of acceptable procedures for demarcating CDZ's can be found in Appendix D of 29 CRF 1926 subpart R).
d) Each employee working in a CDZ must have completed CDZ training in accordance with 29 CFR 1926.761.
e) Unsecured decking in a CDZ must not exceed three thousand (3,000) square feet.
f) Safety deck attachments must be performed in the CDZ from the leading edge back to the control line and must have at least two attachments for each metal decking panel.
g) Final deck attachments and installation of shear connectors must not be performed in the CDZ.

6.34.8 Training

Each employee engaged in any steel erection activity who is on a walking/working surface with an unprotected side or edge more than six (6) feet above a lower level must be trained and instructed, but not limited to, the following areas:

a) Have completed connector training in accordance with 29 CFR 1926.761
b) Each employee working in a CDZ must have completed CDZ training in accordance with 29 CFR 1926.761.
c) The recognition and identification of fall hazards in the work area.
d) The use and operation of protective systems, such as guardrail systems, personal fall-arrest systems, positioning-device systems, fall- restraint systems, safety-net systems, and other protection to be used.
e) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.
f) Procedures for protection from falls to lower levels and into holes and openings in walking/working surfaces and walls.

6.35 Steel Erection Safe Plan of Action (SPA)

A Steel Erection Safe Plan of Action (SPA) is a comprehensive site-specific steel erection plan which outlines key erection elements such as methods, procedures, and equipment that will be utilized during all phases of the steel erection operation. This evaluation and plan must be in writing and must be submitted to the Owner's Representative prior to any steel erection activity. Review and acceptance by the General Contractor Safety Manager is required prior to submission, the start of work, or any employee engagement with this activity.

a) General Contractors must coordinate and conduct an on-site Steel Erection SPA pre-work meeting one week prior to any engagement of steel erection activities. The Cover Letter (EXHIBIT L) must be submitted along with a Steel Erection SPA. The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.
b) The Steel Erection SPA pre-meeting agenda must include discussion about the scope and review of any existing and/or potential hazards as it relates to the planned scope of work.
c) To hold a Steel Erection SPA pre-work meeting, at a minimum, the following parties must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

6.36 Aerial Crane Operations

The General Contractor must ensure the establishment of a written Aerial Crane Procedure that adheres to all applicable regulations of the Federal Aviation Administration (FAA) 14 CFR – Part 77, and the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.551 – Subpart N, in addition to applicable State and local regulations. A copy of this procedure must be submitted to the Owner's Representative, made part of the Contractor's Construction Project Safety Manual as EXHIBIT M, and maintained on-site.

Every precaution must be taken to provide protection against flying objects in the rotor downwash. All loose objects within one hundred (100) feet of any areas susceptible to rotor downwash must be secured or removed prior to any Aerial Crane Lift.

a) Aerial Crane Operations must not be performed during regular school hours or near occupied areas.
b) No unauthorized person(s) must be allowed to approach within fifty (50) feet of the helicopter when the rotor blades are turning.
c) Open flames, hot work, or any other spark producing activities must not be permitted in an area that could result in fires being spread by the rotor downwash.
d) Ground personnel must be properly trained when required for safe helicopter loading and unloading operations.
e) Constant reliable communication must be provided between the pilot, and a designated employee of the ground crew who acts as a signalman during the period of loading and unloading. This signalman must be distinctly recognizable from other ground personnel.

f) When visibility is reduced by dust or other conditions, ground personnel must exercise special caution to keep clear of main and stabilizing rotors. Precautions must also be taken by the General Contractor to eliminate any conditions of reduced visibility.

g) Personal protective equipment for ground persons receiving the load shall consist of complete eye protection and hard hats secured by chinstraps.

h) The helicopter operator is responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made. The weight of any external load must not exceed the manufacturer's rating.

i) When Contractors are required to perform work under hovering craft, a safe means of access must be provided for workers to reach the hoist line hook and engage or disengage cargo slings. Employees must not perform work under hovering craft except when necessary to hook or unhook loads.

j) Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves must be worn by all ground personnel touching the suspended load.

k) Loads shall be properly slung, and tag lines shall be of a length that will not cause them to be drawn up into rotors.

l) Electrically operated cargo hooks must have the electrical activating device designed and installed to prevent inadvertent operation. In addition, these cargo hooks must be equipped with an emergency mechanical control for releasing the load. The hooks must be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

6.37 Aerial Crane Operations Safe Plan of Action (SPA)

An Aerial Crane Operations Safe Plan of Action (SPA) is a site-specific comprehensive aerial lift plan which outlines what methods, procedures, and equipment will be used in its plan. This evaluation and program must be in writing and must be submitted to the Owner's Representative prior to any aerial crane activity. Review and acceptance by the General Contractor Safety Manager is required prior to submission.

a) Any changes in site conditions that could affect the safe operation of the aerial lift must be evaluated and included within the SPA. This plan must be approved by a qualified person.

b) General Contractor must coordinate and conduct an on-site Aerial Crane Operations SPA pre-work meeting one week prior to any planned crane activity. The Cover Letter (EXHIBIT M) must be submitted along with a Crane Operations SPA. The safety plan must be evaluated and approved by the General Contractor Safety Manager prior to submission.

c) This briefing shall set forth the plan of operation for the pilot and ground personnel. A copy of this procedure must be made part of the Contractor's Construction Project Safety Manual as EXHIBIT M and maintained on-site.

d) Prior to any aerial crane activity, the General Contractor must submit, to the Dallas ISD PM and Bond Program Safety Manager the following minimum elements of an Aerial Crane Operations SPA:
    (1) Lift Plan (scope of work, travel path, ground level and ariel hazards or obstructions)
    (2) Site Set-Up (map of staging areas, sequence of operation, primary and alternate emergency area locations, and potential drop zones in relation to occupied areas)
    (3) Material to be lifted (method of attachment, rigging to be used, configuration, and load capacities)
    (4) Roles and responsibilities (communication methods for ground crew, roof crew, and operator)
    (5) Competent Person Designation form (must identify areas of competency along with proof of training)
    (6) Rigger and signal person training records
    (7) JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)
    (8) Emergency Action Plan (including emergency contact information and medical facility)
    (9) Standard Airworthiness Certificate
    (10) Congested Area Plan Request to FAA
    (11) FAA Registry of Aircraft
    (12) FAA Airman Detail Report
    (13) Notification of Dallas City Officials
    (14) Certificate of Aircraft liability insurance (insurance limit must be $10 million, per contract amount)
    (15) Evidence of additional insured and waiver of subrogation endorsement

e) To hold an Aerial Crane Operations SPA pre-work meeting, at a minimum, the following parties must be present:
    (1) Sub-Contractor Competent Person
    (2) General Contractor Safety Representative
    (3) Owner's Representative [Optional]

NOTE: The District's Safety Department must receive acceptance of Certificate of Insurance (COI) from the District's insurer prior to any Aerial Crane Activity.

6.38 Hot Work

All work that includes an open flame, burning, welding, or spark producing of any type must be defined as "hot work" and must require the presence of a fire extinguisher, at least one fire watch, and a Hot Work Permit.

6.38.1 General

In addition to strictly following the provisions of OSHA and NFPA, each Contractor must also comply with the following:

a) No hot work must be conducted during occupied hours
b) A Hot Work Permit issued by the Fire Marshal must be Posted within the General Contractor's trailer or on-site officing area.
c) A Hot Work Permit must be completed for each task using EXHIBIT N or equivalent.
d) Fire extinguisher(s) used for "Hot Work" must be placed within this immediate vicinity of each task operation and must be of proper size and type for the activity, fully charged, and inspected prior to use. Extinguisher location must be kept clear and accessible at all times.
e) A fire watch must be present during all hot work operations and remain at the work area 30 minutes after work is completed. All fire watch personnel must be trained in fire extinguisher safety.

6.39 Welding and Cutting

a) All welding operations must provide appropriate screening measures, erected in advance, to contain the high energy light. Welding operations must not be allowed to present an opportunity for flash burn exposures to the eyes of any workers in the vicinity.
b) Shielding, or welding curtains must be placed around established work areas to protect other workers from flash and sparks.
c) Ventilation must be provided to adequately remove harmful fumes and gasses.
d) The unused stubs of welding electrodes "rod butts" must be collected and placed in proper disposal containers as soon as each one is expended. Whenever an operation is idle, the welding electrode must be removed from stinger/electrode holder.
e) Workers must receive training on the proper use, inspection, and limitations of all welding and cutting equipment and Personal Protective Equipment, as it pertains to the operation.
f) Regulators for fuel gas and oxygen cylinders must be inspected before each use and be maintained in good working order.
g) Anti-flashback arrestors must be properly installed on all cutting torches so that they prevent ignition of any gas sources upstream from the torch.
h) Acetylene cylinder valve key must be kept with the cylinder at all times. Valve keys must be kept in position while in use.

6.40 Compressed Gas Cylinders

Contractor must store oxygen cylinders separate from fuel gas cylinders. This separation must be either a minimum distance of 20 feet or by a fire resistive wall/partition with a one-half hour fire rating and a minimum of five (5) feet in height. All compressed gas cylinders must be properly secured from movement – in an upright (vertical) position.

a) All cylinders must be stored in the upright position, especially acetylene. When an acetylene cylinder is stored on its side, the acetylene may separate from the acetone, becoming unstable, and cause an internal explosion.
b) Valves of the empty cylinders must be in the closed position.
c) Cylinders must not be moved by tilting and rolling them on their bottom edges.
d) When not in use, cylinders must have their protective caps in place and be hand tightened.
e) Workers must be trained in the safe handling, storage and use of compressed gas cylinders.
f) Workers must be trained in the proper use and handling of fuel gas and O2 cylinders

6.41 Earth Moving Equipment and Powered Industrial Trucks

A Powered Industrial Truck (PIT) is defined by any mobile, power-pulled truck used to carry, push, pull, lift, stack, or tier materials, whether ridden by the operator or controlled by a walking operator.

a) All earth moving equipment and PIT must be maintained in a safe working condition and must be appropriate and adequate for the intended use. Excavation activities must not be conducted during occupied hours.
b) Only authorized personnel must operate equipment. Operators of equipment, machinery, vehicles, or PIT must be qualified and properly authorized for the operation involved.
c) Equipment and PIT operators must perform a pre-shift walk around safety inspection of their equipment, and any conditions that may affect safe operation will be corrected before use.
d) Equipment must not be operated unless all required safety devices are in place and functioning properly.
e) Careless, reckless, or otherwise unsafe operation or use of equipment must result in discipline and may constitute grounds for dismissal.
f) Equipment maintenance is to be performed only by qualified mechanics.
g) When equipment is serviced or repaired the operator must dismount until the service or repair is completed. Prior to remounting, operators must perform a complete walk-around safety inspection of the equipment.
h) Before performing any service or repair work, all equipment must:
    (1) Be stopped and positively secured against movement or operation.
    (2) locked and tagged out of service, unless it is designed to be serviced while running, following the manufacturer's instructions.

i) All bi-directional earth moving equipment, PIT, and motor vehicles with an obstructed view to the rear must be equipped with a warning horn and an automatic back-up (reverse) alarm that can be heard above and distinguished from the surrounding noise level.

j) All off-highway earth moving equipment and trucks such as loaders, dozers, scrapers, motor graders, rock trucks, tractors, rollers, and compactors will be equipped with roll-overprotective structures (ROPS) and seat belts, per OSHA standards.

k) Seat safety belts, when required by the manufacturer, must be used by all operators of equipment.

l) Mobile equipment must not be left unattended unless parked securely to prevent movement, with all ground engaging tools lowered to the ground, brakes set, and the engine off.

m) Equipment parked at night will be illuminated, barricaded, or otherwise clearly marked where exposed to potential traffic.

n) Personnel must not be transported or ride on any equipment or vehicles that are not equipped with seats for passengers.

o) When fueling equipment or vehicles with gasoline or liquefied petroleum gas (LPG) the engine must be shut off.

p) All equipment and vehicles must be equipped with appropriate fire extinguishers or fire suppression system.

q) Equipment, tools, and materials hauled on pickups and flatbed trucks must be secured to prevent them from falling onto the road.

6.42 Haul Routes

Haul roads must be designed, constructed, and maintained for safe operation consistent with the type of haulage equipment in use. Standard traffic control signs must be used where necessary.

a) Elevated roadways must have axle high beams or guards maintained on their outer banks.

b) Equipment, pickups, and passenger vehicles must be parked well away from the work area to reduce congestion and avoid collision.

c) Vehicle and equipment speed limit while traversing school property must be a maximum of five (5) miles per hour during school hours and/or when children are present.

6.43 Traffic Control

a) All General Contractors, Subcontractors, and employees must comply with local city ordinances when work interfaces with traffic of the general public.

b) Vehicle and equipment speed limit while traversing school property must be a maximum of five (5) miles per hour during school hours and/or when children are present.

c) All materials and equipment deliveries should be coordinated with General Contractors as to prevent traffic congestion around peak school hours for children being dropped off or picked up from school.

6.44 Environmental and Hygiene

General Contractors and Subcontractors of any tier must comply with all applicable federal, state, and local statutes, laws, rules, regulations, ordinances, codes, and any amendments relating to the environment, hazardous substances or exposure to hazardous substances, including without limitation the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Hazardous Material Transportation Act (HMT A), Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Oil Pollution Act (OPA) and the Safe Drinking Water Act (SDW A).

The General Contractor is responsible for the implementation and management of its Storm Water Pollution Prevention Plan (SWPPP) and SWPPP Oversight as Attachment VI of this manual.

Where necessary, The General Contractor must provide, and the General Contractor's Safety Representatives must be trained and capable of, properly operating industrial hygiene equipment as required by any Federal, State, and local regulations. Tests must be performed as often as necessary to afford protection to employees and the general public.

6.45 Spill Prevention and Response

When utilizing hazardous and non-hazardous substances that could cause a negative impact when released on land, water, and\or the atmosphere, the General Contractor must exercise extreme caution by developing and implementing a site-specific spill prevention and spill response procedure in accordance with OSHA, Federal, State, and local regulations.

No Contractor must omit or discharge any substance into the environment in violation of the Environmental Protection Agency (EPA), OSHA or other regulatory agencies. Where necessary, the General Contractor's Safety Representative must be responsible for all environmental monitoring and testing.

6.46 Portable Relocation

Prior to commencement of work, the Controlling Contractor is responsible for obtaining the Disconnection Form provided by the Moving Contractor for each portable to be relocated. The Controlling Contractor must provide a completed copy of the Disconnection Form along with applicable safety submittal documentation to the Owner’s Representative prior any relocation, demolition, or disconnection of portables.

a) The relocation of portables must be coordinated around peak hours of school traffic, i.e., morning drop off of children and afternoon pick-ups.
b) All relocation activities (including haul routes) must remain properly separated from occupied areas. Barriers for outdoor areas affected by construction must consist of six (6) foot chain link fencing.
c) Haul routes must be designed, constructed, and maintained for safe operation consistent with the type of haulage equipment in use. Standard traffic control signs must be used where necessary.

d) Equipment, pickups, and passenger vehicles must be parked well away from the work area to reduce congestion and avoid collision.
e) Vehicle and equipment speed limit while traversing school property must be a maximum of five (5) miles per hour during school hours and/or when children are present.
f) The Moving Contractor and/or General Contractor must field verify the safe relocation of portables from site "A" to site "B" and inspect the safe passage of established haul routes.
g) portable classrooms and ADA approved ramps, decks, steps, etc. must meet the specifications contained in the RFP, Contract Award Doc, and applicable Federal, State, and local requirements.

NOTE: Contractors are responsible for submitting moving permit applications to the City and are responsible for communication with the city of Dallas to resolve all action items related to the moving permit.

7. INCIDENT NOTIFICATION GUIDELINES

The District's objective is an injury and incident-free project, with a focus on project safety that must not be compromised to achieve any other business objective. The General Contractor must structure an effective and systematic safety management approach that emphasizes **continuous safety process improvement.**

The District recognizes that the General Contractor and Subcontractors may have existing safety management programs with established safety policies, processes, procedures, and work practices. The District will support these where they prove to be as effective and meet the intent and purpose of this Section.

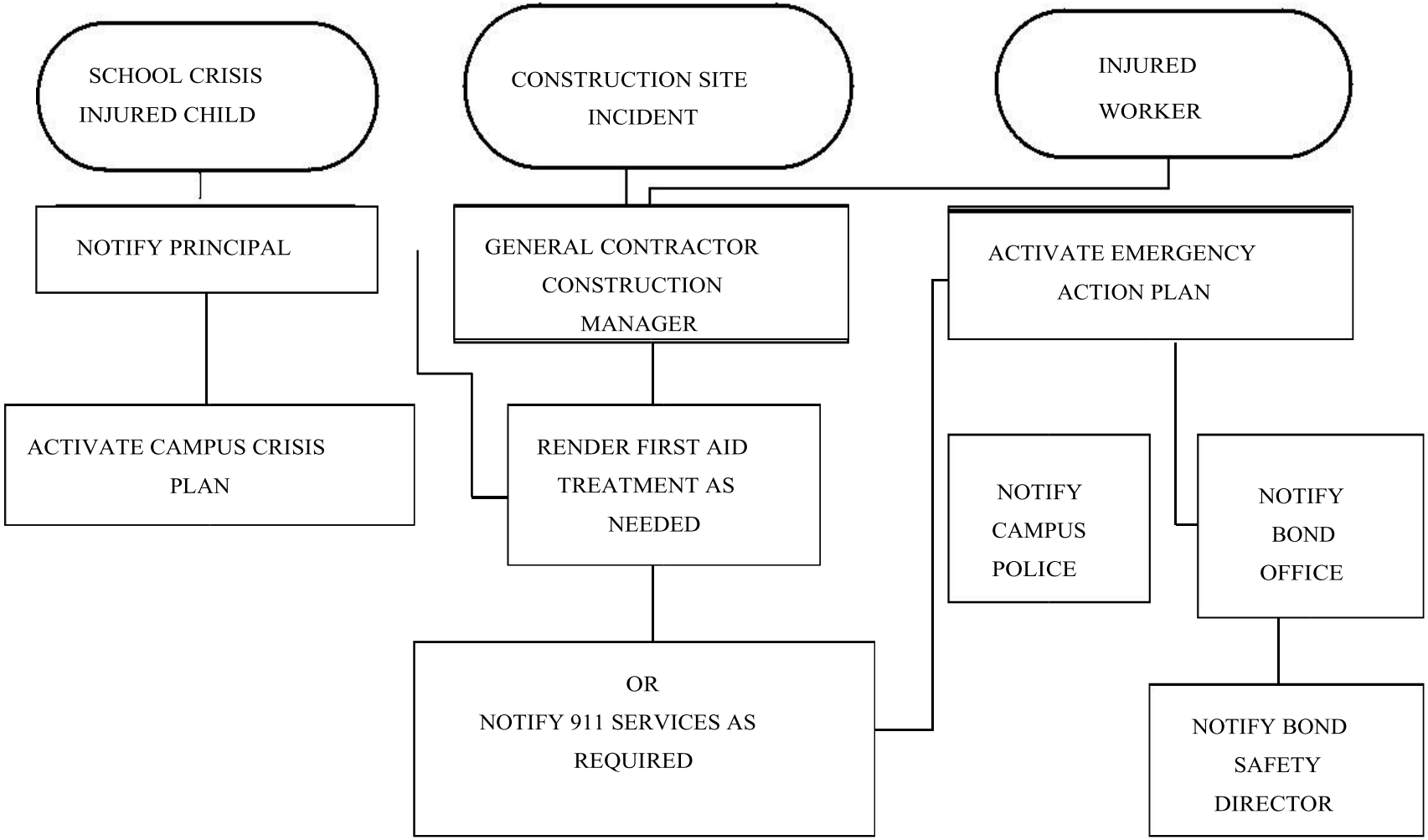
a) General Contractors and Subcontractors of any tier must instruct all workers to immediately report every incident to their supervisor, even if there is no obvious injury or property damage. Supervisors must immediately notify the General Contractor, who must immediately notify the Owner's Representative of any incident.
b) The Bond Program Safety Manager and others as directed must be included in the incident notification process. Depending on potential severity of the incident, notifications may be in written and/or verbal form as directed.
c) Upon request of the Owner's Representative, the General Contractor and/or Subcontractors of any tier must promptly produce and provide copies of any required documents related to project safety or property damage.
d) Where opportunities for improvement are identified, the General Contractor and Subcontractors of any tier must work collaboratively with the Owner's Representative in making appropriate revisions to progress toward an injury and incident-free workplace.
e) The General Contractor's Safety Representative must generate a formal incident report using EXHIBIT O, or equivalent company accident report forms, in the manner and time as directed by the Owner's Representative.
f) The General Contractor's Safety Representative, accompanied by the Owner's Representative, must perform a site inspection immediately following any near miss,

property damage, fire, hazardous chemical spill, or accident involving construction equipment that results in injury to a worker, student, school employee, or visitor to the site.

g) Contractors must review the filed copy of the pre-construction Site-specific Safety Plan and/or Safe Plan of Action (SPA) that was performed prior to commencement of any construction activity.

[Notification Flow Chart is located on the next page]

7.1 DISD Incident/Crisis Notification Flowchart



7.2 Incident Investigations

When an accident or near miss with major potential for a loss occurs, the supervisor of the crew(s) involved must perform an accident investigation. The General Contractor and involved Subcontractors must tailor the magnitude and depth of the investigation effort to correspond to the potential, rather than the actual outcome of the incident.

a) Investigation team members must include safety personnel, project management, line management, affected workers, and consultants as the circumstances dictate. The Owner's Representatives reserves the right to participate in any incident investigation.
b) Upon request of the Owner's Representative, the General Contractor and/or Subcontractors of any tier must provide a Root Cause Analysis as outlined in Section 7.4 of this manual or its equivalent.
c) Once a root cause has been identified and recommendations for corrective action have been determined, a procedure may be implemented to prevent a similar incident from occurring again.

7.3 Incident Follow-up Guidelines

All near miss incidents, first Aid injuries, high risk safety inspection observations, and other such incidents must be investigated. The General Contractor's Safety Manager must lead the efforts and follow a structured incident investigation program that emphasizes **continuous safety process improvement.**

The General Contractor and involved Subcontractors must tailor the magnitude and depth of the investigation effort to correspond to the potential, rather than the actual outcome of the incident. The Bond Program Safety Manager and/or designee reserves the right to participate in any incident investigation.

a) Investigation team members must include, at minimum:
    (1) General Contractor and Subcontractor Safety Representatives
    (2) General Contractor and Subcontractor Project Management
    (3) Designated Competent Person (Front Line Management)
    (4) Affected workers, and consultants as the circumstances dictate.
b) The General Contractor must develop a Root Cause Analysis report that summarizes the incident, identifies the underlying contributing factor(s), determines which process element(s) failed to control the incident, determines which process element(s) will be implemented or improved, and the time needed to take sustainable corrective action(s).
c) The General Contractor must conduct and submit an incident investigation report that supports the Root Cause Analysis in the manner and time as directed by the Owner's Representative. The Bond Program Safety Manager and/or designee reserves the right to determine the acceptability of the findings.
d) The General Contractor must prepare and submit reports that will allow the Bond Program Safety Director, designee, and Subcontractors to understand findings and any planned changes to the operating procedure(s) based on those findings.

7.4 Contributing Factors to Consider

The Root Cause Analysis investigation should thoroughly address the following:

(1) Was the incident controlled and limited so that all workers and the project were made safe post-incident? If so, what was done?
(2) Explain what happened (facts and circumstances) that resulted in the incident.
(3) Are there other work areas or tasks where this type of incident could occur again?
(4) What processes were in place to prevent the incident? (Identify processes that failed)
(5) What processes could've been implemented or improved that might have prevented this incident?
(6) What processes will be improved or implemented to reduce risk of recurrence?

8. CONSTRUCTION SAFETY FOR STUDENTS

8.1 Introduction

The aim of Program Managers, General Contractors, and Subcontractors of any tier is to carry out their work activities in a safe and efficient manner to complete each project in a timely manner.

The safety of the children is of the utmost importance, and every effort must be made to see to it that in those projects that are concurrent with school activities, each job done be evaluated for child safety.

Our children are totally dependent on us to create a safe place for them to learn, study and play. Any work related or work generated condition deemed to be unsafe must be corrected immediately, because children do not see the world as we do. Children are often attracted by what is new and alien to them and will try to gain access to what may seem to be great places to play and have fun.

Therefore, it is the responsibility of everyone to control the potentially dangerous areas that exist on any construction project. All, regardless of the trades involved, must make this effort. In other words, the responsibilities of each person working in occupied areas become that much larger or expanded due to child safety conditions. Remember, it is for the children that construction is underway.

8.2 Separation of Construction Activities

Should any part of an occupied and operational school facility be shut down for construction work, then the General Contractor must erect appropriate construction barricades to completely eliminate access for non-construction personnel to the work area.

General Contractors must ensure safety inspections are conducted in all work areas regularly and periodically throughout the work shift to ensure proper elimination, mitigation, and/or safeguarding of hazards which may result as contributing factors that may lead to any exposure, injury, or property damage. **All unsafe conditions must be corrected immediately.**

a) Construction work areas must be kept segregated from school operations, staff, and students at all times. Separation may include, but is not limited to fencing, privacy fencing, bulkheads, and coordination of planned construction activities.

b) Barriers for indoor construction must be made of 3/4" plywood, and must extend from floor to ceiling, wall to wall. The temporary barrier must have a door that can be locked. This barrier will remain until work in the specified area is completely finished. Proper signage should be displayed near the temporary barrier, according to safety regulations.

c) Barriers for outdoor areas affected by construction must consist of six (6) foot chain link fencing.

d) Doors and/or gates must remain secured/closed when they open directly into occupied areas. A security service may be utilized if necessary.

e) The requirements of NFPA 101, Life Safety Code for Occupied Schools must be maintained during construction. **Separate atmospheres must be maintained between the school areas in full occupancy and the areas under construction**. Construction activities must not interfere or interrupt the normal teaching schedules.

f) Means of egress for the school occupancy must be maintained free of obstructions, clean and properly lighted. While this may be a function of the school custodian, no construction related operations must be allowed to cause an impairment of the normal means of egress.

g) All components and/or combinations of existing life safety systems (smoke detection, fire alarms, fire suppression, communication, alarm systems, intrusion control, etc.) must be maintained during construction.

h) School entrances and exits must not be blocked until school officials have been notified and re-routing has been established.

i) Appropriate warning and directional signage must be maintained at all times.

j) Dust and noise must be properly controlled to ensure the school maintains its teaching schedules without interruptions. General Contractors must respond to complaints and immediately establish control measures.

k) All deliveries (heavy equipment, tools, materials, etc.) must be coordinated around peak hours of school traffic, i.e., morning drop off of children and afternoon pick-ups.

l) Electrical box panels, even during breaks, must not be left exposed. Exposed boxes must be physically covered with the panel cover, and areas must be protected with barricades if necessary.

m) Construction debris and/or material must not be left in areas occupied by students and staff.

n) All construction debris must be removed before the end of each work shift and must not be left overnight.

o) Nails and screws must not be left protruding from lumber or other materials. All nails and screws must be removed or bent over.

p) Compressed gas cylinders must never be left unattended or overnight in occupied areas. Cylinders must remain secured in upright position; caps on and regulators disconnected when not in use.

q) Tools and equipment must not be left unattended.

9. CRISIS COMMUNICATION

A crisis is an emergency event that usually requires police, fire, or EMS response and could attract media or public attention. A crisis on a construction site might involve a fire, hazardous chemical spill, or accident involving construction equipment that results in injury to a worker, student, school employee, or visitor to the site.

a) The General Contractor must instruct all construction employees not to discuss the incident with reporters. All media inquiries must be referred to an official Dallas ISD spokesperson.

b) The Dallas ISD spokesperson must be the only person authorized to release live or pre-recorded video or written statements to the media. All Contractors of any tier must cooperate with the Dallas ISD spokesperson for all media arrangements as directed.

c) Should a crisis, serious emergency, or incident occur (requiring the presence of an ambulance, Fire Department or Police) the Contractor must immediately implement the Crisis Communication Guidelines and contact by phone the Bond Program Safety Director, **including nights, weekends, and holidays.**

9.1 Suggested Steps for Crisis Situations

(1) Evaluate the situation and extent of damage or injuries.

(2) If students are present, immediately contact the principal or school office.

(3) Call **9-1-1** if necessary. Be prepared to give the dispatcher details of the accident and injuries, the exact address and where emergency crews should enter the site.

(4) Assign someone to meet emergency crews at the gate.

(5) Call Dallas ISD Communications at **(972) 925-3917**. Be prepared to provide as much information as possible.

(6) Call Dallas ISD Police at **(214) 932-5627**.

(7) Call Construction Services at **(972) 925-7200**.

(8) Call the Safety Manager at **(214) 435-2204**.

(9) Do not speak to reporters or photographers. Refer them to Dallas ISD Communications.

9.2 EMERGENCY TELEPHONE NUMBERS

Dallas ISD Police	DISD Police	(214) 932-5627
District Spokesperson	Robyn Harris	(972) 925-3917
DISD Bond Safety Manager	Alvaro Meza	(214) 435-2204

9.3 Emergency Planning

On a regular basis, the General Contractor must review and update, when necessary, its Emergency Procedures for maximum effectiveness.

The updated procedures must be submitted to the Owner's Representative for review in accordance with the safety guidelines outlined in this manual and all applicable OSHA, Federal, State, and local regulations and maintained on-site.

The following provisions must be included in the emergency procedure:

a) The highest-ranking supervisor automatically becomes responsible for handling any emergency that occurs during working hours and may call upon the assistance of any available employee.
b) Following an emergency, ranking personnel must:
    (1) Secure the area as expediently as possible.
    (2) Provide access and an account of the emergency to authorized representatives of the District and specific government agencies. Questions from the media must be referred to the Dallas ISD spokesperson.
c) To ensure prompt emergency services, the General Contractor must:
    (1) Determine who is responsible for making emergency calls (preferably the highest-ranking supervisor present).
    (2) Conspicuously post a list of emergency phone numbers, along with information to be transmitted.

10. CONTRACTOR SAFETY AUDITS

10.1 Purpose

The effectiveness of this program depends upon the active participation and cooperation of all Engineers, Project Managers, Inspectors, Supervisors and General Contractors, their employees, and Subcontractors. The primary goals of this program are to increase safety awareness, raise safety standards in the work environment, provide incentives to make the workplace safer, and increase management involvement in the safety process.

General Contractors must ensure safety inspections are conducted in all work areas regularly and periodically throughout the work shift to ensure proper elimination, mitigation, and/or safeguarding of hazards which may result as contributing factors that may lead to any exposure, injury, or property damage. **All unsafe conditions must be corrected immediately.**

10.2 Jobsite Safety Inspections

a) The General Contractor must ensure that its Safety Representative conducts inspections of the project as needed (including storage areas, office areas, barriers, separation of activities, work areas, etc.) to ensure compliance with the District and OSHA requirements.
b) Contractors may utilize the Construction Safety Inspection Checklist EXHIBIT P, or its equivalent. Safety deficiencies that are noted during the inspection must be recorded on

the form and those deficient items must be communicated to his/her project manager/superintendent in a timely manner.

c) The project manager and/or superintendent must be responsible for implementing corrective action.

d) The General Contractor's Safety Representative will follow up and note the status of each safety deficiency until the deficiency has been abated, but until abatement takes place, each previously noted deficiency should be recorded during each subsequent site inspection.

e) In addition to performing jobsite safety inspections, the General Contractor's Safety Representative must cooperate with designated District Representatives who conduct jobsite inspections (i.e., Insurance Carrier Loss Control personnel).

10.3 Inspections by Regulatory Agencies

The General Contractor must immediately notify the Owner's Representative of the arrival of any representative of a Regulatory Agency (OSHA Compliance Officer, TCEQ Representative, Law Enforcement Officer, etc.), and provide the Owner's Representative with a copy of any published findings or citations issued to any employer and must ensure that statutory posting requirements are met. The General Contractor must provide the Owner's Representative with a copy of any employer's response to the same findings or citations. No Contractor of any tier must prohibit the entry of an OSHA Compliance Officer onto Dallas ISD property.

11. GREENFIELD PROJECTS

Greenfield Project must refer to as any DISD property that does not have students and/or Staff present during the duration of the Project. If, during the project, staff or students are present or any District/school operation is active, it is not considered a Greenfield job site.

Property must refer to all land owned by the District, to all property thereon; buildings, structures, facilities, platforms, fixtures, tunnels, installations, and to all project vehicles, stationary or mobile equipment, whether owned or leased. This definition may also include other work locations while in the scope and course of employment on the District's Construction Projects.

Worker must refer to any employee or agent included as example, but not by way of limitation, persons providing services on the project including all persons or entities performing all or part of the services the General Contractor has undertaken to perform on the project regardless of whether that person has employees. This includes, without limitation, independent contractors, Subcontractors, owner-operators, employees of any such entity, or employees of any entity that furnishes persons to provide services on the project.

11.1 Greenfield Shutdown Guidelines

Prior to conducting any type of permanent or temporary shutdown, the General Contractor is responsible for completing the Greenfield Utility Authorization Request Guidelines as outlined in Attachment VII, along with the applicable safety submittal requirements outlined in section 6.15 of this manual.

11.1.1 Permanent Utility Shutdown Guidelines

(1) **10-Day Notice of Shutdown** – The General Contractor must provide Dallas ISD with notification of power or other utility shutdown no less than ten (10) calendar days in advance of shutdown.

(2) The General Contractor must select "**Permanent**" on the top right portion of the Shutdown Authorization Form (EXHIBIT I) prior to submitting for approval (See Attachment VII for reference).

(3) The General Contractor is responsible for providing power for the duration of the project.

(4) Once the project reaches substantial completion, the General Contractor and PMF representative must provide the Dallas ISD Sustainability Department with a copy of the General Contractor's utility bills for transfer of the utility service to Dallas ISD. Should Contractors have questions regarding this process, please reach out to the Dallas ISD Sustainability Department via email at: sg9453@dallasisd.org

NOTE: Before demolishing a portable and/or building, all meter numbers must be provided to the DISD sustainability department to close the account and have meters removed through the Owner provider. It is important ALL Utility Accounts are closed through sustainability to prevent the General Contractor from reimbursing the District. DISD is not responsible for providing General Contractors with utilities at Greenfield Project locations.

11.2 Greenfield Badging

Personnel who are issued a Greenfield Job Site Identification Badge are authorized to work on Greenfield Project **Sites until seven (7) days prior to substantial completion of the project or project site commencing operations** (no longer a Greenfield Project Site), whichever comes first. All other requirements for Non-Greenfield Project Sites (sites where district operations are on-going, or students/staff present) remain in effect.

a) General Contractors must issue/provide all workers with a Greenfield Identification Badge, along with a site-specific safety orientation prior to conducting any construction activity.

b) General Contractors must issue identification badges, at their own expense, for all workers on DISD Greenfield Project Sites.

c) Workers must wear the General Contractor issued identification badge at all times while on DISD Greenfield Project Sites.

d) Greenfield Project Site Identification Badge Requirements: Greenfield Identification Badges issued by the General Contractor must be issued by Dallas ISD's approved third-party badging vendor. Badges must contain the following information:

(1) The issuing/authorizing General Contractor's company logo in lieu of the DISD logo

(2) The issuing/authorizing General Contractor's company name

(3) The authorized Subcontractor or Vendor's company name
(4) The name of the specific project site authorized to work at
(5) A photograph and name of the authorized employee receiving the badge
(6) Badges must be labeled "Greenfield"

12. UNMANNED AIRCRAFT SYSTEM (DRONE) POLICY

The purpose of this Unmanned Aircraft System (UAS) Policy is to establish minimum standards for the safe use and operation of UAS and Small Unmanned Aircraft Systems (SUAS) on any Dallas ISD Bond Projects.

This policy requires that all UAS operations are performed in a manner that mitigates risks to safety, security, and privacy, and ensures compliance with the Federal Aviation Administration (FAA), 14 CFR Part 107 (for commercial purposes) and all applicable laws.

Contractors of any tier that will operate a UAS at a Dallas ISD Project must receive approval in advance in accordance with this Policy.

12.1 Operating Requirements

This Policy sets the minimum requirements for operating UAS. The requirements below must be implemented by the General Contractor, through their respective designated Project Manager. Minimum Requirements for UAS Operations and Operator:

a) Operations of UAS must not be conducted during occupied hours or extracurricular activities.
b) Operators of any UAS must hold a current Remote Pilot Certification.
c) Unmanned Aircraft must be FAA registered.
d) Certificate of Authorization must be in place and all requirements followed. The General Contractor must provide UAS / Drone liability coverage either through endorsement to its General Liability policy or a separate Aircraft Liability policy. The policy must name Dallas ISD as an Additional Insured and provide a waiver of subrogation in favor of Dallas ISD.

12.2 Pre-Operation Procedure

(1) General Contractor must submit a request to the Project Manager and DISD Safety Department **48 hours** prior to fly-through.
(2) Project Manager and DISD Safety Department may accept or reject this request.
(3) The Project Manager must verify with school admin that no activities will be taking place during fly-through.
(4) The Project Manager must notify Dallas ISD Police dispatch and school principal of UAS fly-through.

EXHIBITS

POLICY STATEMENT

It is the Dallas ISD's policy that, prior to work, Contractors are required to submit for review, an acceptable Site-Specific Safety Plan that includes safe and health work practices. The Owner's Representative will evaluate the plan to see that it meets the safety requirements for the Project's scope of work.

It is critical that contractors understand the importance of developing an effectively functioning Site-Specific Safety Plan that is pro-active and addresses the exposures to their employees for the particular work to be done. This should be addressed extensively in the Site-Specific Safety Plan.

The Site-Specific Safety Plan must provide guidelines to implement an accident prevention program on Dallas ISD projects, and fully describes the Contractor's commitments for meeting its obligations to provide safe and healthful working conditions for its employees.

This Document is intended to provide a working, uniform minimal level of program guidelines to assist or provide direction to the Contractors. This Document is not intended to replace the need for each Contractor of any tier to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBITS:

- EXHIBIT A – Campus Readiness Form
- EXHIBIT B – Job Hazard Analysis (JHA)
- EXHIBIT C – Demolition SPA Cover Letter
- EXHIBIT D – Confined Space SPA Cover Letter
- EXHIBIT E – Trenching and Excavation SPA Cover Letter
- EXHIBIT F – Pier Drilling SPA Cover Letter
- EXHIBIT G – Utility Shutdown SPA Cover Letter
- EXHIBIT H – Electrical Shutdown SPA Cover Letter
- EXHIBIT I – Shutdown Authorization Form
- EXHIBIT J – Elevated Work SPA Cover Letter
- EXHIBIT K – Crane Operation SPA Cover Letter
- EXHIBIT L – Steel Erection SPA Cover Letter
- EXHIBIT M – Aerial Crane Operation SPA Cover Letter
- EXHIBIT N – Hot Work Permit
- EXHIBIT O – Incident Investigation Report
- EXHIBIT P – Safety Inspection Checklist
- EXHIBIT Q – Contractor Acknowledgement Statement

EXHIBIT A – Campus Readiness Form

A completed copy of this form, along with **photographs of each area** must be provided to the Owner's Representative one (1) working day prior to the return of staff and students to ensure sustainability of proper separation of all work areas and conditions affected by all construction activities.

General Contractor: _____ Project & ORG Number:_____

Person in Charge:_____ Date and Time of Completion: _____

Column: **A** = Adequate	Column: **B** = Inadequate	Column: **C** = Not Applicable

Focused Areas	A	B	C
Appropriate Barricades to prevent non-construction personnel from entering work areas.			
Proper signage displayed near the temporary barricades.			
Access to school facility clean, orderly, and safe, e.g., sidewalks, building entrances, lobbies, corridors, aisles, stairways, etc.			
Critical systems functional, e.g., life safety systems, air conditioning systems, water systems, electrical systems, etc.			
Laydown and Staging areas neat and orderly.			
Campus EAP not impacted by construction activities, e.g., travel ways, access, emergency exits, and egress points, maintained clear of obstructions.			
Proper Traffic Control with work that interfaces with traffic or public			
Trash Dumpsters maintained			
Excavations, Trenches properly barricaded			
All floor holes and openings into which persons can accidentally walk or fall through are guarded by a physical barrier or cover, secured, and labeled.			
Heavy Equipment inside a fenced area and properly secured to prevent unauthorized access.			
Hydraulic Booms and/or Cranes not suspended over playgrounds or occupied areas.			
Construction work areas are kept segregated from school operations, staff, and students			
Nails, screws, and rebar not protruding from lumber or other materials in occupied areas.			
Means of egress for the school occupancy is maintained, free of obstructions, clean, and properly illuminated.			
Remarks:			

EXHIBIT B – Job Hazard Analysis (JHA)

Project Name:	**Contractor Name:**
Date:	**Competent Person Name:**
Scope of work to be Performed:	

EMERGENCY CONTACT LIST ASSOCIATED WITH THIS ACTIVITY		
Name	**Title**	**Phone Number**
1.	1.	1.
2.	2.	2.
3.	3.	3.

STEPS OF THE ACTIVITY	POTENTIAL HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS
1.		
2.		
3.		
4.		

STEPS OF THIS ACTIVITY	POTENTIAL HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

Potential Fall Hazards	Potential Struck-By Hazards
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Potential Electrical Hazards	Potential Caught In-between Hazards
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Required Personal Protected Equipment

☐ Hard Hat	☐ Fall Protection	☐ Welding Hood
☐ Gloves	☐ Life Vest	☐ Welding Leathers
☐ Respirator	☐ Hearing Protection	☐ Welding Gloves
☐ Safety Boots	☐ Face Shield	☐ Safety Vest
☐ Rubber Boots	☐ Cutting Goggles	☐ High Vis Pants
☐ Safety Toed Boots	☐ Safety Glasses	☐ Blasting Hood
☐ Tyvek Suits	☐ Safety Goggles	☐ Other (if checked list PPE in the column spaces above)

List Other Protective Equipment (PPE)	
1.	
2.	
3.	
4.	
5.	

Required Equipment and Tools

☐ Telehandler	☐ Concrete Saw	☐ Welding Machine
☐ Crane	☐ Concrete Bucket	☐ Angle Grinder
☐ Scissor Lift	☐ Ladder	☐ HEPA Filtered Tools
☐ Boom Lift	☐ Generator	☐ LOTO System
☐ Scaffolding System	☐ Hand Tools	☐ GFCI
☐ Excavator	☐ Powder Actuated	☐ Cutting Torch
☐ Roofing Kettle	☐ 4-Gas Meter	☐ Other (list on right side)

Other Equipment & Tooling	
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Required Traffic Control Equipment	
☐ Lane Closure	☐ Pilot Car
☐ Barrier Rail	☐ Signage
☐ Trench Plates	☐ Speed Limit
☐ Flagger Station	☐ 6' Fencing

Utilities Located / Marked	
☐ Gas	☐ Overhead
☐ Electric	☐ Sewer/Water
☐ Fiber	☐ Telecommunications
☐ Irrigation	☐ Other Utilities Located:_____

PERSONNEL PARTICIPATING IN THIS ACTIVITY		
Name (Printed)	**Signature**	**Company**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

EXHIBIT C – Demolition SPA Cover Letter

The following Demolition requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Demolition activities must not be performed during regular school hours or near occupied areas.**

To hold an on-site Demolition SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Start Date: _____

Demolition SPA must include but is not limited to the following:

- ☐ Scope of Work (describe methods, safe working procedures, and any critical systems affected by this operation. Critical systems include life safety systems, security systems, etc.)
- ☐ Make Safe (confirm if asbestos, lead, and/or other hazardous materials are present within the immediate work areas, provide LOTO procedure, and engineering survey)
- ☐ Asbestos Awareness Training Records (for all crewmembers performing this task)
- ☐ Competent Person Letter of Designation (include areas of competency and signatures)
- ☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)
- ☐ Silica Exposure Prevention Plan
- ☐ Existing Utilities (describe safe working practices associated with any known utilities that may be affected by demolition activities)
- ☐ Site Map (identifying areas to be affected by demolition)
- ☐ Emergency Action Plan (including emergency contact information and medical facility)
- ☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT D – Confined Space SPA Cover Letter

The following Confined Space Entry requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work.

To hold an on-site Confined Space SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Entry Date: _____

Confined Space SPA must include but is not limited to the following:

- ☐ Scope of Work (describe methods, operating procedures, and affected work areas)
- ☐ Confined Space Entry Procedure (describe atmospheric testing/monitoring methods, ventilation, communication, and make safe procedures to be taken prior to entry)
- ☐ Site Map (identifying entry points, emergency egress locations, and work areas affected by this operation)
- ☐ Confined Space Training Records (for all crewmembers performing this task)
- ☐ Competent Person Letter of Designation (include areas of competency)
- ☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)
- ☐ Emergency Action Plan (describe emergency actions to be taken should a worker need rescue, first aid, medical treatment, or emergency contact information)
- ☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT E – Trenching and Excavation SPA Cover Letter

The following Trenching and Excavation SPA pre-meeting requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Trenching and Excavation activities must not be performed during regular school hours or near occupied school areas.**

To hold an on-site Excavation SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Start Date: _____

Trenching and Excavation SPA must include but is not limited to the following:

☐ Scope of Work (describe methods, known utilities in the area, and any affected right-of-way)

☐ Utility Strike Prevention (include GPR report, potholing method, and preventative measures)

☐ Excavation Training Records (for all crewmembers performing this task)

☐ Competent Person Letter of Designation (include areas of competency and signatures)

☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)

☐ Site Map (identify areas affected by this operation and underground utility shut-off locations)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT F – Pier Drilling SPA Cover Letter

The following Pier Drilling SPA pre-meeting requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Pier Drilling activities must not be performed during regular school hours or near occupied school areas.**

To hold an on-site Pier Drilling SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Start Date: _____

Pier Drilling SPA must include but is not limited to the following:

☐ Scope of Work (describe methods, known utilities in the area, and any affected right-of-way)

☐ Utility Strike Prevention (include GPR report, potholing method, and preventative measures)

☐ Competent Person Letter of Designation (include areas of competency and signatures)

☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)

☐ Site Map (identify areas affected by this operation and underground utility shut-off locations)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT G – Utility Shutdown SPA Cover Letter

The following Utility Shutdown requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Contractors of any tier must at no time perform any type of power or other utility shutdown activities during regular school hours**.

To hold an on-site Utility Shutdown SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Shutdown Date: _____

Utility Shutdown SPA must include but is not limited to the following:

- ☐ Shutdown Authorization Form (EXHIBIT I) must be submitted **10 days prior** to any planned shutdown and must contain pre-work notification signatures of approval)
- ☐ Scope of Work (describe methods, operating procedures, and any critical systems affected by this shutdown. Critical systems include life safety systems, security systems, kitchen, etc.)
- ☐ De-energizing System (describe system to be shutdown, methods for controlling hazardous energy, inadvertent release of stored energy, and make safe procedures)
- ☐ Contingency Plan (to prevent any disruptions to school operations, describe emergency actions to be taken for restoring system operations as quickly as possible)
- ☐ Restoring System (describe methods for safely restoring systems, removal of LOTO devices)
- ☐ Competent Person Letter of Designation (include areas of competency and signatures)
- ☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)
- ☐ Site Map (identifying areas where shutdown is to be performed)
- ☐ Emergency Action Plan (including emergency contact information and medical facility)
- ☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT H – Electrical Shutdown SPA Cover Letter

The following Electrical Shutdown requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work.

To hold an on-site Electrical Shutdown SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Shutdown Date: _____

Electrical Shutdown SPA must include but is not limited to the following:

- ☐ Shutdown Authorization Form (EXHIBIT I) must be submitted **10 days prior** to any planned shutdown and must contain pre-work notification signatures of approval)
- ☐ Scope of Work (describe methods, operating procedures, and any critical systems affected by this shutdown. Critical systems include life safety systems, security systems, kitchen, etc.)
- ☐ De-energizing System (describe system to be shutdown, methods for controlling hazardous energy, inadvertent release of stored energy, and make safe procedures – NFPA 120.2)
- ☐ Contingency Plan (to prevent any disruptions to school operations, describe emergency actions to be taken for restoring system operations as quickly as possible)
- ☐ Restoring System (describe methods for safely restoring systems, removal of LOTO devices)
- ☐ Electrically Qualified Person [NFPA 70 E] Training Records – NFPA 120.2(b)(2)
- ☐ Competent Person Letter of Designation (include areas of competency and signatures)
- ☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)
- ☐ Site Map (identifying areas where shutdown is to be performed)
- ☐ Emergency Action Plan (including emergency contact information and medical facility)
- ☐ JHA (include hazard assessment equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT I – Shutdown Authorization Form

Dallas Independent School District
Bond Program
Scheduled Utility Shutdown Authorization Form: General Contractor(s)

SECTION A. GENERAL INFORMATION: ☐ ***Permanent** ☐ **Temporary**

School Name and Org. #: _____

Bond Program Manager (PM) Name: _____

General Contractor (GC) Person In-Charge: _____ _____

Sub-Contractor (SUB) Person In-Charge: (Name) _____ (Contact No.) _____

SECTION B. PRE-WORK NOTIFICATION:

Utility System(s) to Be Shut down: _____

Utility Meter number _____

Description of Work Performed: _____

Describe Procedure for Shutdown: _____

Safety Measures/ Precautions for Shutdown: _____

Date/ Time **Requested** for Shutdown: _____ Shutdown Date _____ Shutdown Time _____ Restart Date _____ Restart Time

It is requested that the noted** building system(s) be allowed for "shutdown" **by the General Contractor to allow for our tie-in of services for the Project as enumerated below. We note that** five (5) days advance notice **is required as a minimum. I hereby certify that the required work has been coordinated and scheduled to achieve completion within the requested time-period.

SUB Person-In-Charge: **(Sign)** _____ **(Date)** _____

GC Person-In-Charge: _____ (Sign) _____ (Date)

Bond Program Manager (PM) Approval: _____ (Sign) _____ (Date)

DISD Project Manager Approval: _____ (Sign) _____ (Date)

SECTION C. POST-WORK CERTIFICATION:

Actual Date/ Time for Shutdown: _____ Shutdown Date _____ Shutdown Time _____ Restart Date _____ Restart Time

GC Person-In-Charge Certification: _____ (Sign) _____ (Date)

Bond Program Manager (PM) Certification: _____ (Sign) _____ (Date)

DISD Project Manager Certification: _____ (Sign) _____ (Date)

DISD Sustainability Certification: _____ (Sign) _____

SECTION D. PROCESS FOR SCHEDULED UTILITY SHUTDOWN AUTHORIZATION

A. The General Contractor is to complete the *Utility Shutdown Request Form*, at least **5 working days** prior to the scheduled utility shutdown, and submit it to the respective Bond Program Manager for approval.

B. The Bond Program Manager (PM) will review and approve submitted *Utility Shutdown Request Form* and forward to the respective Dallas ISD Project Manager for approval.

C. The Dallas ISD Project Manager will review and approve form and return to the PM.

D. PM forwards approved form to Director/Maintenance Solutions and notifies Deputy Chief Director, Emergency Operations and Bond Program Safety Manager.

Note: All scheduled shutdown requests will require a jobsite meeting with the Program Manager and the School staff 48 hours in advance to discuss the outage procedures and status of all District departments involved on the shutdown request.

Note: For electrical shutdowns (Scheduled/ involuntary), when required for building operations, the General contractor must supply a power generator to keep the telephones, data and alarms working at all times.

***Permanent shutdowns are facilities or specific meters that will not require power/ utility to be restored.**

EXHIBIT J – Elevated Work SPA Cover Letter

The following Elevated Work SPA pre-meeting requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **No roof work, regardless of the extent, is to be done over an occupied area/building.**

To hold an on-site Elevated Work SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Start Date: _____

Elevated Work SPA must include but is not limited to the following:

☐ Scope of Work (describe methods, operating procedures, and affected work areas)

☐ Fall Protection (describe systems to be used, methods, anchor point locations, etc.)

☐ Fall Protection Training Records (for all crewmembers performing this task)

☐ Competent Person Letter of Designation (include areas of competency and signatures)

☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)

☐ Site Map (identifying areas where work is to be performed)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT K – Crane Operation SPA Cover Letter

The following Crane Operation requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Booms or suspended loads must not be allowed to pass over playgrounds or other school property when there is a potential for students or staff to be present in these areas and/or within any fall radius.**

To hold an on-site Crane Operations SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Lift Date: _____

Crane Operations SPA must include but is not limited to the following:

☐ Scope of Work (describe methods, operating procedures, and affected work areas)

☐ Crane Location and Logistics Plan (identify underground and overhead crane hazards)

☐ Lift Plan (identify load capacities, means of communication, and rigging/lifting methods)

☐ Site Map (identifying sequence of operation and fall radius in relation to any occupied areas)

☐ Crane Certificate of Insurance and Annual Inspection Records

☐ Competent Person Letter of Designation (include areas of competency and signatures)

☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)

☐ Crane Operator Certification and Medical Card

☐ Rigger and Signal Person Training Records

☐ Fall Protection (if applicable, describe systems to be used, methods, anchor point locations, etc.)

☐ Fall Protection Training Records (for all crewmembers performing this task)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT L – Steel Erection SPA Cover Letter

The following Steel Erection requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Steel Erection must not be allowed when students and/or staff are present in occupied areas and/or within any fall radius.**

To hold an on-site Steel Erection SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Start Date: _____

Steel Erection SPA must include but is not limited to the following:

☐ Scope of Work (describe methods, operating procedures, and affected work areas)

☐ Steel Erection Plan (describe equipment placement, lifting methods, and connection procedures)

☐ Written Notification from the General Contractor confirming concrete footings, piers, and/or walls have been cured to a level that will provide adequate structural strength and stability.

☐ Site Map (identifying sequence of operation and fall radius in relation to any occupied areas)

☐ Fall Protection procedures (describe systems to be used, Controlled Access Zones, etc.)

☐ Fall Protection Training Records (for all crewmembers performing this task)

☐ Rigger and Signal Person Training Records

☐ Competent Person Letter of Designation (include areas of competency and signatures)

☐ Competent Person Training Documentation (OSHA 10-hour and First Aid/CPR)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

Note: This Document is **not** intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

EXHIBIT M – Aerial Crane Operation SPA Cover Letter

The following Aerial Crane Operation requirements have been established for the General Contractor's Safety Manager. The General Contractor's Safety Manager must ensure and approve that its Subcontractor's SPA documentation meet all Federal, State, and local regulations and the requirements outlined in this manual prior to submitting for review.

The General Contractor's Safety Manager must submit this Cover Letter, along with the criteria listed below, to the Owner's Representative 5-7 days of any planned critical phases of work. **Aircraft or suspended loads must not be allowed to pass over playgrounds or other school property when there is a potential for students, staff, or public to be present in these areas and/or within any potential drop zones.**

To hold an on-site Aerial Crane Operations SPA pre-work meeting, at a minimum, the following parties must be present:

- ✓ Subcontractor Competent Person
- ✓ General Contractor Safety Representative
- ✓ Owner's Representative [Optional]

Campus Name and ORG Number: _____

Subcontractor Name and Competent Person: _____

General Contractor Name and Site-Superintendent: _____

General Contractor Safety Manager Signature of Approval: _____

Anticipated Lift Date: _____

Aerial Crane Operations SPA must include but is not limited to the following:

☐ Lift Plan (scope of work, travel path, ground level and ariel hazards or obstructions)

☐ Site Set-Up (overhead map of staging areas, sequence of operation, primary and alternate emergency area locations, and potential drop zones in relation to occupied areas)

☐ Material to be lifted (method of attachment, rigging to be used, configuration, and load capacities)

☐ Roles and responsibilities (communication methods for ground crew, roof crew, and operator)

☐ Competent Person Letter of Designation form (include areas of competency and proof of training)

☐ Rigger and signal person training records

☐ JHA (include hazard assessment, equipment, and PPE needed to safely perform this task)

☐ Emergency Action Plan (including emergency contact information and medical facility)

☐ Standard Airworthiness Certificate

☐ Congested Area Plan Request to FAA

☐ FAA Registry of Aircraft

☐ FAA Airman Detail Report

☐ Notification of Dallas City Officials

☐ Certificate of Aircraft liability insurance (insurance limit must be $10 million, per contract amount)

☐ Evidence of additional insured and waiver of subrogation endorsement

EXHIBIT N – Hot Work Permit

All temporary work involving open flames, intense heat, or sparks will require a Hot Work Permit. The permit must be issued by the contractor and authorized by the appropriate supervisor before any hot work (welding, brazing, cutting, grinding, etc.) can begin. Two copies of the Hot Work Permit must be made. One should be filed with the contractor. The second copy should be posted at the site of the hot work until the job is completed.

Issue Date:	Permit Expires:	
Building:	Sub:	Area:
Authorizing Supervisor (GC):	Start Time:	End Time:
Operator:	Fire Watch:	

Checklist

Following items must be checked by the authorizing supervisor and operator/welder. If any item is checked "No", then hot work must not begin until item or area is corrected.

Yes	No	
☐	☐	Work area examined
☐	☐	Equipment inspected, in good repair
☐	☐	PPE inspected, in good repair
☐	☐	Sprinkler system operable
☐	☐	Combustible materials/items moved a radius of 35 feet away from work area.
☐	☐	Explosive atmosphere (s) eliminated
☐	☐	Floor and wall openings covered
☐	☐	Fire watch assigned and required during work and for 30 minutes afterwards*
		*Fire watch must be at least 30 minutes in duration
☐	☐	Fire watch has ample extinguishing equipment and is trained to properly use it
☐	☐	Work area is considered a confined space (if yes additional confined space will be required. Contact supervisor before proceeding)
☐	☐	Proper ventilation provided for the work area

Other precautions

1._____

2._____

Authorizing Supervisor Signature:_____ Date:_____

Final Checkup: To be completed after hot work is finished and fire watch is over

The work area and all surrounding areas subjected to heat and sparks were monitored during the hot work operations and during the required fire watch period and found to be safe.

Fire Watcher Signature: _____ Title:_____ Date:_____

EXHIBIT O – Incident Investigation Report

CONTRACTOR: _____ACCIDENT DATE: _____TIME: _____LOCATION _____

ACCIDENT LOCATION (SPECIFIC): _____

WHAT HAPPENED? (Describe operation, activity, condition and how accident or loss occurred.

Use separate sheet and diagram if necessary): _____

_____

Recommended correction action:

_____

Equipment involved #: _____Employee involved: _____

Employee Injury (Describe):

_____

Root Cause (Describe): _____

Medical referral? Yes____ No_____

Company Property Damage or Loss

(Describe): _____

DISD Property, Damage, or Injury to Others

(Describe): _____

Witnesses (Name, address, phone): _____

Police Report Number: _____ DISD Police Report Number: _____

Foreman/Supervisor_____ Date: _____

Keep Original in contractor's File and CC: Owner's Representatives

[Attach Photos]

EXHIBIT P – Safety Inspection Checklist

SAFETY INSPECTION CHECKLIST				
Contractor:	Contract No.			
Job-site Location:				
Person in Charge:				
Date: Time:				
Person(s) making inspection:	Column: A= Adequate B= Inadequate N/A = Not Applicable			
PROGRAM ADMINISTRATION:	A	B	N/A	REMARKS
1. Posting OSHA and other job-site warning posters.				
2. Do you have safety meetings?				
3. Job safety training, including first-aid training?				
4. Is first-aid equipment and supplies available?				
5. Are job-site injury records being kept?				
6. Are emergency telephone numbers, such as police department, fire department, doctor, hospital, and ambulance, posted?				
HOUSEKEEPING AND SANITATION:	A	B	N/A	REMARKS
1. General neatness of working areas.				
2. Regular disposal of waste and trash.				
3. Passageways and walkways clear?				
4. Adequate lighting.				
5. Protruding nails removed or bent over?				
6. Oil and grease removed.				
7. Waste containers provided and used.				
8. Sanitary facilities adequate and clean.				
9. Drinking water potable.				
10. Adequate supply of water.				

11. Disposable drinking cups.				
FIRE PREVENTION:	A	B	N/A	REMARKS
1. Fire instructions to personnel.				
2. Fire extinguishers identified, checked, accessible.				
3. Proper fire extinguishers provided.				
4. Hydrants clear, access to public thoroughfare open.				
5. Good housekeeping.				
6. "No Smoking" signage posted and enforced where needed.				
7. Fire brigades.				
ELECTRICAL INSTALLATIONS:	A	B	N/A	REMARKS
1. Adequate wiring, well insulated.				
2. Circuit breakers and GFCI (where required) provided.				
3. Fire hazards checked.				
4. Electrical danger signs posted.				
5. Are terminal boxes equipped with required covers? Are covers used?				
HAND TOOLS:	A	B	N/A	REMARKS
1. Proper tool being used for each job.				
2. Neat storage, safe carrying.				
3. Inspection and maintenance.				
4. Damaged tools repaired or replaced promptly. Are employee's tools inspected and repaired?				

POWER TOOLS:	A	B	N/A	REMARKS
1. Good housekeeping where tools are used.				
2. Tools and cords in good condition.				
3. Proper grounding.				
4. Proper instruction in use.				
5. All mechanical safeguards in use.				
6. Tools neatly stored when not in use.				

7. Right tool being used for the job at hand.				
8. Wiring properly installed.				
POWDER ACTUATED TOOLS:	A	B	N/A	REMARKS
1. Local laws and ordinances complied with.				
2. All operators trained.				
3. Tools and charges protected from unauthorized use.				
4. Competent instruction and supervision.				
5. Tools checked and in good working order.				
6. Tools not used on anything but recommended materials.				
7. Safety goggles or face shields provided and used.				
8. Flying hazard checked by backing up, removal of personnel, or use of captive stud tool.				
LADDERS:	A	B	N/A	REMARKS
1. Ladders inspected and in good condition?				
2. Secured to prevent slipping, sliding, or falling?				
3. Do side rails extend 36" above top of landing?				
4. Rungs or cleats not over 12" on center.				
5. Metal ladders not used around electrical hazards.				
6. Proper maintenance and storage.				
7. Are ladders not painted?				

SCAFFOLDING:	A	B	N/A	REMARKS
1. Is erection properly supervised?				
2. Will all structural members meet the safety factor?				
3. Are all connections secure?				
4. Is scaffold tied into structure where necessary?				
5. Are working areas free of debris, snow, ice, grease?				
6. Are base plates and mud sills provided?				
7. Are workers protected from falling objects?				

8. Is the scaffold plumb and square with cross- bracing?				
9. Are guardrails, intermediate rails, and toe boards in place?				
10. Are hoist ropes and cables in good condition?				
HOISTS, CRANES AND DERRICKS:	A	B	N/A	REMARKS
1. Inspect cables and sheaves.				
2. Check slings and chains, hooks, and eyes.				
3. Equipment firmly supported.				
4. Outriggers used, proper cribbing.				
5. Power lines deactivated, removed or at safe distance				
6. Proper loading for capacity of lifting radius.				
7. All equipment properly lubricated and maintained.				
8. Signalman where needed.				
9. Signals understood and observed.				
10. Are inspection and maintenance logs maintained?				
HEAVY EQUIPMENT:	A	B	N/A	REMARKS
1. Regular inspection and maintenance.				

2. Lubrication and repair of moving parts.				
3. Lights, brakes, warning signals operative.				
4. Wheels chocked when necessary.				
5. Haul roads well maintained and laid out properly.				
6. Protection when equipment is not in use.				
7. Shut-off devices on hose lines in case of failure?				
MOTOR VEHICLES:	A	B	N/A	REMARKS
1. Regular inspection and maintenance.				
2. Qualified operators.				
3. Brakes, lights, warning devices operative.				

4. Weight limits and load sizes controlled.				
5. Is all glass in good condition?				
6. Are back-up (reverse) alarms provided?				
7. Fire extinguishers provided in all vehicles?				
BARRICADES:	A	B	N/A	REMARKS
1. Floor openings planked over and secured, or barricaded.				
2. Roadways and sidewalks effectively protected.				
3. Adequate lighting provided.				
4. Traffic controlled.				
HANDLING AND STORAGE OF MATERIALS:	A	B	N/A	REMARKS
1. Are materials properly stored or stacked?				
2. Are passageways clear?				
3. Stacks on firm footings, not too high.				
4. Proper number of men for each operation.				
5. Are workers lifting loads correctly?				

6. Are materials protected from weather conditions?				
7. Protection against falling.				
8. Is dust protection observed?				
9. Extinguishers and other fire protection provided.				
10. Is traffic controlled in the storage area?				
EXCAVATION AND SHORING:	A	B	N/A	REMARKS
1. Are adjacent structures properly shored?				
2. Is shoring, benching, or sloping used for soil depth or excavation properly sloped?				
3. Are roads and sidewalks supported and protected?				
4. Is material stored at least 2 feet from excavations?				
5. Is excavation barricaded and lighting provided?				
6. Is equipment a safe distance from edge of excavation?				
7. Are ladders provided where needed?				

8. Are equipment ramps adequate?				
9. Is job supervisor on-site during trenching operations?				
DEMOLITION:	A	B	N/A	REMARKS
1. Are operations planned ahead?				
2. Is there shoring of adjacent structures?				
3. Are material chutes used?				
4. Is there sidewalk and other public protection?				
5. Adequate access ladders or stairs.				
FLAMMABLE GASSES AND LIQUIDS:	A	B	N/A	REMARKS
1. All containers U.L. approved meeting OSHA requirements with contents clearly identified.				
2. Proper storage practices observed.				
3. Fire hazards checked.				
4. Proper storage temperatures and protection.				
5. Proper types and number of extinguishers nearby.				
6. Carts for moving cylinders available.				
MASONRY:	A	B	N/A	REMARKS
1. Proper scaffolding.				
2. Saws properly equipped; dust protection provided.				
ROADWAY CONSTRUCTION:	A	B	N/A	REMARKS
1. Laws and ordinances observed.				
2. Flag-person properly dressed, instructed, and posted.				
3. Adequate warning signs and markers.				
4. Equipment not blocking right of way.				
5. Traffic control through construction site.				
6. Adequate marking and maintenance of detours.				
7. Dust control.				
8. Adequate lighting.				
PERSONAL PROTECTIVE EQUIPMENT:	A	B	N/A	REMARKS
1. Eye and Head protection.				
2. Face shields.				
3. Respirators and masks.				
List actions to be taken for all items found non-compliant				

EXHIBIT Q – Contractor Acknowledgement Statement

Campus Name and ORG Number: _____

Contractor Name:_____

Date: _____

By executing this document as an authorized representative of the referenced Company identified above, I acknowledge and confirm that I have read and understand the contents of the Dallas ISD Construction Safety Program Guidelines in its entirety.

I also recognize and acknowledge that the obligation to protect the safety and health of all persons affected by construction activities is not limited to the requirements of the Dallas ISD Construction Safety Program Guidelines only, but also includes all applicable OSHA, Federal, State, and local regulations, and guidelines necessary to provide a safe and healthful working environment for all contractors, campus staff, students, and general public.

The Contracting Company and its employees will comply with all applicable safety requirements while performing work on any Dallas ISD property. The Company will further communicate the requirements of the Dallas ISD Construction Safety Program Guidelines and other applicable OSHA, Federal, State, and local regulations, and guidelines to all tiered Subcontractors that will perform work on the Project and retain a physical signed copy of this Contractor Acknowledgement Statement from each such Subcontractor.

_____
(Name of Authorized Representative)

_____
(Signature of Authorized Representative)

_____
(Date Signed)

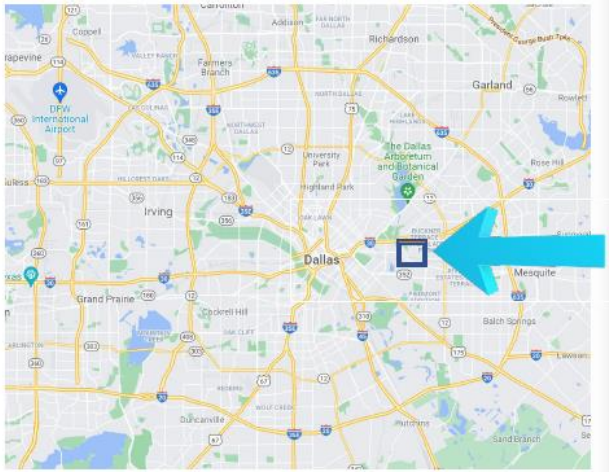
ATTACHMENTS

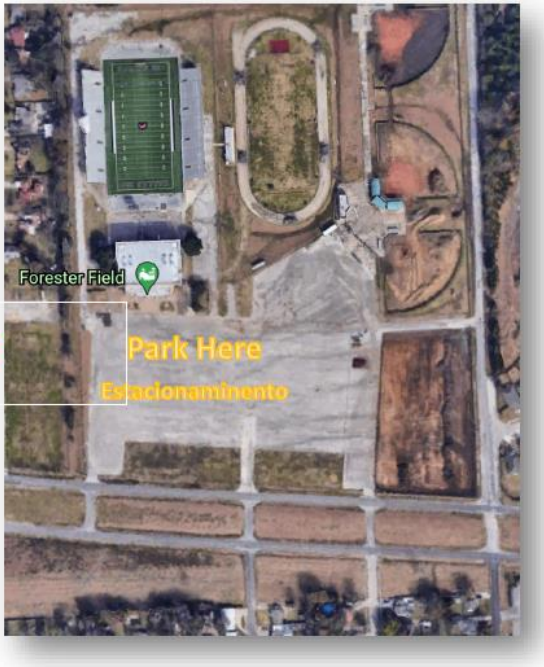
- Attachment I – Dallas ISD Orientation Location and Schedule
- Attachment II – Site-Specific Safety Plan Guidelines
- Attachment III – Crisis Communications Poster
- Attachment IV – Visitor's Release and Hold Harmless Agreement
- Attachment V – Shutdown Notification Guidelines
- Attachment VI – SWPPP Oversight Flowchart
- Attachment VII – Greenfield Shutdown Authorization Request Guidelines
- Attachment VIII – Intruder Detection
- Attachment IX – Campus Security Reminders
- Attachment X – Safety Meeting Sign-in Sheet
- Attachment XI – Geotechnical Soil Sampling Safety Guidelines
- Attachment XII – Inclement Weather Plan of Action

Dallas ISD Orientation Location and Schedule

DALLAS INDEPENDENT SCHOOL DISTRICT

Construction Services





Dallas ISD
Construction Safety Orientation
(Orientacion de Seguridad)

Location/Ubicacion
Forester Field
8233 Military Pkwy
Dallas, TX 75227

Schedule/Horario
7:30am-8:30am
Tuesday and Thursday
Martes y Jueves

You must have your Dallas ISD Badge to attend this orientation.

Usted debe tener su identificacion para poder asistir a esta Orientacion.

CRITERIA FOR DEVELOPING A SITE-SPECIFIC SAFETY PLAN

Prior to work, Contractors are required to submit for review, an acceptable Site-Specific Safety Plan that includes safe and health work practices. The Owner's Representative will evaluate the plan to see that it meets the safety requirements for the Project's scope of work.

A Site-Specific Safety Plan must include but is not limited to the following:

(1) **Scope of Work:** A description of the scope of work is to be included on the front page of the Site-Specific Safety Plan.

(2) **Job Safety Procedures:** Explain in detail and specifically how job safety is to be incorporated into each phase of the scope of work. Use of ladders, scaffolds, flagging, equipment, exposures, special conditions, fall protection, etc., must be included for the plan to be accepted. Generalities will not be accepted to Explain the safety and health conditions employees will be exposed to.

(3) **General Contractor's Site-Specific Safety Orientation:** Each employee who is new to the jobsite must receive a thorough safety and hazard communication orientation, which imparts basic information about the project safety and health program, federal/state regulations, and other safety rules and regulations needed to perform tasks safely. Future safety instructions may be necessary if hazardous work and/or unfamiliar tasks are performed.

(4) **Competent Person Designation(s):** Competent Person Designation Form(s) accompanied by a valid First Aid/CPR and OSHA 30-hour certification (within 5 years of the issuing date) must be provided for all on-site persons designated as competent.

(5) **Supervising for Safety:** Explain how supervisors are going to constantly review the safe practices and procedures. Jobsite inspections are required daily. An inspection checklist should be documented at least weekly.

(6) **Disciplinary Policy:** Contractor must explain disciplinary action for any employee who jeopardizes his health or safety, or the health or safety of others.

(7) **Subcontractor Compliance:** Explain how Subcontractor compliance with your safety program and the Construction Minimum Safety Program Guidelines Manual will be verified and documented. When Subcontractor's programs are deficient, the General Contractor must be responsible for providing them with the necessary training and protection. This must be documented.

(8) **Incident Investigation Procedure:** Explain how the General Contractor and involved Subcontractors will investigate all incidents involving a near miss, injury, and/or property damage. Investigation Procedures must include a Root Cause Analysis and Corrective Action Plan to prevent reoccurrence.

(9) **Emergency Action Plan:** Describe Actions to be taken should an emergency occur. Emergency Action Plans must cover injuries, fires, evacuations, and similar situations. Plans must include designated emergency contact names and telephone numbers, e.g., on-site supervision, police department, fire department, doctor, hospital, and ambulance.

(10) **Personal Protective Equipment:** Describe Personal Protective Equipment (PPE) to be worn, training requirements, and parameters for its use.

(11) **Occupational Health Programs:** Site-specific Occupational Health and Illness Prevention Programs are required to protect employees working on the project, i.e., Asbestos Awareness, Air Monitoring, Silica, Sampling, Special Protective Clothing or Equipment, and Particular Hazards.

(12) **Job Hazard Analysis (JHA):** Explain the formal job hazard analysis process

(13) **Task Training:** Contractors are required to task train employees in the exposures they will be confronted with and the job they are expected to perform. Other situations, however, may arise during the course of the project that will require additional training. Explain how task training will be accomplished, how often it will be conducted, and who will be conducting the training.

(14) **Reporting Unsafe Acts or Conditions:** Explain the program in place that promotes positive feedback to supervision and employees who report unsafe acts and/or conditions.

(15) **Toolbox Talk Safety Meetings:** These must be held and documented at least weekly. Explain who will be responsible for conducting these meetings, when they will be held, and where they will be held.

(16) **Fire Prevention and Protection Plan:** Explain the job-site fire prevention and protection program in detail.

(17) **Hazard Communication Program:** Provide copy of the Site-specific Haz-Com program.

(18) **Lock-out/Tag-out (LOTO) Program**: Provide a copy of the Site-specific LOTO Program

(19) **Confined Space Entry:** Provide a copy of the Site-specific Confined Space Program

(20) **Trenching/Excavation and Utility Strike Prevention**: Provide a copy of the Site-specific Trenching/Excavation Procedures and a Utility Strike Prevention Plan.

(21) **Fall Protection and Prevention Program:** Provide a copy of the Site-specific Fall Protection and Prevention Program

(22) **Traffic Control Plan:** Provide a copy of the Site-specific Traffic Control Plan

(23) **Substance Abuse Policy:** Provide a copy of the Substance Abuse Policy

(24) **Special Instructions and Information:** Provide any special instruction or additional safety information as it relates to the unique conditions and/or environment associated with the project.

Note: The requirements outlined in this Document are intended to provide a working, uniform minimal level of program guidelines to assist or provide direction to Contractors. This Document is **not** intended to replace the need for each Contractor of any tier to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

CONSTRUCTION SITE Crisis Communications GUIDELINES

SUGGESTED STEPS FOR CRISIS SITUATIONS:

1. Evaluate the situation and extent of damage or injuries.
2. If students are present, immediately contact the principal or school office.
3. Call 9-1-1 if necessary. Be prepared to give the dispatcher details of the accident and injuries, the exact address and where emergency crews should enter the site.
4. Assign someone to meet emergency crews at the gate.
5. Call Dallas ISD Communications at (972) 925-3917. Be prepared to provide as much information as possible.
6. Call Dallas ISD Police at (214) 932-5627.
7. Call Construction Services at (972) 925-7200.
8. Call the Safety Manager at (214) 435-2204.
8. Other than as noted below, *do not speak* to reporters or photographers. Refer them to Dallas ISD Communications.

How to handle reporters who come to the construction site:

There is no such thing as "off the record." Be polite, but firm. Tell reporters and photographers they must wait off-site, outside the main gate, until an authorized Dallas ISD spokesperson arrives. Do not push, shove, block, or attempt to physically restrain a reporter or photographer. When dealing with reporters, photographers or TV crews, always assume that they are recording.

EMERGENCY TELEPHONE NUMBERS:

Dallas ISD Police
(214) 932-5627

Robyn Harris
Dallas ISD Communications/ District Spokesperson
(972) 925-3917

Alvaro Meza
Bond Program Safety Manager
(214) 435-2204

DALLAS INDEPENDENT SCHOOL DISTRICT

Visitor's Release and Hold Harmless Agreement

General Contractor: _____

Project Name: _____ Date: _____

In consideration of being permitted, for my own purposes and interests, to enter upon the premises or construction site of Dallas Independent School District Construction Project, I hereby release, hold harmless, and indemnify the Dallas Independent School District, Consultants, Inspectors, Contractors and Subcontractors from and against, and assume the risk for and on behalf of myself, my heirs, my supervisor and my estate, all damages, losses, injuries and any and all other claims of any type whatsoever for personal injury (including death) and other loss or damage of any nature whatsoever including damage to my personal property, and reasonable attorney's fees and court costs sustained or caused while on such premises or site.

In the event any clause, term, or provision of this agreement must be declared or adjudicated void or invalid, it must in no manner affect the other clauses, terms, and provisions hereof, which must remain in full force and effect, as if the clause, term, or provision so declared or adjudicated invalid was not originally a part hereof.

Visitor's Name: _____

Visitor's Signature: _____

Address: _____

Date: _____

Shutdown Notification Guidelines

The General Contractor must provide Dallas ISD with notification of power or other utility shutdown no less than ten (10) calendar days in advance of the shutdown. Notification includes Dallas ISD Central Maintenance Office, A/E, Program Manager, and the Principal at each affected school.

- Shutdown Authorization Form (EXHIBIT I) must be submitted to the Dallas ISD Bond Program Manager and Dallas ISD Project Manager for signatures of approval **10 days prior** to any planned shutdown.
- Shutdowns to be scheduled during weekends or extended breaks.
- Overtime Code may be needed for Dallas ISD Personnel involved after hours.
- Permanent shutdowns must be field verified by Contractor. If utility service remains active, immediately report to DISD Sustainability via Bond PM.

Water Shut-off Guidelines

Notification To:

- ✓ Dallas ISD Quadrant Supervisor
- ✓ Dallas ISD Department Supervisor
- ✓ Affected Dallas ISD Departments & Confirmation of readiness (Including but not limited to HVAC, Kitchen, Fire Suppression, etc.)
- ✓ Dallas ISD Sustainability Manager and/or Technician

Content of Notification:

- ✓ Signed Authorization form-DISD PM.
- ✓ Type of Shutdown: Emergency, Minor, Complete, Relocation.
- ✓ Meter number (if applicable).
- ✓ Area affected, Duration, and Contingency Plan
- ✓ SPA-Cover Letter Authorized by GC Safety Representative
- ✓ When relocating a utility, DISD Sustainability department must be notified.

Dallas ISD Plumbing Department:

- Department Manager: Bart Braswell
- SE Quad Supervisor: Jesse Rincon
- SW Quad Supervisor: James Baker
- NE Quad Supervisor: Justin Morris
- NW Quad Supervisor: David Martin
- Sustainability Department Manager: Bryant Shaw
- Sustainability Department Technician: Stephanie Garcia

Re-pressurizing:

- ✓ Include City Inspection
- ✓ Contractor to provide post inspection along with photos to DISD Plumbing Manager

Gas Shut-off Guidelines

Notification To:

- ✓ Quadrant Supervisor
- ✓ Department Manager
- ✓ Affected Departments & Confirmation of readiness (Including but not limited to HVAC, Kitchen, etc.)
- ✓ Dallas ISD Sustainability Manager and/or Technician

NOTE: When adding HVAC units, Project AE approval of increased load is expected.

Content of Notification:

- ✓ Signed Authorization form-DISD PM.
- ✓ Type of Shutdown: Emergency, Minor, Complete, Relocation.
- ✓ Meter number (if applicable).
- ✓ Area affected, Duration, and Contingency Plan
- ✓ SPA-Cover Letter Authorized by GC Safety Representative
- ✓ When relocating a utility, DISD Sustainability department must be notified.

Re-pressurizing:

- ✓ Include City Inspection
- ✓ Contractor to provide post inspection along with photos to DISD Plumbing Manager

Sanitary Sewer Guidelines

Notification To:

- ✓ Quadrant Supervisor
- ✓ Department Manager
- ✓ Dallas ISD Sustainability Manager and/or Technician

Content of Notification:

- ✓ Signed Authorization form-DISD PM
- ✓ Type of Shutdown: Emergency, Minor, Complete
- ✓ Meter number (if applicable)
- ✓ Area affected, Duration, and Contingency Plan
- ✓ SPA-Cover Letter Authorized by GC Safety Representative
- ✓ PMF PM to provide a Post Audit to DISD Plumbing Manager
- ✓ Include Pictures of tie-in
- ✓ Include City Inspection for all work.

Tie-In Guidelines:

- ✓ PMF PM to provide post inspection of service to DISD Plumbing Manager.

Electrical Shutdown Guidelines

Notification To: [Prior to Shut down and after restoration of service]

- ✓ ONCOR (if applicable)
- ✓ DISD Electrical Quadrant Supervisor
- ✓ DISD Electrical Department Supervisor
- ✓ MEP Director
- ✓ Dallas ISD Sustainability Manager and/or Technician.
- ✓ Affected Departments & Confirmation of readiness (HVAC, Kitchen, IT, Building Security, Fire Alarm, etc.)

Dallas ISD Electrical Department:

- Department Director: Bart Webster
- Department Manager: George Lakes
- NW Supervisor: Ainsworth, Steven
- NE Supervisor: Kevin T Liles
- SE Supervisor: Douglas Hall
- SW Supervisor: Jim Ward

Dallas ISD Sustainability Department:

- Sustainability Department Manager: Bryant Shaw
- Sustainability Department Technician: Stephanie Garcia

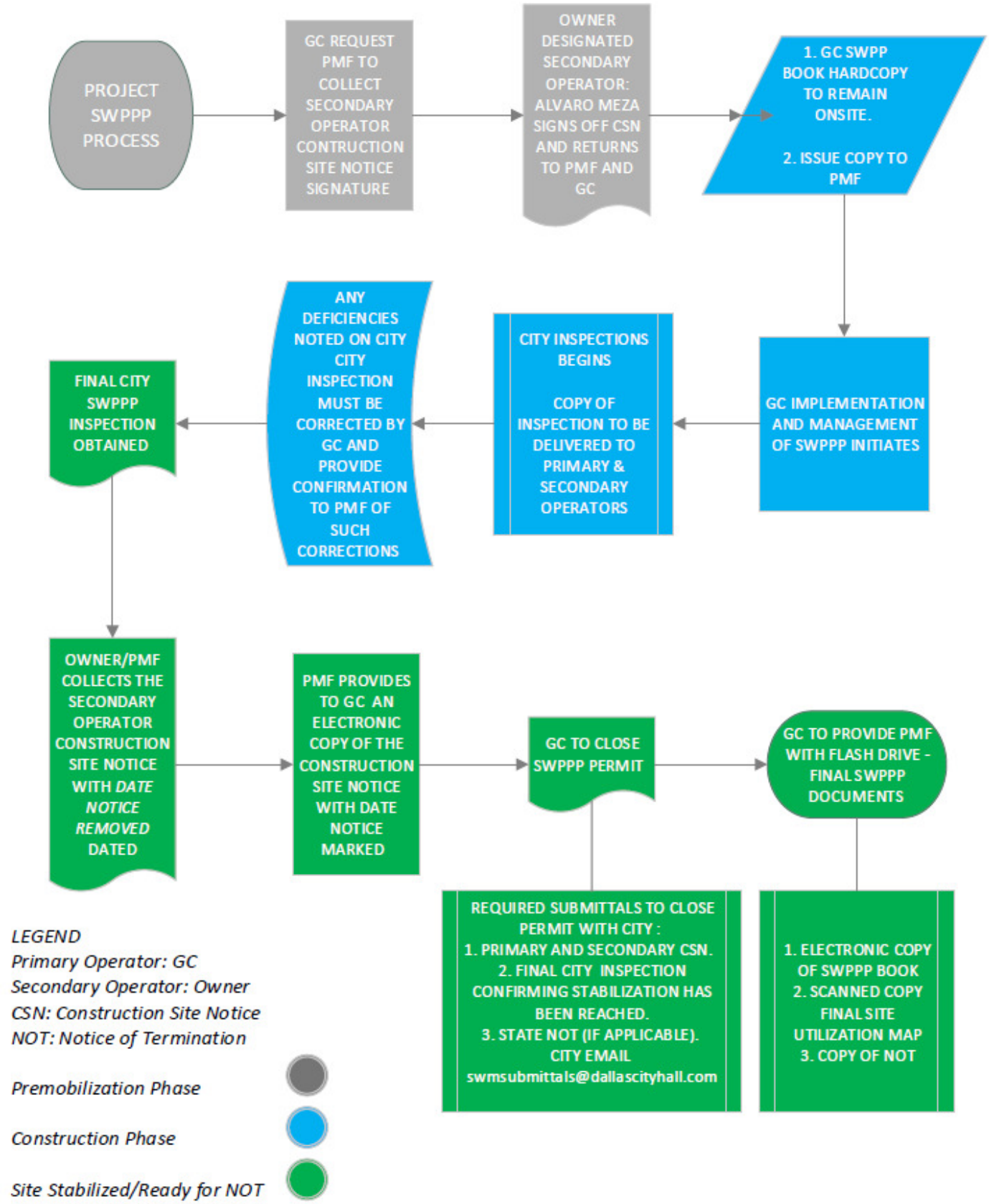
Content of notification:

- ✓ Signed Authorization form-DISD PM
- ✓ Type of Shutdown: Emergency, Minor, Complete
- ✓ Meter number (if applicable)
- ✓ When relocating a utility, DISD Sustainability department must be notified
- ✓ Area affected, Duration, and Contingency Plan
- ✓ SPA-Cover Letter Authorized by GC Safety Representative
- ✓ Complete-Shutdowns-

Re-energizing:

- ✓ Quadrant Supervisor
- ✓ Department Supervisor
- ✓ Affected Departments & Confirmation of readiness (HVAC, Kitchen, IT, Building Security, Fire Alarm, etc.)
- ✓ Electrical Contractor to gradually increase power

SWPPP Oversight Flowchart



Greenfield Shutdown Authorization Request Guidelines

See below set of guidelines for greenfield projects requesting permanent utility shutdown:

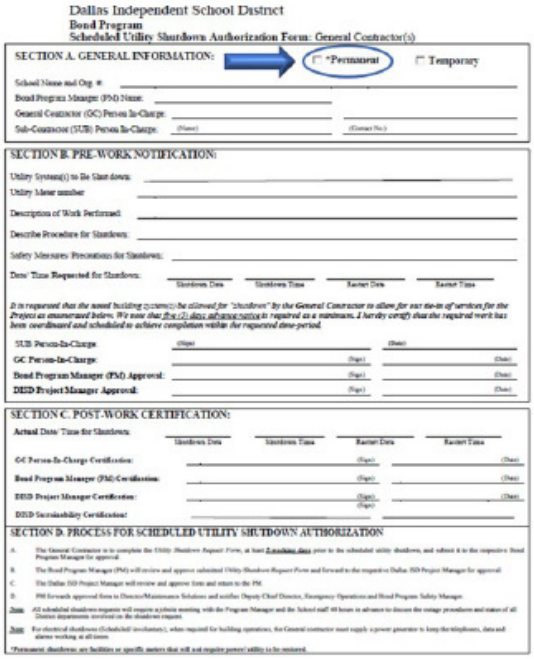
1. **Utility Shutdown request should select PERMANENT on the top right portion of our authorization form. (See below sample)**

2. **General Contractor (GC) responsible to provide power for the duration of the project.**

3. **Once the project reaches substantial completion, the GC/PMF to provide the Dallas ISD Sustainability Department with a copy of the GC utility bills to transfer the utility service to Dallas ISD.**

If you have any questions, please reach out to Dallas ISD Sustainability Department: sg9453@dallasisd.org

Note:
- Before demolishing a portable and/or building all meters numbers should be provided to DISD sustainability department to closed account and have the meters removed through the Owner provider.
- Please be reminded there is a "Minimum of 10-day(s) advance notice" for utilities.
It is very important that ALL Utility Accounts are closed through sustainability to prevent the GC reimbursing the district.
- Lastly, DISD is not responsible to provide GC utilities on Greenfield Locations.



Dallas Independent School District
Bond Program
Scheduled Utility Shutdown Authorization Form: General Contractor(s)

SECTION A. GENERAL INFORMATION: ☐ *Permanent ☐ Temporary

School Name and Org. #:
Bond Program Manager (PM) Name:
General Contractor (GC) Person In-Charge:
Sub-Contractor (SUB) Person In-Charge: (Name) (Contact No.)

SECTION B. PRE-WORK NOTIFICATION:

Utility System(s) to Be Shut down:
Utility Meter number:
Description of Work Performed:
Describe Procedure for Shutdown:
Safety Measures/ Precautions for Shutdown:
Date/ Time Requested for Shutdown: Shutdown Date / Shutdown Time / Restart Date / Restart Time

It is requested that the named building systems/s be allowed for "shutdown" by the General Contractor to allow for our tie-in of services for the Project as enumerated below. We note that five (5) days advance notice is required as a minimum. I hereby certify that the required work has been coordinated and scheduled to achieve completion within the requested time-period.

SUB Person-In-Charge: (Sign) (Date)
GC Person-In-Charge: (Sign) (Date)
Bond Program Manager (PM) Approval: (Sign) (Date)
DISD Project Manager Approval: (Sign) (Date)

SECTION C. POST-WORK CERTIFICATION:

Actual Date/ Time for Shutdown: Shutdown Date / Shutdown Time / Restart Date / Restart Time

GC Person-In-Charge Certification: (Sign) (Date)
Bond Program Manager (PM) Certification: (Sign) (Date)
DISD Project Manager Certification: (Sign) (Date)
DISD Sustainability Certification: (Sign)

SECTION D. PROCESS FOR SCHEDULED UTILITY SHUTDOWN AUTHORIZATION

A. The General Contractor is to complete the Utility Shutdown Request Form, at least 5 working days prior to the scheduled utility shutdown, and submit it to the respective Bond Program Manager for approval.
B. The Bond Program Manager (PM) will review and approve submitted Utility Shutdown Request Form and forward to the respective Dallas ISD Project Manager for approval.
C. The Dallas ISD Project Manager will review and approve form and return to the PM.
D. PM forwards approved form to Director/Maintenance Solutions and notifies Deputy Chief Director, Emergency Operations and Bond Program Safety Manager.

Note: All scheduled shutdown requests will require a phone meeting with the Program Manager and the School staff 48 hours in advance to discuss the outage procedures and status of all District departments involved on the shutdown request.

Note: For electrical shutdowns (Scheduled/ involuntary), when required for building operations, the General contractor must supply a power generator to keep the telephones, data and alarm working at all times.

*Permanent shutdowns are facilities or specific meters that will not require power/ utility to be restored.

AGENDA FOR CAMPUS SECURITY MEETING

Sign-in Sheet

- ✓ All personnel in attendance must sign-in

Welcome

- ✓ Purpose of the Meeting – To Review the Requirements Regarding Intruder Detection and Campus Security.

Intruder Detection

- ✓ All visitors must enter through the campus' secured entry point
- ✓ Immediately report any suspicious activity to the Project Management Team
- ✓ Always be alert – See Something, Say Something, Do Something
- ✓ Stop any individuals in your building who do not display a District Badge or Visitor Badge and escort them to the main office.

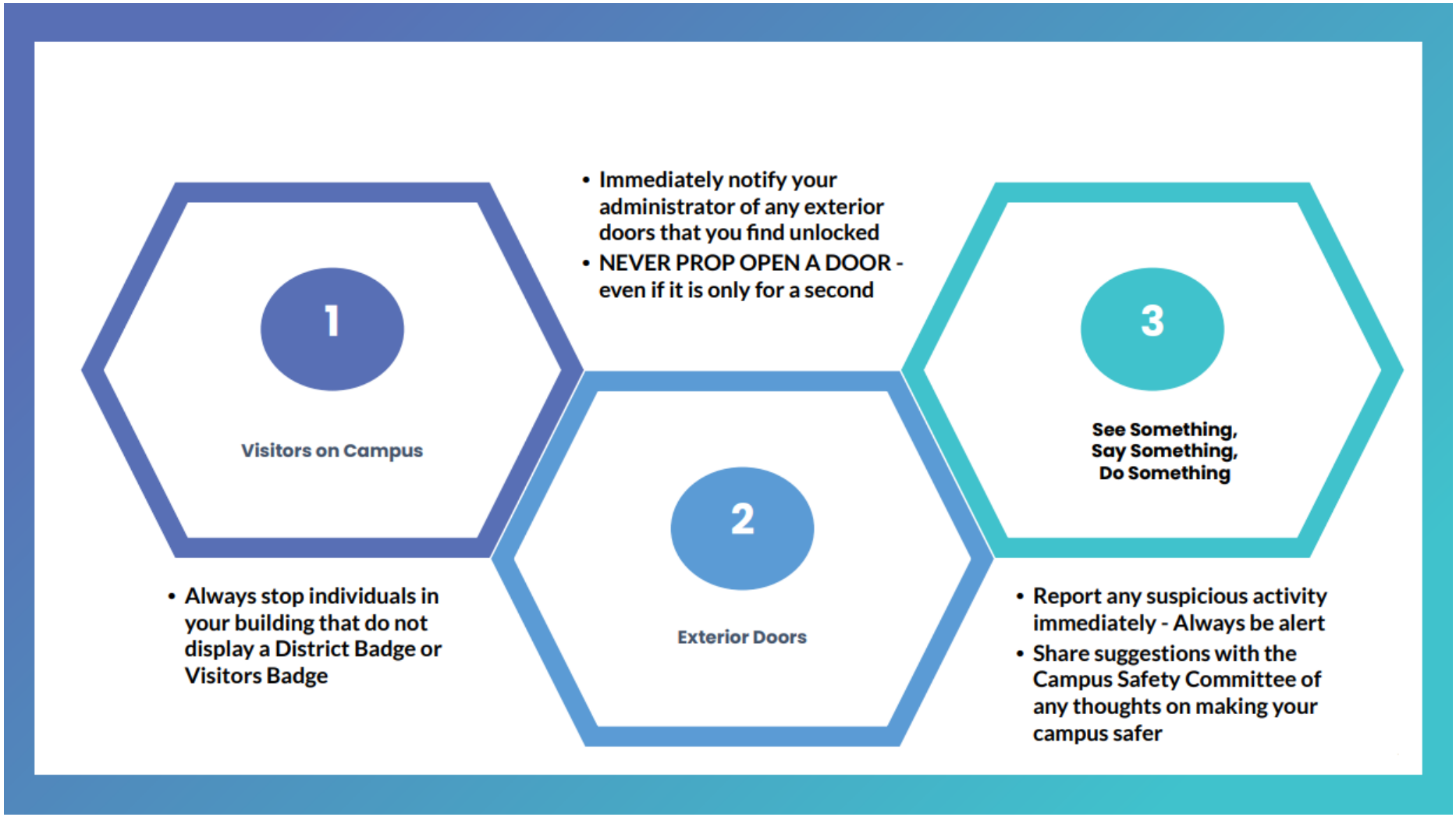
Propped Doors and Secured Areas

- ✓ **NEVER** prop open a door for any reason
- ✓ All exterior doors must remain locked at all times
- ✓ All interior doors leading into construction areas must remain locked at all times
- ✓ Portable doors are considered exterior doors and must be locked at all times
- ✓ Immediately notify the Project Management Team of any exterior door that you may find unlocked or propped open

Questions and Answers:

Note for General Contractors: All locked doors leading into construction areas and/or restricted pathways must be communicated with the campus Principal and Fire Marshal to ensure restrictions and/or physical alterations of any kind do not conflict with Campus Emergency Action Plans, Emergency Egress and NFPA 101 Life Safety Codes.

Campus Security Reminders



Safety Meeting Sign-in Sheet

DATE: _____ PROJECT: _____

CONTRACTOR:_____

Foreman's Signature:_____

Safety Representative:_____

TOPICS DISCUSSED:_____

NAME – PRINTED	SIGNATURE	COMPANY
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

Geotechnical Soil Sampling Safety Guidelines

General Information:_____

School Name and Org #:_____

Bond Program Manager: _____

Company Name: _____ Supervisor: _____Cell Phone_____

Scope: _____Boring Map Location Attached: [circle] YES or NO

Mobilization Date: _____ Demobilization Date: _____Work Hours: _____

Minimum Drilling Safety Guidelines:

1. ALL crew members must be properly badged.
2. Schedule site access through your Dallas ISD Project Manager
3. [If Applicable] Pre-approved signed forms for custodial overtime may apply. Please confirm with your Dallas ISD PM.
4. During arrival, check in at the front office with badge displayed in the upper body and face cover.
5. Drill Rig must be barricaded and NOT be operated in occupied school areas.
6. Before any excavation is started, should contact 811 DIG-TESS for confirmation, Ground penetrating radar (GPR), review of existing plans, and any other reasonable efforts shall be made to determine if any underground utilities (i.e.: power lines, water lines, fuel lines, etc.) are present within the boundaries of the proposed work area. As the excavation work approaches the location of any known utilities, the lines shall be uncovered, using extreme caution not to disturb the lines, and adequate measures shall be taken to protect the lines from damage while the work progresses.
7. Any disturbed areas must be returned to existing and safe condition prior to departure.
8. Damage to property-Injuries Beyond First Aid must be immediately reported to Alvaro Meza 214-435-2204 and your Dallas ISD Project Manager.

NOTE: This Document is intended to provide a working, uniform minimal level of program guidelines to assist or provide direction to the Contractors. This Document is not intended to replace the need for each Contractor to establish and maintain a proper Illness and Injury Prevention Program as required by the Department of Labor, Occupational Safety and Health Act (29 CFR 1926 and 29 CFR 1910) and the State of Texas.

Inclement Weather Plan of Action

General Guidelines
PMFs are required to notify and coordinate with the GCs to take proactive steps during inclement weather events. •Construction Services may schedule a coordination call prior to any severe weather event with PMF (in a group call or individually- These calls or meetings may be on a regular or impromptu basis as needed) to share information about projects with medium/high probability of damage to property or interruption to school operations. The intent is to provide Construction Services a complete situational awareness of a school's readiness for return of students, and to eliminate or mitigate risk to DISD's facilities.

PRIOR to Inclement Weather Event:
For projects under construction PMF to provide a report to DISD Construction Services any conditions that may impact campus occupancy or function.
Coordination with DISD Maintenance (Managers and Supervisors) and Custodial Services (campus, and supervisors), along with Principals is REQUIRED. Be prepared to report this coordination.

POST Inclement Weather Event:
•PMFs to conduct a field verification and begin the mitigation phase.
•Work with contractors and appropriate maintenance personnel to create a recovery plan
•Provide Construction Services a real time update - by campus- on said issue(s)•Reporting shall continue as needed till mitigation is completed.

Return of Students and Staff
•PMF Leadership or designee to coordinate with campus Principal and Facility Supervisor. iffeasible, PMF Project Manager will be on site for that morning to confirm good working schooloperations.

Sample Reporting
•013-FD Roosevelt – No issues to report
•013-FD Roosevelt- 2. Campus has an issue – Provide detailed description and mitigation.

The intent of this document is to establish a minimum level of proactive steps/reporting, but not be completely inflexible.
After Action Reviews or a Root Cause Analysis may be required. Information should be captured to support these events

[End of Document]

DISD 2020 Bond – General Contractor

Step One: Set up your project account with Field Control Analytics formerly FC Construction Services

- Visit **www.fcbackground.com/clientsignup/**
  (Internet Explorer 5.0 or higher required)
- Enter your Project Pass Code: **DI20SC21**

EXISTING CUSTOMERS: You will be required to provide login credentials to complete signup. If you do not know your login credentials contact Customer Support @ customer.support@fieldca.com

You will be required to provide the following information. You will be unable to complete signup without all.

- Billing address and contact information
- Contact information for all authorized users
- Name and contact information for the company that hired you (Prime Contractor)
- Credit card information for payment

ALLOW TWO FULL BUSINESS DAYS FOR ACCOUNT SETUP COMPLETION AND NOTICE TO CLIENT/EMPLOYER

Step Two: Initiate Project Drug Testing, Background Check, and Badging

DISD 2020 Bond - $74.50 *(see Pricing Agreement for details)*
Replacement Badge Fee – $25.00 * Enrollment Fee - $50.00

1. Upon setup completion, contractor receives **Web Instructions** to download/print **Consent Document**.
2. Consent Document. ($25.00 handling fee for employees without a properly authorized Consent Document. No appointment necessary and maps are available online.)
3. Most results are available within one business day, but may take up to three. Authorized users will receive an e-mail notification when report results are available.
4. DISD badges will be printed and available for pickup at the facility selected during project setup.

Other Important Information

- FCA notifies your General Contractor of all unpaid invoices.
- If a worker fails a drug test, he/she will not be authorized to work for the duration of the project.

Background checks and badging requires one of the following identification sources of a person:

- Current U.S. Driver's License
- U.S. Birth Certificate (along with photo id)
- Current US Passport
- U.S. Citizenship Naturalization
- Foreign Passport
- U.S. issued photo ID Card
- Temporary identification card
- Resident Visa
- Employment Visa

Acceptable forms of ID do not include the non-US issued Matricula Card.

DISD 2020 Bond Badge Qualifications:

- Negative drug test result
- No felony convictions, no open or pending felony cases for crimes against a minor (no time limit)
- No felony convictions, no open or pending felony cases for crimes against a person (25 years)
- No felony convictions, no open or pending felony cases (7 years)
- No misdemeanor crimes (see misdemeanor offenses below). Misdemeanor records are limited to the previous 7-years.
- No registered sex offenders
- No outstanding warrants for crimes that would disqualify an individual from receiving a badge

Misdemeanor Offenses Include the following:

Possession of a Prohibited Weapon
Unlawful Carrying Weapon
Purchase/Furnish Alcohol to Minor
Assault Causes Bodily Injury
Terroristic Threat
Enticing a Child
Harboring Runaway Child
Violation of a Protective Order
Criminal Mischief
Burglary
Shoplifting
Theft
Larceny
Fraud
Forgery
Passing Forgery Writing
Fleeing from Police Officer
Leaving Scene of Accident
Failure to Stop and Give Information
Fail to Identify Giving False/Fictitious Info
Resisting Arrest
Evading Arrest/Detention
Escape from Custody
Interference with Public Duties
Disorderly Conduct
Interference with Emergency Call
Harassment
Prostitution

FCA Client Support Team
Phone: (972) 404-4479
Monday - Friday 6:00am – 6:00pm CST
customer.support@fieldca.com



DISD 2020 Bond – Professional Services

Step One: Set up your project account with Field Control Analytics formerly FC Construction Services

- Visit **www.fcbackground.com/clientsignup/**
  (Internet Explorer 5.0 or higher required)
- Enter your Project Pass Code: **DI20PS21**

EXISTING CUSTOMERS: You will be required to provide login credentials to complete signup. If you do not know your login credentials contact Customer Support @ customer.support@fieldca.com

You will be required to provide the following information. You will be unable to complete signup without all.

- Billing address and contact information
- Contact information for all authorized users
- Name and contact information for the company that hired you (Prime Contractor)
- Credit card information for payment

ALLOW TWO FULL BUSINESS DAYS FOR ACCOUNT SETUP COMPLETION AND NOTICE TO CLIENT/EMPLOYER

Step Two: Initiate Project Drug Testing, Background Check, and Badging

DISD 2020 Bond - $74.50 *(see Pricing Agreement for details)*
Replacement Badge Fee – $25.00 * Enrollment Fee - $50.00

1. Upon setup completion, contractor receives **Web Instructions** to download/print **Consent Document**.
2. Consent Document. ($25.00 handling fee for employees without a properly authorized Consent Document. No appointment necessary and maps are available online.)
3. Most results are available within one business day, but may take up to three. Authorized users will receive an e-mail notification when report results are available.
4. DISD badges will be printed and available for pickup at the facility selected during project setup.

Other Important Information

- FCA notifies your General Contractor of all unpaid invoices.
- If a worker fails a drug test, he/she will not be authorized to work for the duration of the project.

Background checks and badging requires one of the following identification sources of a person:

- Current U.S. Driver's License
- U.S. Birth Certificate (along with photo id)
- Current US Passport
- U.S. Citizenship Naturalization
- Foreign Passport
- U.S. issued photo ID Card
- Temporary identification card
- Resident Visa
- Employment Visa

Acceptable forms of ID do not include the non-US issued Matricula Card.

DISD 2020 Bond Badge Qualifications:

- Negative drug test result
- No felony convictions, no open or pending felony cases for crimes against a minor (no time limit)
- No felony convictions, no open or pending felony cases for crimes against a person (25 years)
- No felony convictions, no open or pending felony cases (7 years)
- No misdemeanor crimes (see misdemeanor offenses below). Misdemeanor records are limited to the previous 7-years.
- No registered sex offenders
- No outstanding warrants for crimes that would disqualify an individual from receiving a badge

Misdemeanor Offenses Include the following:

Possession of a Prohibited Weapon
Unlawful Carrying Weapon
Purchase/Furnish Alcohol to Minor
Assault Causes Bodily Injury
Terroristic Threat
Enticing a Child
Harboring Runaway Child
Violation of a Protective Order
Criminal Mischief
Burglary
Shoplifting
Theft
Larceny
Fraud
Forgery
Passing Forgery Writing
Fleeing from Police Officer
Leaving Scene of Accident
Failure to Stop and Give Information
Fail to Identify Giving False/Fictitious Info
Resisting Arrest
Evading Arrest/Detention
Escape from Custody
Interference with Public Duties
Disorderly Conduct
Interference with Emergency Call
Harassment
Prostitution

FCA Client Support Team
Phone: (972) 404-4479
Monday - Friday 6:00am – 6:00pm CST
customer.support@fieldca.com



DISD 2020 Bond - Subcontractor

Step One: Set up your project account with Field Control Analytics formerly FC Construction Services

- Visit **www.fcbackground.com/clientsignup/**
  (Internet Explorer 5.0 or higher required)
- Enter your Project Pass Code: **DI20SC21**

EXISTING CUSTOMERS: You will be required to provide login credentials to complete signup. If you do not know your login credentials contact Customer Support @ customer.support@fieldca.com

You will be required to provide the following information. You will be unable to complete signup without all.

- Billing address and contact information
- Contact information for all authorized users
- Name and contact information for the company that hired you (Prime Contractor)
- Credit card information for payment

ALLOW TWO FULL BUSINESS DAYS FOR ACCOUNT SETUP COMPLETION AND NOTICE TO CLIENT/EMPLOYER

Step Two: Initiate Project Drug Testing, Background Check, and Badging

DISD 2020 Bond - $74.50 *(see Pricing Agreement for details)*
Replacement Badge Fee – $25.00 * Enrollment Fee - $50.00

1. Upon setup completion, contractor receives **Web Instructions** to download/print **Consent Document**.
2. Consent Document. ($25.00 handling fee for employees without a properly authorized Consent Document. No appointment necessary and maps are available online.)
3. Most results are available within one business day, but may take up to three. Authorized users will receive an e-mail notification when report results are available.
4. DISD badges will be printed and available for pickup at the facility selected during project setup.

Other Important Information

- FCA notifies your General Contractor of all unpaid invoices.
- If a worker fails a drug test, he/she will not be authorized to work for the duration of the project.

Background checks and badging requires one of the following identification sources of a person:

- Current U.S. Driver's License
- U.S. Birth Certificate (along with photo id)
- Current US Passport
- U.S. Citizenship Naturalization
- Foreign Passport
- U.S. issued photo ID Card
- Temporary identification card
- Resident Visa
- Employment Visa

Acceptable forms of ID do not include the non-US issued Matricula Card.

DISD 2020 Bond Badge Qualifications:

- Negative drug test result
- No felony convictions, no open or pending felony cases for crimes against a minor (no time limit)
- No felony convictions, no open or pending felony cases for crimes against a person (25 years)
- No felony convictions, no open or pending felony cases (7 years)
- No misdemeanor crimes (see misdemeanor offenses below). Misdemeanor records are limited to the previous 7-years.
- No registered sex offenders
- No outstanding warrants for crimes that would disqualify an individual from receiving a badge

Misdemeanor Offenses Include the following:

Possession of a Prohibited Weapon
Unlawful Carrying Weapon
Purchase/Furnish Alcohol to Minor
Assault Causes Bodily Injury
Terroristic Threat
Enticing a Child
Harboring Runaway Child
Violation of a Protective Order
Criminal Mischief
Burglary
Shoplifting
Theft
Larceny
Fraud
Forgery
Passing Forgery Writing
Fleeing from Police Officer
Leaving Scene of Accident
Failure to Stop and Give Information
Fail to Identify Giving False/Fictitious Info
Resisting Arrest
Evading Arrest/Detention
Escape from Custody
Interference with Public Duties
Disorderly Conduct
Interference with Emergency Call
Harassment
Prostitution

FCA Client Support Team
Phone: (972) 404-4479
Monday - Friday 6:00am – 6:00pm CST
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Farmers Branch, TX 75234
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option 2
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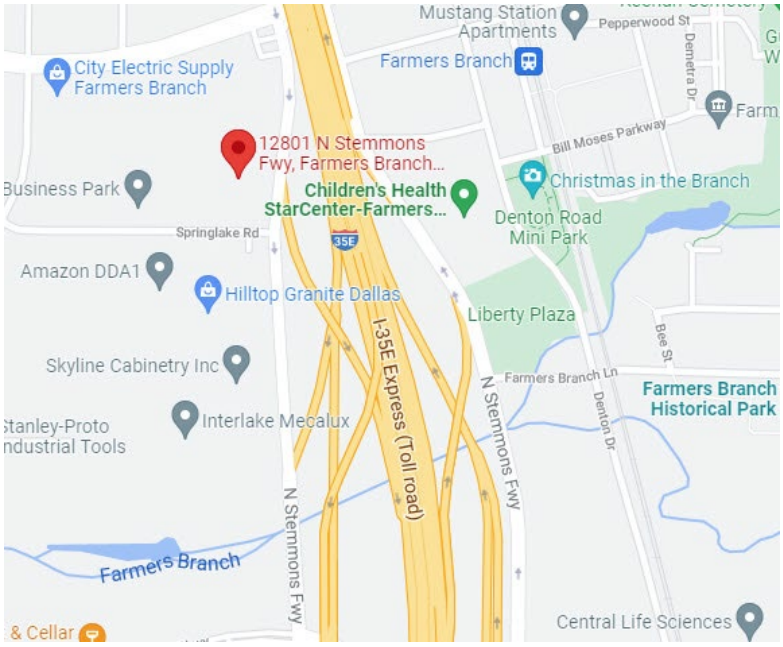

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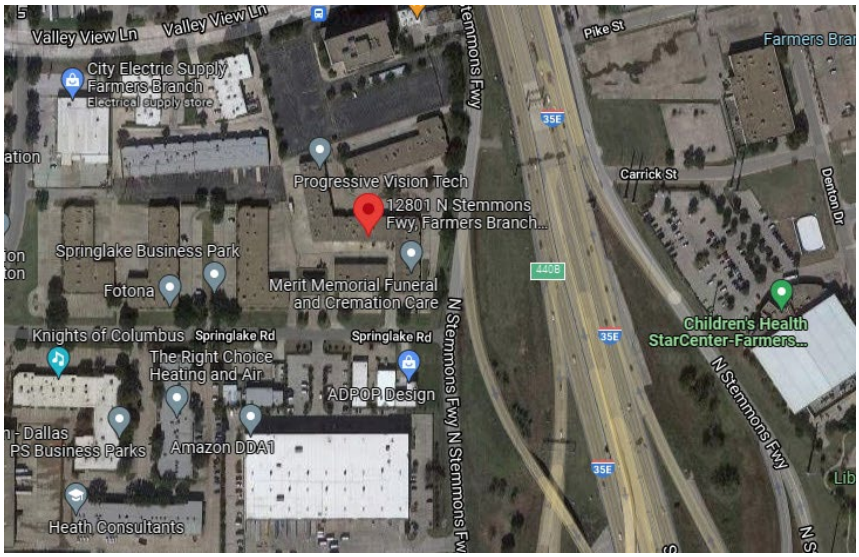

All FCA Express locations can process screens that require a background, drug test and badge.

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SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

PART 2 - <<< Revise this Section by deleting and inserting text to meet Project-specific requirements.

PART 3 - Much of this Section consists of Project-specific data. Examples given in the model text in the Evaluations illustrate possible Section content. Use the model text to develop text for specific Project requirements. See Evaluations.

PART 4 - Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed. >>>

4.1 1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

4.2 1.2 Summary

A. A. Section includes:
1. **Project information**
2. **Work covered by Contract Documents**
3. **Phased construction**
4. **Access to site**
5. **Coordination with occupants**
6. **Work restrictions**

B. B. Related Sections:
1. **Division 00 Section 00 31 00 Available Project Information**
2. **Division 00 Section 00 31 18 School Operations Parameters Statement**
3. **Division 01 Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities**
4. **Division 01 Section 01 52 14 "Temporary Facilities for Students" for specifications and procedures regarding the use of temporary swing space that the Contractor may furnish and install to accommodate the Work**

1.3 Project Information

A. Refer to Section 00 31 00

1.4 Scope of Work. The Work consists of:

120 - L.L. Hotchkiss Elementary School - Renovation

1. **Provide new marquee sign at front entry**
2. **Provide new way-finding site signage**
3. **Provide secure front vestibule - Renovation**
4. **Replace exterior waterproofing/ sealant joints**
5. **Paint all previously painted exterior surfaces and power wash as required**
6. **Provide new landscaping**
7. **Construct new side entry pre-fabricated metal canopy**
8. **Replace outdated exterior windows**
9. **Provide security window film at front vestibule**
10. **Remove and replace concrete sidewalks**
11. **Replace fire alarm**
12. **Provide exterior lighting controls**
13. **Replace exterior lighting with LED**
14. **Provide/replace IDF & MDF air conditioning units**
15. **Provide new VAV Boxes**
16. **Provide security access control and new cameras with pathways (secure front vestibule)**

1.5 Multiple Project Site Representation for Bid Packages. If multiple project sites are identified in the Work, the contractor shall employ and designate one qualified full-time Superintendent who shall oversee the performance on each individual project site within the bid package, for the duration of the project. Any deviation from this will need to be approved by DISD and the Program Manager.

1.6 Schedule of Values for Bid Packages. If multiple project sites are identified in the Work, the contractor shall provide one Schedule of Values for each project site attached to each application for payment. In addition, each school site shall have a separate schedule of values in the CSI format followed in the bid documents, identifying the labor and material components separately. Projects that have both Renovation and Addition scope shall have a sub-total for each of these two categories, within the Schedule of Values.

1.7 Concurrent Construction for Bid Packages. Work (additions and renovations) at each school site will be performed concurrently with the other school sites unless otherwise indicated by DISD.

1.8 Phasing. Since the school buildings will be in use during construction, the Work shall be conducted in such a manner as to not interrupt or disturb school activities. THE PHASING PLANS ARE GUIDELINES AND ARE USED TO IDENTIFY A POSSIBLE APPROACH TO THE WORK. THE CONTRACTOR MAY SUBMIT A PHASING PLAN. ANY DEVIATION FROM THE SUGGESTED PLAN CONTAINED IN THE CONTRACT DOCUMENTS MUST BE APPROVED BY THE A/E, PROGRAM MANAGER, AND PRINCIPAL PRIOR TO IMPLEMENTATION.

A. Temporary classroom space (Swing Space) if needed, shall be provided by the Contractor. The Contractor will be responsible for all associated planning, permitting, scheduling, installation, removal, site restoration, coordination and costs associated with providing temporary space for classrooms. Temporary classroom space will be in accordance with Section 01 52 14 - TEMPORARY FACILITIES FOR STUDENTS.

B. The Contractor may submit, as part of the proposal, optional phasing plans that can potentially save the District time and money.

C. Some work may need to be performed after normal school operating hours, nights and weekends. A DISD representative must be present at the school during times that the Contractor is working at the school site. The Owner will incur overtime costs for DISD staff presence at the school site outside normal hours of school operation, including weekends and holidays. Such overtime costs incurred will be the financial responsibility of the General Contractor and will be credited to the Owner in a manner to be determined by the DISD and the Program Manager.

D. Refer to the School Operations Parameter Statement Section for details of the regular working hours, holidays and procedures for custodial overtime, etc.

E. Work cannot start in a particular Phase until students/staff have been relocated to the designated Swing Space (either in the existing building or in Temporary Buildings outside) or until there is an arrangement in place for alternate shift work involved.

1. Close coordination with the A/E, Program Manager, and the School Staff, will be required of the Contractor.

F. Certain areas included in the Contractor's scope of work may contain furniture, boxes, etc. Protection of these contents is the responsibility of the Contractor.

G. Refer to Construction Documents for additional Phasing information.

1.9 HVAC and Water Treatment Requirements. Contractor will coordinate with DISD for water treatment and HVAC maintenance. Please refer to the plumbing and mechanical specifications for the contractor's responsibilities related to these requirements.

1.10 Phase Acceptance. Upon certification by the Contractor and recommendation of the A/E, DISD will accept the Work of each individual phase as it is completed. Architectural acceptance shall be called "phase acceptance". The HVAC, electrical, plumbing and roofing systems will be accepted by DISD when the entire project has been completed; at that point, upon completion of all relevant contractual requirements, DISD will issue substantial completion. The contractor will operate and maintain the HVAC, electrical and plumbing systems that are a part of his scope of work until substantial completion. The contractor's warranty for any new HVAC, electrical, plumbing and roofing systems shall commence at substantial completion for each school project. The contractor will install new filters and record date of replacement on each filter upon substantial completion.

1.11 Use of Technology for Project Management. DISD will furnish information related to accessing web-enabled project management applications for this contract. DISD and the Program Manager will implement project management software, that will be easily accessible through the Internet. Contractor will cooperate with the Program Manager for the implementation and use of this tool.

Contractor will be required to create and post several types of documents into the web-enabled project management software via the Internet. Request for Information (RFIs) will be posted by the Contractor and responded to by the A/E(s) in the software via the Internet, thereby facilitating communication among all parties and expediting resolution of issues. A/E responses to RFIs will not be considered official and are still subject to revision until the Program Manager has approved the response in the software . Any meeting minutes and field reports required to be created by the Contractor or A/E(s) will be posted to the software. DISD and the Program Manager reserve the right to require additional documents to be entered into the software at their discretion.

1.12 Permitting. Contractors are responsible for the costs of acquiring the building permit at standard City of Dallas rates.

1.13 Storm Water Pollution Prevention Plan. Once the Notice to Proceed has been issued, the Contractor is obligated to comply with the applicable municipalities and applicable SWPPP codes and protocol. The Contractor assumes full responsibility for any complaints, citations, maintenance and complete management of the SWPPP plan including any and all documentation. For new schools with demolition scope by a separate contractor, Contractor shall coordinate with the separate contractor for a seamless transfer / transition of an existing SWPPP. Contractor will then submit all documentation to the District at closeout.

1.14 Construction Specification Index. All construction documentation will follow the Construction Specification Index format followed by the construction bid documents.

1.15 The contractor shall tag locations of all equipment within the scope of work by securing a plastic tag on the appropriate ceiling grid locations. This will assist easy identification of the equipment to DISD maintenance staff. The contractor will install stickers on all equipment provided indicating the warranty dates/periods and the contact information.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. Refer to the AIA 201 General conditions for additional requirements concerning allowances,

2. All lump-sum and Owner Controlled Allowances are within the Contract Sum, and shall be covered by the bonds, insurance, general conditions, overhead, profit and all other costs so that the totals represented by the Allowances are available without additional charge or cost to the Owner.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Owner Controlled Contingency allowances.

C. Related Sections:
1. Division 00, File 00 41 11 - Proposal Form - Base Bid.
2. Division 01, File 01 22 00 - Unit Prices (for procedures for using unit prices)
3. Divisions 02 through 49 (or as applicable) Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, Contractor shall advise Architect and Program Manager of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's or Program Manager's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Once the proposal is approved by the Owner, purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Allowance Expenditure Request Authorization (AERA).

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight, insurance, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.7 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a proposal based on the difference between purchase amount and the allowance.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

B. Schedule of Allowances is included in section 00 41 11

END OF SECTION 01 21 00

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Sections:

1. Division 00 Section 00 41 12 Proposal Form – Alternates and Unit Pricing.
2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Division 01 Section "Quality Requirements" for general testing and inspecting requirements (File: 01 40 00)

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are either increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. If the quantities of the items listed in the Schedule of Unit Prices are increased, the Unit Prices set forth by the Contractor in Section 00 41 12 shall apply to such increased quantities. Unit Prices for adjusting the Contract Sum for less work or material installation will be 95% of these amounts.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

3.1 SCHEDULE OF UNIT PRICES

Refer to section 00 41 12 for Schedule of Unit Prices.

END OF SECTION 01 22 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by Proposers and stated on the Proposal Form for certain work defined in the Proposal Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the total addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum. Pricing for alternates may not be submitted or listed in the form of an allowance amount on the proposal form.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

2. Cost listed for each Alternate includes cost of related coordination, modification or adjustment.

B. Notification: Immediately following award of the Contract, Contractor shall prepare and distribute to each entity or person to be involved in the performance of the Alternate Work, a notification of the status of each Alternate scheduled herein. Indicate which alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates if any.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Contractor shall be responsible for any changes in the Work affected by acceptance of Alternates. Claims for additional costs or time extensions resulting from changes to the Work as a result of the Owner's election of any or all Alternates will not be allowed.

E. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Refer to section 00 41 12 for Schedule of Alternates

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Sections:

1. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
4. Divisions 02 through 49 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor and Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit five (5) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include related Specification Section number and title, Drawing numbers and titles and complete documentation for substitution. Include the following information with each request:
1. Certification by the Contractor to the effect that, in the Contractor's opinion, after thorough evaluation, the proposed substitution will result in work that in every significant respect is equal to or better than the work required by the Contract Documents, and that it will perform adequately in the application indicated.
a. Include in a certification the Contractor's waiver of right to additional payment or time, which may subsequently be necessary because of the failure of the substitution to perform adequately.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from IBC.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any.

3. Approval: If necessary, Architect will request additional information or documentation for evaluation within a reasonable amount time from receipt of a request for substitution. Architect will recommend to the Program Manager acceptance or rejection of proposed substitution within a reasonable amount of time from receipt of all required documentation. Program Manager will recommend to the District acceptance or rejection of proposed substitution within a reasonable amount of time from receipt of all required documentation. Upon recommendation from the Program Manager, the District will provide acceptance or rejection of proposed substitution within a reasonable amount of time from receipt of all required documentation.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work with Program Manager and Owner written approval.
   b. Rejection will include a statement giving reason for rejection.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

B. The Owner may not consider the request if the Contractor cannot provide the product or method because of failure to pursue work promptly or coordinate activities properly.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

Approval process for both types of substitutions shall be as described above.

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within twenty (20) days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect, only when there is an advantage to the Owner. The Owner may override rejections made by the Architect and request that the Program Managers make a determination as to whether the substitution shall be considered by the Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

C. System Substitution: No changes should be anticipated in major building system types or approved manufactures in pricing of schedule; the Owner has standardized materials in place in existing buildings, and will not change for the convenience of the contractor.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Provisions established within the General, Supplementary and Other Conditions of the Contract, Division 1 – General Requirements, and Drawings are collectively applicable to this Section.

1.02 SECTION INCLUDES

A. Procedures for preparation and submittal of Application for Payment.

1.03 RELATED SECTIONS/DOCUMENTS

A. General Conditions: Progress Payment, and Final Payment.

B. Section 01340 – Shop Drawings, Product Data and Samples

C. Section 01370 – Schedule of Values

1.04 FORMAT

A. AIA G702 – Application and Certificate for Payment

B. For continuation sheet, use AIA G703 in format at Section 01 29 73 for schedule of values.

1.05 PREPARTATION OF APPLICATIONS

A. Type required information or use media printout.

B. Execute certification by authorized officer.

C. Use data on accepted Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for products.

D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for original item of Work.

E. Prepare Application for Final Payment as specified by Program Manager.

F. Prepare one application with a schedule of values for each school with a breakdown in the CSI format followed by the bid documents.

G. Projects that have both Renovation and Addition scope shall have a sub-total for each of these two categories, within the Schedule of Values.

1.06 SUBMITTAL PROCEDURES

A. Schedule meeting (20) days prior to submitting first pay request, to review schedule with Architect, and Project Manager.

B. Submit one (1) original copy of each Application for Payment at times stipulated in Agreement.

C. Submit under transmittal letter.

D. Payment Period: Submit at intervals stipulated in the Agreement.

1.07 SUBSTANTIATING DATA

A. When Architect requires substantiating information, submit data justifying line item amounts in questions. On Owner controlled allowance items, submit actual invoices from supplier of product or service.

B. Provide one (1) copy of data with cover letter for each copy of submittal. Show Application number and date, and line item by number and description.

1.08 FORMAT AND SUBMITTAL REQUIREMENTS

A. Set-up format and submittal requirements include but are not limited to the following:
   a. Contractor must use AIA 702 and AIA 703 forms for Application for Payment.
   b. All values should be taken to the hundredth (penny).
   c. All items must be broken down by school, by addition/renovation (where applicable). This break down must match the breakdown as specified in the GC Contract or established with the Program Manager.
   d. All items must be organized by the CSI division.
   e. All items must be broken down by material and labor.
   f. All applicable CSI divisions must be sub-totaled.
   g. Each addition/renovation (where applicable) and school must be sub-totaled.
   h. The Owner's Contingency Allowance (O.C.A.) should occupy one line item at the bottom of each addition/renovation and match the amount specified in the GC contract. This line item should be separated from any other CSI division.
   i. All other contract allowances (pre-bid or post-bid) should be specified per the GC contract and included in CSI division 1.
   j. Contractor must include a summary by school, by addition/renovation (where applicable), at the end of AIA 703.
   k. General Conditions, P&P Bonds, Insurance, Fee, Building Permit, and Mobilization must be broken out and included in CSI division 1.

B. Post-set-up format and submittal requirements include but are not limited to the following:
   a. Contractor may not change the "scheduled values" after approval of the Schedule of Values (SOV) by the A/E, PM, and DISD (at first Application for Payment).
   b. Include DISD P.O. number on AIA 702.
   c. Include DISD P.O. number in application number. For example, "222123-3" would be the third Application for Payment for P.O. 222123.
   d. Certified by A/E.
   e. Previous invoice totals match previous invoice.
   f. Attach fully executed signature page when billing for any DISD-approved CAEAs.
   g. Attach fully executed signature page when billing for any DISD-approved AERAs.
   h. Attach fully executed signature page when billing for any DISD-approved CAELs.
   i. Attach fully executed signature page when billing for any DISD-approved Change Orders.
   j. Attach an M/WBE Pay Activity Report, signed or acknowledged by e-mail or waiver by all minority subcontractors. (Acknowledgment must include amount paid during current period.)
   k. Attach all Custodian Overtime Approval forms for the billing period, with a summary of OT hours to date for the project.
   l. Attach a complete project schedule for each project, updated for the billing period, with substantial completion dates per GC contract.
   m. Attach a Title Transfer Form insurance/bonding documents for storage facility for any material stored off-site, per GC contract.
   n. Attach "GC Application for Payment Review & Sign-Off" with GC signature signifying review of all Application for Payment elements.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01 29 00

SECTION 01 29 73 - SCHEDULE OF VALUES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Provisions established within the General, Supplementary and Other Conditions of the Contract, Division 1 – General Requirements, and the Drawings are collectively applicable to this Section.

1.02 REQUIREMENTS INCLUDED

A. Procedures for preparation and submittal of Schedule of Values.

1.03 RELATED SECTIONS/DOCUMENTS

A. General Conditions.

B. Section 01 29 00 – Payment Procedures.

1.04 FORMAT

A. Print schedule on AIA Documents G703 – Continuation Sheet for Application and Certificate for Payment.

B. Follow Table of Contents of Project Manual for listing components parts. Identify each line item by number and title of major Specifications Section.

1.05 CONTENT

A. Using CSI format, each school shall have a separate schedule of values for Renovation Work and for Addition Work, as applicable.

B. In CSI format, list installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Do NOT Round off values to nearest dollar. All values should be taken to the hundredth (penny).

C. In CSI format, for each major subcontract, list material and labor of that subcontract as separate line items.

D. List Owner Controlled Contingency Allowance and other allowances with the specified monetary amount for each allowance in separate divisions.

E. Contractor to use separate lines for bonds, insurance, temporary facilities and controls, superintendence, and mobilization. Each item shall include pro rata portion of overhead and profit.

F. The sum of the values listed shall equal total Contract Sum.

1.06 SUBMITTAL

A. Submit electronic copy of Schedule of Values within ten (10) days of award of contract and prior to Pre-Construction Meeting.

B. Transmit under Architect accepted form transmittal letter. Identify Project by title and number.

C. Secure the A/E and Program Manager's (PM) review of the Schedule of Values prior to submitting the first Pay Application.

D. Limit amount of items on the Schedule of Values not to exceed $25,000, unless approved by the Architect and the Program Manager.

E. Break all major equipment costs into equipment and materials/labor at a minimum.

1.07 SUBSTANTIATING DATA

A. When the A/E or the PM requires substantiating information, submit data justifying line item amounts in question.

B. Provide one (1) copy of data with cover letter for each copy of Pay Application. Show Pay Application number and date and line item by number and description.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION – 01 29 73

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Administrative and supervisory personnel.
3. Requests for Information (RFIs).
4. Project meetings.

B. Related Sections:
1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.

6. Pre-Installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Shutdown requests
10. Abatement coordination
11. Owner inspections
12. Training

1.5 KEY PERSONNEL

A. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified using the District-specified electronic project management software.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. If solution(s) impacts the Contract Time, Construction Documents or the Contract Sum, Contractor shall state impact in the RFI. Select importance category from pull down menu.
12. Include e-mail notification to the Architect, Program Manager and District Project Manager for all RFI’s.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form generated using District-specified electronic project management software with substantially the same content as indicated above.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow fourteen (14) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for coordination information already indicated in the Contract Documents.
   d. Requests for adjustments in the Contract Time or the Contract Sum.
   e. Requests for interpretation of Architect's actions on submittals.
   f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum will be administered per the general conditions of contract.

   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Program Manager in writing within seven (7) days of receipt of the RFI response.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Program Manager within seven (7) days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit on a weekly basis a log of RFI's organized by the RFI number. The log should be generated using the District-specified electronic project management software and should contain the following basic information:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference at the earliest possible date after the execution of the Agreement and before starting construction, at a time convenient to Owner, PM and Architect.

1. Purpose of the conference will be to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, PM, Architect, and their consultants; Contractor, Contractor's Project Manager and its superintendents; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Introductions
   b. Submission of Post Proposal Information if any outstanding

c. Tentative Construction schedule.
d. Safety
    1) Emergency Contact List
    2) First aid.
    3) Site Security.
    4) Badging requirements
e. Meetings: dates, locations, attendees, types, agendas
f. Communication: District-specified electronic project management software set up and administration procedures, correspondence flow
    1) Lines of communications, decision ladder and escalation procedures.
g. Schedule:
    1) Phasing
    2) Critical work sequencing and long-lead items
h. Designation of key personnel and their duties
i. Procedures for processing field decisions and Change Orders
j. Procedures for RFIs
k. Consultant / Lab Notification Requirements
    1) HazMat
    2) Roofing
    3) Test & Balance
    4) Materials Testing
    5) Inspecting
l. Procedures for processing Applications for Payment
    1) Schedule of Values
    2) Review
    3) M/WBE
m. Distribution of the Contract Documents.
n. Submittal procedures.
o. Preparation of record documents. Use of the premises and existing building Work restrictions.
p. Working hours.
q. After hours work requirements and overtime payment procedures.
r. Owner's occupancy requirements.
s. Responsibility for temporary facilities and controls.
    1) Site access
    2) Signage
    3) Dumpsters
    4) Fencing
    5) SWPPP
    6) Parking availability
    7) Office, work and storage areas
    8) Equipment deliveries and priorities
t. Procedures for shutdowns.
u. Progress cleaning.

4. Minutes: Architect will record and distribute meeting minutes and sign-in sheet using the District-specified electronic project management software.

B. Progress Meetings: The architect will schedule and administer progress meetings at weekly intervals.
1. Contractor shall make physical arrangements at site for the progress meetings.
2. Location of meetings: Contractor’s field office, unless agreed upon mutually by the Architect, Contractor and PM.
    a. Determine at the Pre-construction Meeting if space in the existing facility or facilities is available for meetings.
    b. For multiple school Bid Packages, weekly progress meetings will be held at each school site on a rotating basis. Site specific meetings may be held at the discretion of the PM.

3. Architect will prepare agenda, distribute notice of the meeting, preside at meetings, record minutes and distribute copies within three (3) days after meeting to participants, and to entities affected by decisions at meetings.
4. Coordinate dates of meetings with preparation of payment requests.
5. Attendees: In addition to representatives of Owner, Program Manager, Professional Consultants, as appropriate to the agenda, and Architect, each contractor, job superintendent, subcontractor, supplier, and other entities as appropriate to the agenda shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
6. Agenda:
    a. Review and correct or approve minutes of previous progress meeting.
    b. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
        1) Safety (lost time, accidents, violations, etc.)
        2) Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
            a) Review schedule for next period.
        3) New Business (Field observations, problems, decision, identification of problems which impeded planned progress, non-confirming work, etc.)
        4) RFI's and RFI log review
        5) Submittals and submittal log review
        6) RFP's, CAEAs and related log reviews
        7) Review of draft Application for Payment, as necessary.
    c. Review present and future needs of each entity present, including the following:
        1) Interface requirements.
        2) Sequence of operations.
        3) Access.
        4) Site utilization.
        5) Temporary facilities and controls.
        6) Progress cleaning.
        7) Quality and work standards.
        8) Status of correction of deficient items.
        9) Field observations.
        10) Pending claims and disputes.
7. Minutes: Using the District-specified electronic project management software, the entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction. These include pre-dig, pre-lift, pre-drill, pre-power shutdown, or pre-roof meetings at the work site prior to commencing the specific construction activity.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner, PM, and Architect of scheduled meeting dates, five business (5) days in advance
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Related RFIs.
c. Approved submittals.
d. Review of mock-ups.
e. Possible conflicts and/or delays
f. Compatibility problems.
g. Time schedules.
h. Safety issues and AHA's
i. Weather limitations.
j. Manufacturer's written recommendations.
k. Warranty requirements.
l. Compatibility of materials.
m. Acceptability of substrates.
n. Space and access limitations.
o. Testing and inspecting requirements.
p. Installation procedures.
q. Coordination with other work.
r. Required performance results.
s. Protection of adjacent work.
t. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions, using the District specified electronic management software
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Pre-installation Conference: When required in individual Specification Sections, convene a Pre-installation conference at work site prior to commencing work of the section.
1. Require attendance of entities directly affecting or affected by Work of the Section.
2. Notify Owner, PM and Architect at least five (5) business days in advance of meeting date.
3. Prepare agenda, preside at conference, record minutes (using the District specified electronic management software), and distribute copies within two (2) business days after conference to participants.
4. Review conditions of reinstallation, preparation and installation procedures, and coordination with related work.

E. Project Closeout Conference: Schedule and conduct a Project closeout conference, at a time convenient to Owner, Program Manager and Architect, but no later than fourteen (14) days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Program Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of record documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Submittal of written warranties.

d. Requirements for preparing operations and maintenance data.
e. Requirements for demonstration and training.
f. Preparation of Contractor's punch list.
g. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
h. Submittal procedures.
i. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes using the District-specified electronic project management software.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Daily construction reports.
   2. Material and equipment delivery status reports.
   .

B. Related Sections:
   1. Division 01 Section “Construction Progress Schedule”.
   2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
   3. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

   1. PDF electronic file uploaded to District’s Project Management software.

B. Daily Construction Reports: Submit at weekly intervals.

C. Material and Equipment Delivery Status Reports: Submit at weekly construction progress meetings.

PART 2 - PRODUCTS

2.1 REPORTS

A. Daily Construction Reports: Prepare a daily construction report using the District-specified Project Management software recording the following information concerning events at Project site:

   1. List of subcontractors at Project site.
   2. Approximate count of personnel at Project site.
   3. Equipment at Project site.
   4. Material deliveries.
   5. High and low temperatures and general weather conditions, including presence of rain or snow.

6. Accidents.
7. Meetings and significant decisions.
8. Unusual events (refer to special reports).
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial completions and occupancies.
18. Substantial Completions authorized.

B. Material and Equipment Delivery Status Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

PART 3 - EXECUTION – Not Used

END OF SECTION 01 32 00

SECTION 01 32 16 – CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 Description

A. Section includes administrative and procedural requirements for developing, submitting and updating a detailed Critical Path Method (CPM) project schedule and related reports. The project schedule is developed by the Contractor and herein referred to initially as the Preliminary CPM Schedule. Subsequent to the Owner, Architect and Contractor acceptance of the Preliminary CPM Schedule, the Contractor completes the development of a more complete and thorough schedule called the Detailed CPM Schedule. Once the Detailed CPM Schedule is accepted by the Program Manager (PM), Architect, and the Contractor, it shall be "baselined" and referred to as the Project Schedule or Detailed CPM Schedule. Monthly progress updates will be compared to the baseline schedule.

B. If the Contractor should desire or intend to complete the Work earlier than any required milestone, completion date, or end period of performance, then the Owner/PM shall not be liable to the Contractor for any costs or other damages should the Contractor be unable to complete the work before such milestone, completion date or end of Period of performance.

1.02 Quality Control and Quality Assurance

A. The Contractor shall develop and maintain a Project Schedule for each project site (School) (referred to as the Preliminary CPM Schedule and ultimately the Project Schedule) in accordance with the requirements of this Section. The requirement for a Project Schedule is included to:

1. Ensure adequate planning before and during the execution and progress of the Work in accordance with the allowable number of working days and milestones.
2. Assure coordination and execution of the work among various trades of the Contractor, subcontractors, suppliers, third party utility companies or other related entities that may be involved in the Project.
3. Assist the Contractor and the Owner in evaluating:
    a. Contract performance relative to the required contract schedule milestones
    b. Monthly progress
    c. Proposed Contract Modifications
    d. Documenting anticipated, requested and or approved time extensions
    e. The documentation of unplanned events, time extensions and other impacts arising from such events

B. The project schedule shall show the sequence and interdependence of activities required for complete performance of the work. The Contractor shall be responsible for assuring all work sequences are logical and show a coordinated plan of the work. The project schedule shall employ computerized CPM planning, scheduling and progress reporting of the work as described in this specification. The Contractor shall create and maintain the schedule using project scheduling software approved by the Owner and PM that utilizes the fundamentals of CPM for scheduling. The observance of the requirements herein is an essential part of the work under the Contract.

C. Within seven (7) calendar days after issuance of Notice to Proceed, the Contractor shall designate in writing a schedule representative in the Contractor's organization who shall be responsible for coordinating with the PM during development and maintenance of the Project Schedule. The Contractor's representative shall have the expertise to operate the CPM software and be capable of rapidly evaluating alternate scenarios to optimize management capabilities. The Contractor has the option to utilize qualified outside scheduling consultation for the assistance of developing and maintaining the Project Schedule, however, the use of an outside consultant does not relieve the Contractor of responsibilities for compliance of this specification. The Contractor's schedule representative shall have complete authority to act for the Contractor in fulfilling the schedule requirements of the Contract, and if such authority is interrupted during the Contract, approval shall be obtained in writing by the PM.

D. All activities shall have at least one predecessor and one successor unless approved by the PM. The exceptions are no predecessor is needed for the Notice To Proceed (NTP) milestone and no successor is needed for the Project Completion milestone.

E. **Contractor shall not use any constraints of any type without prior approval of the Owner.**

F. Each activity's "Activity ID" and "Activity Description" or "Task Name" shall remain unchanged throughout the duration of the project subsequent the baseline acceptance by the Owner.

G. An activity's "Activity Description" may only be revised to clarify an activity's original scope. If the scope of an activity increases or decreases, a replacement activity shall be created.

H. PM acceptance shall be obtained prior to making any changes or revisions to an activity's "Activity Description".

1.03 Submittals

A. All CPM Schedules shall be presented on two (2) copies (preferable 8 ½ x 11) and one electronic copy (accessible format, not pdf). Preliminary CPM Baseline Schedule: Within fourteen (14) calendar days after issuance of Notice to Proceed, but prior to the start of any construction activities, the Contractor shall submit the Preliminary CPM Baseline Schedule deliverable package. The preliminary baseline

schedule shall cover the planned activities for each project site (school) in sufficient level of detail.

B. Detailed CPM Schedule: Within thirty (30) calendar days after Notice to Proceed (NTP), the Contractor shall submit the Detailed CPM Baseline Schedule deliverable package, with a detailed schedule for each project site (school). The substantial completion date in the detailed CPM schedule shall coincide with the substantial completion date in the approved preliminary baseline schedule.

C. Schedule Update: The Contractor shall submit with the payment application a CPM Schedule Update on at least a monthly basis throughout the duration of the Work. The "baselined" Project Schedule, once updated for actual activities, shall be used as the first CPM Schedule Update. All schedule updates shall have a current data date (not older than 5 days). Include a narrative report specifying all changes and modifications made to the CPM schedule.

D. Recovery or Revision to the Detailed CPM Schedule: The Contractor shall provide a Recovery CPM Schedule within seven (7) calendar days of any CPM Schedule Update Meeting if any milestone, completion date or end of Period Performance falls seven (7) calendar days or greater behind (negative float).

E. Schedule Review: All schedules that are to be submitted for review shall be stamped as being reviewed/approved by the General Contractor and key subcontractors.

PART 2 PRELIMINARY CPM SCHEDULE

2.01 Preliminary CPM Schedule

A. The Preliminary CPM Schedule shall be the basis for the sequence of work during the first ninety (90) calendar days of the Contract while the Project Schedule is being developed, submitted, reviewed and accepted. The Preliminary CPM Schedule shall be updated on a monthly basis. If the acceptance of the Project CPM Schedule extends beyond one month, the Preliminary CPM Schedule shall be updated according to the requirements stated in paragraph 3.03.

B. The Preliminary CPM Schedule shall include:

1. The Procurement activities for each project site (school) to be accomplished (either in whole or in part) during the first ninety (90) calendar days of the Contract. The procurement activities shall include mobilization, shop drawing submittal, sample submittal, Architect/Engineer review and approval period, material fabrication and delivery of key and long-lead items. If portable swing space buildings are required for a project, the preliminary CPM schedule shall include milestones for relocation and installation of such swing space buildings.

2. The construction activities for each project site (school) to be accomplished (either in whole or in part) during the first ninety (90) days of the Contract. These activities shall be in units of

whole working days and shall be limited to a maximum of ten (10) work days, unless otherwise approved by the PM, except for non-construction activities including mobilization, procurement and concrete curing activities.

3. The approach to scheduling the remaining work or phases of work beyond the first ninety (90) calendar days of the contract. The work for each phase or milestone must be represented by at least one summary activity for each major item of work such that they cumulatively indicate the entire schedule, with milestones as defined in Paragraph 3.01, B.7. The approximate duration for each summary activity shall include the Contractor's best estimate for the work it represents.

4. Submit a written narrative describing the Contractor's approach to mobilization, procurement, and construction during the first ninety (90) calendar days of the Project. The narrative shall elaborate on the basis for durations, major equipment to be used, and shall identify all major assumptions used to develop and support the schedule. The narrative shall also include the Contractor's description of the critical path work activity as represented in the Preliminary CPM Schedule.

C. The Preliminary CPM Schedule shall be used for review of time extension request(s) until the Project CPM Schedule is accepted. When changes and alterations are initiated, unplanned events or excusable delays are experienced, or the Contractor desires to revise the sequence of work, the Contractor shall submit a written time impact analysis.

D. The final determination of all time extensions requested under the Preliminary CPM Schedule shall be determined and finalized subsequent to the review and acceptance of the Project CPM Schedule.

E. Deliverable: **No later than fourteen (14) calendar days after award of Contract, but prior to the start of any construction activities, the Contractor shall submit the Preliminary CPM Schedule deliverable package**. The deliverable package shall include at a minimum, the following information:

1. Two (2) copies (preferable 8 ½ x 11). The critical path shall be readily discernible in red ink.

2. Two (2) copies of the written narrative as described in paragraph 2.01B.5.

3. One (1) electronic copy (accessible format not pdf).

2.02 Schedule Review and Acceptance

A. The PM, Architect/Engineer and the Contractor shall meet within seven (7) calendar days of receipt of the Preliminary CPM Schedule for joint review. The Contractor shall revise any areas, which, in the opinion of the PM and/or Architect/Engineer, conflict with either the intent of this

specification or the timely completion and acceptable coordination of the Project. In the event the Contractor fails to define any element of work activity or logic currently designed and the PM review does not detect this omission or error, such omission or error, when discovered by the Contractor or the PM, shall be corrected by the Contractor and incorporated into the next schedule submission.

Within seven (5) business days after the joint review between the A/E, Contractor and the PM, the Contractor shall revise the Preliminary CPM Schedule in accordance with agreements reached during the joint review and submit the revised schedule per the deliverable requirements.

Acceptance of the Preliminary CPM Schedule by the A/E, Owner or PM does not relieve the Contractor of any of its responsibility for the accuracy or feasibility of the project schedule. However, to the extent that the accepted Project Schedule is reasonable, it becomes a part of this Contract.

B. Submission and final PM and Contractor acceptance of the Preliminary CPM Schedule will be a condition precedent to the application or payment of any progress payments under the Contract, unless otherwise agreed upon by the Owner. The PM shall notify the Contractor of the Owner acceptance of the Preliminary CPM Schedule in writing.

PART 3 PROJECT CPM SCHEDULE

3.01 Project Schedule

A. The Project Schedule shall begin at the project NTP and incorporate the accepted Preliminary CPM Schedule including all required revisions and applicable progress updating as warranted. The Project Schedule shall indicate a logical sequence of work for each project site (school) and major restrictions from the availability and use of manpower, material and equipment. Utilize the schedule in planning, scheduling, coordinating and performing the work under this Contract (including all activities of subcontractors, equipment vendors and suppliers). The Project Schedule shall indicate the sequence and interdependence of activities required for complete performance of the Work.

Proposed durations assigned to each activity shall be the Contractor's best estimate of time required to complete the activity considering the scope and resources planned for the activity. In developing the Project Schedule, the Contractor shall be responsible for ensuring that subcontractor work scope and sequencing at all tiers, as well as its own work, is included. If a contract for a subcontractor has not yet been awarded for a certain portion of the work, the Contractor is responsible for the development of the schedule for the work as described under this section. After the subcontractor award of contract, the Contractor shall modify the current accepted schedule to reflect any changes or revisions for the subcontractor sequence of work. Under no circumstance or event, shall a schedule modification or revision under

this paragraph extend a milestone. The Project Schedule shall comply with the various limits imposed by the scope of work and by any contractually specified intermediate milestone dates and completion dates. The degree of detail shall be to the satisfaction of the PM the A/E or the Owner.

B. Provide sufficient detail and clarity of form and technique so that all work can be properly controlled and progress monitored by the PM and A/E. The Project Schedule shall consist of, but not be limited to, the following criteria:

1. Full detail of all major procurement activities including the activities and information contained within the Preliminary CPM Schedule. Break up all procurement activities for major components and long lead items to include submittal dates, fabrication duration, and expected delivery dates.

2. Full detail of all major construction activities including the activities and information contained within the Preliminary CPM Schedule. Add column for responsible party for all construction activities.

3. Multiple Calendars shall be used for establishing Holidays and periods of non-work based on the School Operations Parameter Statement in the Project Information Section of Division 0, concrete curing activities, other weather or ambient temperature sensitive construction activities, and or other work requiring overtime or double shift work.

4. Seasonal weather conditions shall be considered and included in the planning and scheduling of all work influenced by high or low ambient temperatures, precipitation and/or saturated soil to ensure recognition, planning and anticipation of intermittent inclement weather throughout the project duration. In addition, activities of similar nature shall be assigned to independent calendars based on this weather data. The software calendars shall be updated monthly to reflect actual days worked.

5. Activity duration in whole working days with a maximum duration of ten (10) working days each, unless otherwise approved by the PM, except for non-construction activities including mobilization, procurement and concrete curing activities.

6. At a minimum, the following guidelines, intermediate and final milestones shall be included in the project schedules for each individual project site (school), except for activities that are specifically identified to be common for all the project sites for a multi-project bundle:

    a. Notice to Proceed

b. Required Periodic Inspections (examples: rebar, utilities, electrical and mechanical rough-in, overhead and architectural
c. Time allotted for coordination with and execution of abatement activities
d. Specific Phase start and finish dates – renovations and additions
e. Preliminary CPM Schedule submission and acceptance
f. Project Schedule submission and acceptance
g. Building dry-in
h. Permanent power
i. Conditioned air available
j. Completed testing and acceptance of Life Safety Systems and other critical building components
k. Completion of ADA upgrades in restrooms
l. Commissioning, when project requires
m. Ten percent (10%) minimum float for the project
n. Substantial Completion
o. Final Completion
p. Owner Turn-Over / Start-Up / Project Closeout Activity / Warranty Period / Owner Testing/Training
q. Earliest Date that Owner can occupy the affected portion of the building (by phase, by complete project, etc.). This shall include all necessary approvals, permits (Fire Marshall Acceptance, Certificate of Occupancy, etc.).

C. The Contractor shall prepare a written narrative explaining the Contractor's approach to construction for the entire Project and include the narrative information as submitted with the Preliminary CPM Schedule deliverable package. The narrative shall elaborate on the basis for durations, major equipment to be used, and shall identify all major assumptions used to develop and support the schedule. The narrative shall also include the Contractor's description of the critical path work activity as represented in the Project Schedule.

D. Deliverable: Within thirty (30) calendar days after the Notice to Proceed, the Detailed CPM Schedule deliverable submitted by the Contractor shall include at a minimum, the following information:

1. Two (2) copies (preferably 8 ½ x 11) of the project schedule. The critical path shall be readily discernible in red ink.
2. Two (2) copies of the written narrative as described in paragraph 3.01, B.5
3. One (1) electronic copy (accessible format not pdf)
3. A list of all rain days occurring over the past month. Each rain day shall be incorporated into the Project Schedule Calendar as record information subsequent to PM review and acceptance.

3.02 Schedule Review and Acceptance

A. Within fourteen (14) calendar days of receipt of the Contractor's proposed Project Schedule, the PM shall evaluate the schedule for compliance with this item and other Contract requirements, and notify the Contractor in writing of its findings.

B. If the PM does not request a revision or justification, The A/E, PM and the Contractor shall meet within seven (7) calendar days on a date selected by the PM and finalize acceptance of the schedule. If a revision or justification is requested by the PM and/or A/E, the Contractor shall re-submit the proposed Project Schedule within seven (7) calendar days and address all issues to the satisfaction of the PM. Any and all disagreements or interpretations of the meaning or intent of this specification shall be solely dictated by the Owner.

C. The PM, A/E and the Contractor shall meet within seven (7) calendar days of receipt of the Contractor's response for joint review, correction or adjustment of the Contractor's proposed Project Schedule. Any area, in the opinion of the PM and/or A/E, conflicts with timely completion of the project, shall be subject to revision by the Contractor. In the event the Contractor fails to define any element of work, activity or logic and the Owner review does not detect this omission or error, when discovered it shall be corrected by the Contractor and amended to the Project Schedule as soon as possible.

D. Within seven (7) calendar days after the joint review meeting, the Contractor shall incorporate revisions as directed by the PM and re-submit the proposed Project Schedule per the deliverable requirement as stated in paragraph 3.01, E. All further review by the PM shall be within seven (7) calendar days of receipt. The PM shall notify the Contractor in writing of final acceptance of the Contractor's Project Schedule.

E. The process of approving Contractor's schedules and updates to Contractor's schedule shall not constitute a warranty by the Owner that any non-Contractor milestones or activities will occur as set out on Contractor's schedule.

3.03 Schedule Updates

A. After the Project Schedule is accepted by the PM and the Contractor, it shall be "baselined" and used as a comparison for future progress updates. The accepted Project Schedule shall be updated on a monthly basis, or as directed by the Owner, throughout the duration of the work until final completion is met. The Contractor shall meet with the PM each month at a Project Progress Meeting to review the work progress update and PM comments regarding the Project Schedule update. The Contractor shall submit a schedule update no later than three (3) working days before the Project Progress Meeting for the PM to review and comment.

B. The percentage of all work shall be calculated by estimating the actual remaining duration of each progressed activity. The data date of each

schedule update shall be determined by the PM each month. Contractor prepared estimates of the percent completion of each scheduled activity and the necessary supporting data shall be submitted on or before the data date referenced above and shall include the following information:

1. One (1) original of the previous month's Schedule Update indicating actual activity start and/or finish dates to date, and revised (current) remaining durations.
2. A narrative report shall be included that indicates in writing those activities the Contractor plans to work on during the following update month and current or anticipated conditions that have delayed or may delay the work in order to discuss remedial action. The Contractor shall also explain, for work that reflects less than satisfactory progress, whether any uncompleted and/or upcoming work will (or will not) be affected in a like manner and the Contractors method of correction. Any additional written information necessary to support the updated schedule including explanations of revisions to activities: logic, durations, resources, etc.

C. In case of disagreements at the project progress meeting concerning actual progress to date, the Owner's determination shall govern. Upon completion of the schedule update meeting, the Contractor shall revise the Schedule Update to reflect progress as of the date of the schedule update meeting and any approved revisions to the Schedule Update and carry out a computer produced calculation to determine the status of the Project Schedule.

D. Each Schedule Update shall be forwarded to the PM within five (5) calendar days after the schedule update meeting and shall include two (2) copies of the narrative report with the following information:

1. Activities that have been added in the month of this Project Schedule Update.
2. Activities that have been deleted in the month of this Project Schedule Update.
3. Activities that have "Actual Starts" prior to the month of this Project Schedule Update and remain unfinished.
4. Activities that have "Actual Starts and Actual Finishes" in the month of this Project Schedule Update.
5. A description of any approved revisions to the activity descriptions, schedule logic, or initial activity durations.
6. One (1) print of the updated CPM Schedule Update indicating the progress made up to the date of the schedule update and indication of any revisions to the CPM Schedule Update.
7. Two (2) prints of the written narrative as described in paragraph 3.03, B.3.

8. A list of all rain days occurring over the past month. Each rain day shall be incorporated into the Project Schedule Calendar.

E. If the Contractor's monthly progress schedule update reflects, or PM determines, that the Contractor is at least ten percent (10%) or at least negative seven (-7) calendar days behind the "baselined" schedule, the Contractor shall provide a revised or recovery schedule. The Contractor's revised or recovery schedule must incorporate a proposed plan for bringing the work back on schedule and completing the work by the contract completion date at no additional expense to the PM or Owner. The revised or recovery schedule shall be in accordance to paragraph 2.08.

3.04 Revisions to the Project Schedule

A. Revisions to the Schedule Update to reflect actual progress made up to the date of a schedule update shall not be considered as revisions to the Project Schedule. If as a result of the monthly schedule update, it appears the Project Schedule no longer represents the actual execution and progress of the work, PM will request, and the Contractor shall submit, a Revision to the schedule.

B. The Contractor may also request revisions to the Project Schedule in the event the Contractor's planning for the work is revised. If the Contractor desires to make changes in the Project Schedule to reflect revisions in his method of operating and scheduling of the work, the Contractor shall notify PM in writing, stating the reason for the proposed revision. If revision to the schedule is contemplated, the Contractor or PM shall so advise the other in writing at least seven (7) calendar days prior to the next schedule update meeting, describing the revision and setting forth the reasons thereof.

Contractors must submit a three (3) week look-ahead schedule that will include all lifts, shutdowns, etc.

3.05 Project Float Time

A. Float time is not for the exclusive use or benefit of either the Contractor or the Owner. Contractor's work shall proceed according to early start dates, and the Owner shall have the right to reserve and apportion float time according to the needs of the Project. The Contractor acknowledges and agrees that actual delays, affecting paths of activities containing float time, will not have any affect upon contract completion times, providing that the actual delay does not exceed the float time associated with those activities.

3.06 Impact Analysis for: Change Orders, Delays, and Contractor Requests

A. When changes are initiated, delays are experienced, or the Contractor desires to revise the Project Schedule, the Contractor shall submit to the PM written time impact analysis illustrating the influence of each change, delay or Contractor request, on any milestone. Each time impact analysis shall include a fragmentary network (network analysis) demonstrating how the Contractor proposed to incorporate the change,

delay or Contractor request into the schedule. The time impact analysis shall demonstrate the time impact to each and every affected activity in the Project Schedule utilizing the most recent schedule update as the basis for the analysis. The date of the most recent schedule update shall be a date prior to the date the change is given to the Contractor, the date the delay occurred or the date the Contractor submits a request for a change. The event times used in the time impact analysis shall include the most recent schedule update or as adjusted by mutual agreement. The time impact analysis shall include a backup copy on CD which shall contain the detail of the change, including but not limited to, added, changed or deleted data for activities and logic restraints. If the Detailed CPM Schedule is revised subsequent to submittal of a time impact analysis but prior to its approval, the Contractor shall promptly indicate in writing to the PM the need for any modification to its time impact analysis.

B. Activity delays shall not automatically mean that an extension of any milestones is warranted or due to the Contractor. A change or delay may not affect existing critical activities or cause non-critical activities to become critical. A change or delay may result in only absorbing a part of the available total float that may exist within an activity chain of the network, thereby not causing any effect on any milestone.

C. A comprehensive narrative of each time impact analysis shall be submitted within seven (7) calendar days after the commencement of a delay or the notice for a change is given to the Contractor.

D. Recommendation to the Owner for the acceptance or rejection of each time impact analysis by the PM and A/E shall be made within seven (7) calendar days after receipt unless subsequent meetings or negotiations are necessary. After a decision has been made by the Owner, a copy of the time impact analysis signed by the PM, A/E, Owner and the Contractor shall be returned to the Contractor and incorporated into the Project Schedule at the next monthly schedule update. The time impact analysis shall be incorporated into and attached to any relevant supplemental agreement (s).

END OF SECTION 01 32 16

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.
4. Preconstruction video recordings.
5. Periodic construction video recordings.

B. Related Sections:
1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
3. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph or video recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files in the quantities and at the intervals described in paragraph 3.1 of this section.

1. Digital Camera: Minimum sensor resolution of at least 8 mega pixels.
2. Format: Unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
3. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name and contact information for photographer.
c. Name of Architect.
d. Name of Contractor.
e. Date photograph was taken.
f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
g. Unique sequential identifier keyed to accompanying key plan.

C. Construction Photographs: The project requires comprehensive documentation of construction progress and post inspection milestones. Submit prints of each photographic view in the quantities and at the intervals described in paragraph 3.1 of this Section.

1. Format: 8-by-10-inch (203-by-254-mm) on photographic paper to allow a 1-inch- (25-mm-) wide margin and enclosed back to back in clear plastic sleeves that are punched for standard three-ring binder.
2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:

    a. Name of Project.
    b. Name and contact information for photographer.
    c. Name of Architect.
    d. Name of Contractor.
    e. Date photograph was taken if not date stamped by camera.
    f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    g. Unique sequential identifier keyed to accompanying key plan.

3. “Progression” photo sets are to be performed at pre-determined intervals throughout the duration of construction, as applicable to the scope and as follows:

    a. Site survey (Pre-construction): A onetime shot that provides coverage of site and immediate and immediate surroundings.
    b. Exterior progression shots: Taken from key perspectives along site perimeter and 360 degrees around building envelope, to be performed at monthly intervals.
    c. Interior progression shots: Broadly track the improvements from logical perspectives, to be performed at monthly intervals and coordinated with pace of erection.
    d. Pre-slab/Pre-Chase/Interior record shots: Underground or concealed utilities will be documented post inspection/pre-insulation and prior to pouring slabs, backfilling or closing chases/walls/ceilings.

D. Video Recordings: Submit video recordings in accordance with paragraph 3.2 of this Section.

1. Submit video recordings in digital video disc format.
2. Identification: With each submittal, provide the following information:

    a. Name of Project.
    b. Name and address of photographer.
    c. Name of Architect.
    d. Name of Contractor.
    e. Date video recording was recorded.
    f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    g. Weather conditions at time of recording.

E. Aerial Photography
1. On new construction and addition projects, submit monthly aerial photographs of the project. The photos should be taken from 4 different angles and 4 sets of color 8”x10” prints should be submitted.

a. Digital Photographs: provide color images in JPG format with minimum sensor of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels. Use flash in low light levels or backlit conditions.
b. Digital Video Recordings: Provide high resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full high-definition mode. Provide supplemental lighting in low light levels or backlit conditions.

1.4 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has the basic skills necessary to record digital photographs and video recordings.

B. Drone Operator Qualifications: FAA Part 107 Licensed drone operator, certified as an unmanned aircraft operator with UAS rating for the operation of a commercial drone (unmanned aerial vehicle) pilot, having a minimum of 7 years' experience as a drone operator with current Certifications.

1.5 COORDINATION

A. Auxiliary Services: Provide auxiliary services necessary, including temporary lighting required to produce clear, well-lit photographs.

1.6 USAGE RIGHTS

A. Contractor will transfer copyright usage rights to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 mega pixels. Images shall not have their resolution reduced.

B. Digital Video Recordings: Provide high-resolution, digital video disc.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

2. Taking photographs or video recordings with students and schools staff included on the photograph is strictly prohibited.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

C. Preconstruction / Pre-Demo / Pre-Site Clearing Photographs: Before starting demolition or construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, or as directed by Architect.
1. Take photographs as required to show existing conditions adjacent to property before starting the Work.
2. Take photographs as required of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
3. Reference Section 017300 Execution for details of documenting and reporting existing conditions.

D. Periodic Construction Photographs: Take a photographs monthly and submit with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken. For renovation projects: The location and type of items to be photographed will be determined by the Architect and/or PM based on the specific project conditions not to exceed the number of progress photographs required above.

E. Final Completion Construction Photographs: Take color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.

3.2 CONSTRUCTION VIDEO RECORDINGS

A. Preconstruction Video Recording: Before starting demolition or construction, record video of Project site and surrounding properties from different vantage points, as directed by Architect.
1. Show existing conditions adjacent to Project site before starting the Work.
2. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of demolition or construction].
3. Show protection efforts by Contractor.
4. Narrate all noted conditions on the video.
5. On renovation projects with crawlspace work, record video of these areas before, during and after work is completed.

B. Periodic Construction Video Recordings: Record video monthly and submit with each Application for Payment. Select vantage points to show status of construction and progress since last video recordings were recorded. Minimum recording time shall be 15 minutes and shall include narration of actual conditions and progress made since last recording.

C. Owner’s Training: Record video during the manufacturer’s training session at substantial completion. Minimum recording time shall be 30 minutes per session. Deliver the recordings with the PDF Electronic File of the O&M Manual at Substantial Completion. Video shall be clear with easily understandable audio.

D. Submit videos in DVD format.

END OF SECTION 01 32 33

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:
   1. Division 01 Section "Payment Procedures" for submitting Applications for Payment.
   2. Division 01 Section "Schedule of Values" for submitting the schedule of values.
   3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
   4. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   5. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   6. Division 01 Section "Demonstration and Training" for submitting video recordings of equipment demonstration and training of Owner's personnel.

C. Refer to other Division 1 Sections and other Contract Documents for Specifications on administrative submittals. Such submittals include, but are not limited to the following:
   1. Permits.
   2. Payment Applications.
   3. Inspection and Test Reports.
   4. Schedule of Values
   5. Progress Reports.
   6. Listing of Subcontractors

D. Shop Drawings are technical drawings and data that have been specially prepared for this Project, including but not limited to the following items:
   1. Fabrication and installation drawings.
   2. Setting diagrams.
   3. Shopwork manufacturing instructions.
   4. Templates.
   5. Patterns.
   6. Coordination drawings (for use on-site).
   7. Schedules.
   8. Design mix formulas.
   9. Contractor's engineering calculations.

   Standard information prepared with specific reference to a Project is not considered to be shop drawings.

E. Product Data includes standard printed information on manufactured products that has not been specially prepared for this Project, including but not limited to the following items:

1. Manufacturer’s product specifications and installation instructions.
2. Standard color charts.
3. Catalog cuts.
4. Rough-in diagram and templates.
5. Standard wiring diagrams.
6. Printed performance curves.
7. Operational range diagrams.
8. Mill reports.
9. Standard product operating and maintenance manuals.
   Modify standard product data, drawings and diagrams to delete information not applicable to the project, and / or supplement standard information to provide specific data that is applicable to the work.

F. Samples are physical examples of Work, including but not limited to the following items:
   1. Partial sections of manufactured or fabricated work.
   2. Small cuts or container of materials.
   3. Complete units of repetitively used materials.
   4. Swatches showing color, texture and pattern.
   5. Color range sets.
   6. Units of work to be used for independent inspection and testing.

G. Miscellaneous Submittals are work-related, non-administrative submittals that do not fit in the three previous categories, including but not limited to the following:
   1. Specially prepared and standard printed warranties.
   2. Maintenance agreements.
   3. Workmanship bonds.
   4. Survey data and reports.
   5. Project photographs.
   6. Testing and certification reports.
   7. Record Drawings.
   8. Field measurement data.
   9. Operating and maintenance manuals.
   10. Keys and other security protection devices.
   11. Maintenance tools and spare parts.
   12. Overrun stock.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Monthly submittal log. Submit at the weekly progress meeting, an updated submittal log indicating status of all project submittals.
4. Final Submittal: Submit concurrently with the first complete submittal of Project schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

5. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action, informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect’s receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 calendars days for review of each resubmittal.
4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 14 calendar days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

C. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Include the following information for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Name of subcontractor.
    f. Name of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.
        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Location(s) where product is to be installed, as appropriate.
    l. Other necessary identification.

D. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Include the following information on an inserted cover sheet:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Contractor.
    e. Name of firm or entity that prepared submittal.
    f. Name of subcontractor.
    g. Name of supplier.
    h. Name of manufacturer.

i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Related physical samples submitted directly.
m. Other necessary identification.

5. Include the following information as keywords in the electronic file metadata:

a. Project name.
b. Number and title of appropriate Specification Section.
c. Manufacturer name.
d. Product name.

E. Options: Identify options requiring selection by the Architect.

F. Deviations: Identify deviations from the Contract Documents on submittals and the transmittal sheet. Failure to note deviation may void action taken on submittal.

G. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Indication of full or partial submittal.
j. Drawing number and detail references, as appropriate.
k. Transmittal number, numbered consecutively.
l. Submittal and transmittal distribution record.
m. Remarks.
n. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Post electronic submittals as PDF electronic files directly to the appropriate location. Defined at the pre-construction meeting.

    a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Submit electronic submittals as PDF electronic files.

    a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
3. Action Submittals: Submit three paper copies of each submittal, unless otherwise indicated. Architect will return two copies.
4. Informational Submittals: Submit two paper copies of each submittal, unless otherwise indicated. Architect will not return copies.
5. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
6. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
7. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable. Cross out all inapplicable data and information.
3. Include the following information, as applicable:
    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.

d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file.
   b. Three paper copies of Product Data, unless otherwise indicated. Architect will return two copies.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination and accessibility (maintenance and service) requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

3. Submit Shop Drawings in the following format:
   a. PDF electronic file.
   b. Three opaque copies of each submittal. Architect will retain two copies; remainder will be returned.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and

physically identical with material or product proposed for use, and that show full range of color and texture variations expected.

a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample sets; remainder will be returned.
   1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
   2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule in the following format:

   a. PDF electronic file.
   b. Three paper copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 01 Section "Schedule of Values."

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Submit subcontract list in the following format:

   a. PDF electronic file.

J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect, no later than 30 days after notice to proceed.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT/ENGINEER’S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
   1. Action Stamp: The Architect/Engineer will stamp each submittal to be returned with a uniform, self explanatory stamp, appropriately marked and executed to indicate whether the submittal returned is for unrestricted use, final-but-restricted use (as marked), must be revised and resubmitted (use not permitted) or without action (as explained on the transmittal form).

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

MEMORANDUM

To: All General Contractors working on Elementary Schools (and other facilities occupied by children under the age of 6) built before 1978 for Dallas ISD Construction Services Department
From: DISD Executive Director
Construction Services
Date: June 14, 2010

RE: EPA Lead-Based Paint Renovation, Repair, and Painting Program

In April of 2008, the EPA introduced its new Lead-Based Paint Renovation, Repair, and Painting Program Rule, hereafter referred to as the RRP. This new rule requires renovation firms to be EPA-certified. Furthermore, the rule requires workers to be trained to use lead-safe work practices when they disturb painted surfaces in buildings built prior to 1978 and which are occupied by children under age 6. These requirements became fully effective on April 22, 2010.

In addition, pre-renovation education requirements are in effect. These require contractors and others who perform renovations for compensation and that may disturb lead-base paint in child occupied facilities built before 1978 to distribute a lead pamphlet to the users of the facility. The RRP defines renovation broadly to include any activity that disturbs painted surfaces greater than 6 square feet per room on the interior and greater than 20 square feet on the exterior of a facility.

It is the understanding and expectation of Dallas ISD that renovation contractors should be fully aware of and in compliance with this new EPA rule.

IF YOUR FIRM IS CURRENTLY PERFORMING RENOVATION WORK ON A CAPITAL IMPROVEMENT PROGRAM PROJECT, AND YOUR FIRM IS NOT IN FULL COMPLIANCE WITH THE NEW RULE, YOU MUST CEASE ACTIVITIES IMMEDIATELY ON ANY WORK THAT MAY DISTURB MORE THAN 6 SF (20 SF ON EXTERIOR) OF PAINTED SURFACES, OR WINDOW REPLACEMENT IN BUILDINGS BUILT PRIOR TO 1978 AND WHICH ARE OCCUPIED BY CHILDREN UNDER AGE 6.

If you must cease work on any portion of the project as a result of this rule, please contact your Project Manager immediately to discuss the appropriate course of action.

If you are in full compliance with the rule, as should be the case, please submit the following at your earliest convenience:

- EPA firm certification (In the absence of prime's firm certification, the certification from the appropriate sub-contractor and the prime's application for certification will suffice for now)
- Identify who is the certified staff on site
- Evidence of worker training by the certified staff
- Summary of lead-safe work practices to be implemented

In addition, please prepare to attend a meeting with the School Principal, Dallas ISD PM and PM to inform her/him about the rule, share the RRP pamphlet and Notices. Your PM will notify you of date and time of the meeting.

If the scope of work planned or in progress does not require compliance with the training and lead-safe work practices of the RRP, then you may continue on with the construction activities and there is no need for any further action on your part. At the same time, the Owner understands that contractors are responsible for compliance with the rule. Therefore, the Owner's expectation is that you will bring to the PM's attention immediately, any scope of work that may trigger compliance with this rule.

Cc: Dallas ISD PM
Program Director, PM Firm
Construction Manager, PM Firm
Project Manager, PM Firm
PM Firm Document Control

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. Owner will employ and pay for the service of an Independent Testing Laboratory to perform specified testing and laboratory services.
   1. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   2. Contractor shall cooperate with the Laboratory to facilitate the execution of its required services.
   3. Contractor shall pay for additional samples and tests required for Contractor's convenience or when initial tests indicate work does not comply with Contract Documents.
   4. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   5. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   6. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

   1. Division 01 Section "Allowances" for testing and inspecting allowances.
   2. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
   3. Division 01 Section "Execution" for cutting and patching.
   4. Divisions 02 through 49 Sections for specific test and inspection requirements.
   5. Division 01 Section "Testing, Adjusting, and Balancing for HVAC" **(FOR INFORMATION ONLY – TAB SERVICES PROVIDED BY OWNER)**

1.3 DEFINITIONS

A. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged by the Owner to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with

the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

C. Conflicts between the specifications and the construction documents. The most stringent requirement will govern.

D. Conflicts on specification requirements. The most stringent requirement will govern.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For [integrated exterior] [laboratory] mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
   1. Indicate manufacturer and model number of individual components
   2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

D. Schedule of Tests and Inspections: Prepare in tabular form and include the following, as applicable:

   1. Specification Section number and title.
   2. Entity responsible for performing tests and inspections.
   3. Description of test and inspection.
   4. Identification of applicable standards.
   5. Identification of test and inspection methods.
   6. Number of tests and inspections required.
   7. Time schedule or time span for tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
   1. Project quality-control manager [may also serve as Project superintendent] [shall not have other Project responsibilities].

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
   1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
   2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
   3. Owner-performed tests and inspections indicated in the Contract Documents [, including tests and inspections indicated to be performed by the Commissioning Authority].

E. E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following as applicable:

   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   7. Identification of product and Specification Section.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
   10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
   11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
   12. Name and signature of laboratory inspector.
   13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329, 'Standards of Recommended Practices for Inspection and Testing Agencies for Concrete and Steel as Used in Construction'; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect [or Construction Manager].
   2. Notify Architect [and Construction Manager] seven days in advance of dates and times when mockups will be constructed.
   3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
   4. Demonstrate the proposed range of aesthetic effects and workmanship.
   5. Obtain Architect's [and Construction Manager's] approval of mockups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.
   6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Demolish and remove mockups when directed unless otherwise indicated.

K. Integrated Exterior Mockups: Construct integrated exterior mockup [according to approved Shop Drawings] [as indicated on Drawings]. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

L. Room Mockups: Construct room mockups incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Architect to evaluate quality of the Work. Provide room mockups of the following rooms:
   1. List or rooms requiring mockups.

1.10 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor**,** and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. GC/Contractor will have a quality control program in place to review the installation and serviceability of all field devices and valves.
3. For tests and inspections performed by the Owner’s Testing Laboratories:
    a. Cooperate with Laboratory personnel; provide access to Work and to manufacturer’s operations.
    b. Secure and deliver to the Laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
    c. Furnish to the Laboratory proposed concrete design mixes, and other material mixes which require evaluation by the Testing Laboratory, a minimum of fourteen (14) days prior to use on the Project.
    d. Furnish incidental labor and facilities
        1) To provide access to Work to be tested.
        2) To obtain and handle samples at the Project site or at the source product to be tested.
        3) To facilitate inspections and tests.
        4) For safe storage and curing of test samples.
        5) Notify Laboratory, PM and Architect sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
            a) When test or inspections cannot be performed after such notice, reimburse Laboratory for personnel and travel expenses incurred due to Contractor’s negligence.
        6) Make arrangements with Laboratory and pay for additional samples, tests, or inspections as required for the Contractor’s convenience.
        7) Make arrangements with Laboratory and pay for additional samples and tests required when initial test indicate non-compliance with Contract Documents, including load test.

4. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
    a. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
    b. Retain first subparagraph below if some Specification Sections require an independent testing agency to perform certain tests and inspections.
    c. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    d. Retain first subparagraph below to assure validity of agencies' reports.

e. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
f. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

5. Testing and inspecting requested by Contractor and not required by the Contract Documents is Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .

1. Distribution: Distribute schedule to Owner, PM, Architect, Commissioning Authority, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK REQUIREMENTS

A. General: This Section specifies procedural and administrative requirements for compliance with governing regulations and codes and standards imposed upon the Work. These requirements include the obtaining of permits, licenses, inspections, releases, and similar statements, as well as payments, associated with regulations, codes, and standards.

B. “Regulations” is defined to include laws, statutes, ordinances, and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the Work regardless of whether they are lawfully imposed by governing authority or not.

C. Governing Regulations: Refer to General and Supplementary Conditions for requirements related to compliance with governing regulations.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference. Individual Specification Sections indicate which codes and standards the Contractor must keep available at the project site for reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and where these standards establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents specifically indicate a less stringent requirement. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Architect/Engineer for a decision before proceeding.

D. Minimum Quantities or Quality Levels: In every instance the quantity or quality level shown or specified is intended to be the minimum for the work to be provided or performed. Unless otherwise indicated, the actual work may either comply exactly, within specified tolerances, with the minimum quantity or quality specified, or may exceed that minimum within reasonable limits. In complying with these requirements, the indicated numeric values are either minimum or maximum values, as noted, or as appropriate for context of the requirements. Refer instances of uncertainty to the Architect/Engineer for decision before proceeding.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction or other entity applicable to the context of the text provision.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the.

C. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations

1.06 SUBMITTALS

A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 45 23

HVAC TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Owner will employ and pay for the service of an Independent Testing Agency for Testing, Adjusting and Balancing (TAB) of HVAC systems.

1. The Testing, Adjusting and Balancing of air conditioning systems will be performed by an impartial Independent Technical Firm whose operations are primarily engaged in the field of professional TAB. TAB work shall be done under direct supervision of a professional engineer, licensed in the State of Texas, a Test and Balance Engineer (TBE, AABC) or TAB Certified Professional (TAB CP, NEBB), or other experienced/certified TAB professional deemed appropriate by the Owner. All personnel performing TAB work shall be fulltime, regular employees of the TAB firm.

2. The Contractor shall cooperate with the Owner provided TAB firm; provide necessary data on design and proper application of system components; furnish labor and materials required to eliminate any deficiencies or mal-performance.

1.2 RELATED WORK

A. Drawings and General Provisions of the Contract, including General, Supplementary and Other Conditions and Division – 1 Specifications Sections, apply to work of this Section.

B. Refer to Division 23 and Division 26 for testing in conjunction with Mechanical and Electrical work.

1.3 QUALIFICATION OF HVAC TESTING, ADJUSTING AND BALANCING FIRM

A. Minimum Qualification of HVAC Testing, Adjusting and Balancing Firm:

1. General:

a. Each professional firm desiring to submit proposals for testing and balancing HVAC systems for Project shall submit necessary brochures describing history of firm and qualifications of personnel to Architect.

b. Each professional firm shall have a minimum of five years of experience.

c. Each submittal shall contain a listing of similar projects.

d. Each professional firm submitting such information on its qualifications and personnel shall keep information current by submitting supplemental data a minimum of once every six (6) months or when professional or technical personnel who shall perform the work may change.

e. Each professional firm warrants by submittal of its personnel qualifications that such personnel shall be used in the performance of the work. In the event of personnel change, professional firm submitting proposal shall submit complete qualifications and experience of new personnel. Owner, upon acceptance of proposal, expects work to be performed by the personnel whose experience is so described.

2. Qualifications of Firm:
    a. Firm shall be one which is licensed to perform professional services of this specified type and as a minimum have one professional engineer (PE), TBE or TAB CP (or equivalent) with current registration/certification to perform such professional services.

    b. Firm shall be capable of performing services at location of facility described within time specified, preparing and submitting the detailed report of actual field work as may be required.

    c. Firm shall be a member in good standing of Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or other experienced/certified TAB governing body deemed appropriate by the Owner, and listed in its current relevant directory.

1.4 TAB FIRM DUTIES AND RESPONSIBILITIES

A. HVAC Testing and Balancing:

1. TAB firm shall act as liaison between Owner, Architect, and Contractor and inspect installation of mechanical piping systems, sheet metal work, temperature controls, and other component parts of Heating, Air- Conditioning and Ventilating systems. Inspection of work shall cover that part relating to proper arrangement and adequate provisions for Testing and Balancing.

2. TAB firm, within sixty (60) days of its employment, shall review Drawings and Specifications to identify potential Testing/Balancing problems and to determine if there are adequate provisions for Testing and Balancing systems. Report any problem to Architect or Architect's representative and Program/Project Manager.

3. Upon completion of installation, start-up, and Controls Contractor point to point verification review on mechanical equipment, check, adjust and balance system components to obtain design conditions in each conditioned space in building. Prepare and submit to Owner, or Owner's delegated representative, complete reports on the Test/Balance and operation of systems.

4. Permanent employed technicians or engineers of firm must do measurements and recorded readings of air, water and electricity that appear in reports.

5. Make a total of three (3) inspections within ninety (90) days after occupancy of building to insure that satisfactory conditions are being maintained throughout and to satisfy any unusual conditions.

6. Make an inspection in building during opposite season in which initial adjustments were made, and at that time make any necessary modifications to initial adjustment required to produce optimum operation of system components to produce proper conditions in each conditioned space. At time of opposite season checkout, Owner's representative shall be timely notified before any readings or adjustments.

1.5 CONTRACTOR'S RESPONSIBILITIES

A. HVAC Testing, Adjusting and Balancing

1. Contractor shall add TAB activities to the Project schedule to allow TAB completion prior to the scheduled Substantial Completion date. TAB completion requires fully functioning HVAC, Lighting and Domestic Hot Water Systems, including all necessary controls. The Owner may occupy the completed areas of the site and existing building prior to Substantial Completion. Cooperate with the Owner during TAB operations to minimize conflicts with Owner's operations

2. Have all systems complete in operational readiness prior to notifying TAB firm that Project is ready for their services. Include scheduled testing dates and times requested allowing a minimum of 7 days prior notification and so certify in writing to Owner that such a condition exists.

3. Make any changes in sheaves, belts and dampers or the addition of dampers required for correct balance as required by TAB firm, at no additional cost to the Owner or TAB Firm.

3. Provide and coordinate services of qualified, responsible subcontractors, suppliers and personnel as required to correct, repair or replace any and all deficient items or conditions found during the Testing, Adjusting and Balancing period.

4. In order that systems may be properly Tested, Adjusted and Balanced as required by these specifications and industry standards, operate said systems for length of time necessary to properly verify that the equipment is free from defects and meets the operational requirements outlined in this Specification and the construction documents. Indicate the completion and readiness for TAB and pay costs of operations during TAB period. Contractor's failure to complete the TAB work by the scheduled date of Substantial Completion will not be a reason to extend the Substantial Completion date, the Final Completion date, or for the Contractor to receive additional monies.

5. The costs for the TAB Firm to re-evaluate functionality of systems due to open issues shall be bore by the Contractor.

6. The TAB Firm will be available for two attempts of Testing, Adjusting and Balancing the Systems with minimal follow-up where necessary (due to deficiencies, systems not ready, incomplete work, etc.) in an effort to accomplish the TAB requirements. When additional work or project site visits are required because Systems are not ready or because they do not successfully meet industry standard installation and functionality requirements, the Contractor will be charged for the TAB Firm's additional reasonable re-testing costs. Charges include a flat fee of $300 plus an hourly fee at the TAB Firm's standard rates per employee that mobilized to the project site for each visit. Additional fees will be paid to the TAB Firm by the Owner and shall be reimbursed to the Owner by the Contractor.

7. Complete operational readiness, prior to commencement to TAB services shall include the following:
    a. Construction status of building permits closing of doors, windows and ceilings installed to obtain projected operational conditions.
    b. All Volume damper handles shall be clearly identified with red/orange/yellow vinyl tape to identify locations.

c. A clean/new set of Final Filters shall be installed prior to the commencement of TAB services.

8. Air Distribution Systems:
   a. Verify installation for conformity to design. Supply, return and exhaust ducts terminated and pressure tested for leakage as required by Specifications.

   b. Volume and fire dampers properly located and functional. All dampers shall be left in the fully open position. Dampers serving requirements of minimum and maximum outside air, return and relief, shall provide tight closure and smooth operation.

   c. Supply, return, exhaust and transfer grills, registers, diffusers and terminal units installed, connected and fully functional.

   d. Air handling systems, units and associated apparatus, such as filter sections and access doors, shall be blanked or sealed to eliminate excessive bypass or air leakage.

   e. Fans (supply, return, and exhaust) operating and verified for freedom from vibration, proper fan rotation and belt tension; heater elements shall be proper size and rating; all VFDs shall be fully functional and programmed; record motor amperage and voltage and verify name plate ratings are not exceeded.

9. Water Circulating Systems:
   a. Check and verify pump alignment and rotation.

   b. Position and valves pertinent to system design and require operation to permit full flow of water through system components. Operate hydronic systems under full flow conditions until circulating water is clean. Strainers shall be removed and cleaned as required during this cycle of operation.

   c. Record each pump motor amperage and voltage. Readings shall not exceed nameplate rating.

   d. Verify electrical heater elements to be of proper size and rating or VFD programming complete.

   e. Water circulating systems shall be full of water and free of air, expansion tanks set for proper water level and air vents installed at high points of systems and operating freely. Verify that the Make-up water pressure is set properly. All manual flow control valves shall be left in the fully open position.

   f. Check and set operating temperature of heat exchangers to design requirements.

   g. Submit digital copies of the recorded findings on the above mentioned items to the TAB firm.

10. Automatic Controls:

a. Verify that control components are installed in accordance with Project requirements and functional, including electrical interlocks, damper sequences, freeze-stats and smoke detectors.
b. Controlling instruments shall be functional and set for designed operating conditions. Factory pre-calibration of thermostats will not be acceptable.

11. TAB firm will not instruct/direct Contractor in any of the work, but will make such reports as are necessary direct to Owner.

12. For design document required plans and miscellaneous adjustment devices for purpose of adjustment to obtain design conditions; install these devices in a manner that will leave them readily accessible, provide access as required by TAB firm.

13. Provide Plans, Plan Revisions, Architectural Specifications, and Change Orders to TAB firm at least 21 days prior to commencement of TAB work.

14. Provide approved Submittal data on equipment installed and related changes required to accomplish test procedures outlined in this Section of the Specification to the TAB firm at least 21 days prior to commencement of TAB work.

15. Transmit one (1) copy of the following 'Record for Owner' to TAB firm for review and comments at least 21 days before commencement of TAB work:
    a. 'As installed' drawings.
    b. Approved Fixture Brochure.
    c. Approved Wiring Diagrams.
    d. Approved Control Diagrams.
    e. Approved, Implemented and Verified Sequences of Operations
    f. Shop Drawings.
    g. Approved Submittals.

1.6 HVAC TESTING, ADJUSTING AND BALANCING

A. Testing and Balancing Air Systems:
    1. Test and adjust air systems to conditions set forth in Plans and Specifications. Air systems include:
        a. Supply Air Systems.
        b. Return Air Systems.
        c. Exhaust Air Systems.
    2. In fan systems, air quantities indicated on Plans may be varied as required to secure a maximum temperature variation of two (2) degrees within each controlled space, but total air quantity indicated for each zone must be obtained.

3. Test and Adjust blowers and fan to deliver CFM required by systems with concurrent recording of RPM, supply voltage and full load amperes. Report any changes of belts and sheaves required.

4. Make Pitot tube traverses of main supply, return and exhaust ducts and adjust fans and dampers to achieve specified air volumes. Patch and cover the Pitot tube holes after air balancing is complete. For Equipment exposed to the sun, metal grommets shall be used.

5. Test and A djust fresh air intake and return air dampers and louvers to conditions scheduled or required.

6. Test and record static pressure on entering and leaving side of each supply fan, exhaust fan filter, coil and balancing dampers and other components of the system.

7. Test and adjust supply air diffusers, grilles, and return air registers to Specification requirements and as shown on Drawings. Adjust supply diffuser pattern blades for proper air distribution in each room or space.

8. A test and balance report shall be completed and submitted to the Owner that includes air flow, temperature and pressure test results for all HVAC equipment/systems included in the project. The systems shall include unit testing that verifies control system correct operation.

B. Testing and Adjusting of Water System:
   1. Flow of water through water coils shall be adjusted by adjusting valves until rated pressure drop across each coil is obtained and water flow verified by Venturi readings. On those with three-way valves, rated pressure drop shall first be adjusted though coils in each of several systems and the temperature differential between inlet and outlet shall be determined to be in accordance with its rating. Bypass valves shall then be adjusted on each coil until an equal pressure drop between supply and return connections is obtained with three-way valves set to bypass all coils in each of the several systems.

   2. Geothermal Heat Pumps TAB shall be performed with a single unit per well field operating. This single unit balancing shall include both the air side, particularly the outside air, and the water side.

C. Testing and Adjusting of Automatic Controls:
   1. Test automatic controls, controlled devices, interlocks, safety devices associated with HVAC system for proper operation and sequence during heating, cooling, intermediate and smoke removal modes of operation. Adjust automatic controls to deliver required quantities of air at temperatures specified or scheduled on Plans and to maintain proper conditions in each room of the building.

   2. Report deficiencies or malfunctions to Owner in the form of a formal, written Deficiency Report.

D. Equipment Settings:
   1. Before final acceptance of reports is made, TAB firm shall furnish Owner the following data:

a. Summary of main supply, return and exhaust duct Pitot tube traverses and fan settings indicating minimum value required to achieve specified air volumes.

b. A tabulated record of temperature in all spaces on each separately controlled zone, together with outside temperature at time of measurement.

c. A list of measured air quantities at each outlet corresponding to temperature tabulation specified above.

d. Air quantities at each return and exhaust air-handling devices.

e. Supply pressure readings entering and leaving each supply fan, exhaust fan, filter, balancing dampers and other components of ventilation equipment and systems. These readings shall be quantified using fan curves in terms of CFM handled.

f. Motor current readings per phase at each equipment motor. Voltage at time of reading shall be listed.

g. Water pressure reading at gauge connections. Pressure readings at coils and pumps shall be quantified using coil and pump curves in terms of GPM flow through metering stations at each coil if applicable.

h. Water temperature readings entering and leaving each coil and heat exchanger under maximum load conditions in each case.

i. Unless specified otherwise in Specification 23 05 93, set HVAC system airflow and water flow rates within the following tolerances:

A. Supply, Return, Exhaust Fans and Equipment with Fans:

1. +/- 10 % of Design conditions.

B. Air Devices

1. +/-10 % of Design conditions.

C. Hydronic Flow Rates

1. +/- 10 % of Design conditions.

2. The final report shall certify test methods and instrumentation used, final velocity reading obtained, air quantities at each outlet supply, return, exhaust, temperature, pressure drops, RPM of equipment, amperage of motors, air balancing problems encountered, recommendations and uncompleted punch list items.

3. A summary of actual operating conditions shall be included on each system outlining normal and/or ventilation cycles of operation. The intent of final report will provide a reference of actual operating conditions for Owner's operating personnel

.

4. Certificate of Substantial Completion will not be signed by the Owner unless an acceptable TAB deficiency report has been provided and accepted by the Owner. An acceptable deficiency report shall indicate that the TAB work is completed except for deficiencies that can be resolved within 14 days.

5. Ensure that all systems are balanced at the proper time in the opposite season.

PART 2 – PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 45 23

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections:
1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.
2. Division 32 Section "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.3 DESCRIPTION OF REQUIREMENTS.

A. Connections for temporary and permanent utilities and payment for temporary utilities services required for the Work, whether the Work is new construction or renovation of an existing facility, are the responsibility of the Contractor. Cost or use charges for temporary services or facilities will not be accepted as a basis of claims for a Change Order. Temporary utilities services required for use at the project site include but are not limited to the following:
1. Water service and sewer.
2. Temporary electric power and light.
3. Telephone service and internet.
4. Provide adequate utility capacity at each stage of construction.
5. Prior to availability of temporary utilities at the site, provide trucked-in-services for start-up of construction operations.

B. Temporary construction and support facilities required for the Project include but are not limited to the following:
1. Temporary heat.
2. Field offices and storage sheds.
3. Sanitary facilities, including drinking water.
4. Dewatering facilities and drains.
5. Temporary enclosures.
6. First aid station.
7. Project identification, bulletin boards and signs.
8. Waste disposal services.
9. Rodent and pest control.
10. Construction aids and miscellaneous general services and facilities.
11. Alternate temporary services and facilities, equivalent to those specified, may be used, subject to acceptance by the Architect/Engineer and Program Manager.
12. Temporary Interior Barriers
13. Temporary Exterior Barriers

C. Security and protection facilities and services required for Project include but are not limited to the following:
   1. Temporary protected interior walkway between occupied building areas.
   2. Dust barricade between occupied building areas and work areas.
   3. Temporary fire protection.
   4. Barricades, warning signs, lights.
   5. Sidewalk bridge or enclosure fence for the site.
   6. Environmental protection.
   7. Alternate security and protection methods or facilities, equivalent to those specified, may be used, subject to acceptance by the Architect/Engineer.
   8. The Contractor shall provide a temporary barrier whenever a certain area of the school is sealed off for remodeling work for phasing purposes. The barrier shall be made of 3/4" plywood or drywall, and it shall extend from floor to ceiling, wall to wall. The temporary barrier shall have a door that can be locked. This barrier will remain until work in the specified area is completely finished. The barrier may subsequently be moved to a different location, provided that it still meets the requirements. Proper signage should be displayed near the temporary barrier, according to safety regulations. Any temporary barriers will need to be coordinated with the emergency egress plan of the building. Signage is to be paid for by an Owner's allowance of $7,500.00. Bond Marketing has oversight of graphic approval and vendor.
   9. Temporary Construction Screening with Dallas ISD graphics is to be paid for by an Owner's allowance of $8,000.00. Bond Marketing has oversight of graphic approval and vendor. For advertising the General Contractor and Architect can split a 6'x10' into two (2) 6'x5' panels for advertising. Advertising panels are to be located at the front of the campus and by the job trailer. (Refer to 3.3 in 01.50.00)
   10. Barrier requirements for minor renovation work will be discussed and agreed upon at weekly progress meetings.
   11. Comprehensive Remote Monitored Surveillance shall be provided by the contractor to be paid for by the Owner's Contingency. DISD Bond Construction Services has vendor approval. 100% Perimeter Coverage, Surveillance Cameras based on the provided Site Plan, 12 high-resolution cameras strategically placed to cover critical areas and zones within your construction site. Each camera shall be equipped with built-in infrared illumination, providing clear, high-quality images even in low-light conditions, ensuring constant vigilance regardless of time or weather. 24/7 Remote Monitoring, Advanced AI Analytics, Desktop and Mobile Web Applications, and Battery Backup system.

1.4 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Owner, Program Manager, Architect, testing agencies, and authorities having jurisdiction.

1.5 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas (including dumpster, construction trailer, temporary fencing, silt fence, storage units and portable toilets), and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of relevant Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage

provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.

1. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust-Control and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust-control and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of the work.
2. HVAC system isolation schematic drawing.
3. Other dust-control measures.
4. Waste management plan.

1.6 QUALITY ASSURANCE

A. Regulations: Comply with requirements of local laws and regulations governing construction and local industry standards, in the installation and maintenance of temporary services and facilities, including but not limited to the following:

1. Building Codes, including local requirements for permits, testing and inspections.
2. Health and safety regulations.
3. Utility company regulations and recommendations governing temporary utility services.
4. Police and Fire Department rules and recommendations.
5. Environmental protection regulations governing use of water and energy, and the control of dust, noise and other nuisances.
6. In addition, comply with “Environmental Impact” commitments the Owner or previous Owners of the site may have made to secure approval to proceed with construction of the Project.

B. Standards: Comply with the requirements of NFPA Code 241, "Safeguarding Construction, Alterations, and Demolition Operations", the ANSI A10.6 "Safety Requirements for Construction and Demolition", and the NECA National Joint Guideline NJG-6 "Temporary Job Utilities and Services".

C. Inspections: Inspect and test each service before placing temporary utilities in use. Arrange for require inspections and tests by governing authorities, and obtain required certifications, and permits for use.

D. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

1.7 PROJECT CONDITIONS

A. General: Provide each temporary service and facility ready for use at each location when the service or facility is first needed to avoid delay in performance of the Work. Maintain, expand as required and modify temporary services or facilities as needed throughout the progress of the Work. Do not remove until services or facilities are no longer needed, or are replaced by the authorized use of completed permanent facilities.

B. Conditions of Use: Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services of facilities, and do not permit them to interfere with the progress of the Work. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.

C. Temporary Utilities: Do not permit the freezing of pipes, flooding or the contamination of water sources.

D. Security and Protection: Maintain site security and protection facilities in a safe, lawful and publicly acceptable manner. Take necessary measures to prevent erosion of the site.

E. The roof removal and new roof installation shall proceed on a phased basis to minimize risk to the School's ongoing operations and its property. The GC shall be responsible for protection of interior spaces from damage during roofing work.

F. Distribute material, debris, and equipment over the roof deck to avoid damage to the structural deck. Not more than two weeks supply of material shall be stored on a roof at any given time. Place materials and equipment to be stored on the roof as nearly direct over structural members as can be determined. Secure equipment, material, and debris on the roof to prevent movement by wind or other elements. Contractor assumes full responsibility for loading on the structural deck or roofing materials during roof replacement operations.

G. Consult with the A/E and the Construction Services PM regarding permission for the use of selected areas with the building. Coordination will also be held with the Principal and / or site staff.

H. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

I. Areas utilized for temporary facilities, staging area, construction access and controls, shall be reestablished to its original condition at the time of substantial completion or demobilization, whichever comes first.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials and equipment for temporary services and facilities; used materials and equipment that are undamaged and in serviceable condition may be used, if acceptable to the Architect/Engineer. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards.

B. Portable Chain-Link Fencing: Minimum 2-inch 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized steel bases for supporting posts.

C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.

D. Dust Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, PM, Architect, and construction personnel office activities and to accommodate project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases. Assign one desk for the Program Manager and/or Architect, with printer and scanner access.
   2. Conference room of sufficient size to accommodate meetings of 8 individuals (minimum). Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
   3. Coffee maker and supplies.
   4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. These shall be weather tight, structurally sound, compliant with applicable codes and shall be secure
   2. Store combustible materials apart from building.

D. Temporary Construction and Support Facilities: Provide facilities that can be maintained properly throughout their use at the Project site.

E. Self-Contained Toilet Units:
   1. Sanitary facilities include temporary toilets, with facilities and drinking water fixtures. Comply with governing regulations including safety and health codes for type, number, location, operation, and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations that will best serve the Project's needs.
   2. Provide single-occupant self-contained toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar non-absorbent material. Provide at least one for every thirty (30) employees.
   3.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary of Work."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
   1. Prior to commencing work, isolate the HVAC system in area where work is to be performed in accordance with approved coordination drawings.
      a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
      b. Maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
   2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
   3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction

from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner. Electrical power service to the project office trailer and other elements and areas of the Contractor's office and staging area is to be provided by the Contractor by means of a temporary power service with a temporary account separate from the facility electrical power service.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.

1. Provide additional telephone lines for the following:
   a. Provide a dedicated telephone line for each facsimile machine in each field office.
2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Architect's office.
   e. Engineers' offices.
   f. Program Manager's office.
   g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone.

K. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access project electronic documents and maintain electronic communications. The computer should be equipped in a manner that provides effective access of project electronic documents and use of electronic communications (e-mail), printer and scanner. Wireless internet access optional.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Parking: Provide temporary parking areas for construction personnel.

C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated in this section.
2. Temporary Signs: Provide other signs as indicated and as required to informing the public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.
4. Two (2) 6'x10' construction screen panels are allowed for advertising by the General Contractor and Architect. Each 6'x10' panel can be split into two (2) 6'x5' panels for advertising. The panel locations are at the front of the campus and by the job trailer.

D. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
   1. Do not load elevators beyond their rated weight capacity.
   2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

E. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
   1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

F. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

H. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.
   1. Construct covered walkways using scaffold or shoring framing.
   2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
   3. Paint and maintain appearance of walkway for duration of the Work.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

J. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied areas fumes and noise.
   1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
   2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
   3. Insulate partitions to control noise transmission to occupied areas.

4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
5. Coordinate with Dallas ISD Bond Marketing Graphics.
6. Protect air-handling equipment.
7. Provide walk-off mats at each entrance through temporary partition.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking on school property per State Law.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.4 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."
3.
4.

E. TEMPORARY CONSTRUCTION SIGN

DALLAS INDEPENDENT SCHOOL DISTRICT

CONSTRUCTION SIGNS

All construction projects are required to have construction signs installed on site. Below are the guidelines for these signs.

Two Column Design (2/3+ 1/3) with vertical line between two columns.



LEFT COLUMN:

- Line 1 Centered: TYPE OF PROJECT
- Line 2 Centered: Board approved school name (all caps)
- Line 3 Centered: Type of School (Elementary, Middle, High School)
- Line 4 Centered: Street Address
- Line 5 Centered: City, TX Zip
- Line 6 Centered: DALLAS INDEPENDENT SCHOOL DISTRICT
- Line 7 Left Justified: TRUSTEE
- Line 8 Left Justified: NAME OF SCHOOL'S TRUSTEE
- Line 9 Left Justified: PROGRAM MANAGER
- Line 10 Left justified: Name of Program Manager firm
- Line 11 Left justified: ARCHITECT
- Line 12 Left justified: Name of Architecture firm
- Line 13 Left justified: CONTRACTOR
- Line 14 Left justified: Name of Contractor

RIGHT COLUMN:

- Top of column centered: Dallas ISD logo
- Line 1 Centered: BOARD OF TRUSTEES
  [all names should be persons in these positions when the construction contract was approved by the Dallas ISD Boa
- Lines 2-10: Board of Trustees in this order and style
- Name, President, District
- Name, First Vice President, District
- Name, Second Vice President, District
- Name, Secretary, District
- Name, District
- Name, District
- Name, District
- Name, District
- Name, District
- *INSERT SPACING*
- Line 11: ADMINISTRATION
- Line 12: Name, Superintendent of Schools
- Line 13: Name, Chief Operatons Officer
- Line 14: Name, Title of person heading Construction

DALLAS ISD CAMPUS SIGNAGE REQUIREMENTS FOR SCHOOL DESIGN TEAMS

F.

3.6 GROUNDBREAKING CEREMONY (New Schools Only)

A. At a time designated by the Owner after project award, the Owner will conduct a groundbreaking ceremony on the project site. The General Contractor will provide support and materials to the Owner for purposes of conducting that ceremony. This support will include providing, but may not be limited to, the following;

1. Land movers to be on site as a backdrop to the groundbreaking.

2. Sandpit at a location coordinated with the owner.
3. Collection of shovels and hardhats from the Construction Services office and transport them to the groundbreaking ceremony.
4. Cleaning and transportation of shovels and hardhats to the Construction Services office after the groundbreaking ceremony.
5. Bottled water for participants.
6. Temporary chairs and tables to seat up to one hundred attendees.
7. All weather access to the site and sandpit.

END OF SECTION 01 50 00

SECTION 01 52 14 - TEMPORARY FACILITIES FOR STUDENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 00 and 01 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section includes requirements for temporary facilities (Swing Space) for the purpose of relocating students to provide temporary classroom facilities during construction activities.

B. Related Sections:
   1. Division 00 Section titled “Technical Proposal”
   2. Division 01 Section title “Temporary Facilities and Controls”

1.3 DESCRIPTION OF REQUIREMENTS

Since the school buildings will be in use during construction, the Work shall be conducted in phases as proposed in the phasing drawings. Contractor will provide temporary classroom buildings for swing space, per the requirements indicated in this section. District will provide moving services to relocate movable classroom furnishings, fixtures and/or equipment in/out of each phased zone. The number of temporary buildings and classrooms which will be made available during the project shall not exceed the numbers summarized below:

SWING SPACE TYPE	ORG 159 L.L. Hotchkiss Elementary School			
Maximum External Temporary Swing Space Classrooms (to be provided by Contractor)				
Maximum Temporary Restrooms				
Swing Space Classrooms Provided Within Existing Facilities				

The Contractor can submit, as part of the proposal, alternate phasing plans that can potentially save the District time and money.

If no external or internal temporary swing space classrooms are indicated above, then Contractor will be required to schedule work during holidays, weekends, or hours other than regular school hours, and price its work accordingly. A Dallas ISD representative must be present at the school during times that the Contractor is working at the school site. Contractor will be responsible for overtime costs for Dallas ISD staff for presence at the school site outside normal hours of school operation, including holidays.

A. If students must be displaced from classroom areas due to the phasing and execution of the work according to the Contractor’s work plan, the Contractor shall be responsible for

providing, on a turn-key basis, temporary facilities for those displaced students.

B. If the Contractor elects to utilize Swing Space, they must include all costs associated with the removal, transportation, installation and dismantling, including, but not limited to:
    1. Equipment relocation
    2. Transport and setup
    3. Maintenance of the temporary facilities for the duration of their use (i.e. HVAC, electrical, and other building repair and maintenance needed, not custodial maintenance)
    4. Site work and utilities
    5. ADA/TAS Accessible ramps and sidewalks
    6. Stairs
    7. Skirting
    8. Interior finish-out
    9. Miscellaneous specialties (i.e. marker boards, tack boards, flag holders, map clips, fire extinguishers)
    10. Signage
    11. Wall Clock and bell to interface with the existing system at the school
    12. Coordination with movers for relocation of Furnishings, Fixtures, and Equipment (FF&E)
    13. Breakdown, removal, and transport of the Swing Space at the completion of its use
    14. Restoration of the site following removal of facilities
    15. P.A. to interface with the existing system at the school

1.4 SCOPE OF WORK

The intent of this scope item is for the Contractor to dismantle and remove the District's existing portable building at the site(s) identified in this section, and relocate to the campus requiring swing space as identified in Section 10.7. Contractor shall be responsible for a turnkey dismantling, transportation and setup of these portable buildings.

Schools with existing portables to be utilized for this project and the portable count are as follows:

Name of School	Portable Details (Include ID# and Single/Double)

Removal of Existing Portables from Other Schools. Contractor shall provide an advance notice of at least five (5) days to the School Principal and the Program Manager before the temporary buildings are expected to be dismantled and demobilized from any of the above sites. Scope may also involve demolition of sidewalks, canopies, electrical, technology pathways as identified in the contract documents. Again, the intent of this scope of work is for the contractor to provide turnkey dismantling, and removal of identified portables and associated infrastructure. Refurbish site(s) where portables / sidewalks are removed.

Removal of Existing Portables scheduled for Demolition in the footprint of Construction or Staging. If a portable needs to be demolished because it is in the footprint of construction or staging, any necessary Abatement will be the responsibility of the Contractor. After any necessary Abatement, the GC will be responsible for the demolition and removal/disposal of the debris remaining. Refurbish site(s) where portables / sidewalks are removed.

Removal of Existing Portables Not Scheduled for Demolition in the footprint of Construction or Staging. If it is necessary to remove a portable building due to construction or staging at a campus and it is not scheduled for demolition, the GC will be responsible to disassemble, disconnect the portable, and deliver it and set it on blocks at a location designated by Dallas ISD Maintenance (this could be another campus). This would only require that the

GC set the building in the designated location, set on blocks, level, etc. Maintenance will be responsible for setting the portable up (Skirting, walkways, utilities, fire alarm hookup, etc.) at the new location and Maintenance will also be responsible for picking up the awnings, skirting and other related items that had to be disassembled at the original location. Maintenance will also be responsible for authorizing the disconnect and any re-connect of the utilities with their requested move of portables. Where portables were removed for staging, refurbish site(s) to match existent surrounding conditions.

Portables designated to be relocated into another Dallas ISD Location If there is a Dallas ISD portable that is designated to be moved from a Dallas ISD location to a campus needing Swing Space – The GC (with contract for the campus needing the swing space) would be responsible for the disconnecting of any utilities and cabling for fire and technology. The GC, who is to move the building for swing space, will be responsible for the removal of awnings, porches, skirting, etc. and be responsible for the removal of the debris. The General Contractor would then be responsible for re-grading the area. The General Contractor would then be responsible to pick up the completely disconnected portable(s) and transport it (them) to the campus they are assigned by Dallas ISD Construction Services office and then be responsible for the setup and complete reconnection of all utilities, fire alarm, technology, etc. that would match Dallas ISD requirements. At the point the work is complete and/or the swing space is no longer necessary, the GC would be responsible for the disconnect and moving to a location designated by the Dallas ISD and would have no requirement other than to secure the moving permit and to set the portable(s) securely in place. The General Contractor would have responsibility to remove any debris from that disconnect and removal. The General Contractor is responsible for all permitting required to install the portable buildings.
NOTE: In all cases involving swing space, the Campus Principal and Facilities must be appropriately and timely notified and aware of swing space issues, including determination and disposition of portable contents.

Transportation of Existing Portables from Other Schools to the Project. Contractor shall provide turnkey transportation services, including management of any required permits, for safe transportation of existing portables from any of the above site to the project. Any removal and replacement of any fencing, or other obstacles for relocation of such buildings shall be the responsibility of the Contractor.

Installation of Portables at the Project. Provide turnkey services for delivery, set-up, maintenance, removal, and restoration of the site for temporary classroom buildings to accommodate phased construction for the Dallas ISD Construction Services office

A. Engineering: The Contractor will provide site engineered civil, utility, blocking plan/foundation plan, sidewalk design and deck/ramp design sufficient to receive a Building Permit from the City, for each site for the installation of all temporary classroom buildings. Existing canopies, sidewalks, foundation details, technology, fire alarm etc. at the schools may be used as a guide for the scope expectations also.

B. Location: The locations of the temporary classrooms are as indicated on the site plan drawings.

C. Permits: The Contractor will coordinate and obtain the permits as required by the City for placement of the classroom buildings at each site. This includes the permits required for the transportation of the classroom buildings.

D. Temp. Facilities: Roll off dumpsters will be provided by the Contractor as required for clean-up during installation and removal of swing space.
E. Clean up: Final broom sweep of the building(s) and removal of trash and debris from each site will be provided by the Contractor prior to occupancy of the swing space by the

students and staff. Floor waxing or shampooing will be provided be the Contractor prior to occupancy by the students and staff. Provisions for site restoration upon completion of the delivery of the modules and/or completion of the scope of work will be provided by the Contractor. Upon the removal of the buildings all underground utilities and/or structures associated with the temporary classroom buildings will be removed and discarded. The concrete sidewalks will be removed and discarded. Rough grading will be performed and new sod will be placed to restore the area to its original condition.

F. Site Preparation: Dallas ISD has made no provisions for any site preparation and/or demolition as may be required for the delivery and/or installation of the portable buildings. Any site preparation and/or demolition that might be required of for installation of the temporary classrooms will be included in the Contractor's scope.

G. Construction Fencing: The contractor will maintain a clean and safe site environment within the limits of the temporary classroom construction area. Temporary chain link construction fencing 6' high will be installed around the perimeter of the limits of construction.

H. Sodding: Upon the removal of the buildings, the Contractor will provide sod within the limits of construction associated with the temporary classroom scope of work. Any irrigation of the new sod will be provided by Dallas ISD.

I. Site Utilities (if applicable): The Contractor will provide the site utility connections required for the temporary classroom buildings. The Contractor is responsible for consulting with the City regarding requirements for restrooms on school projects that are located in cities other than Dallas. If required by those cities, the Contractor must provide restroom services and utilities as required by local code.

J. Storm: All storm water management and any sedimentation control will be the responsibility of the Contractor. Gutters and downspouts will be installed as needed by the Contractor.

K. Sanitary (if applicable): The Contractor will install all fixtures, stub all sanitary lines below the floor and manifold to one location at the edge of the building(s). All final connections, utility company charges and impact fees that might be required will be included in the Contractor's scope of work. The Contractor is responsible for consulting with the City regarding requirements for restrooms on school projects that are located in cities other than Dallas. If required by those cities, the Contractor must provide restroom services and utilities as required by local code.

L. Water (if applicable): The Contractor will install all fixtures and stub all water lines to one location at the edge of the building(s). All final connections, utility company charges and impact that might be required will be included in the Contractor's scope of work. The Contractor is responsible for consulting with the City regarding requirements for restrooms on school projects that are located in cities other than Dallas. If required by those cities, the Contractor must provide restroom services and utilities as required by local code.

M. Natural Gas: No provisions for any gas service are anticipated at the present time.

N. Life Safety: Building(s) will be approved and inspected by the Texas Department of Licensing and Regulation. Any provisions for fire suppression, fire sprinkler system or fire rated assemblies that might be required will be included in the Contractor's scope of work.

O. Fire Alarm: The contractor will provide and install fire detection systems as required by the building code and the City.

P. Electrical: The contractor will provide and install electrical systems as required by the building code and the City. Installation and electricity consumption costs associated with the swing space will be the financial responsibility of the Contractor.

Q. Mechanical: The Contractor will supply and install the standard end mount HVAC units. The condensate from both HVAC units of a classroom building will harnessed together and discharged into a 24" diameter by 36" deep french drain filled with gravel. All condensate piping will be PVC but will be protected where directly exposed to UV radiation.

R. Internet Access: The Contractor will provide wireless internet access appropriate for the swing space. Portable technology connectivity shall be coordinated with the Technology Department.

S. Skirting: After the modules are installed, the Contractor will install full perimeter skirting around the building(s) using the same material and finish as that of the building siding to provide a consistent finish down to grade. Sections of skirting will be perforated as required for proper crawl space ventilation. Access to the crawl space will be accomplished by removing sections of the skirting.

T. Decks/Stairs: The Contractor will install landings at the exit doors of the building(s) within the limits of construction as required by code and the City. Landings will utilize pressure treated wood construction with slip resistant surface treatment and handrails.

U. Ramps: The Contractor will install handicapped accessible ramps at the exit doors of the building(s) within the limits of construction as required by code and the Local City. Ramps will utilize pressure treated wood construction with slip resistant surface treatment and handrails.

V. Sidewalks: The Contractor will install 4' wide, 4" thick, 3,000 psi concrete sidewalks to service the building(s) within the limits of construction. Sidewalks will receive a light broom finish and be poured on select fill and/or sand bed.

W. Foundation and Anchorage: The swing space facilities should be securely anchored to a foundation system which utilizes some means of structural support, as determined by a certified structural engineer. Provide construction documents that depict the foundation system as designed and certified by a structural engineer.

X. Hitch/Tires/Axles: Hitches will be removed and stored under building while tires and axles are to remain on the modules. Tires and axles will be removed only if necessary to complete the building installation due to site constraints and will also be placed under the modules.

Y. Keys. Contractor shall coordinate with the District for re-keying of all swing space buildings. Provide 10 sets of keys for each building. Doors shall be provided with hardware to enable locking of the buildings from the inside also, and shall have vandal resistant hardware.

Dismantling / Removal of Temporary Buildings upon Completion of Work. Contractor shall demobilize/dismantle/ remove the temporary buildings from site only upon mutual agreement with the Program Manager and Dallas ISD. The temporary buildings shall not be removed from site unless the classrooms that are being renovated under the “Work” of the Contract have been substantially completed and all system upgrades/installation/repairs are completed to accommodate students. Under no circumstances shall the temporary buildings be demobilized if it is deemed by the Program Manager and Dallas ISD that student safety is

a potential issue or if the demobilization is likely to adversely impact the student instruction schedule. Contractor shall provide an advance notice of at least five (5) days to the School Principal and the Program Manager before the temporary buildings are expected to be dismantled and demobilized from the site.

Maintenance and Final Cleaning. Dallas ISD will be responsible for the day-to-day cleaning and janitorial services such as floor cleaning, floor vacuuming, trash removal, etc. Contractor shall be responsible for other maintenance of the temporary buildings, including vandalism. Maintenance of building structure and systems (HVAC, Plumbing, Electrical, Lighting, etc.), for the duration that the buildings are on the School site shall be the responsibility of the Contractor. Contractor shall be responsible for rendering the Project site to its original condition after removal of the temporary buildings, including cleaning and grading and ground cover, termination of the temporary facilities and connections per the requirements of the Owner, the City of Dallas and/or the relevant Government Agency or applicable code. Removal of foundations for the buildings, sidewalks, canopies, ramps etc. will be the responsibility of the Contractor.

Coordination with Project Schedule and Phasing Plan. Contractor shall provide a detailed schedule listing all relevant milestones for the installation and dismantling of swing space buildings as part of the overall project schedule. Activities may include, but are not limited to:

1. Texas Accessibility Standards (TAS) submittals, if required,
2. Procurement of permit to transport the prefabricated buildings from another school to the Project site,
3. Procurement and delivery of the prefabricated temporary buildings,
4. Coordination with the power, water, sanitary sewer and any other applicable utility companies to obtain permits and procure additional primary connections, if required.
5. Installation of canopies, sidewalks, fire alarm systems etc.

Lack of understanding of involved coordination and approval processes, and delays caused thereby shall not be grounds for claim(s) for any contract time extension(s). Contractor shall assume a reasonable time frame from the date of issuance of the Notice To Proceed for the installation of these swing space buildings, and coordinate the timing for the delivery and installation of the temporary classroom buildings with the Project schedule.

END OF SECTION 01 52 14

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Sections:

1. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "Substitution Procedures" for requests for substitutions.
4. Division 01 Section "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.

4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
2. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Products:

    a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.

3. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.
    b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

4. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Cutting and patching.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

B. Related Sections:

1. Division 01 Section "Submittal Procedures" for submitting surveys.
2. Division 02 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
3. Division–07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Cutting and Patching Plan: Submit plan describing procedures at least 5 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.

3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate how long services and systems will be disrupted.

1.5 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that will result in increased maintenance or decreased operational life or safety. Operational elements may include the following:

   a. Primary operational systems and equipment.
   b. Fire separation assemblies.
   c. Air or smoke barriers.
   d. Fire-suppression systems.
   e. Mechanical systems piping and ducts.
   f. Control systems.
   g. Communication systems.
   h. Conveying systems.
   i. Electrical wiring systems.
   j. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, reduce their capacity to perform as intended, or that will result in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

   a. Water, moisture, or vapor barriers.
   b. Membranes and flashings.
   c. Exterior curtain-wall construction.
   d. Equipment supports.
   e. Piping, ductwork, vessels, and equipment.
   f. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
3. Contractor shall be responsible for locating all underground utility lines that may be affected by the Work, including but not limited to use of technologies such as Ground Penetrating Radar (GPR). Contractor shall provide a report showing location of existing utilities before pre-dig meeting and shall retain a hard color copy of the report on site at all times. Contractor shall maintain the site markings through the duration of the project. Contractor is responsible for protecting all utility lines (underground and above ground) while performing work. Any damaged utility lines will be replaced by the Contractor at no cost to the Owner.

4. Prior to starting work, Contractor shall review and provide a report that documents operations of existing systems, including but not limited to fire alarm, security, and PA. Contractor shall also record and provide screenshots of all existing mechanical equipment and controls, from the Owner's front end operating system.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility company that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

D. Surface and Substrate Preparation: Comply with manufacturer's recommendations for preparation of substrates to receive subsequent work.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.

5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Program Manager. Submit log at project completion for project records.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of **96 inches** in occupied spaces and **90 inches** in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Contractor shall provide filters for all mechanical equipment (new and existing) impacted by the Contractor’s scope of work, at minimum, at the following stages of construction;
1. Construction filters at the start of construction, and as needed through-out the project to maintain proper air flow
2. MERV filters at the start of Test & Balance
3. MERV filters at Substantial Completion (filters to be dated and provide photo documentation)

D. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

F. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

2. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with the original installer’s recommendations.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."

E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
6. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

3.6 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually

agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

2. Pre-installation Conferences: Include Owner's construction personnel at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Provide necessary daily cleaning during construction to maintain premises and adjoining public properties free from construction waste, debris and rubbish, and dust caused by operations.
2. At completion of each day, remove waste materials and rubbish; store tools, equipment, machinery and surplus materials; and clean all sight exposed surfaces.
3. If Contractor fails to clean up each day and at the completion of his Work, the Owner may do so and charge the cost thereof to the Contractor. At his next pay application a deductive change order will be processed and there is no appeal for back charges due to clean up.
4. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
5. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
6. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   a. Utilize containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Cleaning Materials: Use only cleaning materials recommended by manufacturer of the surface to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

G. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

H. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, whether completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

L. During Construction:
1. Oversee cleaning and ensure that building(s) and ground(s) are maintained free from accumulations of waste materials and rubbish.
2. Sprinkle dusty debris with water.
3. During progress of Work, clean-up site and access and dispose off waste materials, rubbish and debris at least once every week.
4. Provide dump containers and locate on site for collection of waste materials, rubbish and debris on a daily basis.
5. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition.
6. Remove waste materials, rubbish and debris from site and legally dispose off at public or private dumping area.
7. Lower waste materials in controlled manner with as few handlings as possible; do not drop or throw materials from heights.
8. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion.
2. Final completion.
3. Warranties.
4. Final cleaning.

B. Related Sections:
1. Division 01 Section "Execution" for progress cleaning of Project site.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

1. Prepare a list of items to be completed and corrected (punch list), the value of item on the list, and reasons why the Work is not complete.
2. Advise the Owner of pending insurance changeover requirement.
3. Grant the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits and similar releases.
4. Complete startup testing of systems.
5. Complete Owner's Training. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Complete final cleaning requirements, including touch-up painting.
7. Submit specific warranties 14 days after Substantial Completion.
8. Submit sign-in sheets from training sessions
9. Submit one (1) electronic copy of Operation & Maintenance (O&M) Manuals

1.4 FINAL COMPLETION – **Please refer to Attached "General Contractor Close out and Hazmat Abatement Close Out Checklist" at the end of this section**.

A. Preliminary Procedures: Before requesting final inspection for determining final completion, the items listed in 1.3 of this section must be complete. The Contractor must also complete the following:

1. Submit final certifications, and similar close-out documents.
2. Prepare and submit Project Record Documents, including construction photographs, damage or settlement surveys, property surveys, and similar record information.
3. Submit test/adjust/balance report records.
4. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.
5. Complete final cleaning and repair of all areas, including touch-up painting.
6. Submit final close-out submittals.

7. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
8. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Close-out submittals include, but are not necessarily limited to, as applicable:

1. Project Record Documents described in Section 01 78 39.
2. Certification of Substantial Completion (AIA Form G704)
3. Certificate of Final Completion (Exhibit D – Form of Final Completion Notice)
4. Certificate of Final Acceptance by the Architect (Exhibit H of the A/E Agreement – Form of Final Completion Certification with punch list sign-off)
5. Certificate of Final Completion by the Program Manager (Exhibit C of the PM Agreement – Form of Final Completion Certificate)
6. TEA Certificate of Project Compliance.
7. Final Change Order.
8. Final Acceptance for Payment to include acceptance of Final Change Order and therefore no work or retainage outstanding
9. Consent of Surety to Final Payment
10. City's Certificate of Occupancy
11. Contractor's Final Affidavit of Release of Liens
12. Contractor's Guarantee
13. Letter from Contractor listing all subcontractors and suppliers with contact information.
14. Transmittal listing Keys: Contractor shall prepare an itemized key list in complete detail ending in a statement that the keys were turned over, the Contractor's signature, a line stating that the keys were received and the receiver's signature. Copies of this list should be retained by the Contractor and receiver and a copy sent to the Architect, PM and Owner. Keys should be identified with tags corresponding to the approved room number designation.
15. Operating, Instruction and Maintenance Manuals for Equipment. For records, provide one (1) paper copy of all O&M manuals at final closeout.
16. Verification of training conducted: Provide copy of sign-in sheet. For records, provide one (1) DVD copy of all training sessions at final closeout.
17. Final approved submittals for HVAC Controls System, Data Cabling System, and Fire Alarm System, and Security System.

Refer to Attached "General Contractor Close out checklist" at the end of this section.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Contractor.
    d. Page number.

4. Submit list of incomplete items in the following format:

    a. PDF electronic file.

1.6 WARRANTIES

A. Submittal Time: All warranties shall commence on the date of substantial completion and copies of the Warranties be submitted no later than 14 days after substantial completion.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document. Coordinate paragraph below if Division 01 Section "Operation and Maintenance Data" is used.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

D. Refer to attached checklist of warranties and close out customized by the Architect for each campus.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
f. Sweep concrete floors broom clean in unoccupied spaces.
g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
i. Remove labels that are not permanent.
j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

k. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report upon completion of cleaning.

o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
p. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

General Contractor Close-out Checklist

To: <<Name>> Project Manager, Dallas ISD **Date:**

GC: <<Name of GC Firm>> **A/E Firm:** <<Name of A/E Firm>>

Org#: xxxx **PM:** <<Name of PM Firm>>

School Name

Project Type: Addition Renovations New Construction

Item #	Document Description	Primary Responsibility	Tab #	Check-Off	Remarks
I.	**FINANCIAL RECONCILIATION / FINAL PAYMENT REQUIREMENTS**				
a.	Copies of Reconciliation to Dallas ISD Financial System and Copy of Final Payment	PM			PM will collect for close-out
b.	Certificate(s) of Insurance including General Liability and (Pollution and/or Professional Liability if applicable)	PM			PM will collect for close-out
c.	Insurance Requirements at Final Completion Statement	PM			PM will collect for close-out
d.	Copy of Final Change Order	PM			PM will collect for close-out
e.	Copies of all executed Change Orders	PM			PM will collect for close-out
f.	Copies of all executed CAEAs and CAELs	PM			PM will collect for close-out with back-up information
g.	Copies of all executed AERAs	PM			PM will collect for close-out with back-up information
h.	Copies of all executed custodian overtime authorizations (Summary Recap (Hrs.)	PM			PM will collect for close-out. Include as deductive CAEA
i.	Confirmation of back charge for Prolog Converge licenses & Custodian Overtime	PM			PM will collect for close-out. Include as deductive CAEA
j.	Confirmation of back charge for technology refund (ERATE), if applicable	PM			PM will collect for close-out. Include as deductive CAEA
k.	MWBE Contract Closeout Evaluation Form	PM			PM will collect for close-out. Include final MWBE payment status report
II.	**PAYMENT AND PERFORMANCE BONDS**				
a.	"Consent of Surety Company to Final Payment"; AIA G707 (Confirm that Power of Attorney is attached to form.)	GC			
III.	**EVIDENCE OF PAYMENT OF DEBTS AND CLAIMS**				
a.	"Contractor's Affidavit of Payment of Debts and Claims" AIA G706	GC			
IV.	**SUBSTANTIAL COMPLETION**				
a.	AIA G704 - Certificate of Substantial Completion	A/E Dallas ISD PM			
b.	Punchlist - Issued at substantial completion	GC			
c.	Exhibit G - Form of Substantial Completion Certification	A/E			This is an Exhibit in the A/E Agreement
V.	**FINAL COMPLETION**				
a.	Exhibit H - Form of Final Competion Certification - with signed off punchlist	A/E			This is an Exhibit in the A/E Agreement
b.	TDLR - RAS report approved or A/E Letter	A/E			If the RAS report shows deficiencies, the A/E will have to confirm/explain and/or justify corrections.
c.	Attachment C - Form of Program Manager's Final Completion Certificate	PM			This is an Exhibit in the PM Agreement
d.	Exhibit D - Form of Contractor's Final Completion Notice	GC			
e.	TEA - Certification of Project Compliance	A/E GC Dallas ISD PM			PM will coordinate the sign-off on this document.
VI.	**OPERATIONS AND MAINTENANCE MANUALS AND EVIDENCE OF TRAINING**				
a.	A/E's O&M Manuals confirmation letter.	GC			
b.	O&M Manuals submitted by GC to A/E	GC			Per detailed list developed by GC and reviewed by A/E and PM. One Manual per each school to be split by CSI Divisions.
c.	Training Matrix, Sign-In sheet(s) and DVDs.	GC			GC is to provide a sign-in sheet for each system for which training has been provided to indicate the person, title and date of completion of the
VII.	**ATTIC STOCK / SPARE MATERIAL / KEY TRANSFER**				
a.	Signed off Transmittal Attic stock & spare material	GC			Provided by GC and received by Principal or Campus Facility Supervisor or Maintenance, as applicable.
b.	Signed off Transmittal Key transfer (Accessory keys)	GC			Provided by GC and received by Principal or Campus Facilities Supervisor, as applicable.
VIII.	**WARRANTIES - By SYSTEM (MEP, Fire alarm, Fire sprinkler, Roofing, Security, etc.)**				
a.	Exhibit B - Form of Contractor's Guarantee	GC			
b.	Exhibit B-2- Certification of Compliance with Contract Documents.	GC			
c.	Manufacturer's Warranty(ies)	GC			A separate "Warranties" manual should be provided for guarantees, warranties, etc.
d.	List of Subcontractors and Suppliers	GC			

IX.	**LOCAL AGENCIES APPROVALS (as applicable)**					
a.	City of Dallas - Certificate of Occupancy	GC				
b.	City of Dallas - Final Inspections (Building)	GC			Green tags colored copies	
c.	Storm Water Prevention Polution Plan, SWPPP	GC				
d.	Elevator Inspection Certificate	GC				
e.	Boiler Inspection Certificate	GC				
f.	Health Department Inspection Certificate	GC				
X.	**RECORD DOCUMENTS (DRAWINGS, SPECIFICATIONS, ETC.)**					
a.	Record Documents transmittal from GC to A/E	GC			GC is to update red-lined record drawings on a monthly basis. Final red-line record set to be provided to A/E.	
b.	A/E's receipt of Record Documents Letter	A/E			A/E is to provide a letter indicating that all record documents have been provided by the G.C.	
XI.	**GC DESIGNED DOCUMENTS**					
a.	Fire Alarm drawings	GC			Need Govermental Agency approved documents.	
b.	Security drawings	GC			Need Govermental Agency approved documents.	
c.	HVAC Controls drawings	GC			Need Govermental Agency approved documents.	
d.	Fire Sprinkler System drawings	GC			Need Govermental Agency approved documents.	
e.	Data Cabling drawings	GC			Need Govermental Agency approved documents.	
XII.	**CERTIFICATIONS**					
a.	Certification of Asbestos Free Project: Letter from GC as per AIA A201 13.11.1	GC				
b.	Certification of Lead-Free Potable Water System: Letter from GC as per AIA A201 13.12.1	GC				
XIII.	**FINAL SYSTEM REPORTS**					
a.	Final Test & Balance Report	T&B				
b.	Final Roof Inspection Report	Roof Inspector				
c.	Final HVAC Controls - CMCS Report	Dallas ISD Facilities				
XIV.	**WARRANTY INSPECTIONS**					
a.	6 month inspection shall be conducted no later than: <<Date>>					
b.	11 month inspecton shall be conducted no later than: <<Date>>					
XV.	**ACKNOWLEDGE STATEMENT**					
a.	Project Completion Acknowledgement - Signed and dated by School Principal	PM				
b.	Project Completion Notification to Dallas ISD Facilities.	Dallas ISD Project				

I have submitted the close-out documentation in compliance with applicable contract:

G.C. Firm	Print Name	Signature	Date

I have reviewed and acknowledge receipt of the close-out documentation submitted by the General Contractor and found it complete and in compliance with applicable contracts:

A/E Firm	Print Name	Signature	Date

I have reviewed and acknowledge receipt of the close-out documentation submitted by the General Contractor and the A/E and found it complete and in compliance with applicable contracts:

Program Manager	Print Name	Signature	Date

I have reviewed and acknowledge receipt of the close-out documentation submitted by the General Contractor, A/E and PM and found it complete and in compliance with applicable contracts:

Dallas Independent School District Owner	Print Name	Signature	Date

HAZMAT CONTRACTOR CLOSE-OUT CHECKLIST

TO:	xxxxxxxxxxxxxxx, Contract Manager, DALLAS ISD	DATE:	
CONTRACTOR:		PMF:	
PROJECT ID / ORG:		EXTENT OF ABATEMENT:	☐ COMPLETE ☐ SPOT ☐ OTHER
CAMPUS:			
PURCHASE ORDER(S):			
PROJECT TYPE:	☐ Abatement of Exist. Bldgs in Acquired Land ☐ Abatement for Renovation Projects		

ITEM/ TAB	DOCUMENT DESCRIPTION	PRIMARY RESP	RECEIVED	REMARKS
I.	**PROJECT DOCUMENTATION and/or EVIDENCE OF COMPLIANCE**			
a.	OSHA Sampling			
b.	Waste Manifest			
c.	Daily work logs			
d.	Daily sign-in sheets			
e.	Asbestos Licensing			
f.	Respirator fit tests			
g.	Accident Report(s)			
h.	Notifications			
i.	Medical Records			
j.	Confirmation of Receipt - Letter of Completion Document	ENVIR DEPT		

I have submitted the close-out documentation in compliance with applicable contract:

JOC HAZMAT CONSTRUCTION FIRM	PRINT NAME	SIGNATURE	DATE

I have reviewed and acknowledge receipt of the close-out documentation submitted by the General Contractor and found it complete and in compliance with applicable contracts:

JOC HAZMAT CONSULTANT FIRM	PRINT NAME	SIGNATURE	DATE

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Operation manuals for systems, subsystems, and equipment.
3. Product maintenance manuals.
4. Systems and equipment maintenance manuals.

B. Related Sections:
1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 02 Section “Demonstration and Training” for instructing Owner’s personnel in the maintenance of the products and in the operation of equipment and systems.
3. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Architect and Program Manager.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. For Facilities use, provide one (1) PDF Electronic File of all O&M manuals at substantial completion. For Permanent Records, provide one (1) paper copy of all O&M manuals at final closeout.

3. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves for paper copy. Architect will return PDF Electronic File and paper copy.

C. Initial Manual Submittal: Submit draft PDF copy of each manual at least 30 calendar days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form as a PDF prior to requesting inspection for Substantial Completion and at least 10 calendar days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or modify each manual to comply with Architect and Program Manager's Comments. Submit copy of each corrected manual within 10 days of receipt of Comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

F. Manuals, Paper Copy: Submit manual in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-

reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of content. Indicate volume number for each of the three required multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in the manual, identify them by product name, and arrange to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identify by product name and arrange to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT AS-BUILTS & RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Sections:
1. Division 01 Section "Execution" for final property survey.
2. Division 01 Section "Closeout Procedures" for general closeout procedures.
3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal: Submit two paper copies set as well as PDF electronic files of marked-up record prints and two sets of plots from corrected record digital data files. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
b. Final Submittal: Submit two paper copies set as well as PDF electronic files of marked-up record prints. Print each Drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit two paper copies as well as PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one paper copy set as well as PDF electronic files of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy set as well as PDF electronic files of each submittal.

E. Reports: Submit written report weekly indicating items incorporated in Project record documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 As-Built Drawings

A. As-Built Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. **Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.**

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up as-built prints with Architect. When authorized, submit marked-up to Architect. The Architect will then prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Annotated PDF electronic file.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect for resolution.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Specifications as a paper copy as well as in scanned PDF electronic file(s) of marked up paper copy.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as a paper copy as well as scanned PDF electronic file(s) of marked up paper copy.

1. Include record Product Data directory organized by specification section number and title, electronically linked to each item of record Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

B. Related Sections:

1. Divisions 02 through 49 Sections for specific requirements for demonstration and training for products in those Sections.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules utilizing manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module. Needs to match section on Final Completion.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.

d. Name of Contractor.
e. Date of video recording.

2. At completion of training, submit complete training manual(s) for Owner's use.

1.5 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:

a. Emergency manuals.
b. Operations manuals.
c. Maintenance manuals.

d. Project record documents.
e. Identification systems.
f. Warranties and bonds.
g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

a. Instructions on meaning of warnings, trouble indications, and error messages.
b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.

b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Owner will furnish an instructor to describe Owner's operational philosophy.
2. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner through Program Manager with at least 7 days advance notice.

C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Architect.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

END OF SECTION 01 79 00

SECTION 01 91 00 – GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Owner will perform the Commissioning activities or has retained an independent Commissioning Authority (CxA) to coordinate Commissioning activities for this project. The objective of the Commissioning process is to verify and document that the performance of facilities, systems, and assemblies installed as part of this project meet the project's defined objectives and criteria.

B. This section outlines the general roles and responsibilities of the CxA, Owner, and General Contractor. Divisions 21, 22, 23, and 26 sections define roles and responsibilities applicable to Division 21, 22, 23, and 26 work.

C. The CxA is an independent contractor retained directly by the Owner and will coordinate all Commissioning activities with the Owner's representative.

D. Commissioning requires support from the contractors. The Commissioning Process does not relieve any contractor from their obligation to complete all portions of work in a satisfactory manner. Post contract/construction award, the Contractor shall not use any Commissioning responsibilities/obligations as justification for construction delays or requests for additional monies.

E. The General Contractor is responsible for coordinating all Commissioning activities with their Sub-Contractors.

1.2 RELATED SECTIONS

A. Division 21 Section 21 0800 – Commissioning of Fire Suppression

B. Division 22 Section 22 0800 – Commissioning of Plumbing Systems

C. Division 23 Section 23 0800 – Commissioning of HVAC Systems

D. Division 26 Section 26 0800 – Commissioning of Electrical Systems

E. Individual Division 21, 22, 23, and 26 sections contain requirements related to the Commissioning process, if applicable for that Division.

1.3 DEFINITIONS

A. *Acceptance:* A formal action, taken by a person with appropriate authority (which may/may not be contractually defined) to declare that some aspect of the project meets defined requirements, thus permitting subsequent activities to proceed. The Owner's Representative shall be responsible for evaluating acceptable criteria.

B. *Commissioning Process or Commissioning (Cx):* A quality focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all of

its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Requirements.

C. *Commissioning Process Activity:* A component of the Commissioning Process.

D. *Commissioning Authority (CxA):* An entity identified by the Owner who plans, schedules, and coordinates the Commissioning team to implement the Commissioning Process.

E. *Commissioning Field Report:* A written document that identifies the Commissioning activities completed during a visit to the project site. The report identifies significant findings, results, comments and questions that resulted from the visit. This is typically produced by the CxA per site visit.

F. *Commissioning Photo Log:* A log of photographs that support the items identified in the Commissioning Issues Log. The photo log numbering corresponds to the issue numbers listed in the Cx issues log.

G. *Commissioning Plan:* A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the Commissioning Process. The Cx Plan will be developed by the CxA.

H. *Commissioning Process Activities*: Components of the Commissioning Process.

I. *Commissioning Progress Report*: A written document that details activities completed as part of the Commissioning Process and significant findings from those activities, and is continuously updated during the course of a project.

J. *Commissioning Request for Information (RFI):* Form used by the Commissioning Authority to request information from the design or construction team.

K. *Commissioning Team:* The individuals and agencies who, through coordinated actions, are responsible for implementing the Commissioning Process. The Cx Team shall consist of: CxA, GC, MC, EC, TAB Contractor, Controls Contractor, Owner's Representative, A/E Representatives and equipment suppliers (as needed).

L. *Commissioning Testing*: The evaluation and documentation of the equipment, assemblies, any building/equipment controls, and systems delivery and condition, installation, proper function according to the manufacturer's specifications and project documentation to meet the design criteria.

M. *Construction Team:* The General Contractor, related sub-contractors, and other contractors working for the Owner during the Construction Phase.

N. *Construction Documents*: This includes a wide range of documents, which will vary from project to project, and with the Owner's needs and regulations, laws, and jurisdictional requirements. Construction documents usually include the project manual (specifications), plans (drawings), and general terms and conditions of the contract.

O. *Contract Documents*: This includes a wide range of documents, which will vary from project to project and with the owner's needs, regulations, laws, and jurisdictional requirements. Contract documents frequently include price agreements; construction management process; subcontractor agreements or requirements; requirements and procedures for submittals, changes, and other construction requirements; timeline for completion; and the construction documents.

P. *Commissioning Issues Log:* A formal document, created and maintained by the CxA, and ongoing record of problems or concerns identified through/during the construction phases which deviate from the project's construction documents, applicable codes and/or normal construction industry practices and their resolution. Items on this issues log should be reviewed by the GC and corrected in a timely manner by the applicable trades and contractors.

Q. *Coordination Drawings:* Drawings showing the work of all trades to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances.

R. *Design Review (Peer)*: An independent and objective technical review of the design of the project or a part thereof, conducted at specified stages of design completion by one or more qualified professionals, for the purpose of enhancing the quality of the design and to determine compliance with regulations, codes, or other standards administered by the Authority having Jurisdiction. The CxA may perform a Design Review during the early stages of design.

S. *Design Review (Commissioning)*: A review of the design documents to determine compliance with the Owner's Requirements and/or Basis of Design, including coordination between systems and assemblies being Commissioned, features and access for testing, Commissioning and maintenance, and other reviews required by the Owner.

T. *Facility Guide*: A basic building systems description and operating plan with general procedures and confirmed facility operating conditions, set points, schedules, and operating procedures for use by facility operations to properly operate the facility.

U. *Final Commissioning Report*: A document that records the activities and results of the Commissioning Process and is developed from the final Commissioning Plan with all of its attached appendices.

V. *Functional Performance Test (FPT):* A written protocol that defines methods, personnel, and expectations, for tests conducted on components, equipment, assembles, systems, and interfaces among systems. These documents shall be developed and provided by the CxA and shall require pre- approval by the Owner's Representative.

W. *Pre-Functional Checklist (PFC):* A form used by the installing contractors to verify that appropriate components are on-site, ready for installation, correctly installed, started up, tested and balanced, in compliance with the owner's project requirements, and is ready for Functional Performance Testing. These documents shall be developed and provided by the CxA and shall require pre-approval by the Owner's Representative.

X. *Submittal Review*: A Commissioning review of the equipment submittals for relevant mechanical, electrical, plumbing and energy consuming equipment and systems.

Y. *Test Procedure*: A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems to verify compliance with the Owner's Project Requirements.

1.4 ROLES AND RESPONSIBILITIES

A. Commissioning Authority (CxA)
   1. Develop a Commissioning Plan outlining the organization, schedule, and documentation requirements of the Commissioning Process.

2. Coordinate and direct the Commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications with the Cx team, and frequently update project timelines and schedules for Cx activities.
3. The CxA is not responsible for the design concept, design criteria, compliance with codes, site safety, construction means and methods, review or approval of change orders, design or general construction scheduling, cost estimating, or construction management.
4. Review contract documents for completeness and quality.
5. Perform focused reviews of the design, drawings and specifications at various stages of development (during schematic design, design development and contract document phases).
6. Develop full Commissioning specifications for all Commissioned equipment (Owner may provide the specifications). Coordinate them with, and integrate into, the specifications of the architect and engineers.
    a. The Commissioning specification will include:
        1) a detailed description of the responsibilities of all parties
        2) details of the Commissioning process
        3) reporting and documentation requirements, including formats
        4) alerts to coordination issues, deficiency resolution
        5) construction checklist and startup requirements
        6) subcontractors' Pre-Functional Checklists (PFC) Forms and responsibilities
        7) the Functional Performance Testing (FPT) Forms and process
        8) specific Functional Performance Test requirements, including testing conditions and acceptance criteria for each piece of equipment to be Commissioned
7. The CxA may assist with problem solving, non-conformance or deficiencies, but ultimately that responsibility resides with the General Contractor (GC) and the Architect/Engineer (A/E). The primary role of the CxA is to oversee the Commissioning process. This includes site observations of installation of Commissioned systems and equipment, development and coordination of the execution of a PFC and FPT testing plan and observation and documentation of performance that systems are functioning in accordance with the Owner's Requirements, design intent and in accordance with the Contract Documents. The Contractors will provide all tools and personnel to start, check-out and test equipment and systems, except as noted in this section.
8. Coordinate the Commissioning work and work with the GC to incorporate Commissioning activities into the master project schedule maintained by the GC.
9. Update and revise the Commissioning Plan as required.
10. Plan and conduct a Commissioning scoping meeting and other Commissioning meetings with the Cx team. The CxA will record meeting minutes for Cx meetings facilitated by the CxA and distribute them to all Cx Team members.
11. Request and review additional information required to perform Commissioning tasks, including installation, operations and maintenance (IOM) manuals and materials, contractor start-up and checkout procedures. Document results and incorporate into the Commissioning plan.
12. Review Contractor submittals applicable to systems being Commissioned, for compliance with the Owner's requirements and for coordination with the Commissioning Process. The CxA review provides information to the Design Team but is not a review for acceptance or rejection of the submitted equipment or system; acceptance or rejection of any submittal remains the responsibility of the Design Team.
13. Conduct periodic construction observations to verify that systems and equipment are installed consistently with Project's requirements. Document deficiencies and distribute to Cx Team members in a timely manner.
14. Attend selected planning and job-site meetings to obtain information on construction progress.

15. With necessary assistance and review from installing contractors, write and distribute the Pre-Functional Checklists and Functional Performance Test procedures for systems and equipment.
16. Approve Pre-Functional Checklists completed by GC by selected site observation visits and spot checking to confirm that systems and equipment are ready for Functional Performance Tests.
17. Review start-up and TAB reports to confirm included systems are ready for Functional Performance Testing.
18. Coordinate, witness and document Functional Performance Testing by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved per design specifications.
19. Coordinate, witness and document required seasonal or deferred Functional Performance Testing and any deficiency corrections required.
20. Review equipment warranties and confirm that they are project specific and clearly define the Owner's responsibilities if any.
21. Oversee and review the training of the Owner's operating personnel.
22. Review O&M manuals submitted by the GC.
23. Provide a final Commissioning report for review and acceptance by the Owner's Representative.
24. The CxA is not responsible for construction means and methods or for site safety and security.
25. The CxA will not authorize or approve construction cost amendments, changes to the construction schedule, or changes to the contract documents.
26. Participate in the TAB Field verification process using a sampling method. Document the verification using TAB FPTs.

B. General Contractor (GC) and Sub-Contractors
1. The GC is responsible for coordinating all Commissioning activities of the sub-contractors. Commissioning activities may be completed by the Mechanical Contractor (MC), Electrical Contractor (EC), Controls Contractor (CC), or Test and Balance (TAB) contractor, but the GC is ultimately responsible for completion of all Cx related tasks.
2. Facilitate the coordination of the Commissioning work by the CxA and incorporate Commissioning activities into the master schedule.
3. Furnish a copy of all construction documents, addenda, change orders, Requests for Information (RFIs), approved submittals, shop drawings, Architect's Supplemental Instructions (ASIs), and IOMs, related to Commissioned systems and equipment to the CxA.
4. In each purchase order or written subcontract, include any requirements for Commissioning.
5. Ensure that all sub-contractors execute their Commissioning responsibilities according to the Contract Documents, responsibilities and schedule.
6. The GC shall designate a staff member who will be knowledgeable and responsible for the construction of the Commissioned systems (typically the site superintendent) to be their active representative on the Commissioning team. This person shall attend the Commissioning scoping meeting and other necessary meetings scheduled by the CxA to facilitate the Commissioning process.
7. Each sub-contractor shall designate a staff member who will be knowledgeable and responsible for the construction of the Commissioned systems (typically the trade superintendent) to be their active representative on the Commissioning team. This person shall attend the Commissioning scoping meeting and other necessary meetings scheduled by the CxA to facilitate the Commissioning process.
8. Coordinate and share the issues identified on the Cx Issues Log with the appropriate trade sub-contractors. Respond in writing to the CxA and Owner's Representative with the contractor's response, appropriate trade responsible for the corrective action and anticipated completion date for the corrective action.

9. Follow up with the subcontractors as to the status of the corrective actions to the items on the Cx Issues Log, and update the CxA.
10. The GC's designated Cx team staff member shall personally examine, witness and verify that all issues are corrected and complete when the sub-contractor states they have "corrected" an item on the Cx Issues Log.
11. Notify the CxA one week in advance of all equipment start-ups and tests required by the Contract Documents.
12. Submit test results for tests required by the Contract Documents, including (but not limited to) duct leakage tests, hydronic system pressure tests, generator tests, etc. as applicable to the Commissioning scope.
13. Receive the Pre-Functional Checklist forms from the CxA. Create a "master" Pre-Functional Checklist document binder containing all checklists for the project that shall remain at the project site.
14. Coordinate and distribute copies of the Pre-Functional Checklists to all relevant subcontractors.
15. Notify the CxA when Pre-Functional Checklists are completed.
16. Remedy any deficiencies identified in the Pre-Functional Checklists and notify the CxA (in writing) that deficiencies have been addressed.
17. Notify the CxA when TAB activities will be taking place and have been completed. Provide the CxA with TAB report(s).
18. Participate in TAB verification, which may include repeating selected measurements contained in the TAB report(s).
19. Coordinate with subcontractors to ensure qualified technicians are available for performing the Functional Performance Test procedures under direction of the CxA.
20. Coordinate the training of Owner personnel.
21. Verify that subcontractors prepare and submit O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
22. Ensure that subcontractors execute seasonal or deferred Functional Performance Testing, witnessed by the CxA, according to the specifications.
23. Ensure that subcontractors correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.
24. Gather and submit all project closeout documentation, including submittals, O&M manuals, as-built drawings, warranties, etc. to CxA for review.

C. Owner
1. Arrange for facility operating and maintenance personnel to attend various field Commissioning activities and field training sessions according to the Commissioning (Cx) Plan.
2. Provide final approval for the completion of the Commissioning requirements.
3. Coordinate site visits and meetings with the CxA.
4. Review and comment on Commissioning documentation such as the Cx plan, field reports, PFC & FPT Forms, and Cx Issue Logs.
5. Provide interpretations and clarifications of the Owner’s Requirements.
6. Provide input and direction on Commissioning-related recommendations that arise from the Commissioning process which may enhance the operation of the building but are not included in the project documents and may be an additional project cost. If the Owner is in agreement with Commissioning recommendations, they are to direct the Design Team to review and issue the appropriate directive to add that scope and maintain the Design Team's responsibility for all construction documents.

D. Design Team (Architect/Engineer)
1. Perform normal submittal review, construction observation, as-built drawing preparation, O&M manual preparation, etc., as contracted with Owner.
2. Fulfill all obligations specified in the contract documents, including reviewing and approving submittals, conducting construction observation, issuing addenda and clarifications,

responding to RFIs, issuing punchlists, and conducting substantial and final completion walkthroughs. Review and provide comments on all recommendations.

3. Provide any design narrative documentation requested by the CxA.
4. Prepare and submit final as-built design intent documentation for inclusion in the Systems Manual.
5. Review and approve the O&M manuals.
6. Coordinate resolution of design non-conformance and design deficiencies identified during the project.
7. Assist (along with the contractors) in clarifying the operation and control of Commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
8. Participate in the resolution of system deficiencies identified during Commissioning.
9. Notify the CxA of substantive changes to the Contract Documents.
10. Provide clarifications to Contract Documents as required.
11. Review the Design Team Commissioning Issues Log and respond to all items in a timely manner. Update contract documents as required to address Commissioning items identified.
12. Review Commissioning suggestions identified on the Design Team Commissioning Issues Log for impact to the design intent. If the design team is in agreement with the suggestion, they are to assist in reviewing the suggestion with the owner for their review and decision if it should be added to the project.
13. The design team shall review all shop drawing and submittal comments from the CxA.

1.5 SCOPE OF WORK

A. Refer to Section 21 08 00 for listing of fire suppression systems to be Commissioned and requirements.

B. Refer to Section 22 08 00 for listing of plumbing systems to be Commissioned and requirements.

C. Refer to Section 23 08 00 for listing of HVAC systems to be Commissioned and requirements.

D. Refer to Section 26 08 00 for listing of Electrical Systems to be Commissioned and requirements.

1.6 COMMISSIONING DOCUMENTATION

A. General

1. Timely and accurate documentation of Commissioning activities is essential for the Commissioning process to be effective. To this end, all Commissioning activities conducted by the contractors shall be documented as outlined below and in Part 3 Execution of this specification.
2. Contractor Commissioning responsibilities on Project Management Software include the following items:
    a. Commissioning Schedule
    b. Construction Issues
    c. Pre-Functional Checklists
    d. Functional Performance Test Forms
3. The Architect, Engineers, GC, subcontractors, and owner will be responsible for responding within five business days of an inquiry being assigned to them.
    a. The owner(s) or their designated responsible party will be one of the final designated personnel in the approval process that will sign off before an item can be closed out.
    b. All of the aforementioned entities will be responsible for the same response time in the identified field punch software.

c. The punch list and open Commissioning items will be tied to identified retention dollars that will not be paid until all open issues are resolved.
d. Owner-Insite will be the designated software that will be used by all Cx agents and used for MEP items identified by the Cx agent and Owner.

4. The Pre-Functional Checklists shall be completed by each respective trade contractor involved with the installation of any Commissioned systems and equipment.
5. The Functional Performance Tests will be completed by the CxA as they witness the test(s) conducted by the contractors.
6. All Contractor Commissioning Documents prepared by the contractors will be fully completed in a neat and workmanlike manner so as to be fully legible. Documentation which, at the CxA's discretion, is incomplete or less than fully legible shall be deemed unacceptable.
7. Commissioning procedures and tests, which are rejected by the CxA due to incomplete, or illegible contractor documentation shall be repeated by the contractor and new Contractor Commissioning Documents shall be prepared to the Commissioning Team's satisfaction at no additional cost to the Owner.
8. Procedures deemed unacceptable by the Commissioning Team after being repeated due to inadequate documentation may be subject to completion by the CxA, at a cost to the contactor as outlined in item Section 3.8 "Cost of Re-Evaluation" below.
9. All Contractor Commissioning Documents shall be completed on the job-site concurrent with the activities being documented. Remedial documentation of Commissioning activities either off-site or after the procedures have been completed is unacceptable.
10. All Contractor Commissioning Documents will be submitted to the CxA for review and acceptance upon completion.

B. Contractor Commissioning Process Status Tracking
1. Contractors shall be responsible for monitoring the progress of their Commissioning activities. The contractor will update the status of meetings, issues, re-scheduling, checklists and tests.
2. The contractors shall regularly update and upload drawings or pictures as Commissioning activities are completed so as to provide a readily available report to CxA regarding current status of the contractors Commissioning activities.

C. Record Drawings
1. Contractors shall regularly update a 'redlined' set of record drawings showing Commissioned systems as work is being installed so that the drawings remain current with the field work, and as required in Division 01, 21, 22, 23, and 26 of the project specifications.
2. Redlining record drawings at the end of construction shall not be acceptable.
3. The Contractors up-to-date, in-progress redlines shall be kept on-site in the Contractor's field office and available for review by the Cx Team.

D. Access to Contractor Documentation
1. Contractors shall provide the CxA with access to shop drawings, coordination drawings, equipment cut-sheets, schematics, in-progress record drawings, manufacturers installation-operation-maintenance manuals, startup reports, etc. to assist the CxA in execution of the Cx process.

1.7 COORDINATION

A. The CxA shall receive a copy of all construction documents, project schedules, addenda, change orders, and appropriate approved submittals and shop drawings directly from the GC.

B. The CxA shall disseminate written information and documents to all responsible parties relative to the nature and extent of the Cx communication.

C. The CxA is primarily responsible to the Owner and, as such, shall regularly apprise the GC and the Owner of progress, pending problems and/or disputes, and shall provide regular status reports on progress with each system. Any potential change in the contractual and/or financial obligations of the owner (credits, change orders, schedule changes, etc.) shall be identified and quantified as soon as possible.

D. The CxA shall coordinate the schedule of Commissioning activities with the construction schedule. It is possible that some procedures will be completed before the entire system is completed.

1.8 SCHEDULE

A. Commissioning of systems shall proceed per the criteria established in the specific sections that follow, with activities to be performed on a timely basis. The CxA shall be available to respond promptly to avoid construction delays.

B. Start-up and testing of systems may proceed prior to final completion of systems to expedite progress. However, testing and checkout services that are the primary responsibility of the contractor / vendor will not proceed in advance of their testing and checkout.

C. Problems observed shall be addressed immediately, responsible parties notified, and actions to correct deficiencies coordinated in a timely manner.

D. Contractor schedules and scheduling is the responsibility of the GC. The CxA shall provide Commissioning scheduling information to the GC for review and planning activities.

1.9 REFERENCE STANDARDS

A. Industry standards and guidelines are a guide to the Commissioning process and are hereby incorporated and will be applied as appropriate. Reference standards and guidelines include, but are not limited, to the following:

B. References:
1. ASHRAE Standard 202-2013: Commissioning Process for Buildings and Systems
2. ASHRAE Guideline 0-2005: The Commissioning Process
3. ASHRAE Guideline 1.1-2007: HVAC&R Technical Requirements for The Commissioning Process
4. ACG Commissioning Guideline (current version)
5. NEBB Commissioning Standard (current version)
6. BCxA Building Commissioning Handbook (current version)

2.0 SUBSTANTIAL COMPLETION

A. “Certificate of Substantial Completion” will not be signed by the Dallas ISD unless the CxA and the Owner’s Representative are in agreement that all Equipment and Systems to be Commissioned are installed and operational, and any open Cx Issues Log items have been identified as minor. Any open Cx Issues Log items shall be resolvable within 21 days.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. All industry standard test equipment required for performing the specified tests shall be provided by the applicable contractor (as specified) and shall be approved by the CxA. Any necessary proprietary vendor specific test equipment shall be provided by that vendor or manufacturer.

B. Any portable or hand-held setup / calibration devices required to initialize the control system shall be made available by the control vendor to the CxA (at no additional cost to the Owner or CxA).

C. The instrumentation used in the Commissioning process shall meet the following standards:
   1. Be of sufficient quality and accuracy to test and/or measure system performance within the tolerances required.
   2. Be calibrated at the manufacturer's recommended intervals (typically within the previous 12 months) with calibration tags permanently affixed to the instrument
   3. Be maintained in good repair and operating condition throughout the duration of use on this project.
   4. Be immediately re-calibrated or repaired if dropped and/or damaged in any way during use on this project.

PART 3 - EXECUTION

3.1 COMMISSIONING PLAN AND SCHEDULE

A. The CxA shall generate a project specific Commissioning plan which identifies Cx tasks, roles and responsibilities for the Cx process. The CxA will submit a Cx schedule for the Commissioning process which shall be integrated into the construction schedule by the GC.

3.2 CONSTRUCTION OBSERVATION

A. This is an additional and separate activity from that provided by the design team. Construction observation is required as part of the Commissioning and coordination process to be provided by the CxA. Field Observation reports will be maintained and distributed by the CxA to all Cx Team members.

3.3 COMMISSIONING ISSUES LOGS

A. As part of the Commissioning process, all issues will be recorded on the Project Management Software. The PM Software will divide the issues as follows.

   1. Construction Commissioning Issues
      a. This log is also a part of the Web-Based Project Management Software. It is a formal and ongoing record of problems or concerns pertaining to the installation of the Commissioned systems and equipment which identifies where the contractors have deviated from the OPR, contract documents, applicable codes or normal industry construction practices. It is the GC's responsibility to regularly login and retrieve this log from the Web-Based Project Management Software, follow up and review each item on the list with the appropriate trades, and respond to the CxA with feedback within 5 business days from the issuance of the log from the CxA.
      b. Team members will be given access through the Web Based Project Management Software to comment on issues. This is where the GC should provide feedback which includes the following sections:
         1) Response/Action: This is the contractor's response to the issue identified by the CxA.

2) Trade: This identifies the specific contractor responsible for the correction of the issue. The issue will be assigned to that contractor or subcontractor.
3) Expected Completion Date: This is the date which the GC and subcontractor agree the issue will be resolved by. This provides information back to the CxA as to when items should be corrected by for spot checking the correction of issues.

c. The GC shall provide feedback and updates to the construction Cx issues log to the CxA within 5 business days from its issuance from the CxA.
d. The CxA will maintain the master cx long on the Web Based Project Management Software.

3.4 PRE-FUNCTIONAL CHECKLISTS

A. The Commissioning Authority shall develop the Pre-Functional Checklists (PFCs) and distribute them to the GC for use by the sub-contractors.

B. The sub-contractors shall complete the checklists and submit them to the GC as they are completed or uploaded to the Web Based Project Management Software.

C. PFCs consist of a series of field observations and verification checks conducted by the contractors during the installation of Commissioned equipment to verify the following:
1. Installed equipment matches the specifications and approved submittals
2. Equipment is installed per the specifications, drawings and manufacturer's recommendations.
3. Utility connections to equipment, such as electrical, steam, chilled water, etc. have been successfully completed.
4. Equipment is ready for start-up per manufacturer's guidelines.

D. Contractors should expect to complete one (1) PFC for each piece of equipment covered by the Commissioning process such as pumps, fans, air handling units, terminal units, control panels, and lighting control panels.

E. PFCs for mechanical equipment will include verification of the safety devices intended to stop and/or prevent equipment operation unless minimum safety standards or conditions are met. These may include adequate oil pressure, proof-of-flow, non-freezing conditions, maximum static pressure, maximum head pressure, etc. The CxA shall observe the actual performance of safety shutoffs in a real or closely simulated condition of failure.

F. Systems may include safety devices and components that control a variety of equipment operating as a system. Interlocks may be hard-wired or operate from software. Operation of these interlocks shall be verified by the CxA.

G. Additional checklists will be required to verify installation of distribution systems such as piping, ductwork, electrical wire and conduit, etc. The number of required PFCs will vary from system to system, but will typically be limited to one form per system per floor or zone.

H. The PFC used for this project will be finalized by the CxA after receipt of equipment Installation, Operation & Maintenance (IOM) Manuals from the Contractors.

I. PFCs shall be completed by the contractor and maintained on-site per the requirements of this specification, Section 1.6 "Commissioning Documentation".

3.5 CONTRACTOR STARTUP TESTING

A. The contractors shall conduct all startup testing as required by the specifications, equipment manufacturer, the manufacturer's installation, operations and maintenance manual or as necessary to verify all equipment is properly installed and fully operational.

B. Startup testing shall be documented. Appropriate documentation shall be by the contractor and/or the manufacturer's representative or entity specified in the construction documents.

C. The startup testing shall be documented using the contractors or manufacturer's standard forms and an electronic copy of the form shall be provided to the CxA or uploaded to the Web Based Project Management Software under the appropriate PFC.

3.6 TESTING AND BALANCING

A. Testing, Adjusting, and Balance Contractor (TAB) Requirements
   1. Air and water balance shall be accomplished by an independent test and balance firm. The test and balance firm shall come back after the final balancing report is approved to work with the CxA and spot check this work to verify accuracy of results. Refer to Division 23 for acceptance criteria.
   2. Test and Balance contractor to provide the final balancing report to the CxA.
   3. The TAB contractor shall be responsible for successful completion and documentation of all TAB activities specified in the Division 23.
   4. Prior to the start of TAB activities, the TAB contractor shall submit a proposed TAB plan, procedures and documentation to the CxA and A/E for review. TAB procedures shall be submitted to allow sufficient time for CxA review and approval prior to the start of TAB activities.
   5. After this review, and prior to start of field work, the TAB contractor will attend one or more planning meetings as required with the Commissioning Team to review and discuss outstanding issues relating to TAB procedures and forms, discuss resolution of issues identified during the TAB contractor’s plan review and field inspections, and to coordinate field work.
   6. Prior to the start of fieldwork, the TAB contractor shall issue a final set of TAB procedures and TAB forms which incorporate any comments received during the Commissioning Team review.
   7. The TAB contractor shall have at least one certified field technician on site whenever TAB work is being performed. The certified technician shall be responsible for the quality of the work of any non-certified technicians.
   8. The TAB contractor is responsible to notify the GC, who in turn shall notify the Commissioning Team, a minimum of two (2) weeks in advance of the time for start of TAB work to allow the CxA and A/E time to assess system readiness.
   9. The TAB contractor will work cooperatively with the CxA.
   10. The TAB contractor shall coordinate with the controls contractor to ensure that changes made to the control system during TAB (flow coefficients, duct areas, etc.) are archived and become the default or initial values for these parameters.
   11. The TAB contractor shall provide daily lists of issues and/or problems identified during TAB work to the GC, CxA and A/E for follow-up & resolution with the appropriate contractors.
   12. Participate in verification of the TAB report, which will consist of repeating any selected measurement contained in the TAB report where required by the CxA for verification or diagnostic purposes.
   13. A TAB Final Acceptance Inspection shall be conducted by the A/E, Owner’s Representative and CxA and will include a field verification of at least 5% of the TAB contractor’s field readings.
   14. The TAB contractor will provide technicians, equipment and instrumentation to support the field verification.
   15. Instruments used for the field verification shall be the same instruments (by model and serial number) that were used for the original TAB work.

16. The TAB Contractor shall provide test equipment calibration certifications to the Owner's Representative or the CxA upon request.

3.7 FUNCTIONAL PERFORMANCE TEST PROCEDURES

A. Scope
   1. Functional Performance Test (FPT) procedures are executed after Commissioned equipment and systems have been installed, started-up, balanced and are fully operational. The goal of these procedures is to conclusively verify that Commissioned equipment, sub-systems and major systems operate and perform per the design intent, and the project specifications.
   2. Equipment-level FPTs will be used to verify operation and capacity of selected equipment such as boilers, chillers cooling towers, pumps, exhaust fans, air handling units, etc.
   3. System-level FPTs will verify the following aspects of system operation.
      a. System operation under both normal and alternate operating conditions and modes.
      b. Interactions between equipment and sub-systems.
      c. Operation of safeties and interlocks.
      d. Control system operation, response time, stability and tuning.
      e. System response to abnormal and/or emergency conditions such as fire, equipment failure and power outages, and associated Alarms.
      f. All control sequence of operation strategies, alarm generation and reporting shall also be reviewed and proper operation verified by the CxA.
      g. The central work station graphics, point assignments, alarm messages, and logging functions shall be verified.

B. Functional Performance Test Forms
   1. The FPTs used for this project will be created, utilized and finalized by the CxA after receipt of approved contractor submittals.

C. Contractor Requirements
   1. The Cx team will, in a joint effort, coordinate and schedule FPT activities.
   2. Scheduling of FPTs shall be contingent on notification from the affected contractor(s) to the GC and CxA that equipment and systems are ready for checkout.
   3. Other prerequisites for execution of FPTs shall include the following:
      a. All Contractor Startup Procedures and Cx Pre-Functional Checklists have been completed and documented.
      b. TAB has been completed.
      c. All Cx Issues Log items identified as affecting equipment or system performance or operations have been resolved.
   4. Prior to claiming readiness for FPT, the Controls Contractor shall ensure that the following items are completed and documented:
      a. Point-to-point checkouts have been verified and documentation has been submitted to the CxA.
      b. Verify that network communication between all devices and systems is established
      c. Sequence of Operation checkouts are completed.
      d. Printed and annotated trend logs and alarm histories establishing acceptable operation including
         1) Stable control
         2) Recovery from upset/changes (e.g., from setback)
         3) Special and/or seasonal modes
         4) Emergency and alarm modes including loss/restoration of power
   5. Execution of the FPTs will be conducted by the contractors providing and installing the equipment and systems being Commissioned and shall be witnessed by the CxA. The Controls Contractor shall verify/validate the BAS Sequences of Operations to the satisfaction of the CxA.

6. Typical activities during FPT execution will include the following:
    a. Starting/stopping equipment
    b. Energizing/de-energizing electrical distribution gear
    c. Opening/closing valves and dampers
    d. Manipulating BAS inputs, outputs and set points
    e. Setup, collection and downloading of BAS trend data
    f. Test all modes of operation (normal, failure, backup, emergency, etc.)
    g. Confirmation of required alarms sent to BA
    h. Written verification of equipment set-points (temperatures, flow rates, etc.)
7. The Contractor(s) shall maintain full responsibility for the facility, equipment and systems operated during the FPTs, maintain all guarantees and warranties, and shall repair any damage to the facility caused during the FPTs.
8. Contractors shall conduct seasonal FPTs as necessary. This includes performing FPTs on equipment during the season it is intended to operate (i.e. test cooling equipment during the peak cooling season and test heating equipment during the peak heating season, etc.). All seasonal FPTs shall be witnessed by the CxA.
9. Tools, test equipment and instrumentation required for completion of the FPTs shall be provided by the contractor. All instruments shall meet the requirements of Part 2 of this specification.
10. FPT acceptance shall confirm the performance of systems to the extent of the design intent. When a system is accepted, the Owner shall be assured that the system is complete, works as intended, is correctly documented, and operator training has been performed.

3.8 COST OF RE-EVALUATION

A. The cost for Contractors to re-evaluate any Commissioning Procedures due to open issues shall be bore by the contractors.

B. The CxA will be available for two attempts of the Functional Performance Tests (one initial and one re-try) with minimal follow-up where necessary (due to deficiencies, systems not ready, incomplete work, etc.) to try to accomplish each test as part of the contract. When additional work is required because systems are not ready or because they do not successfully pass the FPT after they have been indicated as ready, the contractor will be charged for the CxA's additional reasonable re-testing costs. Additional fees will be paid to the CxA by the Owner and shall be reimbursed by the Contractor.

C. Any required re-testing by any contractor shall not be allowed as a justified reason for a claim of delay or for a time extension by the contractor or for a request for additional monies.

3.9 SOFTWARE DOCUMENTATION REVIEW

A. Review detailed software documentation for all DDC control systems. This includes review of vendor documentation, their programming approach, and the specific software routines applied to this project. Discrepancies in programming approaches and/or sequences shall be reported and coordinated in order to provide the Owner with the most appropriate, simple, and straightforward approach to software routines.

3.10 OPERATING AND MAINTENANCE (O&M) MANUALS

A. The CxA shall review the draft form of the O&M manuals provided by the Division 21, 22, 23, and 26 contractors. The review process shall verify that O&M instructions meet specifications and are included for all equipment furnished by the contractor, and that the instructions and wiring

diagrams are project specific (edited where necessary) to the actual equipment provided for this project.

1. Published literature shall be specifically oriented to the provided equipment indicating required operation and maintenance procedures, parts lists, assembly/disassembly diagrams, and related information.
2. The contractor shall incorporate the standard technical literature into system specific formats for this facility as designed and as actually installed. The resulting O&M information shall be project and system specific, concise, to the point, and tailored specifically to this facility. The Commissioning Authority shall review and edit these documents as necessary for final corrections by the contractor.

B. The O&M manual review, and coordination efforts MUST be completed prior to Owner training sessions, as these documents are to be utilized in the training sessions.

C. In addition to the O&M manual requirements within specification Division 21, 22, 23, and 26, O&M manuals shall include at a minimum the following:

1. An equipment data sheet with the equipment name tag, model number, serial number and any other relevant information for the equipment.
2. A copy of the approved submittal, indicating the exact make and model of the equipment installed.
3. A copy of the manufacturer's IOM manual
4. A copy of all warranty's
    a. If not included on warranty certificate, provide the start/end dates of warranty period, descriptions of what is and isn’t covered and contact information for warranty claims.

3.11 RECORD DRAWINGS

A. The Commissioning Authority shall review the as-built contract documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted shall be corrected by the appropriate party.

3.12 EXCLUSIONS

A. Responsibility for construction means and methods: The CxA is not responsible for construction means, methods, job safety, or any construction management functions on the job site.

B. Hands-on work by the CxA: The contractors shall provide all services requiring tools or the use of tools to start-up, test, adjust, or otherwise bring equipment and systems into a fully operational state. The CxA shall coordinate and observe these procedures (and may make minor adjustments), but shall not perform construction or technician services other than verification of testing, adjusting, balancing, and control functions.

END OF SECTION 01 91 00

PROJECT MANUAL

FOR

ASBESTOS-CONTAINING BUILDING MATERIALS ABATEMENT

L. L. HOTCHKISS ELEMENTARY SCHOOL

6929 TOWN NORTH DRIVE
DALLAS, TEXAS 75218

BENAS PROJECT No. BA-24-1703

VOLUME 1 OF 1

BENAS
ENVIRONMENTAL SERVICES, INC
Environmental Consultants and Engineers

BENAS
ENVIRONMENTAL SERVICES, INC
Environmental Consultants and Engineers

ENVIRONMENTAL CONSULTANTS

324 CROOKED TREE COURT
COPPELL, TEXAS 75019
PHONE: 972/393-0128
FAX: 972/393-0793
INTERNET WEB SITE: WWW.BENAS.COM

ASBESTOS CONSULTANTS

LEAD-BASED PAINT CONSULTANTS

IN-DOOR AIR QUALITY CONSULTANTS

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November 13, 2024

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS AND ENGINEERS

ASBESTOS ABATEMENT PROJECT DESIGN & TECHNICAL SPECIFICATIONS

FOR:

L. L. HOTCHKISS ELEMENTARY SCHOOL
6929 TOWN NORTH DRIVE
DALLAS, TEXAS 75218

PREPARED FOR:

DALLAS INDEPENDENT SCHOOL DISTRICT (DISD)
DALLAS ISD CONSTRUCTION SERVICES DIVISION
LINUS D. WRIGHT DALLAS ISD ADMINISTRATION BUILDING
9400 CENTRAL EXPRESSWAY, SUITE 800
DALLAS, TEXAS 75231
ATTENTION: MR. TERRENCE MACK, CBRE/VANIR JV DESIGN MANAGER

PREPARED BY:

EPHRAIM N. OKOTCHA "EO"
INDIVIDUAL ASBESTOS CONSULTANT
TDSHS LICENSE NUMBER 10-5399

BENAS ENVIRONMENTAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS
POST OFFICE BOX 739
COPPELL, TEXAS 75019
PHONE: 972/393-0128
FAX: 972/393-0793

INTERNET WEB ADDRESS: WWW.BENAS.COM EMAIL ADDRESS: EO@BENAS.COM.

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Computer Aided Design Drawings for Abatement Work Areas with ACM Quantities.

Photographic Documentation of Representative Bulk Samples Collected and Analyzed.

EXECUTIVE SUMMARY

The Dallas Independent School District **(DISD)** is seeking to remove asbestos-containing building materials **(ACM)** as specified. This abatement project involves the complete and total removal of all designated asbestos-containing building materials in and outside the buildings at this facility, which could impact scheduled renovation and/or demolition activities. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

The areas for specific asbestos abatement are described in the Scope of Work and the drawings contained in these technical specifications. The schedule for the execution of the removal project shall be contained in the abatement notifications which shall be filed with the Texas Department of State Health Services **(TDSHS)** prior to the start of any abatement work. Any abatement project to be performed for this facility shall be strictly conducted according to the start and stop dates contained in the notifications to the TDSHS and these specifications **(No Exceptions)**. Information available to BENAS indicates that all the buildings at this facility, including the administrative offices, as well as all other buildings at this facility may be scheduled for future renovation and/or demotion activities. All detected and designated ACM at these buildings, as well as others that may be located underneath concrete structures and fixtures which may impact any renovation and/or demolition work shall be removed prior to the renovation and/or demolition activities.

Any **on-going renovation and/or demolition activities shall stop immediately if any suspect materials underneath the surface(s) are discovered; bulk samples of such suspect materials shall be collected and analyzed for the presence, or absence thereof asbestos fibers prior to the continuation of the renovation and/or demolition activities. No Exceptions.**

This project is considered to be asbestos abatement prior to building renovation and/or demolition work to meet current TDSHS notification requirements. Proper interpretation of the current National Emission Standards for Hazardous Air Pollutants **(NESHAP)** regulations, as well as the current Texas Asbestos Health Protection Rules **(TAHPR)** must be observed for this distinction. BENAS Environmental Services, Inc. from Coppell, Texas, shall be the Owner's representative **(Consultant)** on this project. The testing laboratory **(industrial hygiene services)** selected by the Owner is also BENAS Environmental Services, Inc.

END OF SECTION

TECHNICAL SPECIFICATIONS

SPECIAL CONDITIONS

The construction general contractor **(GC)** and the chosen asbestos abatement contractor shall notify BENAS Environmental Services, Inc. **(BENAS)** if any areas including walls, ceilings, floors, rest rooms, custodial closets, chases and other mechanical areas not already included in the drawings and specifications are to be impacted in any form or manner prior to any activities that might disturb any ACM in any portion(s) in the buildings prior to and during the course of the renovation and/or demolition work. All renovation and/or demolition activities shall stop anytime suspected asbestos-containing building materials which may be located underneath surfaces are discovered. The consultant shall collect additional bulk samples of the suspected material(s) to rebut the presence of asbestos in that material. **No Exceptions.**

The chosen asbestos abatement contractor shall comply with all federal, state, and local regulations and rules which guide asbestos abatement in the State of Texas, including but are not limited to those detailed in these technical specifications, NESHAP, TAHPR, Occupational Safety and Health Administration **(OSHA)**, Texas Commission on Environmental Quality **(TCEQ)**, and National Institute for Occupational Health and Safety **(NISOH)** Regulations; and all others. The following is required of the chosen asbestos abatement contractor for this project:

Multiple Mobilizations:

The chosen abatement contractor shall provide "Alternate Pricing" **(Quotes)** for multiple mobilizations throughout the duration of this project. All renovation and/or demolition activities for the buildings at this facility shall be coordinated with the Building Owner **(District)**, Dallas ISD Construction Services Division, the General Contractor **(GC)** executing the renovation and/or demolition of the buildings, including the roofs, the Architectural Firm, the project management firm – CBRE/Vanir Joint Venture Program Management Services, and the Consultant **(BENAS)** at all times. **No Exceptions.**

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

Waste Handling and Disposal

1. The chosen asbestos abatement contractor shall provide a "Closed Metal **(Steel)** Disposal Dumpster" on site everyday throughout the duration of the abatement project. This dumpster must be locked at the end of each workday such that there is no public access to asbestos waste stored in the dumpster.

2. Each dumpster shall be full prior to pick-up for disposal by the abatement contractor, or a subcontractor retained by the abatement contractor.

3. All disposal manifests shall be type-written such that all entries are legible through all copies of the waste disposal manifest document.

4. The manifest for each load of waste shall be signed by the Consultant, or the On-Site Project Manager retained by the Consultant on behalf of the Owner, prior to leaving the job site.

5. One copy of the document **(equivalent of the Green Copy)** shall remain with the Consultant or Project Manager prior to departure of the truck dumpster from the site.

6. Each load of waste that leaves the job site shall be taken straight to the approved asbestos disposal landfill selected by the abatement contractor as documented in the Notifications.

7. A copy of the receipt from the disposal landfill shall be returned to the Consultant or Project Manager next day **(Within 24-Hours)** immediately following disposal. No subsequent load of waste shall leave the job site **(School)** premises without the receipt of the previous load which documented proper disposal. **No Exceptions.**

8. All original copies of the waste disposal manifests shall be sent to the Owner during submittal of the 'Close-Out Documents' by the abatement contractor.

9. Failure to follow the above stipulated procedures shall be grounds for work stoppage and possible contract termination. **No Exceptions.**

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

The abatement contractor shall protect all surfaces near or adjacent to all abatement work areas, especially the walls, floors, decks, and ceiling near the immediate work locations from any damages, including but are not limited to water and/or structural damages. Any damages to any surfaces shall be repaired and/or replaced by the abatement contractor at his/her own cost. **No Exceptions.**

OSHA Personal Compliance Monitoring:

The selected abatement contractor shall conduct OSHA Mandatory Personal Compliance Air Monitoring on at least 25% of his workers every day, or a minimum of two samples per shift throughout the duration of the abatement project. If more than one crew or shift is performed simultaneously, a minimum of 25% of the workers in each crew or shift shall be monitored per OSHA regulations and these specifications. Abatement activities for the non-friable ACM Floor Tiles and Black Mastic, glazing compounds on interior and exterior windows and door frames and glass panes, caulking on cabinet works, sealant on wood cove-base, as well as black mastic behind chalk boards, and others may and can be conducted with the use of Half-Face Negative Pressure Demand Air-Purifying Respirators **(Half-Face Masks).** However, all workers shall don-on the Power Air Purifying Respirators **(PAPR)** during the removal of all friable ACM Thermal Systems Insulation , as well as the 1' X 1' Stock-On Ceiling Tiles and DOT Mastic. The half-face respirator has a protection factor of ten (10); while that of the PAPR is 1,000. This means that the fiber concentration inside these respirators is reduced ten and one-thousand times, respectively, the outside fiber concentration. These respirators are adequate to protect the abatement workers against possible asbestos exposure throughout the duration of the abatement work.

The security of any section(s) of the building(s) and/or areas where abatement operations are in progress shall be the responsibility of the abatement contractor throughout the duration of the abatement work for that section of the facility. The contractor shall secure the building(s) and/or areas at the end of each work shift or day. Missing or stolen of on-site equipment, including those of the Owner, general contractor, the abatement contractor, the consultant, sub-contractors, or anyone else authorized to be on site, is not the responsibility of the building owner/manager, or the consultant. Personnel and visitors' safety during this abatement project shall be the responsibility of the abatement contractor. The contractor shall ensure that all persons, including all workers, the personnel of the Owner, architect, program management firm, consultant and/or air monitoring firm, and other authorized visitors entering or leaving the work areas during this project are safe. The contractor shall provide on-site security throughout the duration of this project if necessary in compliance with these specifications and the contract documents.

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All vehicles including those of the abatement contractor's personnel operated within the premises of the L. L. Hotchkiss Elementary School facility shall be insured in accordance with the State of Texas Department of Public Safety **(DPS)** regulations and requirements. Proof of liability insurance and driver license shall be produced at the request of any authorized staff, especially those overseeing this project. **No Exceptions.** The use of foul language(s) of any type, in any setting, is forbidden of all persons within the premises of the L. L. Hotchkiss Elementary School facility. Those affected include, but are not limited to the abatement contractor, his/her personnel, and/or subcontractor(s) retained by the abatement contractor, any visitors of the contractor and/or subcontractor(s). ***No Exceptions.***

It is absolutely the responsibility of the abatement contractor to verify both quantities and/or assumed quantities of the ACM in all designated locations, and site conditions prior to bidding. The consultant does not guarantee the drawings to be fully accurate, and/or to scale. Failure to verify all quantities and site conditions SHALL NOT relieve the abatement contractor the obligation to complete this project as, and in the manner specified.

END OF SECTION

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

1.0 SCOPE OF WORK

The following is a *"Scope of Work"* to be performed on this project:

L. L. HOTCHKISS ELEMENTARY SCHOOL

1. Level 1 Unit A – Containments #1 and 2:

Removal and proper disposal of **approximately 12,488 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 5,422 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 1,216 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 432 square feet of non-friable ACM Plaster Ceiling (Plaster); and approximately 1,162 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); located throughout the interior surfaces in Level 1 - Unit A at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in two full containment work area enclosures **(Containments 1 and 2)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 8)**.

Also, the abatement contractor shall remove and properly dispose **approximately 119 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 186 linear feet of non-friable ACM Caulking on Exterior Building Penetrations Joints (Caulking); located throughout the exterior walls of the buildings in Level 1 Unit A at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit A described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 8)**.

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2. Level 1 Unit B – Containments #3 - 6:

Removal and proper disposal of **approximately 233 linear feet of friable ACM Thermal Systems Insulation (TSI); approximately 2,986 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 4903 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 1,260 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 480 square feet of non-friable ACM Plaster Ceiling (Plaster); approximately 560 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); and approximately 64 square feet of non-friable ACM Sink Putty (Sink Putty); located throughout the interior surfaces in Level 1 Unit B at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in four full containment work area enclosures **(Containments 3 - 6)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 9)**.

Also, the abatement contractor shall remove and properly dispose **approximately 60 linear feet of non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows (Caulking and Glazing); approximately 120 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 209 linear feet of non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints (Caulking and Sealant); located throughout the exterior walls of the buildings in Level 1 Unit B at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit B described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 9)**.

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

2. Level 1 Unit C – Containments #7 and 8:

Removal and proper disposal of **approximately 12,256 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 6,204 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 2,805 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 192 square feet of non-friable ACM Plaster Ceiling (Plaster); approximately 1,189 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); and approximately 48 square feet of non-friable ACM Sink Putty (Sink Putty); located throughout the interior surfaces in Level 1 - Unit C at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in two full containment work area enclosures **(Containments 7 and 8)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 10)**.

Also, the abatement contractor shall remove and properly dispose **approximately 120 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 220 linear feet of non-friable ACM Caulking on Exterior Building Penetration Joints (Caulking); located throughout the exterior walls of the buildings in Level 1 Unit C at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit C described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 10)**.

5. Crawl Space Work Area – Containment #10:

Removal and proper disposal of **approximately 4,386 linear feet of friable ACM Thermal Systems Insulation (TSI); in the Crawl Space Underneath all original buildings at the L. L. Hotchkiss Elementary School Facility.** The ACM in Crawl Space can be removed in one full containment work area enclosure, with full negative pressure ventilation systems and wet methods. The abatement contractor may choose to conduct glove bag procedures for the Crawl Space work area; however, the entire Crawl Space shall be cleared with Transmission Electron Microscopic Sampling and Analysis. No Exceptions. **(Figure 11).**

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All the ACM located in the interior surfaces of these buildings shall be removed in nine full containment work area enclosures using wet methods with full negative pressure ventilation systems and full engineering controls. Also, all NESHAP Methods and protocols shall be strictly adhered to, for all exterior abatement operations **(No Exceptions)**. Furthermore, the contractor shall construct approximately nine **(Equal Number)** of three-staged wet decontamination facilities, plus a bag-out chamber for each of the above-described full containment work area enclosures for the interior abatement work. Ambient and personal air monitoring shall be conducted throughout the duration of the gross removal and detailed cleaning operations.

Some of the abatement work can be conducted with the use of the half face negative pressure demand respirators, including the removal of ACM Floor Tiles and Black Mastic, Black Mastic behind Chalk Boards, Caulking on Cabinet Works, Sink Putty underneath Hand-Wash Basin, Interior and Exterior Window Caulking and Glass Glazing, Caulking on Interior and Exterior Door Frames, and Caulking and Sealant on Exterior Building Penetration Joints. This respirator has a protection factor of ten **(10)**, which means that the fiber concentration inside the respirator **(Mask)** is reduced ten **(10)** times the outside fiber concentration.

However, the Power Air-Purifying Respirators **(PAPR)** shall be utilized during the removal of any friable and some non-friable ACM in the building interior, including the Thermal Systems Insulation, and 1' X 1' Stock-On Tiles on the Walls and Ceiling in the interior of these buildings. This respirator has a protection factor of one-thousand **(1,000)** by NIOSH Standards, which means that the fiber concentration inside the respirator **(Mask)** is reduced one-thousand **(1,000)** times the outside fiber concentration. The asbestos abatement contractor shall conduct OSHA mandatory personal air monitoring for its workers each day throughout the duration of the abatement work. Historical exposure data shall not be permitted for the documentation of worker exposure for this project. **No Exceptions.**

END OF SECTION

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

Each Full Containment Work Area Enclosure Shall Consist of:

Two-layers of 6-mil fire-retardant polyethylene sheeting covering all the walls where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting covering the Ceiling where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting covering the floors where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting shall be utilized to construct a separate bag-out chamber attached to each full containment work area enclosure

One layer of 6-mil fire-retardant polyethylene sheeting shall be utilized as critical barrier for all immovable objects and fixtures, holes, air conditioning ventilation units, including supply and return grills etc. for each containment work area enclosure.

As previously noted, a full 3-staged wet decontamination corridor shall be constructed for each full containment work area enclosure in the interior of these buildings **(See Drawings)**. The decontamination facility shall consist of an equipment room (**dirty room**), a shower room, a clean room, plus a bag-out chamber. Each compartment shall be separated by air locks. Each decontamination corridor shall be equipped with hot water, shampoo, soap, and other necessary amenities for proper workers' decontamination. All work areas shall be completely and adequately wetted down with amended water prior to the start of the preparation and construction of each containment work area. **No Exceptions.** As many Air-Filtration Devices **(AFDs)** as necessary **(adequate number to be determined by the consultant)** shall be utilized in each containment work area enclosure during this abatement project **(See Drawings)**. The manometer reading for each containment work area shall be a minimum **–0.020** inch of water pressure differential.

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Each AFD shall be capable of exhausting air at 2,000 cubic feet per minute **(CFM)**. A minimum of four **(4)** air changes per hour is required from each operational AFD for this project. The contractor shall stop all abatement activities whenever the manometer reading is below **–0.020** inch of water pressure differential. The manometer equipment shall be calibrated each day prior to the start of any abatement operations. Should the contractor work more than one shift per day or at a time, all manometers shall be calibrated before the start of work for each shift. The electronic manometer equipment shall be equipped with a printer and programmed to print out the pressure readings every two minutes at a minimum.

One functional AFD unit shall be stationed as a stand-by unit in each containment work area enclosure at all times throughout the duration of the abatement project as an emergency backup unit. Also, one AFD unit shall be stationed inside each containment as a scrubber to ensure there are no dead-spaces within the contained work area. **No Exceptions.** All removal work shall be done by hand scrapping. No mechanical equipment shall be utilized during this abatement project. Any methods other than those specified herein shall be with the approval of the building owner and the consultant. The consultant shall perform initial exposure assessment by background ambient air monitoring in each work area to determine initial respiratory protection requirements.

ACM waste generated during this abatement project shall be disposed of in an approved landfill, such as DFW Disposal Landfill in Lewisville, Texas. Each load of waste taken out of this facility during this project shall have a separate **Waste Disposal Manifest**. All double-bagged waste shall be labeled with the generator's name, address, telephone number and the contact person. The consultant or owner shall sign every waste manifest. The original copy from the landfill shall be delivered to the owner during final submittals with other close-out documents. **No Exceptions.**

The abatement contractor, his supervisors and workers must be licensed and certified by the TDSHS to perform asbestos abatement operations in the State of Texas, in accordance with all applicable federal, state, and local regulations and these specifications which guide the handling of asbestos abatement in the State of Texas. All licenses and certifications must be current. **No Exceptions**.

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

All clearance air testing shall be by aggressive methods for this project. Project air samples collected throughout this project shall be analyzed by Phase Contrast Microscopy (PCM). All project air samples collected throughout this project shall be analyzed by a TDSHS licensed asbestos PCM laboratory. Clearance air samples collected for this project shall be analyzed by Transmission Electron Microscopy (TEM). A minimum of five clearance air samples shall be collected and analyzed for each contained work area.

No clearance air sample(s) collected and analyzed during this project shall contain fiber levels greater than 70 Structures in accordance with these specifications. Re-testing costs including the consultant's time and material expenses shall be at the expense of the abatement contractor. The consultant's time and material expenses shall not exceed $125/Hour or $1,000 for an eight-hour shift, per these specifications. The testing laboratories shall participate in an approved quality assurance quality control programs (QAQC), such as Proficiency Analytical Testing (PAT), or the Asbestos Analyst Registry (AAR) administered by the American Industrial Hygiene Association (AIHA).

When the area is certified acceptable by the consultant in writing, the contractor may dismantle the containment work area enclosure in a manner to ensure no re-contamination occurs. The dismantled enclosure shall be disposed of as asbestos waste.

******REPEAT******

It is absolutely the responsibility of the abatement contractor to verify site conditions and all quantities. Failure to verify site conditions and all quantities shall not relieve the abatement contractor the obligation to complete this abatement work as specified.

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

The following Glove-Bag Procedures shall be strictly adhered to at all times during this abatement project:

Glove-Bag Procedures for Pipe Lagging Removal:

A typical glove bag consists of between 3-12 mil-polyethylene or polyvinyl chloride **(PVC)** which is fitted with long sleeve gloves, a tool pouch, a small opening for water sprayers and HEPA vacuum nozzles.

Materials necessary to conduct a standard glove-bag operation include:

a. A 3-12 mil Polyethylene sheeting or PVC Glove-bag
b. A 2-3 gallon garden pump sprayer
c. Smoke tubes with aspirator bulb
d. Wire saw or Flexi-saw.
e. HEPA–filtered vacuum cleaner.
f. Tin snips, where aluminum jackets are present.

g. A 4-6 mil polyethylene sheeting for drop cloth.
h. Duct Tape **(approximately three (3) inches in width)**
i. Dual cartridge respirators with high efficiency cartridges
j. A wettable cloth or other patching materials
k. Asbestos danger signs and labels
l. Amended water **(surfactant)**
m. Materials from re-insulation, where necessary
n. Polyethylene disposal bags **(6-mil thick)** properly labeled per OSHA, EPA, and DOT Regulations
o. Rags for clean-up work

A glove-bag operation typically requires two workers. A third worker is usually necessary to carry out certain important functions which include: providing supplies, keeping unwanted visited out of the restricted work area, and sometimes to conduct both ambient air and OSHA personal compliance monitoring.

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All workers mentioned above must receive appropriate training to perform glove-bag operations, participate in the necessary respiratory protection and medical surveillance programs. All tools, materials and supplies needed for the glove-bag work should be brought into the work area. The work area must be demarcated with caution tapes and asbestos danger barrier tapes. Also, danger signs should be posted at the perimeter to restrict entry to the work area.

The heating ventilation and air conditioning **(HVAC)** for the immediate work area should be shot-off if possible. A remote decontamination facility should be installed as close to the glove-bag work area as possible. Emergency procedures should be implemented in the event the glove-bag ruptures. These procedures include wet wipe **(Cleaning)** all surfaces, HEPA vacuuming and employee wipe down in the immediate location before proceeding to the nearby decontamination unit. Glove-bag work should never be conducted if the pipe is heated up to temperatures of 150 degree-F and above, since typical polyethylene plastic will melt.

Glove-bag Removal Procedures:

1. Mix water with surfactant **(Usually Soap)** in the 2-3 gallon garden sprayer according to Manufacturer's directions.

2. Each worker should don-on high efficiency cartridge respirator which is approved for asbestos removal work. The respirator must be adequate to address the asbestos dust exposure levels expected within the immediate work area, with an aim not to exceed the permissible exposure limit **(PEL)** set by OSHA. The respirator must be fit-tested and checked for face-fit with each worker.

3. Each worker should don-on one disposable full-body Tyvek suit, with the hood over the respirator straps.

4. Check the area(s) or damage(s) to the pipe where the glove-bag work is to be performed. Wrap and secure the two ends of the area on the pipe that need to be removed, if TSI material is damaged, lagging and hanging. High asbestos dust exposure levels and contamination have often been the results of TSI material becoming loose due to the glove-bag work.

5. Place one layer of 6-mil polyethylene sheeting on the floor under the area where the glove-bag work is to be performed, even if the insulation on the pipe is undamaged. Failure to locate a drop cloth has also resulted in numerous and severe exposure levels of airborne asbestos dust during a glove-bag operation.

6. Open the top of the glove-bag and cut down the sides to accommodate the size of the pipe with approximately two inches longer than the diameter of the pipe. This should permit movement within the glove-bag during gross removal work and detailed-cleaning of the pipe surfaces. Some bags have zippers or two-sided tape on top and straps at each end to facilitate glove-bag installation on the pipe.

7. Insert all the necessary tools required for work into the provided pouch inside the glove-bag. The tools that should be in the pouch include utility knives, wettable cloth, tin snips, wire-cutters, clean-up rags, flexi-saw, scrub or wire brush, and any other tool that a worker may need to perform work.

8. Cut out a Donut Shape with the inner diameter ½ inch smaller than the diameter of the pipe beneath the insulation. The outer diameter of the donut should be three inches longer than the diameter of the pipe insulation being removed. Also, cut a slit in each of the two donuts so they can be slipped around the pipe.

9. Place one strip of duct tape along the edge of the open tip slit of the glove-bag for reinforcement. Place the glove-bag around the section of the pipe insulation to be removed and seal up at both ends, especially if the bag has two-sided tape.

10. Fold the flap back and tape it down with a strip of duct tape to provide adequate seal of the top of the glove-bag, with duct tape seal at the two ends of the glove-bag to the pipe.

11. Place the smoke tube and aspirator bulb into the water porthole inside the glove-bag. Squeeze the bulb to fill bag with smoke. Remove the tube and twist the water porthole closed. While holding the water porthole tightly, squeeze the glove-bag and look for leaking smoke, usually at the top and ends of the glove-bag. If leaks are found, they should be resealed and retested until the glove-bag is leak free.

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12. Place the wand from the water sprayer through the water porthole. With duct tape, seal the water porthole tightly around the wand with no air leakage.

13. One worker shall place his hands into the long-sleeved gloves while the second worker directs the water sprayer at the site of the removal work. In the event the pipe is covered with aluminum jacket; the worker should use the wire cutter to cut any bands and tin snips to remove the aluminum jacket. Caution must be exercised not to cut the glove-bag with the sharp edges of the aluminum jacket, as well as other sharp objects.

14. The exposed insulation should be cut with the flexi-saw at each end of the section being removed. The second worker should continuously spray water on the TSI material being removed throughout the operation to reduce the incidence of high levels of air borne asbestos fibers.

15. With the two ends of the section cut, another cut should be made along the top side of the pipe from end to end using a utility knife. Water spraying by the second worker continues. Caution must be exercised so that the cutting or the utility knife did not puncture the glove-bag.

16. Gently lift the TSI material off the pipe and place it in the bottom of the glove-bag. With either the wire or scrub brush, thoroughly brush the surfaces of the pipe and wipe down the exposed pipes.

17. Wet the donut-shaped wettable cloth over the exposed ends of the remaining insulation on the pipe **(e.g., CP-11)**.

18. Remove the water wand from the water porthole and replace with the nozzle of the HEPA vacuum cleaner. Turn on the vacuum cleaner until the glove-bag is collapsed. Remove the vacuum cleaner and twist the water porthole until it is closed, and seal up with duct tape.

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19. Pull the tools through the glove from outside of the bag and away from the glove-bag. Tape over the twisted section of the glove arm and make a cut within the twisted section. The contaminated tools could be placed into the next glove-bag without cleaning or emptied into a bucket full of water. Any materials that cannot be cleaned and properly decontaminated should be disposed of as asbestos waste, including used rags, scrub brush, etc.

20. While the removed waste is located at the bottom of the glove-bag, twist the bag several times and tape over with duct tape. HEPA vacuum all surfaces and also suctions air out of the glove-bag.

21. Slip a 6-mil asbestos marked disposal bag over the glove-bag, while the glove-bag is still attached to the pipe. Remove duct tape and open the top of the glove-bag and fold it down into the disposal bag. Also, remove the disposal Tyvek suit and place inside the glove-bag.

22. Twist the top of disposal bag until closed, fold over in gooseneck style and seal with duct tape, without the outermost bag labeled according to OSHA, EPA, and DOT regulations.

23. With a clean damp cloth rag, wipe the exterior of the respirator and replace it with an appropriate respirator container or bag, and leave the immediate work area.

24. All asbestos containing waste must be disposed of in EPA approved landfill in accordance with USEPA regulations. Air monitoring and project management shall be conducted by a qualified person throughout the duration of the glove-bag and clearance following the work completion.

End of Glove-Bag Procedures.

END OF SECTION

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

General Notes:

The schedule for this abatement project shall be detailed in the notifications filed with the TDSHS. Work hours shall begin at 8:00 a.m. through 5:00 p.m. Monday through Friday, unless as otherwise ordered by the school district and/or the construction services division.

The chosen abatement contractor shall provide enough workers each day for the performance of the abatement work, in order to complete the project within the notification schedules to the TDSHS and these specifications.

Hours outside those mentioned above should be with the approval of the building Owner and the consultant.

The contractor shall provide his own OSHA mandatory personal compliance monitoring for his workers, in accordance with federal **(OSHA)** and TDSHS regulations, as well as these specifications. ***No Exceptions.***

BENAS may elect to perform OSHA personal compliance monitoring for the abatement contractor's personnel, if requested.

For Contractor to Perform Own OSHA Monitoring, the following shall Apply:

The contractor's air monitor technician to be utilized for the collection of personal air samples must be currently licensed and certified by the State of Texas **(TDSHS)**. The contractor shall monitor a minimum of 25% of his workers every day or shift throughout this project duration, per OSHA regulations and these specifications. All previous day's air sample results shall be ready and posted at the entrance(s) into the decontamination chamber prior to the start of abatement activities each day throughout the duration of this project. No abatement activities shall commence without the previous day's results. ***No Exceptions.***

A copy of the previous day's air samples results shall be made available to the consultant each day before the start of abatement operations.

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Calibration of the personal air sampling pumps shall be performed each day in the presence of the consultant.

Quality control protocol including blind recount, coefficient of variation for the PCM analyst shall be provided to the consultant each day prior to the start of abatement activities for that day. ***No Exceptions.***

Historical exposure data ***SHALL NOT*** be allowed for the documentation of worker exposure throughout the duration of this abatement project, in accordance with these specifications and the contract documents.

Contractor may use existing water and electricity from the site. A licensed electrician must supervise any and all electrical work that is required during the normal operation of the project. The work includes but is not limited to, insulating, or removing new or existing light fixtures and/or transformers; establishing temporary electrical service; or insulation of temporary lights. Also, the contractor shall provide all water hoses in OSHA approved connectors and accessories in order to provide water at the needed locations throughout the abatement project.

NOTE: If the owner is unable to provide electric power or water supply for this project, the contractor shall provide his/her own electric power by generators, etc. and adequate water supply for the abatement work.

** **A mandatory pre-construction meeting shall be held at the project site location prior to the start of abatement activities. The chosen abatement contractor's competent person, *On-Site Supervisor(s)* shall be in attendance at this meeting. This meeting can be scheduled on the same day as the start date for this abatement work in accordance with the notification schedules filed with the TDSHS and these technical specifications.**

END OF SECTION

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

GENERAL OVERVIEW

The purpose of this asbestos abatement project entails the complete removal of all designated friable and non-friable ACM in the interior and exterior surfaces, including the crawl space underneath the original buildings located at the L. L. Hotchkiss Elementary School facility. This abatement project involves the complete and total removal of all designated asbestos-containing building materials in and outside the buildings at this facility, which could impact scheduled renovation and/or demolition activities. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

All work shall be performed in compliance with these specifications, the United States Environmental Protection Agency **(USEPA)**, and National Emissions Standards for Hazardous Air Pollutants **(NESHAP**) Methods and Protocols. Also, Occupational Safety and Health Administration **(OSHA)**, Texas Asbestos Health Protection Rules/Act (**TAHPR**), Texas Commission on Environmental Quality **(TCEQ)**, and any other applicable federal, state, and local governmental regulatory agencies' requirements must be complied with. Furthermore, the recommendations of the National Institute for Occupational Safety and Health **(NIOSH)** with regards to respiratory protection program, the collection and analysis of air samples before, during and after the abatement work shall be strictly adhered to.

Finally, this project shall be completed strictly according to the detailed requirements of these specifications and the contract documents. In any event where the requirements of these specifications and contract documents are in conflict with applicable federal, state, or local regulations guiding the handling and abatement of ACM in the State of Texas, the most stringent requirements shall apply.

OBJECTIVES

The objective of this project is to safely remove all designated friable and non-friable ACM in the interior and exterior, plus the crawl space underneath all original buildings located at the L. L. Hotchkiss Elementary School facility. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

Effort shall be made to:

1. Remove all specified ACM from the above-described property interior areas.

2. Prevent any person or persons from inhaling asbestos fibers.

3. Prevent any asbestos contamination of adjacent work areas, and the general environment throughout the project duration.

4. Ensure all asbestos wastes are disposed of completely and properly and to provide the Owner with documentation indicating proper disposal.

5. Maintain a safe working environment throughout the duration of the project.

6. Accurately document all project activities.

2.0 CONTRACTOR'S RESPONSIBILITIES

All abatement contractors are directed to carefully examine these specifications prior to bidding and before the start of abatement operations, as well as during the course of asbestos abatement activities to ensure that adequate resources are devoted to meet the approved schedules, contract documents, notifications, and these specifications. The chosen asbestos abatement contractor is responsible for carefully examining the site conditions and all quantities prior to the start of abatement work. Failure to verify all quantities and site conditions shall not relieve the contractor the obligation and responsibility to complete this abatement project as specified in the contract documents and these specifications.

2.1 Coordination with Independent Testing Laboratory

A. The asbestos abatement contractor shall fully cooperate with the independent testing laboratory **(Consultant)** personnel in providing access to all work locations.

B. The contractor shall furnish incidental labor facilities to:

   i) Provide access to all work locations to be tested and

   ii) Facilitate inspections and testings.

C. The contractor shall notify the testing laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

D. Payment for laboratory time if the work area is not ready for testing when scheduled shall be at the contractor's expense. Laboratory’s time and materials expenses shall not exceed $125.00 per hour, or $1,000 for an eight-hour work shift.

2.2 Notification

The contractor is responsible for ensuring that proper notifications have been filed with all regulatory agencies having authority over proposed abatement work, including but are not limited to the city, county, state, and/or federal agencies, especially the TDSHS. The building Owner, the consultant and/or the abatement contractor can file the necessary notification schedules to the TDSHS; however, the Owner is responsible for the payment of notification fees to the TDSHS.

2.3 Materials and Equipment

The contractor shall provide all items, articles, materials, operations, or methods listed or mentioned, including all labor, materials, equipment, applicable permits and notifications, and all incidentals necessary and required for their use to complete the abatement work specified in the manner and time specified. The contractor shall supply all protective equipment **(protective clothing, respirators, cover glasses, steel toe boots, etc.)** for all personnel entering any area exposed to asbestos dusts, including the Owner, personnel of the testing laboratory and authorized visitors.

2.4 Contractor's Effort

The contractor shall provide all personnel; equipment, supplies and facilities necessary to complete this project as specified in the detailed Scope of Work for this project **(See Scope of Work)*.***

2.5 Personnel

2.5.1 Supervisor

A. The on-site supervisor(s) must be currently licensed with the State of Texas Department of State Health Services to manage any asbestos abatement operations for this project.
B. The supervisor(s) must be present at the project site 100% of the time during the active removal phase of this project. Also, the supervisor **SHALL** enter into the containment work area enclosure at least 25% of the time during active removal operations, in accordance with TDSHS regulations and these specifications.

2.5.2 Employee Conduct

A. Dallas ISD Policies and Procedures regarding Safety and Communications shall be in force at all times during this abatement project. Dallas ISD Safety Guidelines shall be strictly adhered to, throughout the duration of this project. Any employee whose conduct is offensive to the Owner or the consultant, or any employee apprehended on Owner-owned or controlled property with alcoholic beverage, or any form of controlled substance on his person, or is suspected of having consumed the same will be brought to the attention of the contractor's on-site supervisor. The supervisor shall take immediate action(s) appropriate to the circumstances. Such action(s) shall include but are not limited to dismissal from the premises.

B. Any person found to be deliberately disposing of asbestos waste in any manner other than those outlined in these specifications, or who is recklessly exposing himself, fellow employees, or the general public to asbestos materials, or engaging in activities that are unnecessarily hazardous to himself, fellow employees, or the general public shall be brought to the attention of the contractor's supervisor. The supervisor shall take immediate action(s) appropriate to include but are not limited to dismissal from the premises.

C. Smoking, eating, drinking or the application of cosmetics within the restricted work areas during active abatement operations are prohibited and shall not be permitted.

2.6 Temporary Facilities and Controls

2.6.1 Water for Construction

The Owner may provide water to be used during the abatement project. The contractor shall provide temporary facilities or other items required to properly transport the water to the location(s) where it is needed, including water hoses and airless sprayers where necessary.

If the Owner is unable to provide water for construction or abatement operations, the contractor shall provide own water for all construction activities during this project in accordance with the contract documents and these specifications.

2.6.2 Electricity for Construction

The Owner may provide electric energy as required for all branches of the work, to operate equipment and to provide artificial lighting. The contractor shall provide temporary wiring and outlets as required. All electrical sources must be equipped with ground fault interrupter system **(GFI)**. If the Owner is unable to provide electric energy **(power)** for construction or abatement operations, the contractor shall provide own electrical energy **(power)** for all construction activities during this project in accordance with the contract documents and these specifications. Any electrical work that is required during the normal operation of this project must be conducted and supervised by licensed electricians. The work includes but is not limited to insulating or removing new or existing light fixtures and/or transformers; establishing temporary electrical services; or insulation of temporary electrical fixtures.

2.6.3 Handling Materials

The contractor shall properly care for and protect materials and equipment at the job site. Placement of building materials and equipment at the site shall be subject to the approval by the Owner.

2.6.4 Cleaning

The contractor shall keep the premises clean at all times during the abatement operations. Upon completion of all abatement activities, the contractor shall ensure that the areas surrounding the project are in a neat and clean condition as approved by the Owner.

2.6.5 Barricades, Walkways and Work Area Barriers

The Contractor Shall:

1) Maintain adequate barricades and enclosed walkways at all times to protect the workmen and the general public from injury.

2) Erect and maintain containment work areas with full three-stage wet decontamination facilities, which shall include an equipment room **(dirty room)**, shower room and a clean room, plus a bag-out chamber.

   The decontamination chambers shall be constructed with two layers of 6-mil fire-retardant resilient polyethylene sheeting barriers to prevent access to any asbestos dusts and/or materials at the work areas. Any barriers that may be visible to the general public shall be covered with 6-mil Black Polyethylene Sheeting. **No Exceptions**.

3) Upon completion of the abatement work at any and all location(s), the contractor shall remove all polyethylene sheeting barriers and all other items from the project site.

2.6.6 Signs

A. No signs or advertisements shall be displayed without the approval of the Owner.

B. The location of the signs if any, must be approved by the Owner and/or Consultant working for the Owner.

2.6.7 Security

The Contractor shall provide adequate security to ensure that:

1. Restricted asbestos abatement areas are not entered by unauthorized persons.

2. Unauthorized persons are prevented from access to any asbestos-containing waste materials.

4) Every person who enters any restricted asbestos abatement Work areas is logged in and out.

2.6.8 Asbestos Waste Storage

Asbestos waste must be removed daily from the abatement areas. Temporary on-site storage of waste near and/or within the immediate abatement areas will be permitted in containers secured from the general public **(truck, dumpster, etc.)**. Asbestos wastes **(bags, drums, etc.)** shall not be stored in direct contact with the ground.

2.6.9 Restrooms

The Owner's restroom facilities shall not be available for the abatement contractor's use for this project. The contractor shall provide own rest room throughout the duration of this project.

2.6.10 Notifications, Permits, Warning Signs, Labels and Posters

The Contractor shall perform the following tasks:

1) Ensure proper notifications to the TDSHS and any other federal, regional, state, and/or local authorities having jurisdiction over the project within time frames specified by the individual authority.

2) The Owner is responsible for the payment of necessary notification fees to TDSHS.

3) Secure all the permits and exemptions required for the work, including disposal of asbestos in an approved landfill.

4) Provide the names, addresses and telephone numbers of approved waste disposal site(s). Provide signed copies of hazardous waste disposal manifests issued by the TCEQ which document proper waste disposal in the State of Texas and deliver original copies to the Owner during close-out following the completion of the abatement project.

5) Erect warning signs around the work areas, and also at every potential point of entry into the restricted work areas from the outside. The warning signs shall be a bright color so that they will be easily noticed. The size of the sign and the lettering shall be no less than OSHA requirements.

6) Label all plastic bags and drums utilized to transport contaminated material(s) to the landfill as required by regulations. Provide any signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn the general public (people) of the hazards from asbestos exposure.

<u>All signs shall be in English and Spanish Languages:</u>

a. Per OSHA Regulations: 29 CFR 1926.1101, warning signs shall Read:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

b. Per OSHA Regulations: 29 CFR 1926.1101, warning signs shall Read:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

c. Per U.S. Department of Transportation, warning labels shall Read:

R Q HAZARDOUS
SUBSTANCES,
SOLID, NOS,
ORM-E, NA 9188
(ASBESTOS)

2.6.11 Emergency Precautions

A. The Contractor shall establish emergency exits from the work area.

B. The Contractor shall be prepared to administer first aid to injured personnel after decontamination from the exclusion zone. Seriously injured personnel shall be treated immediately or evacuated without decontamination. When an injury occurs, the Contractor shall stop work and implement fiber reduction techniques **(e.g., amended water spraying and hosing down)** until the injured person has been removed from the work area(s).

2.6.12 Respiratory Protection

The minimum respiratory protection requirements for this project are summarized as follows:

1. Air Purifying Respirators may be used (**negative pressure-demand half-face or full-face masks only)** where the concentration of fibers in the work area may reasonably be expected not to exceed 0.010 fibers per cubic centimeter of air **(0.010 f/cc)**. The protection factor for the half-face mask shall be 10, in accordance with NIOSH, OSHA Standards and these specifications.

2. Powered Air Purifying Respirators **(PAPRs)** may be used where the concentration of fibers in the work area may reasonably be expected not to exceed 0.100 fibers per cubic centimeter of air **(0.100 f/cc)**. The protection factor for the PAPR shall be 1,000, in accordance with NIOSH, OSHA Standards and these specifications.

3. Type "C" Positive Supplied Air or Self-Contained Breathing Apparatus **(SCBA)** air with continuous flow or pressure demand clasp must be used where fiber concentration in the work area can reasonably be expected to exceed 3.00 fibers per cubic centimeter of air **(3.00 f/cc)**.

NOTE: The above-described respiratory protection is based on an eight-hour time-weighted average **(TWA)** or a ceiling concentration.

1. If any air samples collected during the abatement process have elevated fiber levels in excess of the limits permissible for the type of respirator being used, respiratory protection must be upgraded. All abatement activities shall be stopped until fiber concentration in that work area is brought down to acceptable levels. It is the responsibility of the contractor to secure enough and approved respiratory protective devices available to complete the abatement project on schedule for any foreseeable contingency.

2. If Type "C" Supplied Air or SCBA type Respirator is used, at least two spare units provided by the contractor shall be available at all times for use in the case of emergency, and/or by the Owner, Owner's Representative, or any other authorized personnel.

The Type "C" Respirator shall be worn with a belt to minimize the possibility of dislocating the facemask when the hose is snagged in the work area.

2.6.13 Disposal Activities

A. It is the responsibility of the contractor to determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The contractor must comply fully with these regulations and all United States Department of Transportation **(USDOT)**, State, Local and USEPA requirements, especially waste handling requirements stipulated by the TCEQ.

B. All containers of asbestos wastes shall be decontaminated prior to loading onto the vehicle transporting the material to the landfill. Wastes shall be bagged inside the contained or restricted work area and placed in a second bag or drum, which must be decontaminated in the contamination-reduction zone **(the decontamination unit)** before transfer into the dumpster. Alternative methods shall be considered if shown as effective as this method.

C. The contractor shall dispose of asbestos waste from this project in landfills approved by the TCEQ as authorized disposal facilities for asbestos. All double-bagged ACM waste must be marked with the "Originator's **(Owner)** name, address and telephone number. The contractor shall employ only a licensed asbestos transporter for this effort. Disposing or attempting to dispose of asbestos waste via sanitary sewers, city waste systems or by placing in unoccupied area is prohibited and will be grounds for immediate cessation of work under this contract until the material is recovered and disposed of correctly and disciplinary actions are taken.

D. The contractor shall document actual disposal of the waste at the designated landfill by completing all asbestos waste disposal manifests and appropriate chains-of-custody and forwarding the originals to the Owner during close-out following the completion of the project.

C. **Scaffolding:** Scaffolding as required to accomplish the specified work shall meet all applicable safety regulations, especially the OSHA standards.

2.7 Execution

2.7.1 Pre-Asbestos Abatement Preparations

A. Prior to any abatement work in any area, the contractor shall seal-off the entire work area to anybody other than trained personnel and authorized visitor(s); erect signs around the perimeter in accordance with USEPA, NESHAP, OSHA, TDSHS and these specifications; and maintain a log of all people entering and exiting the workplace.

B. Thoroughly decontaminate through wet cleaning and/or HEPA vacuuming all equipment and supplies used during the course of the abatement project.

2.7.2 Utilities

The contractor shall provide all necessary connections for temporary utilities in the workplace during the abatement work. Temporary electrical power shall be utilized in accordance with OSHA and Electrical Code for Wet Environment.

2.7.3 Asbestos Removal

A. All ACM shall be removed according to the stipulations of these specifications.

B. Immediately following removal, the wetted asbestos shall be packed into labeled six-mil plastic bags to prevent the material from drying. The excess air in the bags should be exhausted in the work area prior to sealing the bags.

Pack and seal all bagged materials in drums and/or containers which are also labeled or alternatively sealed in double bags of six-mil plastic. Thoroughly clean the exterior of the bags or sealed drums prior to loading onto the truck for transportation to the landfill. Alternative procedures must be approved in writing by the consultant before work starts.

C. Disposal shall be in a landfill meeting USEPA, Department of Transportation **(DOT)**, TDSHS and TCEQ requirements. The contractor shall not throw bags into the landfill in a manner that may cause the bags to burst open. If the bags cannot be taken out of the drums undamaged, then include the disposal of the drums with the bags. Ensure that the bags are not opened in the process.

D. All used plastic, tapes, cleaning materials; clothing and filters shall be treated and disposed of as asbestos waste materials.

2.7.4 Final Asbestos Decontamination

After the removal of asbestos has been completed and before the removal of any barriers, the entire work area shall be thoroughly wet-cleaned and/or vacuumed with HEPA filtered vacuum cleaners. All equipment used in the work areas such as scaffolds, ladders, vacuum cleaners, masks, hard hats, etc., shall be thoroughly decontaminated through wet cleaning, HEPA vacuumed prior to removal from the work area.

After detailed cleaning has been completed, the consultant shall perform a visual inspection to ensure that all ACM and contaminated debris have been properly removed and the entire restricted work area is clean.

NOTE: It should be stated that abatement work area fiber levels are counted according to the recommended A-Counting Rules of the NIOSH 7400 Methods. These methods do not distinguish between asbestos and non-asbestos fibers.

When the Owner's representative **(Consultant)** certifies that the containment work area enclosure is acceptable in writing, the contractor may dismantle the remainder of the barricades. The tape barricades shall be disposed of as asbestos waste.

2.7.5 Post-Abatement Submittals

The contractor shall provide a final report which contains signed copies of the hazardous waste disposal manifests, OSHA mandatory personnel compliance air monitoring records, copies of required insurance certificates, and copies of the daily project logs. A copy of the contractor's final report shall be made available to the consultant and the building Owner.

3.0 LABORATORY RESPONSIBILITIES

Except as otherwise specified the Owner shall separately employ the services of an Independent Testing Laboratory **(Laboratory)** to perform sufficient ambient air monitoring to determine if the contractor is complying with the requirements of these specifications, as well as federal, state, and local regulations guiding asbestos handling and abatement in the State of Texas. Teaming arrangements between the abatement contractor and the testing laboratory are permitted in this circumstance, but separate employment by the Owner is required.

The laboratory shall perform air monitoring and testing during abatement work and cleaning operations. A Texas licensed asbestos PCM Laboratory shall analyze all the abatement work area samples.

1. The laboratory shall conduct air monitoring in accordance with the method prescribed by Section 1926.1101 of the OSHA regulations.

3.1 Laboratory Duties

A. Cooperate with the Contractor; provide qualified personnel after due notice.

B. Perform specified ambient air sampling and testing; comply with specified standards **(See Section 7.0)**; and ascertain compliance of materials and work procedures with requirement of the contract documents and technical specifications.

C. Promptly notify the contractor and the Owner of observed irregularities or deficiencies of work or products.

D. Stop all abatement operations if gross negligence and irregularities are observed, or for non-compliance with regulated, recommended and/or applicable work practices and procedures, as well as these specifications.

E. Promptly submit written report of each test and inspection; one copy to Owner and contractor. Each report shall include:

1. Date Issued.

2. Project title, number and building identification.

3. Laboratory name, address, and telephone number(s).

4. Name and signature of a laboratory inspector and/or microscopist.

5. Date and time of sampling or inspection.

6. Location of sample or test in the project.

7. Type of inspection or test.

8. Results of tests and compliance with Contract Documents.

F. Perform additional tests as required by the Owner.

3.2 Authority of the Laboratory

The Laboratory is authorized to:

1. Release, revoke, alter or enlarge on the requirements of the scope of work and applicable specifications;

2. Approve or accept any portions of the work.

4.0 OWNER'S RESPRESENTATIVE (CONSULTANT)

4.1 Pre-Asbestos Abatement Preparations

The consultant shall inspect the work site prior to the commencement of abatement activities to document conditions which might adversely impact the contractor's ability to meet his obligations.

4.2 Authority to Stop Work

The Owner or Owner's representative **(Consultant)** has the authority to stop the abatement work at any time he determines that conditions are not within the specifications and applicable regulations. The cessation of work shall continue until conditions have been corrected; and corrective steps have been taken to the satisfaction of the consultant. Standby time required to resolve violations shall be at the contractor's expense.

5.0 PROJECT COORDINATION AND PROCEDURES

5.1 Project Coordination

The contractor shall provide a full-time Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, and disposal procedures in the State of Texas. This person is the Competent Person as set forth in OSHA 29CFR 1926.1101 and is the contractor’s representative responsible for compliance with all applicable federal, state, and local regulations and must meet the criteria for the TDSHS licensing requirements.

Also, this person must have had a minimum of five (5) years of on-the-job experience and meet any additional requirements set forth in OSHA 29CFR 1926.1101 as amended June 29, 1998, or thereafter.

5.2 Special Reports

Except as otherwise indicated, the superintendent shall submit special reports directly to the consultant within one-hour of occurrence requiring special attention with a copy to the building Owner and all others affected by the special occurrence.

5.3 Reporting Unusual Events

When an event of unusual nature occurs at the site, the superintendent shall prepare and submit a special report listing the chain of events, persons participating, and response by contractor's personnel, evaluation of results or effects, and similar pertinent information. If such an event(s) is known or predictable in advance, the contractor's superintendent shall advise the consultant at the earliest possible time.

5.4 Reporting Accidents

The superintendent shall prepare and submit reports to the consultant of accidents on site. Record and document data and action; and comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

5.5 Contingency Plans

The superintendent shall prepare contingency plans for emergencies including fire, accidents, power failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in the plan's specific procedures for decontamination or work area isolation. ** Note that nothing in these specifications shall impede existing safety or the pursuit of adequate medical attention in the event of an emergency.

5.6 Emergency Numbers

The superintendent shall provide emergency numbers to the consultant during pre-construction meeting and post them in room of contractor's staging area; on heavy equipment and other approved locations as applicable. Telephone numbers and locations of emergency services including but are not limited to fire, ambulance, doctor, hospital, police, power-generating company, telephone company, and poison control center.

5.7 Submittals

Prior to the start of work, the superintendent shall submit the following to the consultant for review. No work shall begin until these submittals are reviewed and returned by Owner.

1. Contingency Plans for emergency actions
2. Telephone numbers and locations of emergency services
3. Notifications to be sent to entities at the work site
4. Copy of notifications filed with all appropriate authorities
5. Construction schedule and plan of action
6. Other abatement submittals

6.0 OTHER

General Applicability of Codes, Regulations and Standards

Except to the extent that more explicit or stringent requirements are directly specified in the contract documents, all applicable codes, regulations, and standards have the same force and effect. They are also made a part of the contract documents by reference as if they are copied into it, or as if published copies are bound here with.

Applicable Publications

The publications listed below form a part of these specifications by reference and are as if copied into it and the contract documents. The publications are referenced in text by basic designation only.

1. **Environmental Protection Agency (EPA):** Regulations for Asbestos (Code of Federal Regulations Title 40, Part 61).

2. **Occupational Safety and Health Administration (OSHA):** Asbestos Regulations (Code of Federal Regulations Title: 29CFR, Part 1926.1101).

3. **National Institute for Occupational Safety and Health (NIOSH):** "Respiratory Protection....A Guide for the Employee"....

4. **American National Standards Institute (ANSI):** Z86.1-1973...Commodity Specification for Air...

5. **Code of Federal Regulations (CFR):**

    a. ***29 CFR 1926.1101***, Occupational Safety and Health Act **(OSHA)**.

    b. ***20 CFR 1910.20, Subpart C***, General Safety and Health Provisions.

    c. ***40 CFR 61, A and B;*** U.S. Environmental protection Agency Regulations for Asbestos.

    d. ***40 CFR 61, Part III***; National Emission Standards for Hazardous Air Pollutants; Asbestos **NESHAP** Revision; Final Rule, November 20, 1990.

    e. 34 CFR 61, Parts 230 and 231, Appendix B, Procedures for Containing and Removing Building Materials Containing Asbestos: Federal Register, Volume 45, N0. 182, Page 61961, September 17, 1980.

6. ***Texas Department of State Health Services***, Division of Occupational Health, Texas Asbestos Health Protection Rules, May 29, 1998, Texas Civil Statutes, Article 4477-3a, Section 12.

7. Resilient Floor Covering Institute Recommended Work Practices for the Removal of Resilient Floor Coverings and Addenda, July 1990.

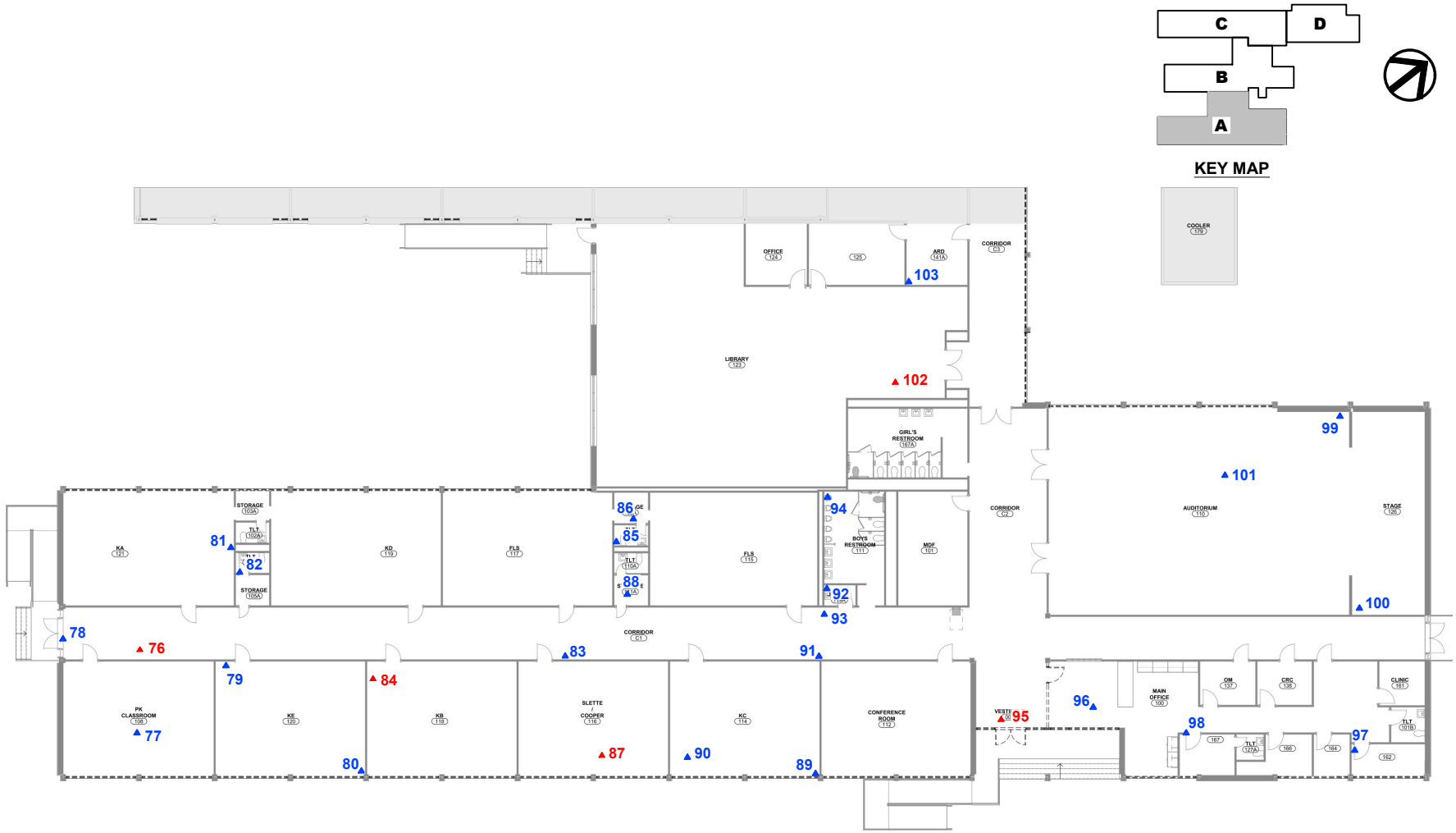
8. ***Texas Commission on Environmental Quality***

    Municipal Solid Waste Division; 30 TAC 330.136(b) (3) pertaining to non-friable Asbestos-Containing Building materials 'Must go to an approved Landfill'.

RESULTS OF LABORATORY TEST AND ANALYSIS OF BULK SAMPLES BY POLARIZED LIGHT MICROSCOPY AND CHAIN-OF-CUSTODY FORMS

COMPUTER AIDED DESIGN DRAWINGS (CADD) FOR THE ABATEMENT WORK AREAS WITH QUANTITIES OF THE ACM

PHOTOGRAPHIC DOCUMENTATION OF REPRESENTATIVE BULK SAMPLES COLLECTED AND ANALYZED



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT A

FIGURE 1

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

BENAS Environmental Services, Inc.

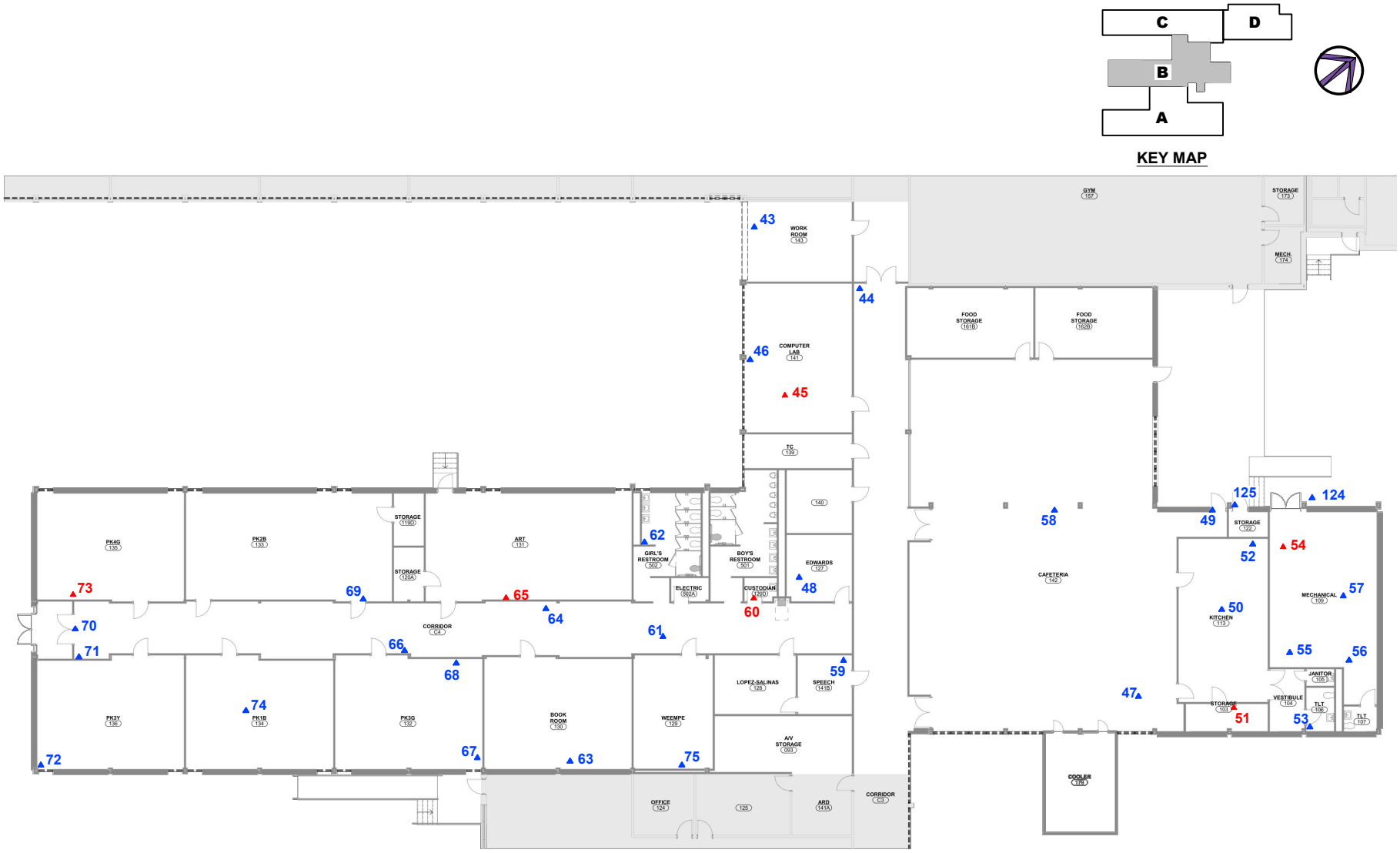
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019

PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT B

FIGURE 2

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

BENAS Environmental Services, Inc.

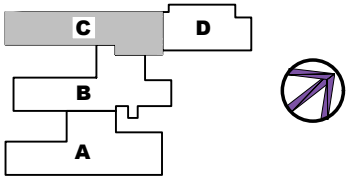
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019

PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT C

FIGURE 3

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

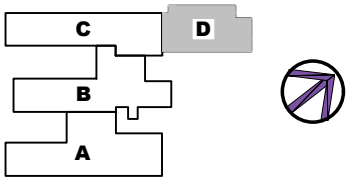
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- Non-ACM Sample
- ACM Sample

LEVEL 1 - UNIT D

FIGURE 4

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

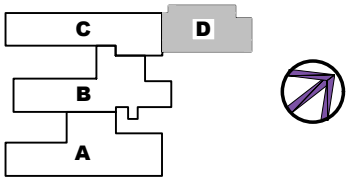
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

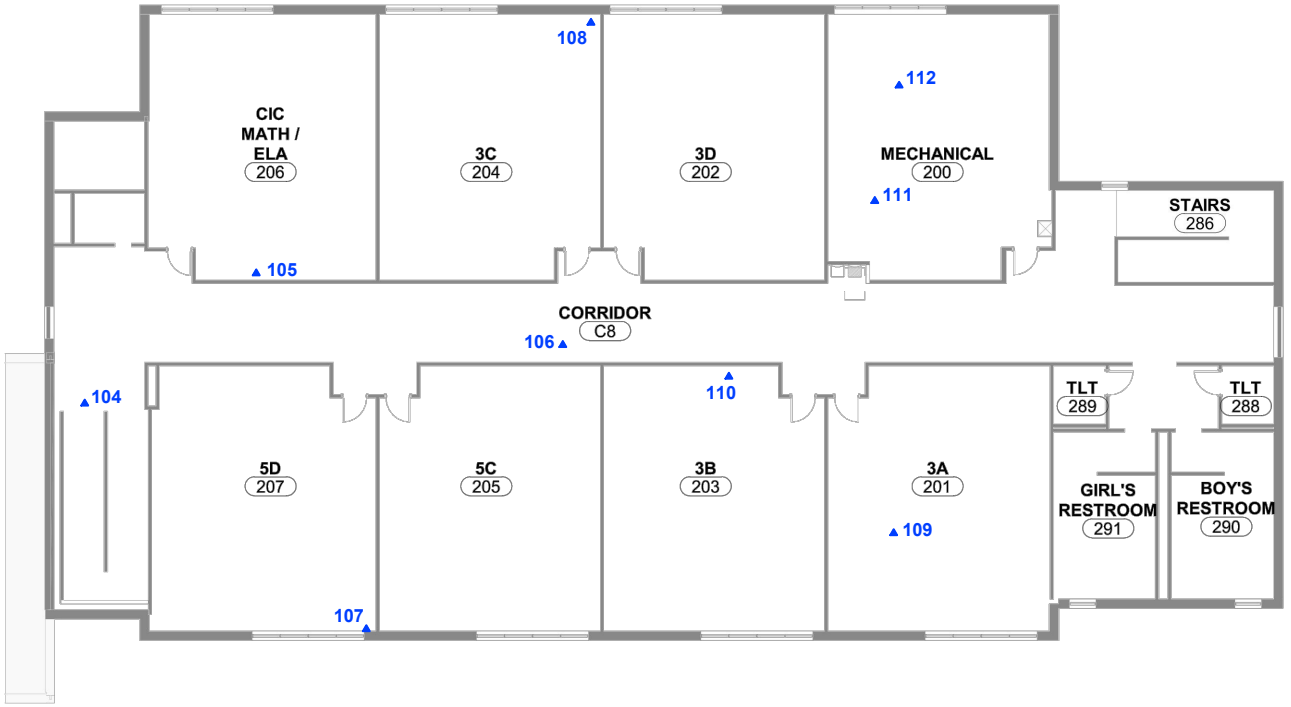
APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 2 - UNIT D

FIGURE 5

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

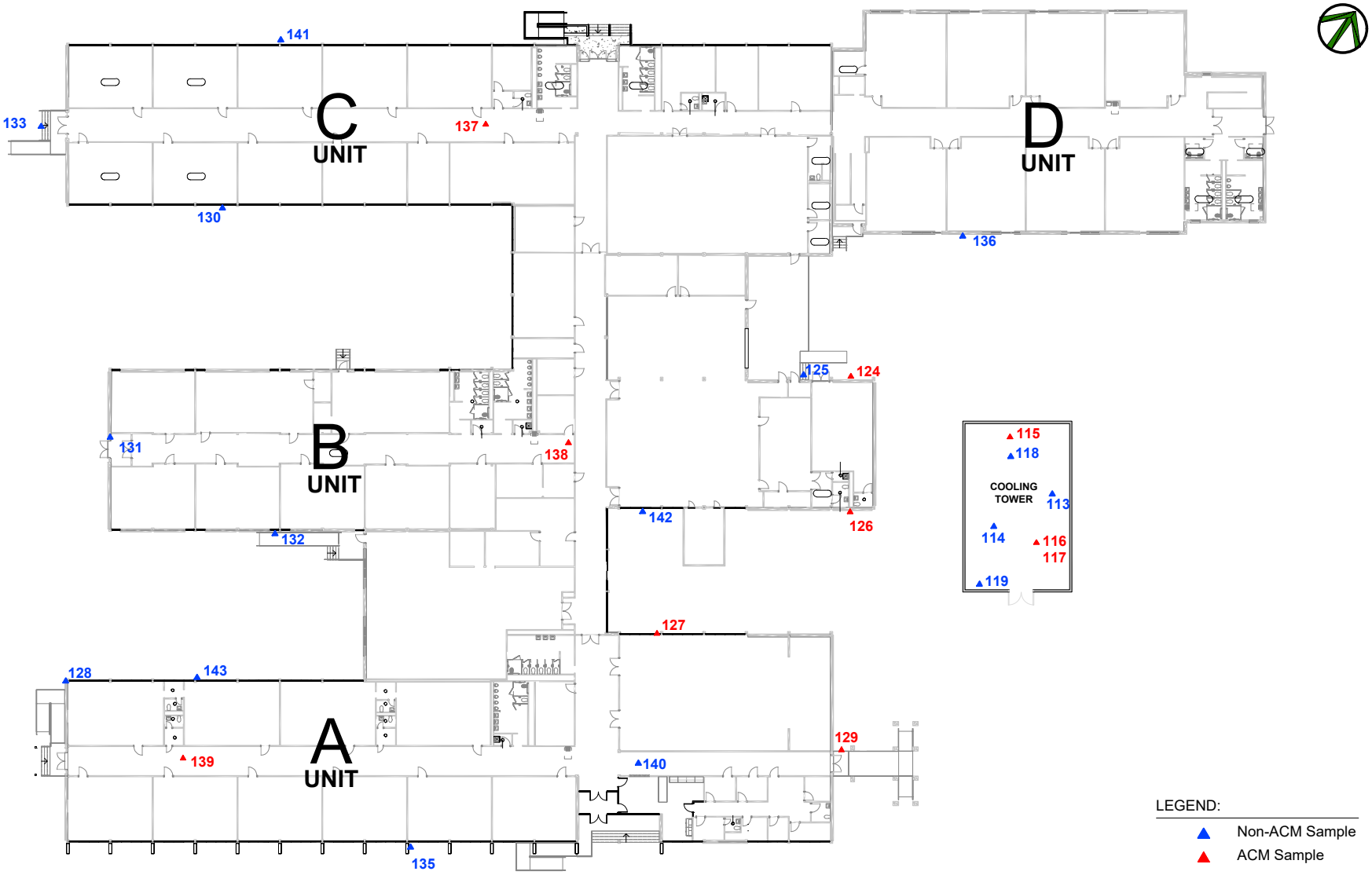
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

COOLING TOWER, BUILDING EXTERIOR & CRAWLSPACE

FIGURE 6

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

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PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
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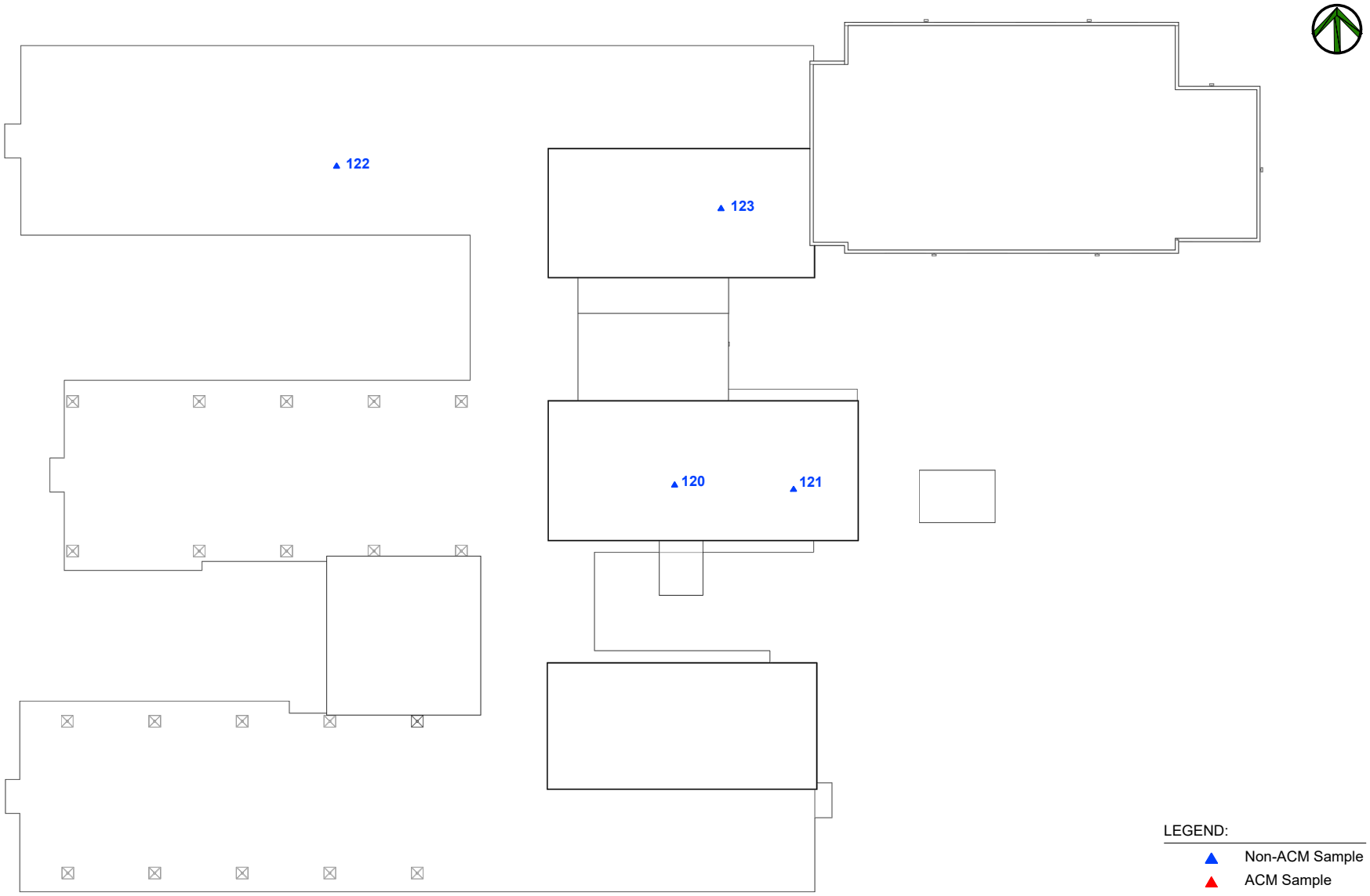
Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



LEGEND:

- Non-ACM Sample
- ACM Sample

ROOF

FIGURE 7

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

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Environmental Services, Inc.
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P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399

PLM REPORT SUMMARY

Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307241	1	Off-white 12" X 12" Floor Tiles & Mastic - Hallway, Double Doors Exit underneath Foot Mat	None Detected - Floor Tile None Detected - Black Mastic
CL1307242	2	1' X 1' Stick-on Ceiling Tiles & Dot Mastic - Classroom 155, Center Section	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1307243	3	Wood Cove Base Sealant - Hallway outside Classroom 154	None Detected - White Sealant
CL1307244	4	White 2' X 2' Drop Ceiling Tiles - Classroom 152 North Section	None Detected
CL1307245	5	Student Locker Caulking - Hallway outside Classrooms 152 & 150	None Detected
CL1307246	6	Interior Window Caulking - Classroom 153 Back North Window at Frame	None Detected
CL1307247	7	Cabinet Caulking - Classroom 150 Front Section at Cabinet Works	None Detected
CL1307248	8	Interior Window Glass Glazing - Classroom 151 Extreme Southwest Section at Window Glass Pane	None Detected
CL1307249	9	1' X 1' Stick-on Ceiling Tiles & Dot Mastic - Classroom 148, Front Entry Section	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1307250	10	Off-white 12" X 12" Floor Tiles & Mastic - Classroom 149, Back Southeast Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1307251	11	Transition Door Strip - Classroom 146, Entrance Doorway	None Detected - Transition Strip None Detected - Yellow Mastic
CL1307252	12	White Plaster Wall - Classroom 146, Front Entry above Cabinet Works	None Detected - Paint Layer None Detected - Plaster
CL1307253	13	Furr Down Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 146, Back Northwest Corner at Furr Down	None Detected - Paint Texture
CL1307254	14	Building Joint Sealant - Classroom 144A at Back Wall	None Detected - White Sealant
CL1307255	15	Spray-applied Ceiling Texture - IDF Room Front Entrance Section at Ceiling	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

PLM REPORT SUMMARY

Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307256	16	Mastic underneath Black Rubber Cove Base - Classroom 144A, Back Southeast Section	None Detected - Cove Base None Detected - Tan Mastic
CL1307257	17	Interior Window Caulking - Boys' Restroom Back Window near Urinals	None Detected
CL1307258	18	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Boys' Restroom Entrance Section near Hand Wash Basins	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound
CL1307259	19	Wall Ceramic Tile & Grout - Boys' Restroom Back Exit Doorway at Extreme Corner	None Detected - Ceramic Tile None Detected - Grout
CL1307260	20	Floor Ceramic Tile & Grout - Boys' Restroom 2nd Stall	None Detected - Ceramic Tile None Detected - Grout
CL1307261	21	Ceramic Cove Base Sealant - Hallway near Custodial Closet 159A at Column	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1307262	22	Student Locker Caulking - Hallway, between Classrooms 144 & 146	None Detected
CL1307263	23	White Wall Ceramic Tile & Grout - Faculty Lounge Room 156 Restroom	None Detected - Ceramic Tile None Detected - Grout
CL1307264	24	Grey-ish Floor Ceramic Tile & Grout - Faculty Lounge Room 156 Restroom	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1307265	25	White 2' X 2' Drop Ceiling Tile - Faculty Lounge Room, Center Section	None Detected
CL1307266	26	Transition Door Strip - Gymnasium, Equipment Storage Room at Door Strip	None Detected - Transition Strip None Detected - Yellow Mastic
CL1307267	27	White CMU & Mortar - Gymnasium, Electrical Room 157A Back Corner	None Detected - Paint Layer None Detected - CMU Block None Detected - Mortar
CL1307268	28	Interior Brick & Mortar - Gymnasium, Extreme Northwest Corner at Front Wall	None Detected - Paint Layer None Detected - Mortar

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307269	29	White Plaster Ceiling - Custodial Closet 159A Front Section at Ceiling	3% Chrysotile - Tan Caulking None Detected - Paint Layer None Detected - Plaster
CL1307270	30	Carpet Mastic - Executive Office 159 Middle North Section	None Detected - Carpet None Detected - Yellow Mastic
CL1308602	31	Transition Door Strip - Hallway at Doorway to Reading Laboratory Room 160	None Detected - Transition Strip None Detected - Yellow Mastic None Detected - Floor Tile None Detected - Yellow Mastic
CL1308603	32	White Wall Texture, Joint Compound, & Sheetrock Mud - Lobby Entrance to New Wing Building	None Detected - Paint Texture
CL1308604	33	Off-white 12" X 12" Floor Tile & Mastic - Classroom 162, Extreme Southeast Corner underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1308605	34	White 2' X 2' Drop Ceiling Tile - Classroom 165, Center Section	None Detected
CL1308606	35	Black Sink Putty - Classroom 164, Front Wall underneath Hand Wash Basin	None Detected
CL1308607	36	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 69, Extreme Southeast Corner at Wall	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308608	37	White 2' X 2' Drop Ceiling Tile - Hallway between Classrooms 166 & 167	None Detected
CL1308609	38	Metal Duct Work Vibrations Isolator (expansion booth) - Mechanical 1 Room 168	None Detected
CL1308610	39	White TSI Wrap & White Mastic - Mechanical 1 Room 168	None Detected - White Mastic None Detected - Wrap None Detected - Insulation

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308611	40	Transition Door Strip - Doorway Entrance to Custodial Closet	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308612	41	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Girls' Restroom, Extreme Southeast Corner at Ceiling	None Detected - Paint Layer None Detected - Paper None Detected - Wallboard Material
CL1308613	42	Wall Ceramic Tile & Grout - Men's Restroom at Junction behind Dresser	None Detected - Ceramic Tile None Detected - Grout
CL1308614	43	Pure White 12" X 12" Floor Tile & Black Mastic - Teachers' Work/Copy Room	None Detected - Floor Tile None Detected - Black Mastic
CL1308615	44	Building Demarcation Sealant - Hallway outside Computer Room at Junction	None Detected - Black Sealant
CL1308616	45	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Computer Room, Center Section	None Detected - Ceiling Tile 3% Chrysotile - Brown Mastic
CL1308617	46	Interior Window Caulking - Computer Laboratory Room at Back Window Frame	None Detected - Caulking 1 None Detected - Caulking 2
CL1308618	47	White 2' X 4' Drop Ceiling Tile - Cafeteria Room above Ceiling near Kitchen	None Detected
CL1308619	48	Sink Putty - Executive Office 127 underneath Hand Wash Basin	None Detected
CL1308620	49	Terrazzo Flooring - Cafeteria Room near Back Exit Door	None Detected
CL1308621	50	Terrazzo Flooring - Kitchen, Middle Floor Drain	None Detected
CL1308622	51	Interior Door Caulking - Kitchen, Door to Storage Room	5% Chrysotile
CL1308623	52	Wall Ceramic Tile & Grout - Kitchen, Extreme Southeast Corner near Sinks	None Detected - Tile None Detected - Grout
CL1308624	53	Plaster Ceiling - Kitchen Restroom near Entry Doorway	None Detected - Plaster
CL1308625	54	TSI & Wrap on Pipe Run - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap 15% Amosite - Insulation

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
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NVLAP Lab No. 200569-0
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Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308626	55	TSI & Wrap on Elbow - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap None Detected - Insulation
CL1308627	56	TSI & Wrap on T-Fittings - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap None Detected - Insulation
CL1308628	57	Gasket Insulation - Basement Boiler/Sprinkler Room	None Detected
CL1308629	58	Transition Floor Strip - Cafeteria Main at Transition Strip to Extension	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308630	59	White Wall Texture, Joint Compound, & Sheetrock Mud - Executive Office 128 at Front Corner	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308631	60	Green 9" X 9" Floor Tile & Black Mastic - Custodial Closet 138 North Section	7% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
CL1308632	61	Type 2 White 2' X 2' Drop Ceiling Tile - Hallway between Custodial Room & Conference Room 128	None Detected
CL1308633	62	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Girls' Restroom Middle Section at Ceiling	None Detected - Paint Texture None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308634	63	Off-white 12" X 12" Floor Tile & Mastic - Classroom 130, Back Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1308635	64	Student Locker Caulking - Hallway across Classroom 130	None Detected
CL1308636	65	Black Sink Putty - Art Room 131, Front Wall underneath Hand Wash Basin	3% Chrysotile
CL1308637	66	12" X 12" Floor Tile & Black Mastic - Hallway outside Classroom 132	None Detected - Floor Tile None Detected - Black Mastic

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
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Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
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Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
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Lab Job No.: PLM-38673
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308638	67	Ceramic Cove Base Tile & Grout - Teachers' Lounge Room, Extreme Southeast Corner	None Detected - Ceramic Tile None Detected - Grout
CL1308639	68	White Sink Putty - Teachers' Lounge Room Northeast Corner underneath Hand Wash Basin	None Detected
CL1308640	69	Transition Door Strip - Science Laboratory 133 at Front Doorway	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308641	70	12" X 12" Floor Tile & Black Mastic - Hallway at Double Doors Exit	None Detected - Floor Tile None Detected - Black Mastic
CL1308642	71	Interior Door Caulking - Hallway at Double Doors Exit	None Detected
CL1308643	72	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 136, Extreme Southwest Corner	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308644	73	White Sink Putty - Classroom 136, Front Wall underneath Hand Wash Basin	7% Chrysotile
CL1308645	74	Type 2 White 2' X 2' Drop Ceiling Tile - Classroom 134, Center Section	None Detected
CL1308646	75	Mastic underneath Rubber Cove Base - Book Room 129, Back Section at Wall	None Detected - Cove Base None Detected - Yellow Mastic
CL1309262	76	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Hallway near Double Doors Exit & Heater Unit	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309263	77	White 2' X 2' Drop Ceiling Tile - Classroom 122 Center Southeast Section	None Detected
CL1309264	78	12" X 12" Floor Tile & Mastic - Hallway at Double Doors Exit underneath Foot Mat	None Detected - Floor Tile None Detected - Black Mastic
CL1309265	79	Interior Door Caulking - Classroom 120 at Front Entrance	None Detected - Paint Layer
CL1309266	80	Interior Window Caulking - Classroom 120 Extreme Back Southeast Corner at Window	None Detected - Silver Sealant None Detected - Caulking

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309267	81	Grey-ish Cove Base Ceramic Tile & Grout - Classroom 121, Front right Wall underneath Chalkboard	None Detected - Ceramic Tile None Detected - Grout
CL1309268	82	White Wall Ceramic Tile & Grout - Classroom 119 Restroom, Back Wall behind Toilet	None Detected - Ceramic Tile None Detected - Grout
CL1309269	83	Student Locker Caulking - Hallway between Classrooms 116 & 118	None Detected - White Sealant
CL1309270	84	Cabinet Caulking - Classroom 118 at Front Door Entrance	3% Chrysotile
CL1309271	85	Grey-ish Floor Ceramic Tile & Grout - Classroom 117 Restroom underneath Hand Wash Basin	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1309272	86	Interior Door Caulking - Classroom 117, Doorway to Restroom	None Detected - Paint Layer None Detected - Plaster
CL1309273	87	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Classroom 116 Southeast corner above Drop Ceiling Tiles	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309274	88	12" X 12" Floor Tile & Mastic - Accessible Staff Restroom at Lobby Area	None Detected - Floor Tile <1% Chrysotile - Black Mastic
CL1309275	89	White Plaster Wall - Classroom 114, Extreme Southeast Corner behind Cabinet	None Detected - Paint Layer None Detected - Silver Sealant None Detected - Plaster
CL1309276	90	White 12" X 12" Floor Tile & Mastic - Classroom 114, Front Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309277	91	Student Locker Caulking - Hallway outside Classroom 115 at Student Lockers	None Detected - Silver Sealant
CL1309278	92	White Plaster Ceiling - Custodial Closet 113 at Northwest Corner Ceiling	None Detected - Paint Layer None Detected - Plaster
CL1309279	93	Building Demarcation Sealant - Hallway at Building Demarcation near Custodial Closet 113	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309280	94	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Boys' Restroom, Extreme Northwest Corner	None Detected - Paint Layer None Detected - Paper None Detected - Wallboard Material
CL1309281	95	12" X 12" Floor Tile & Black Mastic - Hallway at Front Entrance Lobby underneath Foot Mat	None Detected - Floor Tile 3% Chrysotile - Black Mastic
CL1309282	96	White 2' X 2' Drop Ceiling Tile - Min Office at Reception Area	None Detected
CL1309283	97	White Wall Texture, Joint Compound, & Sheetrock Mud - Administrative Offices, Back Storage Room behind Door	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1309284	98	Black Transition Door Strip - Administrative Offices, Entrance to Executive Office	None Detected
CL1309285	99	Carpet Mastic - Auditorium, Back Door Exit Section	None Detected - Carpet
CL1309286	100	White CMU & Mortar - Auditorium, Stage near Double Doors Exit	None Detected - Paint Layer None Detected - CMU Block None Detected - Mortar
CL1309287	101	Black Transition Door Strip - Auditorium, Middle Section at Aisle	None Detected
CL1309288	102	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Media Room (library), from Entry at Lower Ceiling	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309289	103	White Wall Texture, Joint Compound, & Sheetrock - Executive Office Entrance to Community Liaison Office 141A	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1309290	104	White 12" X 12" Floor Tile & Mastic - 2nd Floor, Lobby Area near Elevator, underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309291	105	Black Sink Putty - Classroom 206 Computer Laboratory underneath Hand Wash Basin	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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EPA Method 600/R-93/116

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309292	106	White 2' X 2' Drop Ceiling Tiles - Hallway, Mid Point between Classroom 202 & 203	None Detected
CL1309293	107	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 205, Extreme Southeast Corner behind TV Stand	None Detected - Paint Texture
CL1309294	108	Mastic underneath Brown-ish Rubber Cove Base - Classroom 204, Extreme Northeast Corner at Wall	None Detected - Cove Base None Detected - Yellow Mastic
CL1309295	109	12" X 12" Floor Tile & Mastic - Classroom 201 Middle Section underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309296	110	Black Sink Putty - Classroom 203, Front Wall underneath Hand Wash Basin	None Detected
CL1310218	111	White Wrap & White Mastic - 2nd Floor Mechanical Room	None Detected - White Mastic None Detected - Wrap None Detected - Insulation
CL1310219	112	Black Metal Duct Vibration Isolator (expansion booth) - 2nd Floor Mechanical Room	None Detected
CL1310220	113	Roof Profile Core Sample - Chiller Building Top Roof	None Detected - White Sealant None Detected - Roof Membrane None Detected - Roofing Foam
CL1310221	114	Cooling Tower Metal Base Sealant - Chiller Building Top Roof	None Detected - White Sealant None Detected - Roof Membrane None Detected - Roofing Foam
CL1310222	115	TSI on Elbow w/White Wrap - Inside Chiller Room	5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Insulation
CL1310223	116	TSI on Pipe Runs w/White Wrap - Inside Chiller Room	None Detected - Paint Layer 5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Insulation

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Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1310224	117	TSI on T-Fittings w/White Canvas - Inside Chiller Room	5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Wrap None Detected - Insulation
CL1310225	118	Gasket Insulation - Inside Chiller Room	None Detected
CL1310226	119	White Wall Texture, Joint Compound, & Sheetrock Mud - Inside Chiller Room	None Detected - Wall Covering None Detected - Paper None Detected - Wallboard Material
CL1310227	120	Roof Profile Core Sample - Top Roofs of Buildings	None Detected - Roofing Membrane None Detected - Felt Backing None Detected - Roofing Foam None Detected - Roofing Insulation
CL1310228	121	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310229	122	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310230	123	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310231	124	Exterior Window Caulking - Building Exterior	3% Chrysotile
CL1310232	125	Exterior Door Caulking - Building Exterior	None Detected - Caulking 1 None Detected - Caulking 2
CL1310233	126	Exterior Building Penetration Sealant - Building Exterior	10% Chrysotile - Grey Sealant
CL1310234	127	Exterior Building Penetration Sealant - Building Exterior	10% Chrysotile - Grey Sealant
CL1310235	128	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310236	129	Exterior Door Caulking - Building Exterior	10% Chrysotile
CL1310237	130	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310238	131	Exterior Building Penetration Sealant - Building Exterior	None Detected - Paint Layer None Detected - Plaster

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Lab Job No.: PLM-38673
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1310239	132	Exterior White Plaster on Columns - Building Exterior	None Detected - Paint Texture None Detected - Plaster
CL1310240	133	Exterior White Plaster on Ceiling - Building Exterior	None Detected - Paint Texture None Detected - Plaster
CL1310241	134	Exterior Building Penetration Sealant - Building Exterior	None Detected - Silver Sealant
CL1310242	135	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310243	136	Exterior Window Frame Black Sealant - Building Exterior	None Detected
CL1310244	137	TSI on Pipe Runs w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 20% Chrysotile - Insulation
CL1310245	138	TSI on Elbows w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 20% Chrysotile - Insulation
CL1310246	139	TSI on T-Fittings w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 25% Amosite - Insulation
CL1310247	140	Debris on Polyethylene Sheeting - Crawlspace underneath Original Buildings	None Detected
CL1315599	141	Exterior Window Caulking	None Detected
CL1315600	142	Exterior Window Caulking	None Detected
CL1315601	143	Exterior Window Caulking	None Detected

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STATEMENT OF LABORATORY ACCREDITATION

The samples were analyzed in general accordance with the procedures outlined in the U.S. EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), or the current U.S. EPA method (EPA Method 600/R-93/116) for the analysis of asbestos in building materials, by polarized light microscopy. The results of each bulk sample relate only to the material tested and the results shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Specific questions concerning bulk sample results shall be directed to the Laboratory Director.

Analyst: Kathy Schosek, Liliana Castillo, Curtis Grigg, John R. Cates





Laboratory Director: John R. Cates, P.G.



Approved Signatory:

NVLAP®

TESTING
NVLAP LAB CODE 200569-0

BENAS ENVIRONMENTAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS
P. O. BOX 739
COPPELL, TEXAS 75019

PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town Drive
Dallas, Texas 75231

Sample Date 10/17/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
1	Hallway, Double-Doors Exit Underneath Foot Mat	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
2	Class Room 155, Center Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
3	Hallway Outside Class Room 154	Wood Cove-Base Sealant	Non-Friable	Good
4	Class Room 152 North Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
5	Hallway Outside Class Rooms 152 and 150	Student Locker Caulking	Non-Friable	Good
6	Class Room 153 Back North Window @ Frame	Interior Window Caulking	Non-Friable	Good
7	Class Room 150 Front Section @ Cabinet Works	Cabinet Caulking	Non-Friable	Good
8	Class Room 151 Extreme Southwest Section @ Window Glass Pane	Interior Window Glass Glazing	Non-Friable	Good
9	Class Room 148, Front Entry Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
10	Class Room 149, Back Southeast Section	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
11	Class Room 146 Entrance Doorway	Transition Door Strip	Non-Friable	Good
12	Class Room 146 Front Entry Above Cabinet Works	White Plaster Wall	Non-Friable	Good
13	Class Room 146 Back Northwest Corner @ Furr-Down	Furr-Down Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
14	Class Room 144A @ Back Wall	Building Joint Sealant	Non-Friable	Good
15	IDF Room Front Entrance Section @ Ceiling	Spray-Applied Ceiling **(SAC)** Texture	Friable	Good

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SETUP BY: **Signature: Ephraim N. Okotcha "EO" DATE/TIME: 10/17/2024**

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LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

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16	Class Room 144A Back Southeast Section	Mastic Underneath Black Rubber Cove-Base	Non-Friable	Good
17	Boy's Rest Room Back Window Near Urinals	Interior Window Caulking	Non-Friable	Good
18	Boy's Rest Room Entrance Section Near Hand-Wash Basins	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
19	Boy's Rest Room Back Exit Doorway @ Extreme Corner	Wall Ceramic Tiles and Grout	Non-Friable	Good
20	Boy's Rest Room 2nd Stall	Floor Ceramic Tiles and Grout	Non-Friable	Good
21	Hallway Near Custodial Closet 159A @ Column	Ceramic Cove-Base Sealant	Non-Friable	Good
22	Hallway, Between Class Rooms 144 and 146	Student Locker Caulking	Non-Friable	Good
23	Faculty Lounge Room 156 Rest Room	White Wall Ceramic Tiles and Grout	Non-Friable	Good
24	Faculty Lounge Room 156 Rest Room	Greyish Floor Ceramic Tiles and Grout	Non-Friable	Good
25	Faculty Lounge Room, Center Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
26	Gymnasium, Equipment Storage Room @ Door Strip	Transition Door Strip	Non-Friable	Good
27	Gymnasium, Electrical Room 157A Back Corner	White Concrete Masonry Units (CMU) and Mortar	Non-Friable	
28	Gymnasium, Extreme Northwest Corner @ Front Wall	Interior Brick and Mortar	Non-Friable	Good
29	Custodial Closet 159A Front Section @ Ceiling	White Plaster Ceiling	Non-Friable	Good
30	Executive Office 159 Middle North Section	Carpet Mastic	Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
31	Hallway @ Door Way to Reading Laboratory Room 160	Transition Door Strip	Non-Friable	Good
32	Lobby Entrance to New Wing Building	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
33	Class Room 162, Extreme Southeast Corner Underneath Carpeting	Off-White 12" X12" Floor Tiles and Mastic	Non-Friable	Good
34	Class Room 165, Center Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
35	Class Room 164, Front Wall Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good
36	Class Room 69, Extreme Southeast Corner @ Wall	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
37	Hallway Between Class Rooms 166 and 167	White 2' X 2' Drop Ceiling Tiles	Friable	Good
38	Mechanical #1 Room 168	Metal Duct Work Vibration Isolator (Expansion Booth)	Non-Friable	Good
39	Mechanical #1 Room 168	White TSI Wrap and White Mastic	Non-Friable	Good
40	Doorway Entrance to Custodial Closet	Transition Door Strip	Non-Friable	Good
41	Girl's Rest Room, Extreme Southeast Corner @ Ceiling	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
42	Men's Rest Room @ Junction Behind Dresser	Wall Ceramic Tiles and Grout	Non-Friable	Good
43	Teacher's Work/Copy Room	Pure White 12" X12" Floor Tiles and Black Mastic	Non-Friable	Good
44	Hallway Outside Computer Room @ Junction	Building Demarcation Sealant	Non-Friable	Good
45	Computer Room, Center Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
46	Computer Laboratory Room @ Back Window Frame	Interior Window Caulking	Non-Friable	Good
47	Cafeteria Room Above Ceiling Near Kitchen	White 2' X 4' Drop Ceiling Tiles	Friable	Good
48	Executive Office 127 Underneath Hand-Wash Basin	Sink Putty	Non-Friable	Good
49	Cafeteria Room Near Back Exit Door	Terrazzo Flooring	Non-Friable	Good
50	Kitchen, Middle Floor Drain	Terrazzo Flooring	Non-Friable	Good
51	Kitchen, Door to Storage Room	Interior Door Caulking	Non-Friable	Good
52	Kitchen, Extreme Southeast Corner Near Sinks	Wall Ceramic Tiles and Grout	Non-Friable	Good
53	Kitchen Rest Room Near Entry Doorway	Plaster Ceiling	Non-Friable	Good
54	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on Pipe-Run	Friable/Non-Friable	Good
55	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on Elbow	Friable/Non-Friable	Good
56	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on T-Fittings	Friable/Non-Friable	Good
57	Basement Boiler/Sprinkler Room	Gasket Insulation	Non-Friable	Good
58	Cafeteria Main @ Transition Strip to Extension	Transition Floor Strip	Non-Friable	Good
59	Executive Office 128 @ Front Corner	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
60	Custodial Closet 138 North Section	Green 9" X 9" Floor Tiles and Black Mastic	Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
61	Hallway Between Custodial Room and Conference Room 128	Type 2 White 2' X 2' Drop Ceiling Tiles	Friable	Good
62	Girl's Rest Room Middle Section @ Ceiling	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
63	Class Room 130, Back Section	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
64	Hallway Across Class Room 130	Student Locker Caulking	Non-Friable	Good
65	Art Room 131, Front Wall Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good
66	Hallway Outside Class Room 132	12" X 12' Floor Tiles and Black Mastic	Non-Friable	Good
67	Teachers' Lounge Room, Extreme Southeast Corner	Ceramic Cove-Base Tiles and Grout	Non-Friable	Good
68	Teacher's Lounge Room Northeast Corner Underneath Hand-Wash Basin	White Sink Putty	Non-Friable	Good
69	Science Laboratory Room 133 @ Front Doorway	Transition Door Strip	Non-Friable	Good
70	Hallway @ Double-Doors Exit	12" X 12' Floor Tiles and Black Mastic	Non-Friable	Good
71	Hallway @ Double-Doors Exit	Interior Door Caulking	Non-Friable	Good
72	Class Room 136, Extreme Southwest Corner	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
73	Class Room 136, Front Wall Underneath Hand-Wash Basin	White Sink Putty	Non-Friable	Good
74	Class Room 134, Center Section	Type 2 White 2' X 2' Drop Ceiling Tiles	Friable	Good
75	Book Room 129, Back Section @ Wall	Mastic Underneath Rubber Cove-Base	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUS40

SETUP BY: Signature: Ephraim N. Okotcha "EO" **DATE/TIME:** 10/18/2024

RETRIEVED BY: Signature: Ephraim N. Okotcha "EO" **DATE/TIME:** 10/18/2024

TRANSPORTED: Signature: Ephraim N. Okotcha "EO" **DATE/TIME:** 10/18/2024

LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

ANALYZED BY:_____ **DATE/TIME:**_____

BENAS ENVIRONMENTAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS
P. O. BOX 739
COPPELL, TEXAS 75019

PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

Sample Date 10/22/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
76	Hallway Near Double-Doors Exit and Heater Unit	1'" X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
77	Class Room 122 Center Southeast Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
78	Hallway @ Double-Doors Exit Underneath Foor Mat	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
79	Class Room 120 @ Front Entrance	Interior Door Caulking	Non-Friable	Good
80	Class Room 120 Extreme Back Southeast Corner @ Window	Interior Window Caulking	Non-Friable	Good
81	Class Room 121, Front Right Wall Underneath Chalk Board	Greyish Cove-Base Ceramic Tiles and Grout	Non-Friable	Good
82	Class Room 119 Rest Room, Back Wall Behind Toilet	White Wall Ceramic Tiles and Grout	Non-Friable	Good
83	Hallway Between Class Rooms 116 and 118	Student Locker Caulking	Non-Friable	Good
84	Class Room 118 @ Front Door Entrance	Cabinet Caulking	Non-Friable	Good
85	Class Room 117 Rest Room Underneath Hand-Wash Basin	Greyish Floor Ceramic Tiles and Grout	Non-Friable	Good
86	Class Room 117, Doorway to Rest Room	Interior Door Caulking	Non-Friable	Good
87	Class Room 116 Southeast Corner Above Drop Ceiling Tiles	1'" X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
88	Accessible Staff Rest Room @ Lobby Area	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
89	Class Room 114, Extreme Southeast Corner Behind Cabinet	White Plaster Wall	Non-Friable	Good
90	Class Room 114, Front Section	White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
91	Hallway Outside Class Room 115 @ Student Lockers	Student Locker Caulking	Non-Friable	Good
92	Custodial Closet 113 @ Northwest Corner Ceiling	White Plaster Ceiling	Non-Friable	Good
93	Hallway @ Building Demarcation Near Custodial Closet 113	Building Demarcation Sealant	Non-Friable	Good
94	Boy's Rest Room, Extreme Northwest Corner	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
95	Hallway @ Front Entrance Lobby Underneath Foot Mat	12" X 12" Floor Tiles and Black Mastic	Non-Friable	Good
96	Min Office @ Reception Area	White 2" X 2' Drop Ceiling Tiles	Friable	Good
97	Administrative Offices, Back Storage Room Behind Door	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
98	Administrative Offices, Entrance to Executive Office	Black Transition Door Strip	Non-Friable	Good
99	Auditorium, Back Door Exit Section	Carpet Mastic	Friable/Non-Friable	Good
100	Auditorium, Stage Near Double-Doors Exit	White Concrete Masonry Units (CMU) and Mortar	Non-Friable	Good
101	Auditorium, Middle Section @ Isle	Black Transition Door Strip	Non-Friable	Good
102	Media Room (Library), From Entry @ Lower Ceiling Area	1"' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
103	Executive Office Entrance to Community Liaison Office 141A	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
104	2nd Floor: Lobby Area Near Elevator, Underneath Carpeting	White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
105	Class Room 206 Computer Laboratory Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good

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ASBESTOS FIELD SAMPLE LOG

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
106	Hallway, Mid Point Between Class Rooms 202 and 203	White 2' X 2' Drop Ceiling Tiles	Friable	Good
107	Class Room 205, Extreme Southeast Corner Behind TV Stand	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
108	Class Room 204, Extreme Northeast Corner @ Wall	Mastic Underneath Brownish Rubber Cove Base	Non-Friable	Good
109	Class Room 201 Middle Section Underneath Carpeting	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
110	Class Room 203, Front Wall Underneath Hand-Wash Basin	Black sink Putty	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUS 40

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
111	Second Floor Mechanical Room	White Wrap and White Mastic	Non-Friable	Good
112	Second Floor Mechanical Room	Black Metal Duct Vibration Isolator (Expansion Booth	Non-Friable	Good
113	Chiller Building Top Roof	Roof Profile Core Sample	Non-Friable	Good
114	Chiller Building Top Roof	Cooling Tower Metal Base Sealanr	Non-Friable	Good
115	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on Elbow with White Wrap	Friable/Non-Friable	Good
116	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on Pipe-Runs/White Wrap	Friable/Non-Friable	Good
117	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on T-Fittings/White Canva	Friable/Non-Friable	Good
118	Inside Chiller Room	Gasket Insulation	Non-Friable	Good
119	Inside Chiller Room	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
120	Top Roofs of Buildings	Roof Profile Core Sample	Non-Friable	Good
121	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
122	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
123	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
124	Building Exterior	Exterior Window Caulking	Non-Friable	Good
125	Building Exterior	Exterior Door Caulking	Non-Friable	Good

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ASBESTOS FIELD SAMPLE LOG

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
126	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
127	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
128	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
129	Building Exterior	Exterior Door Caulking	Non-Friable	Good
130	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
131	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
132	Building Exterior	Exterior White Plaster on Columns	Non-Friable	Good
133	Building Exterior	Exterior White Plaster on Ceiling	Non-Friable	Good
134	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
135	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
136	Building Exterior	Exterior Window Frame Black Sealer	Non-Friable	Good
137	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on Pipe-Runs/Black Wrap	Friable/Non-Friable	Good
138	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on Elbows Black Wrap	Friable/Non-Friable	Good
139	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on T-Fittings/Black Wrap	Friable/Non-Friable	Good
140	Crawl Space Underneath Original Buildings	Debris on Polyethylene Sheeting	Friable/Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

Sample Date 11/05/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
141	Building Exterior	Exterior Window Caulking	Non-Friable	Good
142	Building Exterior	Exterior Window Caulking	Non-Friable	Good
143	Building Exterior	Exterior Window Caulking	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

SETUP BY: Signature: Ephraim N. Okotcha "EO" DATE/TIME: 11/05/2024

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LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

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1. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM OFF-WHITE 12" X 12" FLOOR TILES AND BLACK MASTIC LOCATED IN SEVERAL AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



2. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



3. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM COVE-BASE CERAMIC TILES AND GROUT LOCATED ON THE BOTTOM WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



4. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE 2' X 2' DROP CEILING TILES LOCATED THROUGHOUT INTERIOR CEILING SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



5. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM STUDENT LOCKER CAULKING LOCATED IN VARIOUS HALLWAYS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



6. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM INTERIOR WINDOW CAULKING LOCATED ON VARIOUS AREAS THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



7. View of Representative (Typical) Sample of Non-ACM Cabinet Works Caulking Located in Various Areas Throughout Interior Wall Surfaces in Buildings at L. L. Hotchkiss Elementary School



8. View of More Representative (Typical) Sample of ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic Located in Various Areas Throughout the Buildings at L. L. Hotchkiss Elementary School



9. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM TRANSITION DOOR STRIP LOCATED ON THE BOTTOM DOOR ENTRANCES TO VARIOUS ROOMS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



10. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM FURR-DOWN WALL TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED THROUGHOUT INTERIOR WALLS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



11. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM INTERIOR BUILDING JOINT SEALANT LOCATED THROUGHOUT THE INTERIOR IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



12. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WALL TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



13. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM MASTIC UNDERNEATH BLACK RUBBER COVE-BASE LOCATED ON BOTTOM WALLS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



14. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE CEILING TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED ON CEILING SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



15. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WALL CERAMIC TILES AND GROUT LOCATED IN VARIOUS WET AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



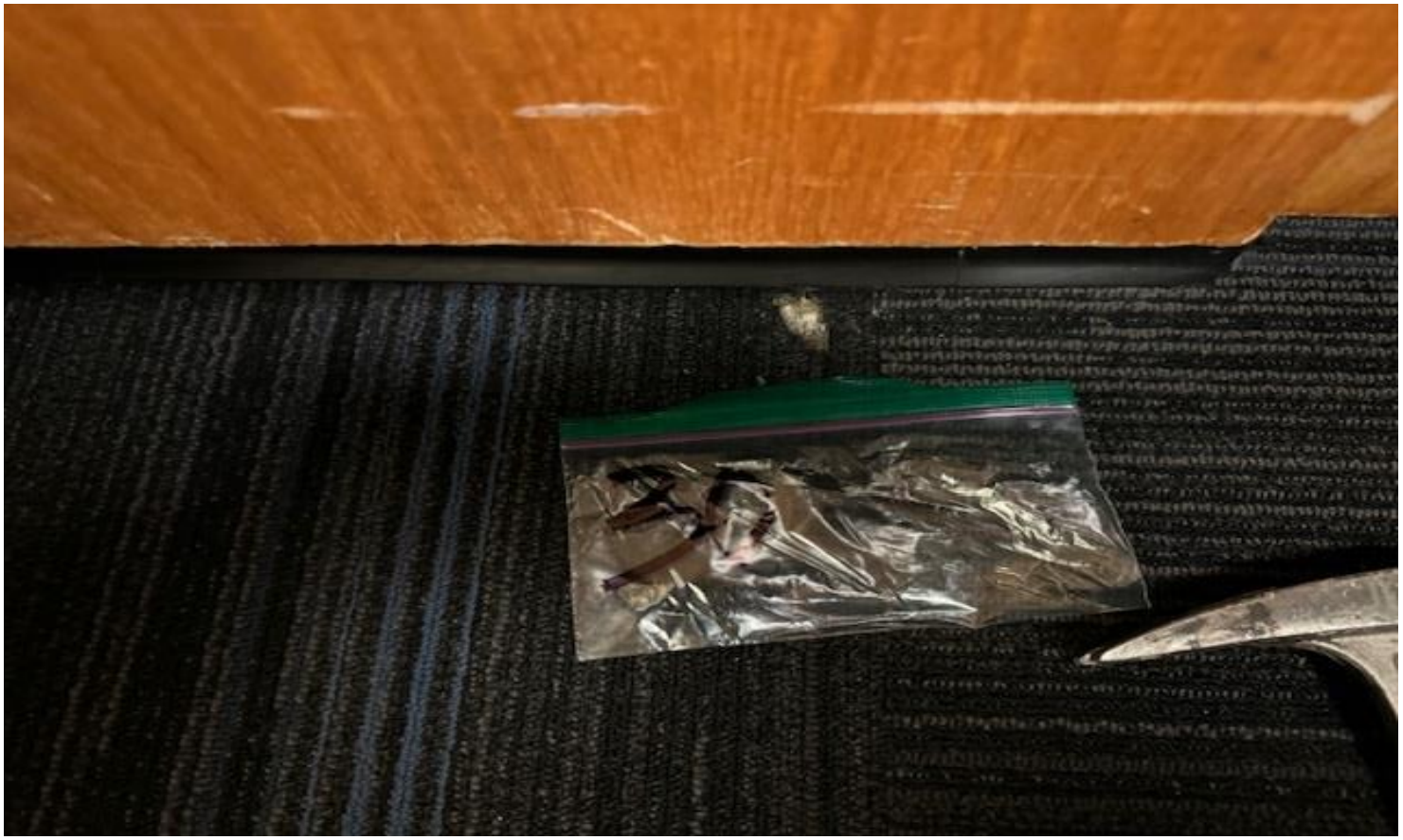
16. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM FLOOR CERAMIC TILES AND GROUT LOCATED IN VARIOUS WET AREAS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



17. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE CONCRETE MASONRY UNITS (CMU) AND MORTAR LOCATED ON INTERIOR WALLS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



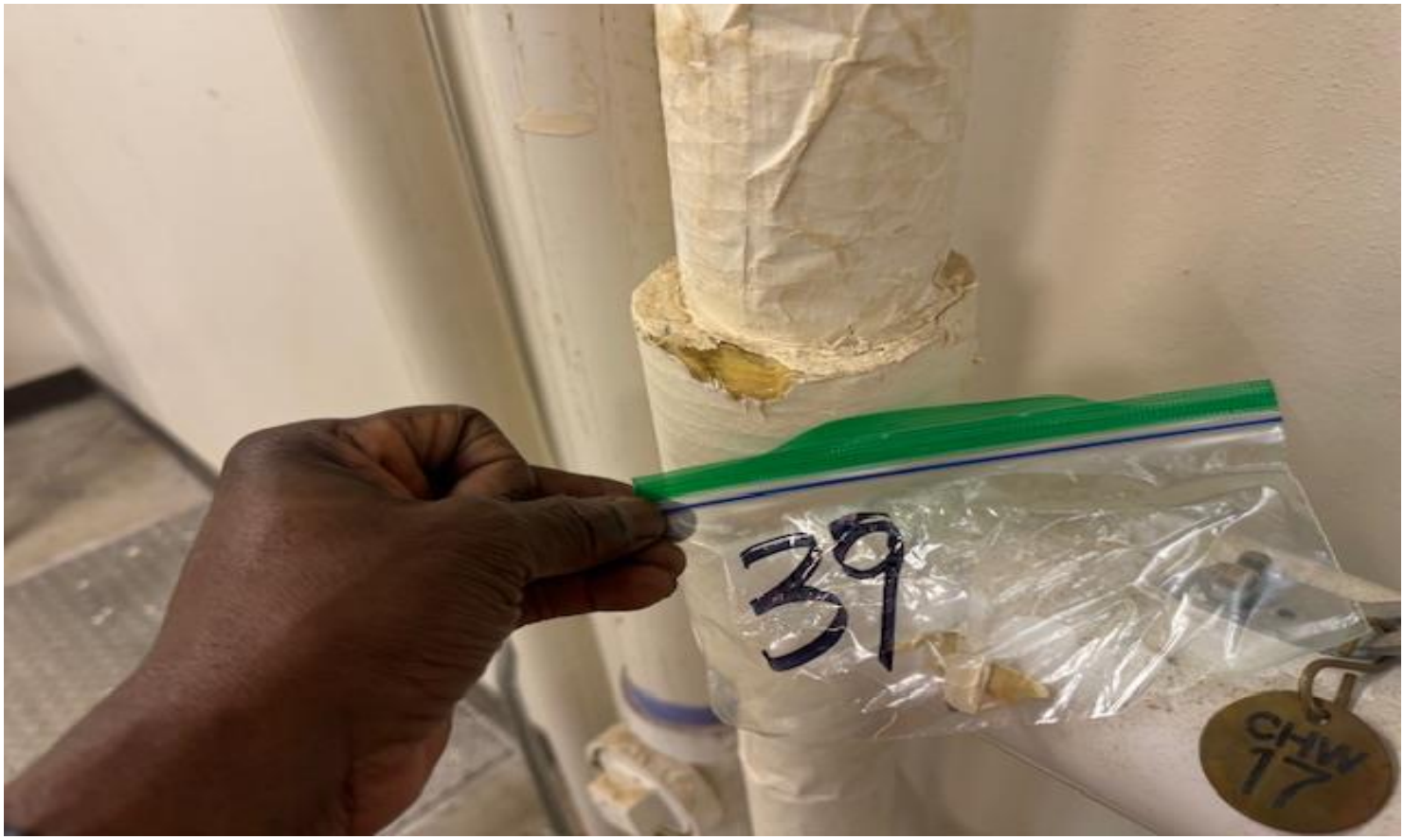
18. VIEW OF REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM INTERIOR BRICK AND MORTAR LOCATED ON VARIOUS INTERIOR WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



19. VIEW OF REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM CARPET MASTIC LOCATED IN SEVERAL EXECUTIVE OFFICE AND OTHERS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



20. VIEW OF MORE REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM METAL DUCT WORK VIBRATION ISOLATOR LOCATED IN VARIOUS MECHANICAL ROOM THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



21. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE TSI WRAP AND WHITE MASTIC LOCATED IN MECHANICAL ROOMS AND ABOVE THE CEILING THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



22. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM PURE WHITE 12" X 12" FLOOR TILES AND BLACK MASTIC LOCATED IN THE TEACHER'S LOUNGE IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



23. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM BUILDING DEMARCATION SEALANT LOCATED IN VARIOUS AREAS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



24. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



25. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GREYISH TERRAZZO FLOORING LOCATED IN VARIOUS WET FLOOR AND WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



26. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM INTERIOR DOOR CAULKING LOCATED ON SOME INTERIOR AND EXTERIOR DOOR FRAMES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



27. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM PLASTER CEILING LOCATED ON CEILING SURFACES IN CLOSETS AND OTHER AREA THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



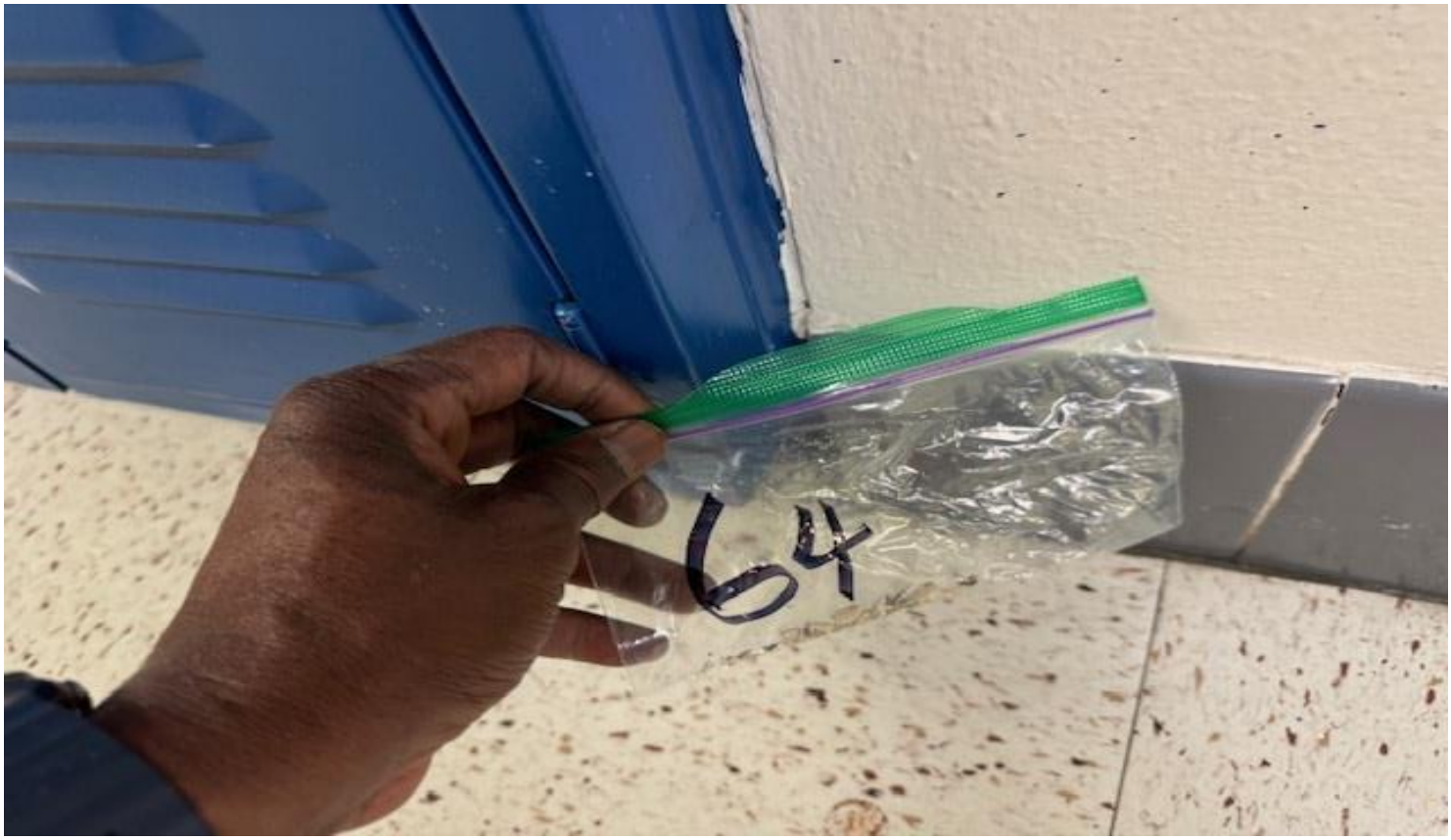
28. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) AND WHITE WRAP LOCATED IN THE BOILER ROOM AND OTHER AREAS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



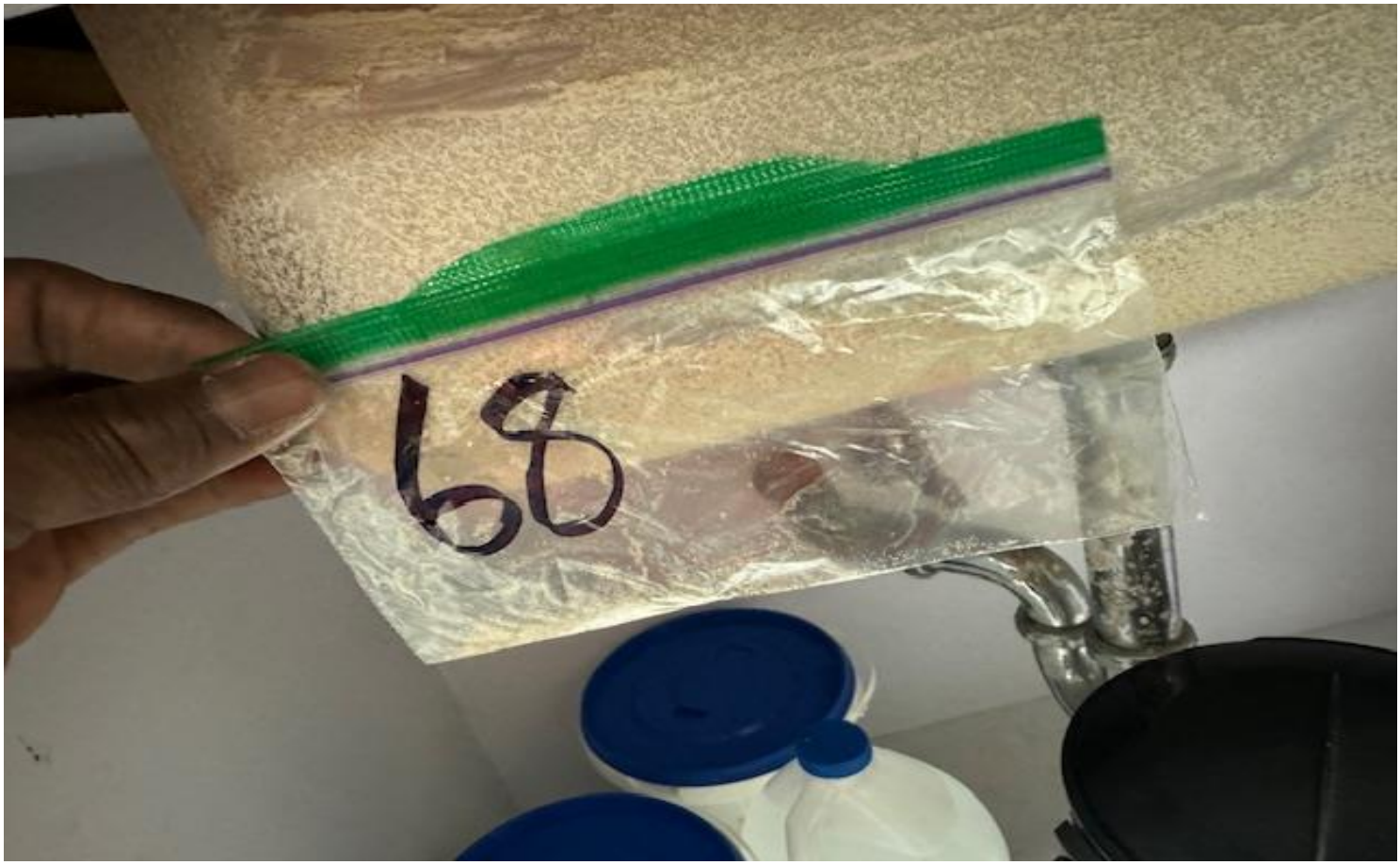
29. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GASKET INSULATION LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



30 VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM GREEN 9" X 9" FLOOR TILES AND BLACK MASTIC LOCATED IN SOME AREAS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



31. View of Representative (Typical) Sample of Non-ACM Caulking on Student Lockers Located Throughout the Buildings at L. L. Hotchkiss Elementary School



32. View of Representative (Typical) Sample of ACM White Sink Putty Located in Various Areas in Buildings at L. L. Hotchkiss Elementary School



33. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



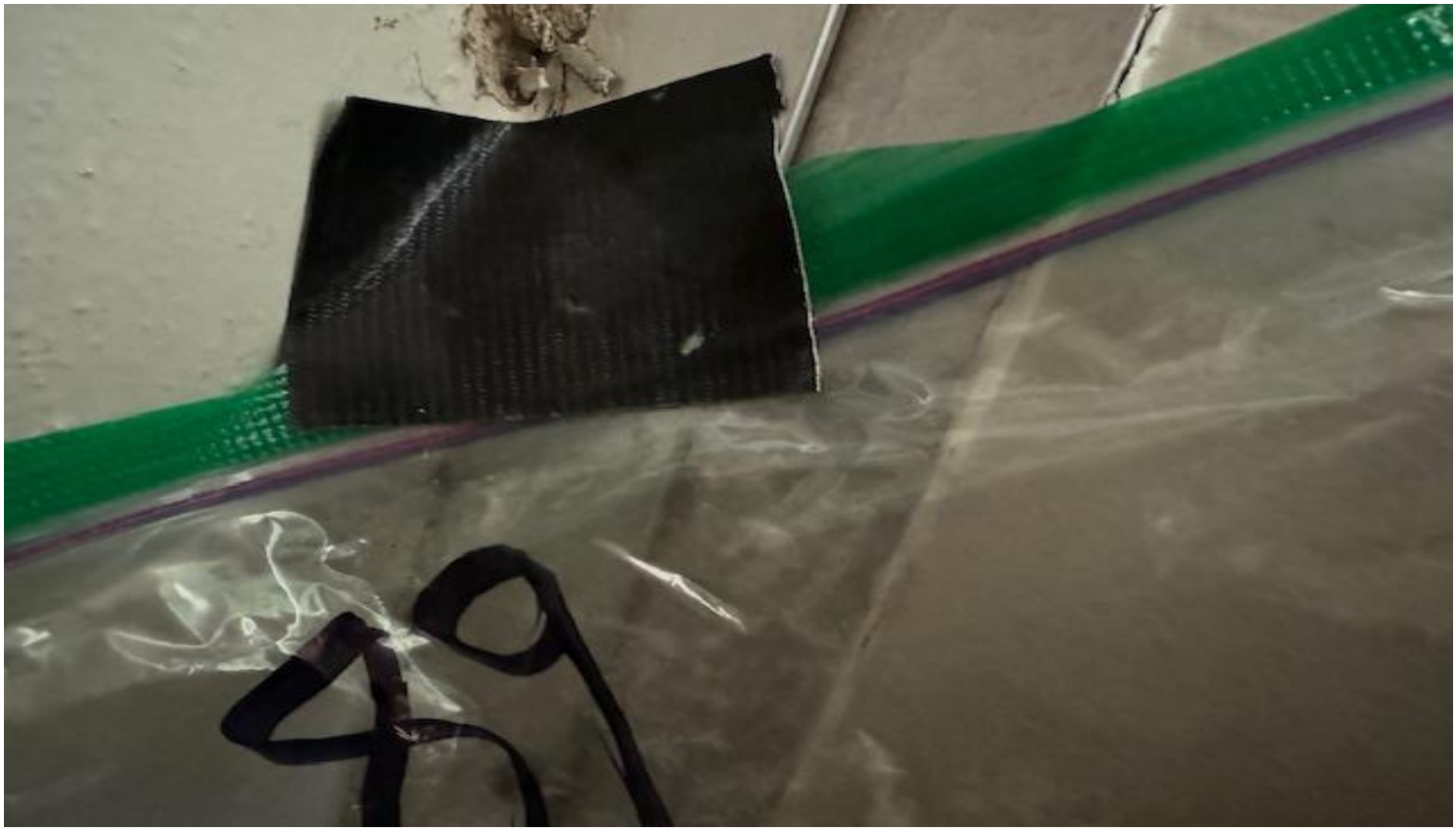
34. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM CABINET WORKS CAULKING LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



35. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GREY FLOOR CERAMIC TILES AND GROUT LOCATED IN SEVERAL WET AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



36. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



37. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE PLASTER WALL LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



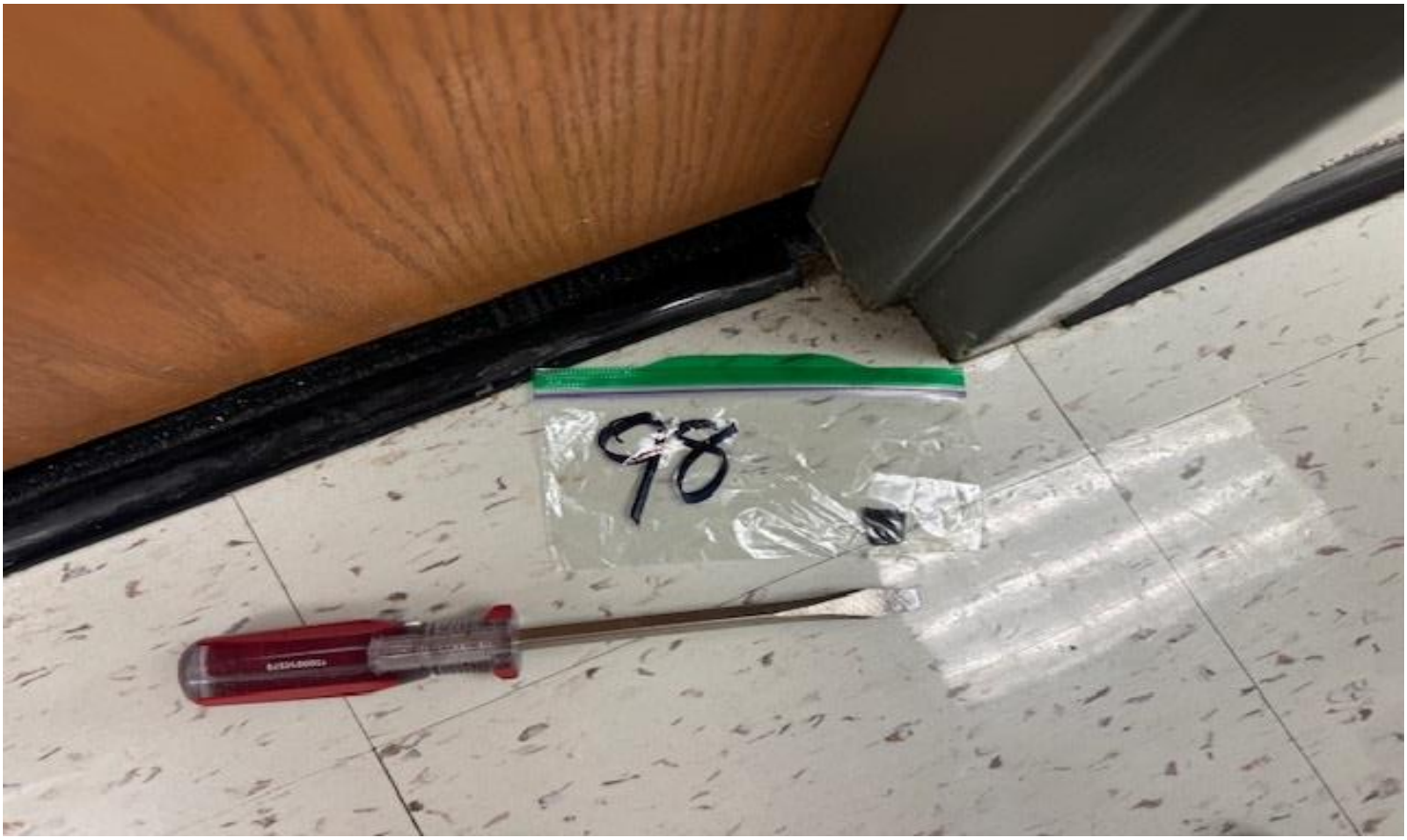
38. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM BUILDING DEMARCATION SEALANT LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



39. View of Representative (Typical) Sample of ACM 12" X 12" Floor Tiles and Black Mastic Located Throughout Hallways and Other Functional Areas in Buildings at L. L. Hotchkiss Elementary School



40. View of Representative (Typical) Sample of Non-ACM Wall Texture Joint Compound and Sheetrock Mud Located on Interior Wall Surfaces Throughout the Buildings at L. L. Hotchkiss Elementary School



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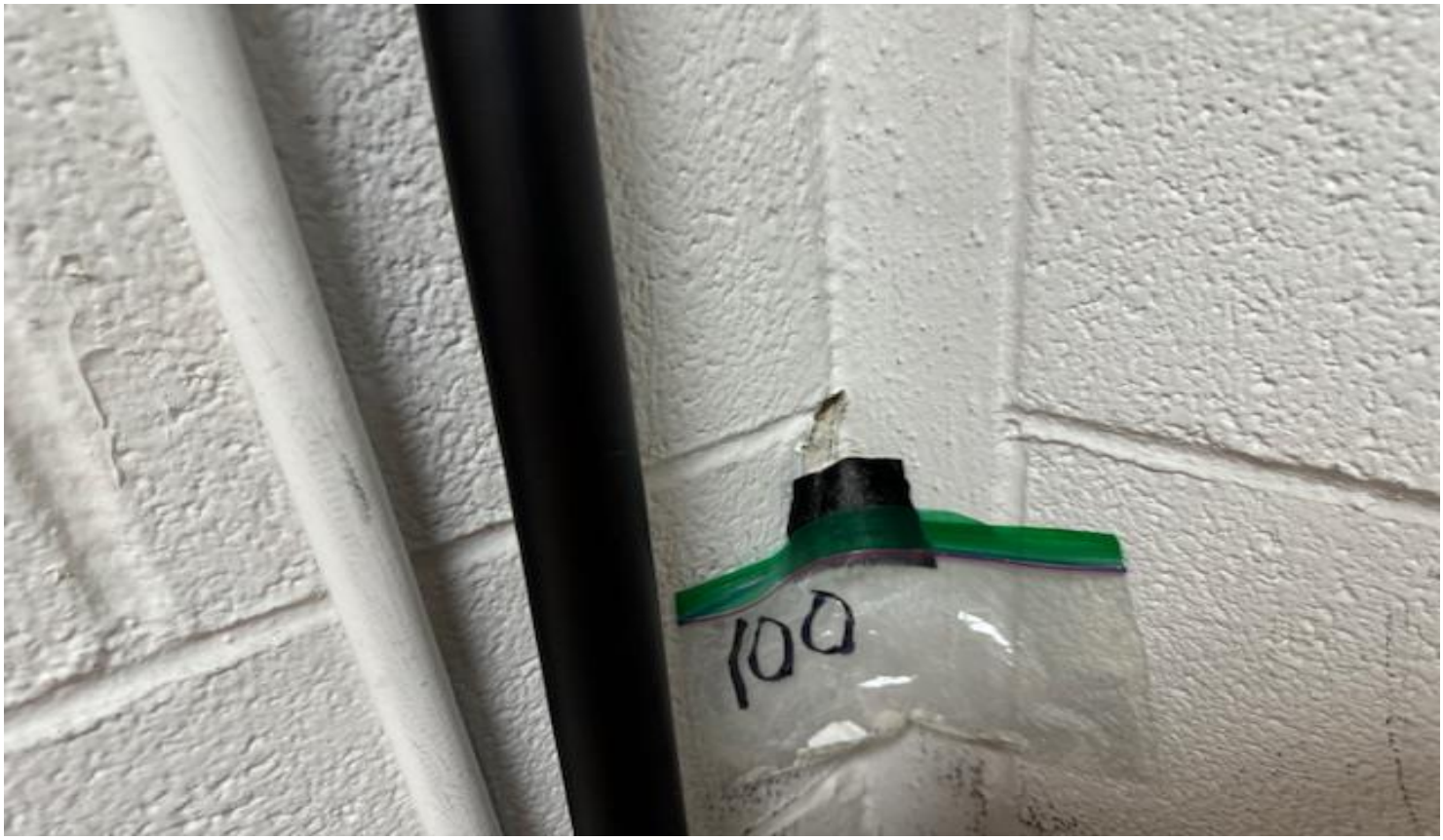

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45. View of More Representative (Typical) Sample of Non-ACM Metal Duct Work Vibration Isolator (Expansion Booth) Located in Mechanical Room Throughout the Buildings at L. L. Hotchkiss Elementary School



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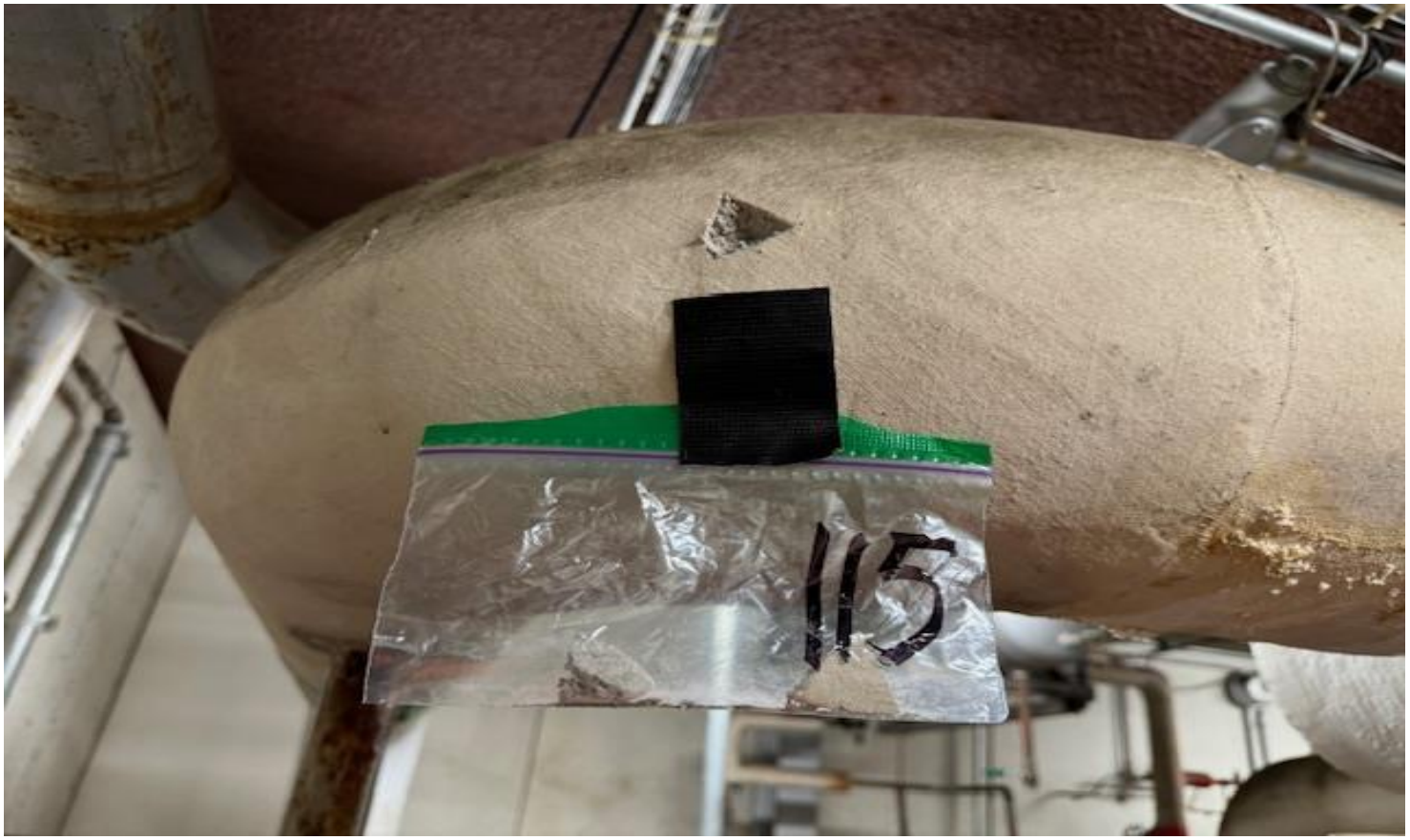
47 VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM COOLING TOWER METAL-BASE SEALANT LOCATED ON TOP ROOF ON THE CHILLER BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



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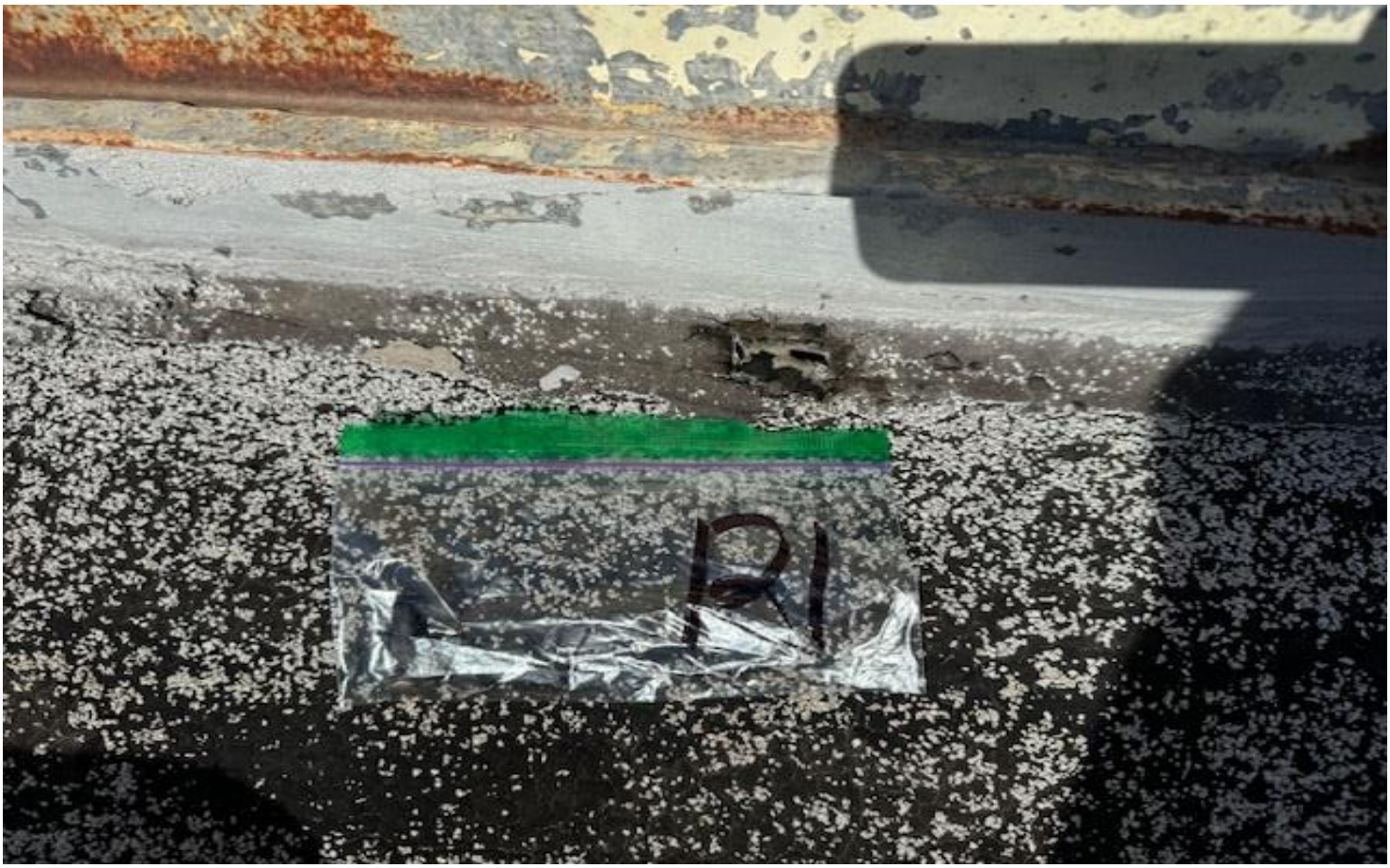
53 View of More Representative (Typical) Sample of Non-ACM Roof Profile Core Sample Located on Various Roof Tops Throughout Buildings at L. L. Hotchkiss Elementary School



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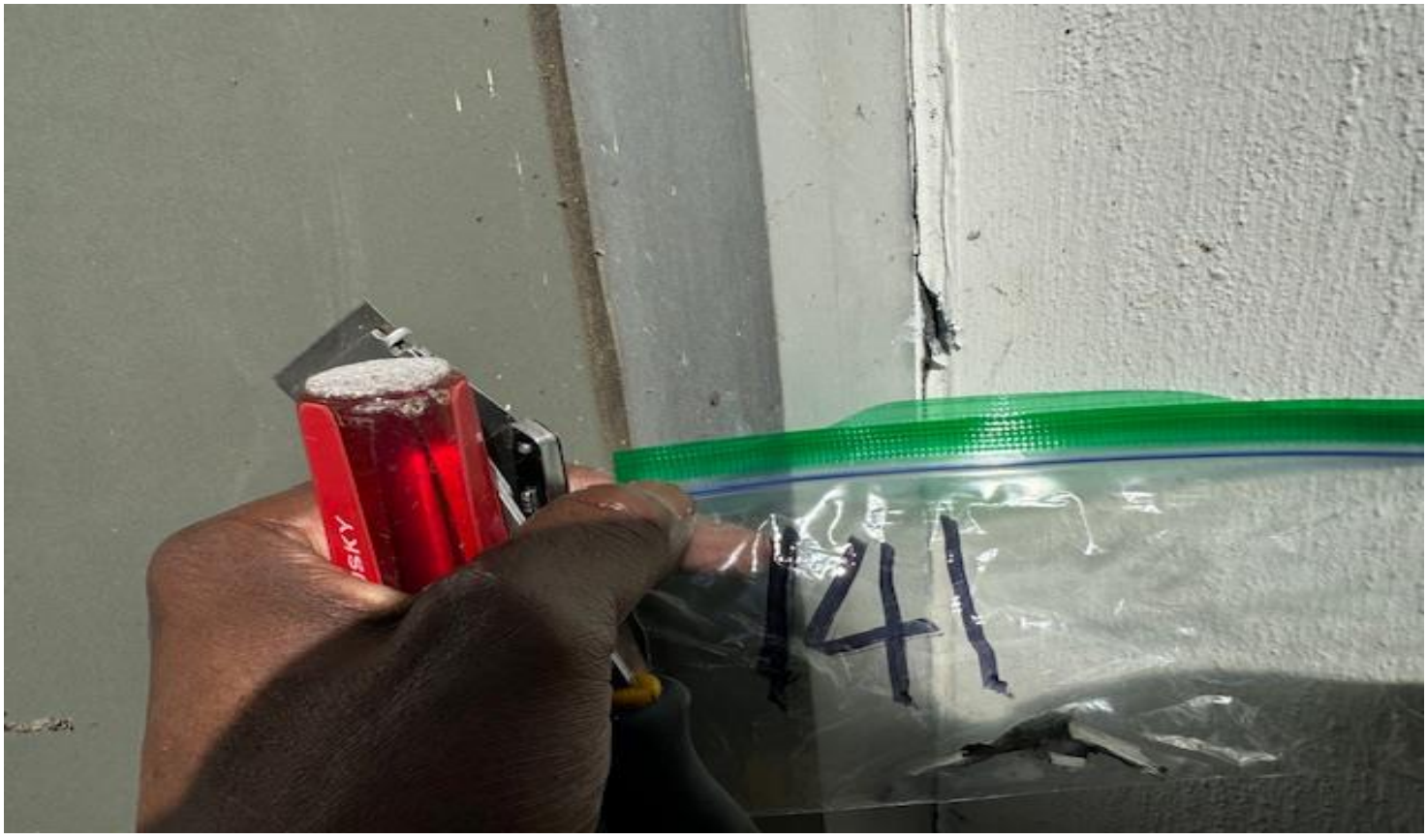
65. VIEW OF MORE REPRESENTATIVE (TYPICAL) MADE-SAFE AREAS LOCATED IN THE CRAWL SPACE UNDERNEATH BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



66. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM EXTERIOR WINDOW CAULKING LOCATED ON SEVERAL EXTERIOR WALL SURFACES THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL

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PRODUCER Environmental Insurance Service P.O. Box 29235 Austin, TX 78755 512/422-8252	**CONTACT NAME:** Wade T Owens **PHONE (A/C, No, Ext):** **FAX (A/C, No):** **E-MAIL ADDRESS:** wadetowens@gmail.com
INSURED Benas Environmental Services Inc 324 Crooked Tree Court Coppell, TX 75019	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** INSURER A: United Specialty Insurance Company — 12537 INSURER B: Texas Mutual Insurance Company — 22945 INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	X COMMERCIAL GENERAL LIABILITY					EACH OCCURRENCE	$ 2,000,000
	CLAIMS-MADE X OCCUR					DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
	X Contractor's Pollution Liab Incl					MED EXP (Any one person)	$ 5,000
A	X E&O/Prof Liab - Claims Made		CCP914239	8-29-20	8-29-21	PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:					GENERAL AGGREGATE	$ 2,000,000
	POLICY PRO-JECT LOC					PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:						$
	AUTOMOBILE LIABILITY					COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO					BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS					BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS					PROPERTY DAMAGE (Per accident)	$
							$
	UMBRELLA LIAB OCCUR					EACH OCCURRENCE	$ 1,000,000
A	X EXCESS LIAB CLAIMS-MADE		CCP914240	8-29-20	8-29-21	AGGREGATE	$ 1,000,000
	DED RETENTION $						$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	Y / N				X PER STATUTE / OTH-ER	
B	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	N / A	0001155456	3-30-21	3-30-22	E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below					E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
						E.L. DISEASE - POLICY LIMIT	$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

30 day notice of cancellation to certificate holder

CERTIFICATE HOLDER

Texas Department of State Health Services
P.O. Box 149347
Austin, TX 78714

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SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Texas Department of State Health Services

BE IT KNOWN THAT

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is certified to perform as a

Lead Firm

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1955 and Title 25, Texas Administrative Code, Chapter 295 relating to Texas Environmental Lead Reduction, as long as this license is not suspended or revoked.

Certification Number: 2110696

Expiration Date: 01/20/2022

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Commissioner of Health

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As of : 05/11/2021 12:28:08

This page is valid for most business transactions but is not sufficient for filings with the Secretary of State

BENAS ENVIRONMENTAL SERVICES, INCORPORATED

Texas Taxpayer Number	17525671248
Mailing Address	PO BOX 739 COPPELL, TX 75019-0710
Right to Transact Business in Texas	ACTIVE
State of Formation	TX
Effective SOS Registration Date	11/10/1994
Texas SOS File Number	0133355700
Registered Agent Name	EPHRAIM NGOZI OKOTCHA
Registered Office Street Address	13919 BROOKGREEN DR. DALLAS, TX 75240

Small Business Enterprise (SBE)
BENAS Environmental Services, Inc.

BENAS Environmental Services, Inc.

has filed with the Agency an Affidavit as defined by NCTRCA Small Business Enterprise (SBE) Policies & Procedures and is hereby certified to provide service(s) in the following areas:

NAICS 541620: ENVIRONMENTAL CONSULTING SERVICES
NAICS 562910: REMEDIATION SERVICES

This Certification commences May 17, 2021 and supersedes any registration or listing previously issued. This certification must be updated every two years by submission of an Annual Update Affidavit. At any time there is a change in ownership, control of the firm or operation, notification must be made immediately to the North Central Texas Regional Certification Agency for eligibility evaluation.

Certification Expiration: May 31, 2023
Issued Date: May 17, 2021
CERTIFICATION NO. BMSB71712N0523

Certification Administrator

Minority Business Enterprise (MBE)
BENAS Environmental Services, Inc.

BENAS Environmental Services, Inc.

has filed with the Agency an Affidavit as defined by NCTRCA Minority Business Enterprise (MBE) Policies & Procedures and is hereby certified to provide service(s) in the following areas:

NAICS 541620: ENVIRONMENTAL CONSULTING SERVICES
NAICS 562910: REMEDIATION SERVICES

This Certification commences May 17, 2021 and supersedes any registration or listing previously issued. This certification must be updated every two years by submission of an Annual Update Affidavit. At any time there is a change in ownership, control of the firm or operation, notification must be made immediately to the North Central Texas Regional Certification Agency for eligibility evaluation.

Certification Expiration: May 31, 2023
Issued Date: May 17, 2021
CERTIFICATION NO. BMMB46892N0523

Certification Administrator

CMBL/HUB Vendor Detail

Vendor ID / Vendor Number	1752567124800 / 63935
Vendor Name	BENAS ENVIRONMENTAL SERVICES,
Vendor Address	INCORPORATED P. O. BOX 739 COPPELL, TX 75019 USA
County	DALLAS
Contact	Pres./EPHRAIM OKOTCHA
Phone/Fax	972-393-0128 / 972-393-0793
Email Address	EO@BENAS.COM
Website	http://www.benas.com
Business Description	ENVIRONMENTAL ENGINEERING AND CONSULTING SERVICES, INDUSTRIAL HYGIENE SERVICES, ASBESTOS AND LEAD-BASED PAINT CONSULTANTS, INDOOR AIR QUALITY
Business Category	Architectural/Engineering And Surveying (05)
Small Business	Y
Service Disabled Veteran	No
CMBL Status	Inactive (F -Deleted for non-payment of annual fee)
Date Removed From CMBL	14-AUG-2004
HUB Status	Active Bidder (A-Approved; Active Texas certified HUB)
HUB Expires	21-FEB-2024
HUB Eligibility	BL (Black American)
HUB Gender	M

Commodity items shown above are available for district(s) 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

CATES' LICENSES AND CERTIFICATIONS

CATES LABORATORIES

CERTIFICATIONS & ACCREDITATIONS

NVLAP Accreditation



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Historically Underutilized Business Certification



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Small Business Enterprise Certification



(assets/SBE_Certification_2017-18.pdf)

Disadvantaged Business Enterprise Certification - Texas



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Small Business Enterprise TxDOT Certification



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Women-Owned Business Enterprise Certification



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LICENSES

TDSHS - Asbestos Analysis License



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TDSHS - Mold Analysis License



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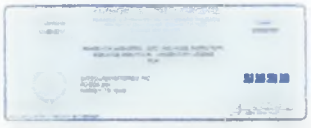

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Arizona Lab License

Arizona Department of Health Services

AZ0948

Cates Laboratories, Inc.
Asbestos - Mold - Petrography

1339 Motor Circle
Dallas, TX 75207

Phone 214-920-5006
Fax 1-972-767-0167

admin@cateslab.com
(mailto:admin@cateslab.com)

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Geotechnical Evaluation Report

ORG 159 L.L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

Prepared for

Dallas ISD Bond Program Management



Matthew Kluthe, P.E.
Project Engineer
License Number: 145307
March 4, 2024

Project B2305889

Braun Intertec Corporation
TBPELS Firm Registration No. F-12228

BRAUN INTERTEC
The Science You Build On.

Braun Intertec Corporation
1160 Mustang Drive, Ste. 300
Dallas, TX 75261
Send USPS mail to: P.O. Box 1685
Grapevine, TX 76099

Phone: 817.786.5999
Web: braunintertec.com

March 4, 2024 Project B2305889

Mr. Terrence Mack
Dallas ISD Bond Program Management
9400 North Central Expressway, Suite 800
Dallas, TX 76063

Re: Geotechnical Evaluation
ORG 159 L.L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

Dear Mr. Mack:

We are pleased to present this Geotechnical Evaluation Report for the proposed improvements at L.L. Hotchkiss Elementary School in Dallas, Texas. The attached report contains a description of our review of available information, our field exploration program, our engineering evaluation, and interpretation of the results concerning the project characteristics, our geotechnical site development, foundation design as well as construction guidelines for the planned project.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact us.

Sincerely,

BRAUN INTERTEC CORPORATION
TBPELS Firm Registration No. F-12228

Matthew Kluthe, P.E.
Project Engineer

Randy Deatherage, P.E.
Group Manager | Senior Engineer

AA/EOE

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Appendix

Soil Boring Location Sketch (1 page)
Log of Boring Sheets B-1 to B-3 (5 pages)
Descriptive Terminology of Soil

A. Introduction

A.1. Project Description

This Geotechnical Evaluation Report addresses the design and construction of the proposed improvements at L.L. Hotchkiss Elementary School located at 6929 Town Drive North in Dallas, Texas. We understand the proposed improvements will include the construction of an entrance canopy on the southwest side of the building as well as a new marquee sign constructed adjacent to Town North Drive. The project also consists of various paving and drainage improvements on the northeast side of the school. Finally, a new access ramp and stair will be constructed on the north side of the existing building.

For purposes of this report, we assumed finished grade will be within 2 feet of existing grades. Both shallow and deep foundation recommendations have been requested. If grading or loading information is different than what we have stated, these should be discussed with our geotechnical engineer.

A.2. Site Conditions and History

At the time of our field investigation, the area of the proposed canopy was grass covered with concrete sidewalks traversing the area. The area of the proposed marquee sign consisted of landscaping and concrete sidewalks. The parking lot northeast of the existing school building consists of concrete pavement overlayed with a layer of hot-mix asphalt (HMA). Based on the elevations of the boring locations obtained from Google Earth®, the area appears to be relatively flat with existing grades varying by less than 2 feet. Figure 1 below shows an aerial photograph of the site, with the approximate area of the proposed site improvements.

Figure 1. Aerial Photograph of the Site

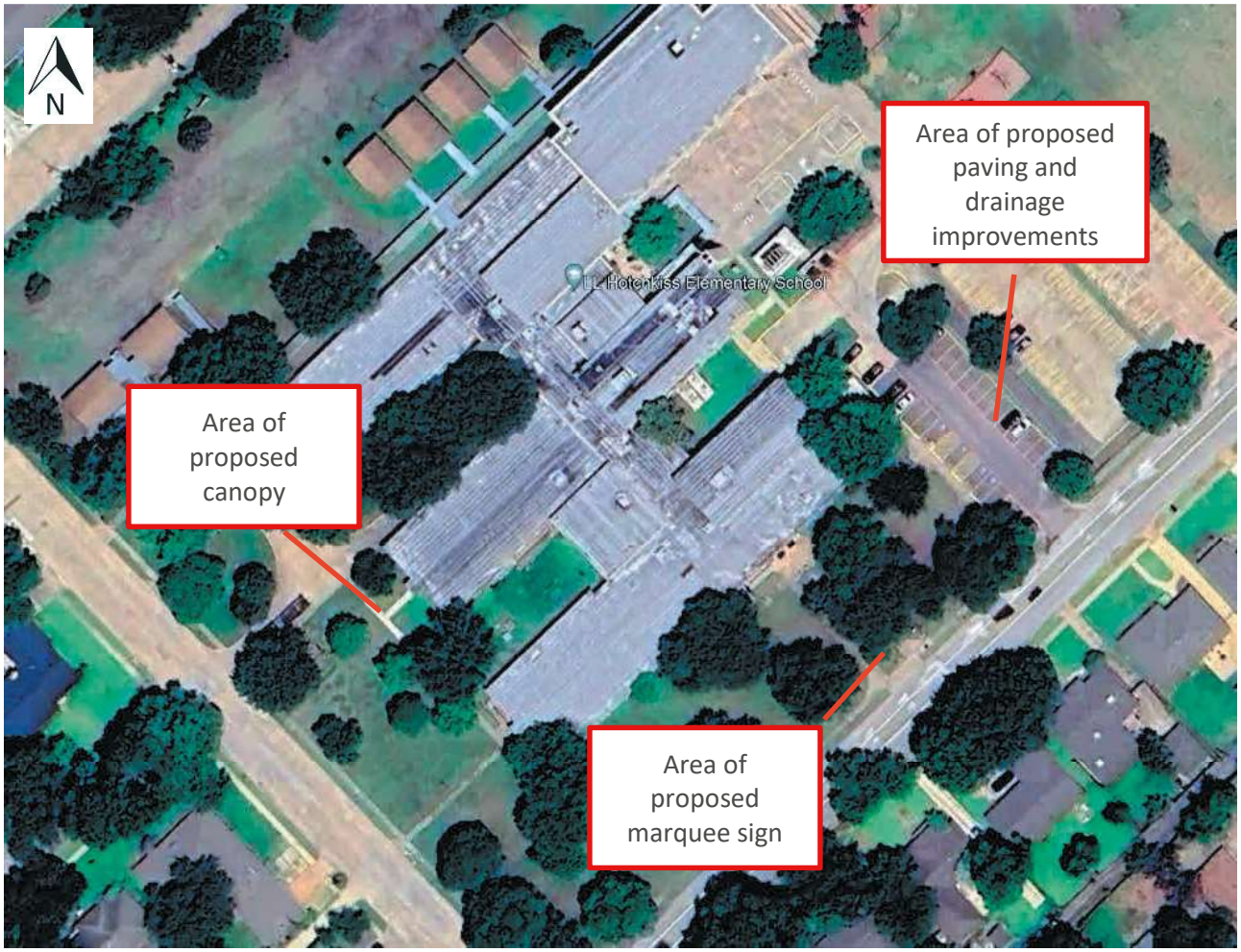


Figure obtained from Google Earth™, imagery date of June 2023.

We reviewed historical aerial imagery of the site dating back to 1995. It appears there was a building addition constructed at the northeast corner of the school building between 2004 and 2005. Several of the portable classrooms northwest of the school building were removed from the property between June 2022 and June 2023. Otherwise, the site appears relatively unchanged since 1995. We understand there was also a building addition constructed around 1987 and the original building was built around 1973.

A.3. Purpose

The purpose of our geotechnical evaluation was to characterize the subsurface geologic conditions at selected exploration locations, evaluate their impact on the proposed structures, and provide geotechnical recommendations for the design and construction of the proposed project. We performed our services in accordance with generally accepted engineering practices prevailing at the time and in the geographical area of the project location.

A.4. Scope of Services

We performed our scope of services for the project in accordance with our revised proposal (QTB173185) to Mr. David Narine with Dallas ISD Bond Program Management, dated June 12, 2023. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewed the background information and reference documents cited.
- Contacted the Texas Call Before You Dig service and notified the participating utilities of our planned exploration locations in an effort to avoid damage to underground utilities. The boring locations were staked in the field using a hand-held GPS device at locations we selected by overlaying the site plan in Google Earth™ and obtaining coordinates at those locations. The ground surface elevations were estimated from Google Earth™. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.
- Drilled eight test borings, denoted as B-1 to B-3, to nominal depths of up to 50 feet below grade across the site.
- Performed laboratory testing on selected samples to aid in soil classification and engineering analysis.
- Prepared this report containing a boring location sketch, logs of soil borings, a summary of the soils observed, results of laboratory tests, and recommendations for structure and pavement subgrade preparation and the design of foundations, floor slabs, exterior slabs, utilities, and pavements.

Our scope of services did not include environmental services or testing. We can provide these services or testing at your request.

A.5. Background Information and Reference Documents

We reviewed the following information:

- Correspondence with you and the design team regarding project details including the specific location of the proposed improvements and preferred foundation systems.
- Information regarding foundation systems used for previous building additions, provided via email from Mr. Seth Stevens, AIA with WRA Architects on July 25, 2023.
- Aerial images of the site viewed in Google Earth™, imagery dates of March 1995 to June 2023.
- USGS - Texas Geology Web Map Viewer (https://txpub.usgs.gov/txgeology/.)

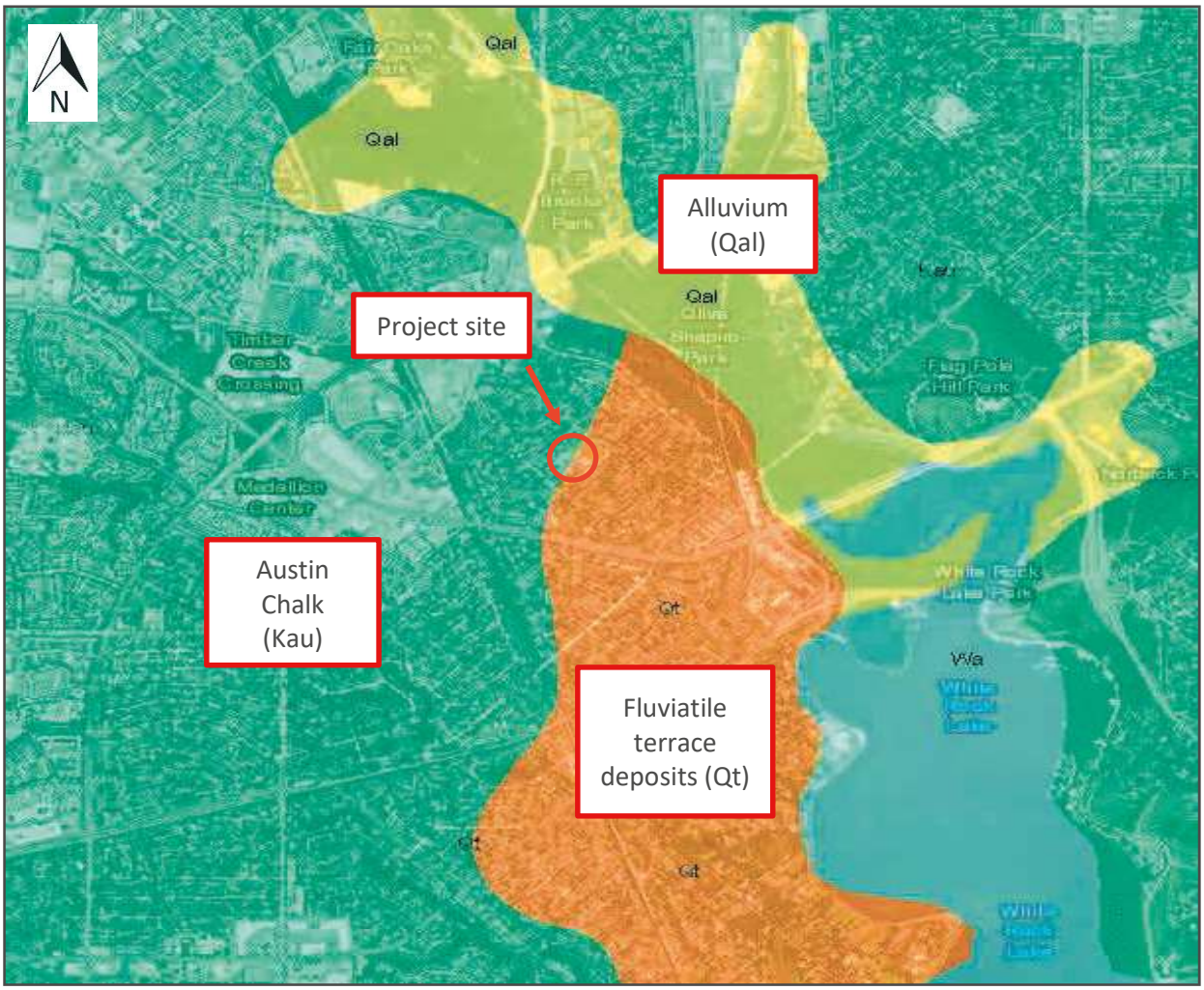
We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

B. Results

B.1. Geologic Overview

Based upon our review of available geologic resources, the site is located along a mapped boundary between the Austin Chalk and Fluviatile Terrace deposits, with the Fluviatile Terrace deposits likely overlying the Austin Chalk. The Austin Chalk typically consists of calcareous fat to lean clay underlain by chalk, marl, and limestone. We did not encounter rock in the borings performed at this site. The upper portion of the rock materials tends to be tan in color and weathered. The weathered rock overlies un-weathered rock that tends to be light gray in color. Interbedded clay and shale can be present within the chalk and limestone. The thickness of the Austin Chalk Formation is approximately 600 feet. Fluviatile terrace deposits consist of gravel, sand, silt, and clay deposited by rivers, and it appears that the terrace deposits are comprised of fat and lean clays with a likely zone at a depth of about 26 to 27 feet at this site that contains water bearing silt or sand seams. Figure 2 provided below is a geologic map for the area with the site location circled in red.

Figure 2. Geologic Map (https://txpub.usgs.gov/txgeology/.)



We based the geologic origins used in this report on the mapped formation, observed soil types, laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history and previous site, geologic origins can be difficult to confirm. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 1 provides a subsoil strata summary of the material observed during drilling operations within the soil borings performed at the site. Please refer to the Logs of Borings sheets in the Appendix for additional details. The Descriptive Terminology sheet in the Appendix include definitions of abbreviations used in Table 1.

Table 1. Subsurface Profile Summary

Strata		Soil Type - ASTM Classification	Relative Density/ Consistency	Approximate Depth to Bottom of Stratum, feet	Commentary and Details
1	Pavement	--	--	0.5	▪ Observed in boring B-3 ▪ Approximately 1 inch of asphalt over 4.5 inches of concrete
2	Fat Clay and Lean Clay	CH	PP = 0.5 to 4.5+ tsf UCS = 2.9 to 10.0 tsf	50+ feet (boring termination)	▪ Observed in all borings ▪ Generally dark brown to yellowish brown in color ▪ Soft to hard consistency ▪ Varying amounts of calcareous deposits, sand, small gravel, and iron staining contained within soil matrix

B.3. Free Water

We observed free water in borings B-1 and B-2 during drilling and after the completion of the borings. Table 2 summarizes the depths where we observed free water during and after completion of the boreholes; the Log of Boring sheets in the Appendix also include this information and additional details. The boreholes were then backfilled as noted on the Log of Boring sheets.

Table 2. Summary of Free Water Measurements

Location	Measured Depth to Free Water During Drilling (ft)	Measured Depth to Free Water After Drilling (ft)
B-1	27	23
B-2	26	23

It is difficult to accurately predict the magnitude of subsurface water fluctuations that may occur following periods of inclement weather. Free water can be present above any of the less permeable soils or rock and can flow through fissures and sandier soils, creating a temporary perched water condition, particularly during wetter seasons.

Therefore, water levels should be expected to fluctuate throughout the year with variations in precipitation runoff, irrigation, site topography, utilities, and water levels from nearby surface water features and other factors not evident at the time of this study.

Long-term observations would be required to provide an accurate evaluation of the water levels and their fluctuations. If these services are desired, Braun Intertec would be pleased to provide water level monitoring as an additional scope of services.

B.4. Laboratory Test Results

Laboratory testing was performed on selected samples recovered from the borings to confirm visual classification and estimate the pertinent engineering properties of the observed soils. The following paragraphs summarize the selected data. Atterberg limit tests, moisture content tests, and percent passing the No. 200 sieve tests were performed on selected soil samples. The individual test results can also be found on the Logs of Boring sheets included within the Appendix.

The measured in-situ moisture content of the soils ranged from approximately 11 to 39 percent. The observed moisture contents indicated the soils exhibited a variety of moisture contents ranging from a dry to a wet condition.

Liquid limits of the tested samples ranged from 50 to 81 with corresponding plasticity indices between 32 to 59, indicating a medium to high soil plasticity. A high plasticity index is generally associated with a high potential for active clay soils to shrink and swell in response to changes in the soil moisture content.

In addition to the index testing outlined above, a total of two, one-dimensional swell tests were performed. The test results indicated a swell percentage of 1.5 to 4.8%. Test results are presented in Table 3 below.

Table 3. One-Dimensional Swell Test Results

Boring ID	Depth (ft)	Liquid Limit (LL)	Plastic Limits (PL)	Plastic Index (PI)	Initial Moisture (%)	Final Moisture (%)	Percent Vertical Swell (%)
B-1	4-6	79	20	59	19.8	26.5	4.8
B-2	8-10	61	18	43	14.4	17.3	1.5

We also performed two unconfined compressive strength tests on selected soil samples. The results are presented in Table 4.

Table 4. Unconfined Compressive Strength Test Results

Boring ID	Depth (ft)	Moisture (%)	Dry Density (pcf)	Strength (tsf)
B-1	6-8	18.1	112.6	10.0
B-2	23-25	23.0	104.8	2.9

C. Recommendations

C.1. Design and Construction Discussion

C.1.a. Foundation-Type Structure Support

Based on the results of our subsurface exploration and evaluation, shallow foundations bearing on a modified subgrade can support the proposed improvements after performing the subgrade preparation outlined in Section C.2 below. For conventionally reinforced shallow foundations the subgrade should be modified to produce a PVR of 1 inch or less.

Further, drilled pier recommendations were also requested for support of the various improvements. We recommend using drilled and underreamed (belled) shafts to support the planned improvements and to resist uplift pressures from the potentially expansive clays.

C.1.b. Expansive Soil Conditions/Potential Vertical Rise (PVR)

The current site stratigraphy consists of fat clay and lean clay observed to the boring termination depths. These soils typically have good strength properties when maintained in a dry to moist condition. However, our analysis showed that the native clay subgrade soils have potential expansive properties and will have a tendency to shrink and swell in response to changes in moisture. These shrinking and

swelling movements can cause unsatisfactory performance of the shallow foundation systems and reducing the magnitude of these movements, through either mitigation and/or moisture control, will be paramount to the success of structures bearing on them.

The potential for soil heave was estimated using the Texas Department of Transportation Potential Vertical Rise (PVR) method (Test Procedure TEX-124-E.) The PVR value from a dry to wet state obtained at the existing grade and heave estimates based on the TEX-124-E method were estimated to be as much as 5¾ inches. The swell test results indicate a similar and slightly larger values of potential soil heave of 6¼ to 6½ inches.

The estimated PVR and heave estimates are based on the soil moisture variations from a dry to a wet condition. The actual soil movements that may occur will depend on various factors. Extreme moisture fluctuations resulting from extended droughts, flooding, shallow groundwater, poor site drainage, leaking irrigation lines, elevated soil densities, and/or soil desiccation may result in swelling values above the estimated values.

C.1.c. Reuse of On-Site Soils

The on-site soils will not meet the requirements for select fill as defined in Section C.2. Select fill will need to be imported to the site and any soils that are considered for use as select fill should be tested to ensure compliance with the material specifications. We do not recommend reusing existing fill that contains debris or organic material as select fill. On-site soils may be utilized as general (or common) fill, elsewhere on-site provided they meet the requirements of Table 6 later in this document.

C.1.d. Free Water

Free water was observed in two of the test borings, at depths ranging from 26 to 27 feet below existing grades during drilling and at 23 feet below existing grades after drilling. We do not anticipate subsurface water impacting shallow earthwork operations associated with select fill placement or other grading. However, subsurface water could affect the installation of drilled and underreamed (belled) shafts constructed to the depths outlined in Section C.4.

Some of the soils will collect water from precipitation or surface runoff. We recommend the contractor remove any water that collects in work areas before performing further work. Groundwater conditions may be different at the time of construction. Groundwater conditions may vary because of seasonal variations in rainfall, landscape irrigation, site drainage, and runoff.

C.1.a. Surface Drainage

To account for potential rainfall during construction, we recommend maintaining construction grades to intercept surface water flow into the area and drain water from the area to an appropriate collection point. Excavations should include a modest slope to direct rainfall to one corner of each excavation, where any accumulated water may be collected in a sump and promptly pumped out of the excavation. After grading, the contractor should compact the soil surface with a smooth drum roller to attempt to lower infiltration. After rain events, the contractor should limit construction traffic until the surface is dry enough that traffic will not mix accumulated surface water into the exposed subgrade.

Effective site drainage is a key component in the performance of the planned site improvements. We recommend roof drainage include gutters to direct water away from the planned foundations. Downspouts should not be allowed to discharge adjacent to the planned foundations. Grading should be such that runoff is directed away from the planned foundation areas. Poor site drainage that results in ponding and collection of surface water in areas adjacent to the structure and site paving may result in shrink/swell movements greater than the values estimated in this report.

C.2. Site Grading and Subgrade Preparation

As indicated in Section C.1.b., the estimated potential heave beneath the proposed improvements was estimated to be as much as 5¾ to 6½ inches. The allowable design movement for the foundations is 1-inch or less. Therefore, subgrade preparation will be required to reduce the PVR to within the acceptable limit of 1-inch or less.

C.2.a. Subgrade Excavations and Preparation

Subgrade preparation recommendations for any of the site improvements supported on shallow foundations are presented below. Subgrade modification depths presented herein should be measured from final grade.

Remove and Replacement Recommendations

The potentially expansive on-site soils can be removed and replaced with compacted select fill. Before the placement of select fill or construction of footings or other foundation elements, we recommend the following steps:

1. Demolish any existing structures and clear the site of vegetation. Strip unsuitable soils consisting of topsoil, organic soils, root masses, vegetation, and soils contaminated with remnant demolition debris from the foundation footprint areas.

2. Excavate the soils to a depth of 9 feet. Excavated soils may be reused in landscape areas or disposed of offsite.

3. Proof roll the subgrade as described in Section C.2.e. Weak or yielding areas should be removed.

4. Scarify the foundation excavation bottoms to a depth of at least 6 inches.

5. Condition the exposed subgrade soils as noted in Table 7 in Section C.2.f.

6. Install select fill soils meeting the requirements of Table 6 and be installed per Table 7 in Section C.2.f.

Removal and replacement depths are provided from the existing grade. If additional fill is needed to achieve the final grade for the structures, it should be added to the above thicknesses.

Moisture Conditioning Recommendations

As an alternative to removal and replacement, the expansive on-site soils can be moisture conditioned. This option may be difficult due to the proximity of existing structures. Before the placement of moisture conditioned fill or construction of footings or other foundation elements, we recommend the following steps:

1. Demolish existing structures within the planned improvement areas and clear the site of vegetation. Reroute all utilities around the planned improvement areas if possible. Strip unsuitable soils consisting of topsoil, organic soils, root masses, vegetation, and soils contaminated with remnant demolition debris from the foundation footprint areas.

2. Excavate the soils to a depth of 12 feet below final grade and stockpile the soils on-site.

3. Proof roll the subgrade as described in Section C.2.e. Weak or yielding areas should be removed.

4. Scarify the foundation excavation bottom to a depth of at least 6 inches.

5. Condition the exposed subgrade soils as noted in Table 7 in Section C.2.f.

6. Reinstall stockpiled on-site clayey soils (free of organics, topsoil, or deleterious materials) in lifts not exceeding 8 inches (loose). Install 10 feet of moisture conditioned on-site soils per Table 7 in Section C.2.f.

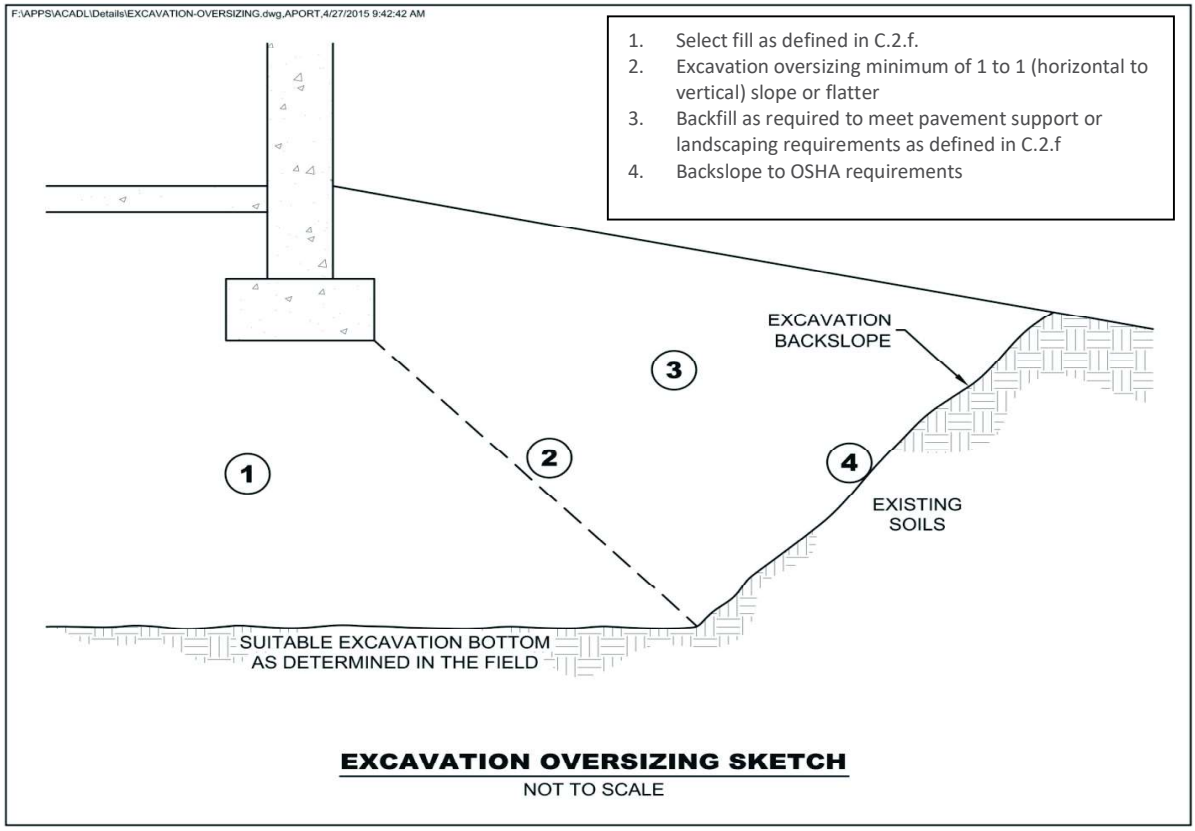
7. Within 48 hours of completion of the installation of moisture conditioned fill, place capping soils in uniform lifts no greater than 8 inches (loose). The minimum cap thicknesses should be two feet. Select fill and flex base soils should meet the requirements of Table 6 and be installed per Table 7 in Section C.2.f.

We recommend installing fill soils and capping within 48 hours of completion of the excavation to prevent drying of the underlying soils.

C.2.b. Excavation Oversizing

When removing unsuitable materials below structures, we recommend the excavation extend outward at a slope of 1H:1V (horizontal: vertical) or flatter. For deeper excavations, it is only necessary to extend the oversizing zone to a depth equal to twice the largest footing width but not less than 5 feet. See Figure 3 for an illustration of excavation oversizing.

Figure 3. Generalized Illustration of Oversizing



C.2.c. Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist of clayey sand, lean clay, and fat clay. Table 5 provides OSHA (Occupational Safety and Health Administration) guidelines in reference to soil type.

Table 5. Maximum Allowable Slopes

Soil Classification	Soil Type	Slopes (H:V)
Lean Clay and Fat Clay- No seepage	Type B	1:1
Lean Clay and Fat Clay, seepage present	Type C	1.5:1

Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, “Excavations and Trenches.” This

document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

C.2.d. Excavation Dewatering

We recommend removing any collected seepage from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays. Portions of the site tend to trap and hold water and remain wet for extended periods. Project planning should anticipate the need to undercut these soft, wet soils to achieve a firm working platform.

C.2.e. Subgrade Proof Roll

After cutting the subgrade as described above and before the placement of fill, we recommend proof rolling the subgrade soils following TxDOT Item 216. We also recommend having a geotechnical representative observe the proof roll. Areas that fail the proof roll likely indicate soft or weak areas that will require additional soil correction work to support building foundations and slabs.

The contractor should correct areas that display yielding or rutting. Possible options for subgrade correction include moisture conditioning and re-compaction, excavation (undercutting), and replacement with re-compacted soil or crushed aggregate, chemical stabilization, and/or geotextiles. We recommend performing a second proof roll after the select fill material or aggregate base material is in place, and before constructing the foundations.

If it is not feasible to proof roll the excavation bottom within the building areas, probing and inspection can be performed by an experienced technician under the supervision of the geotechnical engineer.

C.2.f. Fill Materials and Compaction

Table 6 contains our recommendations for fill materials.

Table 6. Fill Materials

Locations to Be Used	Fill Classification	Possible Soil Type	Gradation	Additional Requirements
Below Foundation	Select Fill	SC/CL	1. 100% passing 3-inch sieve 2. 60% maximum passing No. 200 sieve	1. Liquid Limit <35 2. Plasticity Index between 7 and 18 3. < 2% Organic Content
	Moisture Conditioned On-Site Soil	CL/CH	100% passing 3-inch sieve	Free of deleterious material and less than 2% organic content

Locations to Be Used	Fill Classification	Possible Soil Type	Gradation	Additional Requirements
Below Foundation or Pavement Subgrade	Flexible Base Material	--	Grades 1-2 as specified by TxDOT Item 247	Type A or D as specified by TxDOT Item 247
Pavement subgrade	Lime treated clay soils	CL, CH	See TxDOT Item 260.	See Section C.6
Below landscaped surfaces, where subsidence is not a concern	Non-Select Fill	--	100% passing 6-inch sieve	< 10% OC*

We recommend placing fill in loose lifts of approximately 8 inches thick. We recommend compacting fill following the criteria presented below in Table 7. The project documents should specify relative compaction of fill, based on the structure located above the fill, and vertical proximity to that structure.

Table 7. Compaction Recommendations Summary

Reference	Recommended Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points
Moisture conditioned Native soils below foundations	93 to 98	+5 minimum
Select fill soils below structures	Min. 95	-2 to +2
Flexible base material	95 (capping soil) 100 (beneath pavement)	-2 to +2
Below landscaped surfaces	Min. 92	±4

We recommend performing density tests in the fill to evaluate if the contractors are effectively compacting the soil and meet project requirements. Table 8 contains our recommended frequency of testing for various aspects of the project.

Table 8. Fill Testing Frequency

Zone Designation	Fill Testing Frequency	Minimum Tests per Soil Lift
Below Shallow Foundations	1 test per every 1,500 square feet	2
Pavement Areas	1 test per every 5,000 square feet	2
Utility Lines	1 test every 150 linear feet	1 Test per every 1 foot of fill
Grade Beams	1 test every 100 linear feet	1 Test per every 6” compacted lift

C.2.g. Inspections of Soils

We recommend including the site grading and placement of fill within the foundation areas under the direction of a licensed geotechnical engineer. Inspection requires observation of soil conditions below fill or footings, evaluations to determine if excavations extend to the anticipated soils and if fill materials meet requirements for the type of fill and compaction condition of fill. A licensed geotechnical engineer should direct the Inspections of site grading and fill placement. The purpose of these Inspections is to evaluate whether the work is following the approved geotechnical report for the project. Special Inspections should include evaluation of the subgrade, observing the preparation of the subgrade (surface compaction or dewatering, excavation oversizing, placement procedures and materials used for fill, etc.) and compaction testing of the fill.

C.2.h. Moisture Density Relations Testing

Moisture density relations testing (field densities) should be performed on each lift by the Geotechnical Engineer or his/her qualified representative to document that the proper moisture content and compaction requirements have been achieved. If the compacted materials fail to meet the moisture and density requirements, the lift should be reprocessed as necessary to obtain the required results.

C.3. Spread Footing Foundations

C.3.a. General

Following subgrade improvements, shallow spread footings can be used to support the proposed site improvements. We anticipate uplift loads for the proposed canopy could be significant. If shallow spread footings are ultimately selected as the foundation system for the proposed canopy, it will be important to size the spread footings accordingly to resist the uplift loads. Table 9 contains our recommended design parameters for foundations bearing a minimum of 24 inches below grade within the select fill soils.

Table 9. Recommended Shallow Spread Footing Design Parameters

Item	Description
Maximum net allowable bearing pressure (psf)	2,000
Minimum factor of safety for bearing capacity failure	3
Minimum width (inches)	24
Minimum embedment below final exterior grade (inches)	18
Total anticipated settlement (inches)	Less than 1 inch
Anticipated differential settlement	Typically, about 2/3 of total settlement*

* Actual differential settlement amounts will depend on final loads and foundation layout.

If the soils exposed in the bottom of the foundation excavations are loose or unstable, additional excavation or treatment will be required to provide a stable subgrade for foundation support.

Foundations should bear at a minimum nominal depth of 18 inches below the planned adjacent grade. All fill should be tested and approved following the recommendations presented in this report. Minimum widths for footings should be 24 inches even if the bearing pressures are less than the recommended values.

C.4. Drilled and Underreamed (Belled) Shafts

If desired, drilled and underreamed shaft foundations can be used to support the proposed improvements. The following sections provide recommendations for designing the drilled shafts.

C.4.a. Soil Parameters for the Design of Drilled Shafts

Underreamed drilled shafts bearing in the fat clay or lean clay strata may be utilized to support the loads and to resist uplift pressures from the potentially expansive clays. The required minimum pier depth should be evaluated by the structural engineer to determine if the provided embedment will sufficiently resist design axial, lateral, and overturning forces. The actual depth of piers may be deeper than the minimum, depending on the configuration and the structural load requirements. However, groundwater was observed at depths ranging from 26 to 27 feet below existing grades during drilling, but rose to depths of 23 feet after drilling. Therefore, a recommended maximum depth for the shafts has been provided to mitigate the effects of groundwater. The recommended design parameters for drilled shafts are provided in Table 10.

Table 10. Recommended Underreamed (Belled) Drilled Shaft Design Parameters

Item	Underreamed Drilled Shafts
Bearing Stratum	Dark Brown to light brown, stiff to hard, Fat Clay and Lean Clay
Maximum Net Allowable End Bearing Capacity (psf)	9,000
Maximum Allowable Skin Friction (psf)	Negligible
Penetration in bearing material to develop end bearing	Minimum of 15 feet below existing grade. Maximum of 20 feet below existing grade.
Minimum penetration in bearing material to develop skin friction	Skin friction should be neglected for underreamed shafts
Factor of safety for bearing capacity failure	3
Minimum shaft diameter (inches)	18 (for inspection)
Minimum bell edge-to-edge spacing	1 bell diameter (largest of the two bells)
Bell-to-Shaft Diameter Ratio	2:1 (maximum)
Total estimated settlement (inches)	½ to 1% of the underream diameter.
Differential Settlement, inches	Typically about 2/3 of total settlement**

* Field Adjustments may be required depending on the groundwater level observed during installation.
**Actual differential settlement amounts will depend on final loads and foundation layout. We can evaluate differential settlement based on final foundation plans and loadings.

C.4.b. Adhesion Uplift

Consideration should be given to the effects of adhesion uplift when designing the drilled shafts. Adhesion uplift occurs as expansive soils swell and transfer load to the shaft element. This force will apply to all portions of the shaft within the in-situ clays to the active zone. For this site, the active zone can be taken to extend to a depth of 12 feet. The adhesion force can be taken to be 2,000 psf for the in-situ clay soils. Adhesion forces can be neglected for select fill soils. Resistance to adhesion uplift will be provided by the permanent deadload on the shaft, and the deadweight of any soil above the perimeter projection of the bell. All shafts should be adequately reinforced to resist pressures caused by either potential swelling soils and/or structural loading conditions. Reinforcing steel should extend the full length of the shaft.

C.4.c. Lateral Load Design Considerations

The proposed drilled shaft foundations may be subject to lateral loading conditions due to wind loading and other related live loads. The drilled shafts should be adequately designed to accommodate the lateral loads and the resulting overturning forces.

Our recommended lateral load design parameters for use in the L-Pile computer program are provided below. Table 11 presents design values for the soil materials observed at the site.

Table 11. Recommended L-Pile Soil Design Parameters

Stratum	Soil Type	Depth Range (ft)	p-y Model	Effective Unit Weight (pcf)	Undrained Shear Strength (ksf)	Strain Factor ε_{50}	Friction Angle (degrees)	k_s, value (pci)
1	Lean Clay and Fat Clay (CL, CH)	0 to 20	Stiff Clay w/out free water	128	3.0	0.005	0	1,000

NOTE: The upper 5 feet of overburden clay soils should be neglected in the lateral load analysis, except for the effective unit weight.

The L-PILE design program models the pile behavior using a finite difference method and determines the non-linear response of the soil using various soil resistance-pile deflection (p-y) criteria. The program accommodates the analysis of various pile types subjected to axial load, lateral load, and bending moments. Braun Intertec recommends the designers size the drilled piers and select appropriate reinforcing steel to resist the anticipated forces.

C.4.d. Drilled Shaft Construction Considerations

We recommend installing the shafts in general accordance with American Concrete Institute (ACI) 336.1-96, "Standard Specification for the Construction of Drilled Piers." Based on the free water observations at the site, we do not anticipate the need for a temporary casing for any drilled and underreamed shafts extended to depths of 20 feet or less below the ground surface.

C.4.e. Drilled Shaft Concrete

The concrete for drilled shafts should be designed with a slump between 8 and 10 inches and good flow characteristics. Before placing concrete in drilled shaft excavations, we recommend the use of a cleanout bucket to remove any soft sediments or disturbed soil from the bottom of the excavation. Proper equipment and procedures for obtaining a clean bearing surface should be used during construction; otherwise, the shafts should be rejected.

The concrete mix should be designed to prevent segregation and the concrete should be directed through a hopper or chute such that the fall is down the center of the shaft without contacting the sides of the shaft or reinforcing steel. Concrete should be placed with a tremie if more than two inches of water are present in the bottom of the shaft. Free-fall of concrete may be used if the excavation is dry or contains less than two inches of water at the time of placement.

The volume of concrete placed should be checked against the calculated volume required to obtain design shaft dimensions. A geotechnical engineer should observe drilled shaft construction.

C.4.f. Special Inspections of Drilled Shafts

The drilled shafts should be constructed under the guidelines of Special Inspections as provided in Chapter 17, of the International Building Code, and requires full-time observations throughout foundation installation including drilling observations, cleaning, and suitability of bearing strata, concrete placement. This work should be carried out under the direction of a licensed geotechnical engineer. The purpose of these special inspections is to evaluate whether the work is being carried out per the approved Geotechnical Report for the project and the requirements of the approved plans and specifications.

C.4.g. Grade Beams and Pier Caps

The cross-section of the pier shafts should not be allowed to increase (mushroom) at or near the ground surface during the installation of the piers. A "mushroom" at the top of the shafts could create additional uplift pressure on the piers related to soil swelling which could be detrimental to the shafts. Any pier caps or grade beams constructed over expansive clays should be constructed over the appropriate specified void space. The void form height should be at least 10 inches. The recommended void is typically formed on a rigid cardboard form placed beneath the grade beam or pier cap concrete. Pre-fit void forms must be installed at the drilled shafts. The pre-fit forms must conform to the actual installed drilled shaft diameter (for both cased and uncased shafts) such that a tight fit results between the void form and pier surface preventing concrete from migrating between the void form and shaft during concrete placement.

Rigid soil retainers must be installed along the outside faces of the grade beam and void form after the concrete forms are removed to protect the void forms and maintain the void height during backfill placement. The soil retainers must be of sufficient rigidity to resist bowing or deflection during placement and compaction of the grade beam backfill. It is recommended that trapezoidal void boxes not be installed on this project. We also recommend that provisions be made for observing and confirming the integrity of the void system prior to installing the soil retainers and backfill placement.

C.5. Flatwork

Flatwork elements, including sidewalk areas, are subject to distress resulting from the aforementioned potential vertical soil movements. It is recommended that flatwork not be rigidly connected to structures, and joints between flatwork and structures are completely filled with an elastomeric material.

Differential movement may occur between the planned slab and adjacent entry areas if subgrade improvements do not extend beneath these areas. If differential movements are a concern the foundation pad can be extended beneath entry areas. Considerations may be given to incorporating these areas into the planned foundation system.

Adequate drainage should be provided so that runoff is not allowed to collect in areas where intrusion into subgrade soils may occur. Unless excavation of existing soils extends beyond the building pad areas, encompassing flatwork elements, some movement-related soil heave or shrinkage can be expected.

C.6. Pavements

C.6.a. Pavement Potential Vertical Movements

Common project budgetary constraints limit subgrade preparation below pavement areas, and it is atypical to limit potential vertical movements to 1 inch or less for parking and drive areas. However, if desired, the subgrade preparations presented in Sections C.2 may be utilized beneath pavements to reduce vertical movement.

We recommend lime treatment of the final 6 inches of clay fill. Placement of the lime-treated soil directly below the Portland cement concrete reduces the infiltration of water into the underlying clays and reduces the likelihood of subgrade pumping through pavement joints and cracks. In addition, experience has shown that substituting an additional 1-inch of concrete is not equivalent to the recommended thickness of lime-treated subgrade.

C.6.b. Design Sections

Based on our experience with similar soils anticipated at the pavement subgrade elevation, we recommend pavement design be based on an assumed CBR value of 3. Note the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value. Table 12 provides recommended pavement sections, based on the soils support, and assumed traffic loads.

Table 12. Recommended Pavement Sections

Pavement Type	Portland Cement Concrete		
Use	Light Duty (45,000 18-kip ESALs)	Medium Duty (100,000 18-kip ESALs)	Heavy Duty & Dumpster Areas
Minimum concrete thickness (inches)	5 inches	6 inches	7 inches
Lime treated subgrade	6 inches	6 inches	6 inches

*All materials should meet the TXDOT Standard Specifications for Highway Construction. Proof roll pavement areas following Section C.2.e before compacting subgrade

C.6.c. Lime Treated Subgrade

Due to the presence of clay subgrades (with a PI over 20) at this site, we recommend a minimum of 6 inches (compacted thickness) of lime treatment for pavement subgrades. Prior to treatment, the pavement areas should be cut or filled to grade, and proofrolled in accordance with Section C.2.e.

Lime treatment should be performed in general accordance with the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges – Item 260 Lime Treatment (Road Mixed). No limes series testing was performed for this geotechnical evaluation. However, based on the high plasticity of the near surface soils encountered in the test borings, we recommend for budgetary purposes that a lime percentage of 8 percent (by dry weight) be utilized. The lime percentage necessary to treat the fat clays should be confirmed once rough subgrade elevations have been established. In addition, we recommend the on-site soils be tested for the presence of sulfates. The contractor should be aware that additional lime might need to be applied to account for losses associated with blowing, overmixing, or other field losses.

The soil-lime mixture should be installed and compacted in accordance with Tables 6 and 7 within Section C.2.f. In all areas where hydrated lime is used to treat subgrade soil, routine Atterberg-limit tests should be performed to verify the resulting plasticity index of the soil-lime mixture is at/or below 12 percent and that the soil pH is at or above a value of 12.4.

C.6.d. Performance and Maintenance

We based the above pavement designs on a performance life based on typical traffic counts for similar projects Braun Intertec has conducted. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions, and the level of ongoing maintenance. We

recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the potential impacts for warm weather distress due to the wetting and softening of the subgrade.

C.7. Drainage Considerations

Positive surface drainage should be incorporated into the grading plans, both during construction of the project and after the project is completed, to minimize the effect of excessive surface moisture infiltration on the underlying foundation soils. All sidewalks should be sloped away from the proposed foundations to prevent ponding of water near the foundations. Final exterior grades must slope downward at least 1 foot (vertical) to 10 feet (horizontal) for a distance of at least 5 feet (but preferably 10 feet) away from the building (if possible.) Due to the potential expansive soils observed at this site, the site grades should be established to assure positive drainage can be maintained away from the buildings and foundations. It is imperative due to the nature of the clayey soils, that all roof drainage be collected and diverted away from the building foundation thereby reducing the possibility that surficial water can migrate beneath the surface or collect near the foundations and activate the in-situ soils.

C.8. Seismic Site Classification

We did not perform a 100-foot-deep boring recommended in the International Building Code (IBC) for seismic site classification. We conservatively assumed the overburden soil consistency continues below the bottom of the borings. Based on the soil boring data and pertinent reference materials, this site meets the criteria for Site Class D as defined in Table 1613.5.2 of Chapter 16 of the 2015 IBC.

C.9. Equipment Support

The recommendations included in the report may not apply to equipment used for the construction and maintenance of this project. We recommend evaluating subgrade conditions in areas of shoring, scaffolding, cranes, pumps, lifts, and other construction equipment prior to mobilization to determine if the exposed materials are suitable for equipment support or require some form of subgrade improvement. We also recommend project planning consider the effect that loads applied by such equipment may have on structures they bear on or surcharge – including pavements, buried utilities, below-grade walls, etc. We can assist you in this evaluation.

D. Procedures

D.1. Test Borings

Our subcontractor drilled the borings with a truck-mounted auger drill. The borings were performed in general accordance with ASTM D1587 taking samples continuously to a depth of 10 feet and then 5-foot intervals thereafter. The boring logs show the actual sample intervals and corresponding depths.

D.2. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance and other in-situ tests performed. The logs also present the results of laboratory tests performed on test samples and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials observed per ASTM D2488. The Appendix includes a chart explaining the classification system.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM or TxDOT procedures.

D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the test borings, and again after auger withdrawal. We then filled the boreholes as noted on the boring logs.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses, and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work, or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the

designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those observed in the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

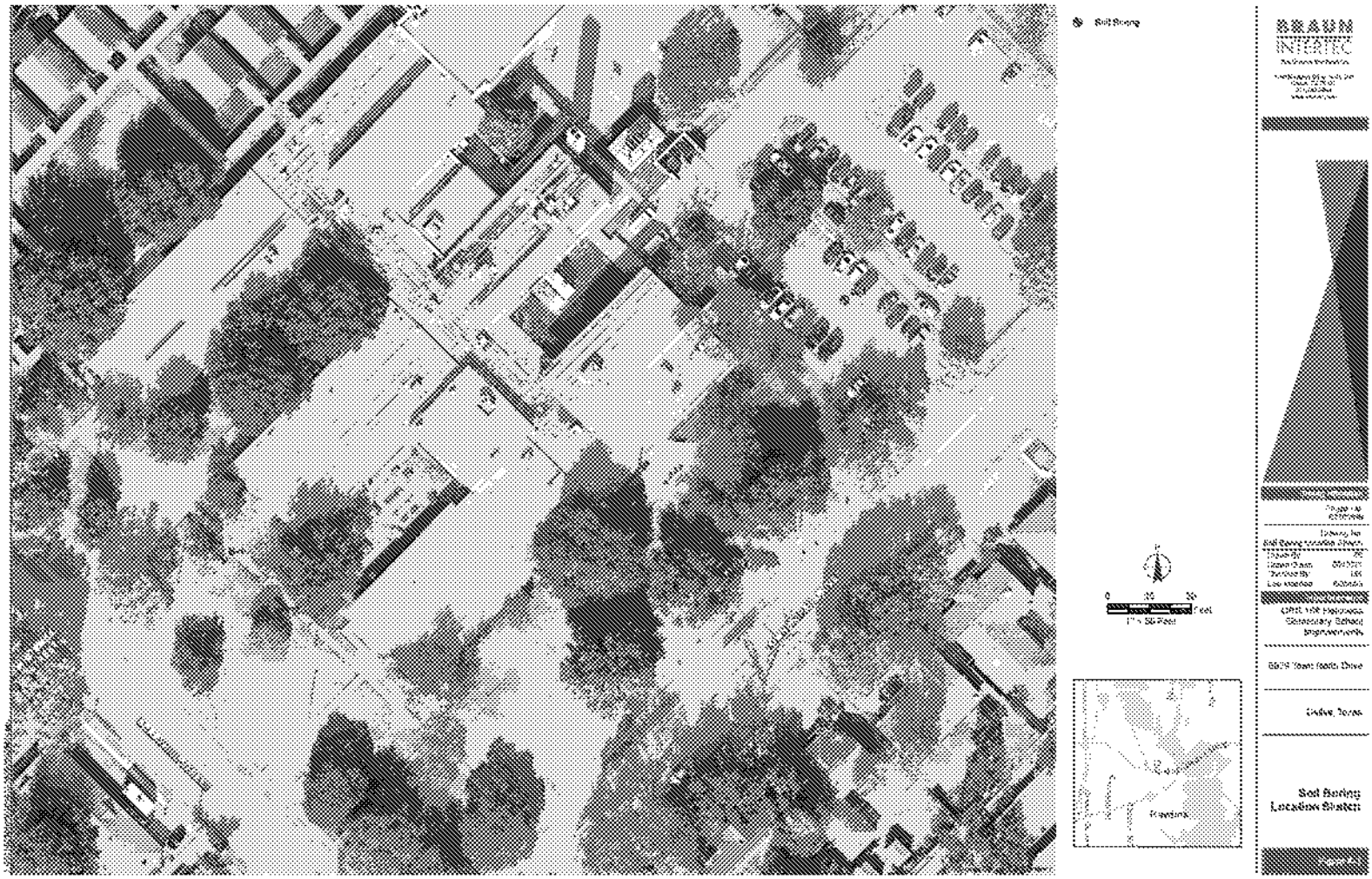
E.3. Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix


Soil Boring
0
20
30
Feet
1" = 30 Feet
BRAUN
INTERTEC
Drawing No.
Soil Boring Location Sheet
Drawn By
Checked By
Date Modified
Dallas, Texas
Soil Boring
Location Sketch

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2305889
Geotechnical Evaluation
Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

BORING: **B-01**
LOCATION: See attached sketch
DATUM:
LATITUDE: LONGITUDE:
DRILLER: Subcontractor | LOGGED BY: A.Bhattarai | START DATE: 07/18/23 | END DATE: 07/18/23
SURFACE ELEVATION: | RIG: Subcontractor | METHOD: Power Auger | SURFACING: Grass | WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (Blows/ft) Recovery	q_p tsf	MC %	%Pass No. 200	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Dry Unit Wt. pcf	Un. Com. Str. tsf	Tests or Remarks
		FAT CLAY (CH), trace Sand, and Gravel, occasional calcareous lenses, dark brown to yellowish brown, hard to very stiff		SH	4.50	11							
				SH	4.50	22							
5				SH	4.50	20	93	79	20	59			
				SH	4.50	18					113	10	
				SH	4.50	14							
10													
				SH	3.00	18	98	50	16	34			
15													
18.0		LEAN CLAY (CL), yellowish brown, very stiff to stiff		SH	3.50	24							
20													
	▼			SH	3.50	24							
25													
	▽			SH	1.50	24							
30													

Continued on next page

Water observed at 27.0 feet while drilling.
Water observed at 23.0 feet at end of drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2305889
Geotechnical Evaluation
Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

BORING: **B-01**
LOCATION: See attached sketch
DATUM:
LATITUDE: LONGITUDE:
DRILLER: Subcontractor | LOGGED BY: A.Bhattarai | START DATE: 07/18/23 | END DATE: 07/18/23
SURFACE ELEVATION: | RIG: Subcontractor | METHOD: Power Auger | SURFACING: Grass | WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (Blows/ft) Recovery	q_p tsf	MC %	%Pass No. 200	Atterberg Limits LL	PL	PI	Dry Unit Wt. pcf	Un. Com. Str. tsf	Tests or Remarks
		LEAN CLAY (CL), yellowish brown, very stiff to stiff											
				SH	1.25	26							
35													
37.0													
		FAT CLAY (CH), yellowish brown, soft to medium											
				SH	0.50	29							
40													
				SH	0.50	26							
45													
				SH	1.00	22							
50.0													
50		END OF BORING Boring then backfilled with auger cuttings											
55													
60													

Water observed at 27.0 feet while drilling.
Water observed at 23.0 feet at end of drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2305889
Geotechnical Evaluation
Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

BORING: **B-02**
LOCATION: See attached sketch
DATUM:
LATITUDE: LONGITUDE:
DRILLER: Subcontractor | LOGGED BY: A.Bhattarai | START DATE: 07/18/23 | END DATE: 07/18/23
SURFACE ELEVATION: | RIG: Subcontractor | METHOD: Power Auger | SURFACING: Grass | WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (Blows/ft) Recovery	q_p tsf	MC %	%Pass No. 200	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Dry Unit Wt. pcf	Un. Com. Str. tsf	Tests or Remarks
		FAT CLAY (CH), with calcareous deposits, trace Sand, with ferrous staining, dark brown to light brown, hard to stiff		SH	>4.50	15							
				SH	>4.50	23							
5				SH	>4.50	27							
				SH	>4.50	20							
				SH	>4.50	14	91	61	18	43			
10													
				SH	4.00	18							
15													
				SH	>4.50	21							
20													
	▼			SH	>4.50	23		51	19	32	105	2.9	
25	▽												
				SH	2.00	24							
30													
		Continued on next page											

Water observed at 26.0 feet while drilling.
Water observed at 23.0 feet at end of drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2305889
Geotechnical Evaluation
Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

BORING: **B-02**
LOCATION: See attached sketch
DATUM:
LATITUDE: LONGITUDE:
DRILLER: Subcontractor | LOGGED BY: A.Bhattarai | START DATE: 07/18/23 | END DATE: 07/18/23
SURFACE ELEVATION: | RIG: Subcontractor | METHOD: Power Auger | SURFACING: Grass | WEATHER: Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (Blows/ft) Recovery	q_p tsf	MC %	%Pass No. 200	Atterberg Limits LL	PL	PI	Dry Unit Wt. pcf	Un. Com. Str. tsf	Tests or Remarks
		FAT CLAY (CH), with calcareous deposits, trace Sand, with ferrous staining, dark brown to light brown, hard to stiff		SH	2.50	26							
				SH	1.50	28							
40.0		END OF BORING Boring then backfilled with auger cuttings											

35
40
45
50
55
60

Water observed at 26.0 feet while drilling.
Water observed at 23.0 feet at end of drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2305889
Geotechnical Evaluation
Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas

BORING: **B-03**
LOCATION: See attached sketch
DATUM:
LATITUDE: LONGITUDE:

DRILLER:	Subcontractor	LOGGED BY:	A.Bhattarai	START DATE:	07/18/23	END DATE:	07/18/23
SURFACE ELEVATION:		RIG:	Subcontractor	METHOD:	Power Auger	SURFACING:	Grass	WEATHER:	Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (Blows/ft) Recovery	q_p tsf	MC %	%Pass No. 200	Atterberg Limits LL	PL	PI	Dry Unit Wt. pcf	Un. Com. Str. tsf	Tests or Remarks
0.5		1 inch Asphalt over 4.5 inches Concrete											
		FAT CLAY (CH), with calcareous lenses, occasional gravel lenses, dark brown to yellowish brown, stiff to hard		SH	2.50	39							
				SH	1.50	34	96	81	26	55			
5				SH	1.75	33							
				SH	4.50	21							
				SH	4.50	18							
10.0		END OF BORING											
10		Boring then backfilled with auger cuttings											
15													
20													
25													
30													

Water not observed while drilling.
Water not observed at end of drilling.

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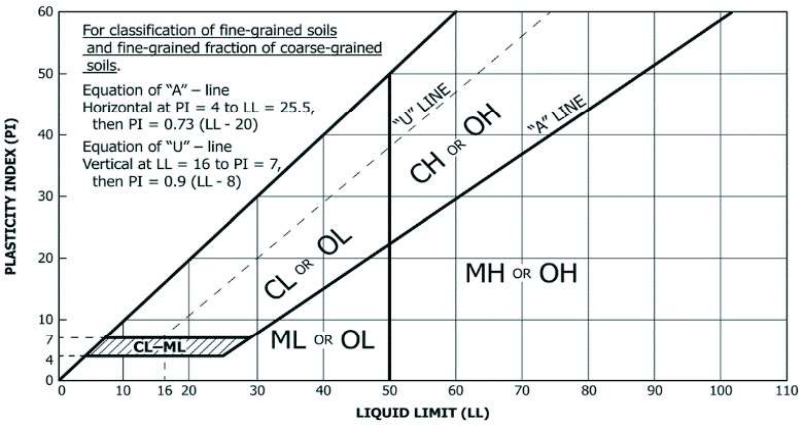
Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3^D$	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3^D$	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	**q_p**	Pocket penetrometer strength, tsf
WD	Wet density, pcf	**q_U**	Unconfined compression test, tsf
P200	% Passing #200 sieve	**LL**	Liquid limit
MC	Moisture content, %	**PL**	Plastic limit
OC	Organic content, %	**PI**	Plasticity index

Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

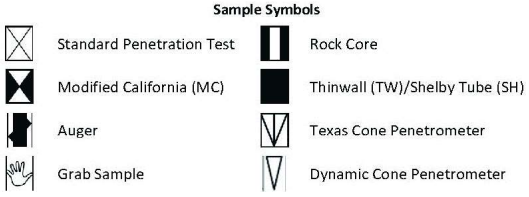
Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Sample Symbols



5/2021

DALLAS INDEPENDENT SCHOOL DISTRICT
CONSTRUCTION SERVICES

Project Manual

VOLUME 2 OF 2

CSP 207325

ORG 159 – L.L. Hotchkiss Elementary School - Renovation

A/E FIRM
WRA ARCHITECTS

Civil Engineer: Click Engineering
Structural Engineer: Ponce Fuess
MEP Engineer: ReSTL Engineering

Technology: Datacom
Landscape: CCA Landscape Architects

11/23/2025

DALLAS INDEPENDENT SCHOOL DISTRICT
CONSTRUCTION SERVICES

Project Manual

VOLUME 1 OF 2

CSP 207325

ORG 159 – L.L. Hotchkiss Elementary School - Renovation

A/E FIRM
WRA ARCHITECTS

11/23/2025

ARCHITECT AND CONSULTANTS SEALS PAGE

ARCHITECT:

WRA Architects, Inc.
6000 Headquarters Dr.
Suite 600
Plano, TX 75024
214.750.0077



CIVIL ENGINEER:

Click Engineering
325 North St. Paul Street
#2850
Dallas, TX 75201
214.871.2302



LANDSCAPE ARCHITECT:

CCA Landscape Architects
12700 Hillcrest Rd.
#149
Dallas, TX 75230
214.739.9105



STRUCTURAL ENGINEER:

Ponce Fuess Engineering
3333 Lee Parkway
#475
Dallas, TX 75219
469.310.2850



MEP ENGINEER:

Restl Engineers
5757 Alpha Rd.
Suite 101
Dallas, TX 75240
214.334.0357



TECHNOLOGY CONSULTANT:

Datacom Design Group
300 N. Coit Rd.
Dallas, TX 75080
214.334.0357



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Division 3

Concrete
03 11 13 Structural Concrete Formwork (S)
03 11 15 Expanded Polystyrene Foam Block Formwork (S)
03 15 19 Cast-In Anchors and Embeds (S)
03 20 00 Concrete Reinforcing (S)
03 31 00 Structural Concrete (S)

Division 4

Unit Masonry
04 20 00 Unit Masonry
04 72 00 Cast Stone Masonry

Division 5

Metals

05 12 00 Structural Steel Framing (S)
05 50 00 Metal Fabrications
05 52 13 Pipe and Tube Railings

Division 6

Wood, Plastics, and Composites

06 10 53 Miscellaneous Rough Carpentry
06 41 13 Wood-Veneer-Faced Architectural Cabinets

Division 7

Thermal and Moisture Protection

07 01 53 Roof Modifications
07 19 00 Water Repellents
07 21 00 Thermal Insulation
07 92 00 Joint Sealants
07 92 19 Acoustical Joint Sealants

Division 8

Openings

08 11 13 Hallow Metal Doors and Frames
08 14 16 Flush Wood Doors
08 41 13 Aluminum-Framed Entrances and Storefronts
08 71 00 Door Hardware
08 71 00a Door Hardware Schedule
08 80 00 Glazing

Division 9

Finishes

09 22 16 Non-Structural Metal Framing
09 29 00 Gypsum Board
09 51 13 Acoustical Panel Ceilings
09 65 13 Resilient Base and Accessories
09 65 19 Resilient Tile Flooring
09 91 13 Exterior Painting
09 91 23 Interior Painting

Division 10

Specialties

10 14 00 Signage
10 14 16 Plaques
10 28 00 Toilet, Bath, and Laundry Accessories
10 73 17 Prefabricated Metal Canopies
10 73 35 Electronic Marquee

Division 12

Furnishings
12 36 23.15 Plastic-Laminate-Clad Countertops

Division 13 – 22 (NOT USED)

Division 23

Heating, Ventilating, And Air Conditioning
23 05 00 Common Work Results for HVAC
23 05 13 Common Motor Requirements for HVAC Equipment
23 05 29 Hangers and Supports for HVAC Piping and Equipment
23 05 53 Identification for HVAC piping and equipment
23 05 93 Testing, Adjusting and Balancing for HVAC
23 07 00 HVAC Insulation
23 23 00 Refrigerant Piping
23 36 00 Air Terminal Units
23 81 26 Ductless Spilt System Air Conditioners

Division 24 – 25 (NOT USED)

Division 26

Electrical
26 00 01 General Electrical Requirements
26 00 10 Electrical Demolition for Remodeling
26 05 00 Basic Electrical Materials and Methods
26 05 19 Low Voltage Electrical Power Conductors and Cables
26 05 29 Hangers and Supports for Electrical systems
26 05 33 Raceways and Boxes for Electrical Systems
26 05 53 Identification for Electrical Systems
26 56 00 Exterior Lighting

Division 27 – (NOT USED)

Division 28

Electronic Safety and Security
28 05 00 Common Work Results for Electronic Safety and Security
28 31 11 Digital Addressable Fire Alarm System

Division 29 – 30 (NOT USED)

Division 31

Earthwork
31 10 00 Site Clearing (C)
31 20 00 Earth Moving (C)
31 23 00 Excavation and Fill (C)
31 25 00 SWPPP (C)
31 25 53 Erosion and Sedimentation Controls (C)
31 32 00 Soil Stabilization (C)
31 63 29 Drilled Concrete Piers (S)

Division 32

Exterior Improvements

32 13 13 Concrete Paving (C)
32 13 73 Concrete Paving Joint Sealants (C)
32 14 00 Unit Paving (C)
32 17 13 Precast Concrete Site Accessories
32 17 23 Pavement Markings (C)
32 84 00 Landscape Irrigation System (LA)
32 92 00 Turf and Grasses (LA)
32 93 00 Landscaping (LA)

SECTION 01 56 39

TREE PROTECTION, REMOVAL, AND PRUNING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with the protection, pruning, care, and removal of trees.

B. The Contractor shall provide protection and care of existing trees or other designated plant material in order to maintain a healthy, vigorous condition.

C. The Contractor shall perform tree removal, stump grinding and pruning as specified, utilizing acceptable horticultural standards as adopted by the Texas Association of Landscape Contractors (TALC) or Texas Nurseryman Association.

D. Such work shall include, but is not limited to, the following:

1. Protection of individual and stands of existing trees and landscape to remain from the following types of damage:
    a. Compaction of root zone by foot, vehicular traffic or material storage.
    b. Trunk, branch and canopy damage from skate bowl construction, construction access clearances, construction equipment operations, material storage, or from nailing or bolting.
    c. Root poisoning from spilled or dumped solvents, gasoline, paint, and other noxious materials.
    d. Truck wash out.
    e. Branch damage due to improper pruning or trimming.
    f. Damage from lack of water due to:
        1) Cutting or altering natural water migration patterns near root zones.
        2) Failure to provide adequate watering.
    g. Damage from alteration of soil pH factor caused by depositing lime, concrete, plaster or other base materials near roots.
    h. Damage to root zone by coverage of soil.
    i. Invasive insect, pest, mite, borer, disease and stress/decline inspection and recommendation for treatment.
2. Pruning roots where indicated or specified.
3. Removal and grinding of stump.
4. Removal of understory vegetation.
5. Removal and pruning of tree branches and roots adjacent to new construction and excavation or where construction access route is to occur to reduce damage to tree canopy and roots.
6. Application of wound treatment to Quercus species branch cuts.
7. Removal of existing gravel drives, asphalt roads, road bedding and existing concrete curbs and/or sidewalk within root zone areas of existing trees to remain. NO excavating procedures shall take place under or around the trees.
8. Removal of abandoned existing utilities to prevent damage to root systems above.
9. Removal of dead wood and broken or hanging branches from the existing trees.
10. Removal of small seedling trees, vines, excessive surface vegetative debris, seeds, nuts and trash.
11. Application of mulch product and root stimulant at trees to be root pruned and trees to be protected.
12. Placement of plywood over mulch in areas between tree protection fencing and face of vertical features or retaining walls to prevent compaction of soils.
13. Watering and maintenance of root pruned trees.
14. Supplemental hand watering as needed to existing trees.
15. Documentation of tree removal, damage and treatment shall be recorded and submitted.

E. All work of this section is to be performed and supervised by ISA Certified Arborist with minimum of ten (10) years of experience.

1.2 INSPECTION OF THE SITE

A. Verify and examine site conditions with the Owner's Authorized Representative prior to any ground disturbing activities.

B. Document the conditions of the easing trees on the site prior to the start of any work as part of the pre-construction photo documentation, tree status report, and assessment under this section.

C. Proceed when official notice is given to the Contractor that the work site is ready. Proceed with tree protection prior to any site work, demolition or grading.

D. The Contractor shall verify with the Owner's Authorized Representative the extent of tree protective fencing and specific trees to be removed.

E. The Contractor shall verify with the Owner's Authorized Representative the understory trees to remain and be protected with the adjacent trees.

F. Submit application for Tree Removal Permit.

G. Utilities: Determine and mark locations of underground utilities to be removed and perform work in a manner which is intended to avoid possible damage to trees and plant root systems.

1.3 DOCUMENTATION SUBMITTAL

A. Document the condition of every tree to remain and every tree to be protected by dated photograph submitted to the Owner. Submit six (6) photographs per tree showing the tree, branching, and roots at various angles. Photograph existing trees to remain with Owner's Authorized Representative present to verify and record tree designation and health at time of commencing site work. Provide one (1) copy of photos to Owner. Contractor to maintain one (1) copy of tree photos and record of tree health in notebook (or pdf file) for entire construction period.

B. Understory trees of minimum of two (2) inch caliper will remain and be protected under or adjacent to the canopy of large existing trees to remain. These trees are not reflected in the survey due to their size, but they have value in the character of this site development. Determination of species, character and condition shall be assessed on site prior to any grubbing or vegetation removal under existing trees to remain. Photos shall be taken to document understory trees.

Refer to City codes for protected trees.

C. TREE STATUS REPORTS - Submit quarterly (4) reports issued by Arborist regarding the status of tree health, for the remaining trees within the area of construction contract, and care along with recommendations to preserve tree health. Existing trees have not been regularly irrigated and are susceptible to stress due to the site construction conditions and duration. The report shall include a narrative from the Arborist and a minimum of two (2) photos per tree to document the tree's health or any damage. Additional reports shall be required should tree damage (e.g. loss of large branches or limbs) occur due to construction or act of God (snow, ice, wind) which are due within one week of the event.

1. Submit a written inventory in Excel spreadsheet format of all trees on the site. The report must be prepared and submitted by Contractor's Arborist. The Arborist shall record the tree identification number and size in caliper inches (as shown on the drawings). The spread sheet shall record all trees on site including type of protection, care, and the type of damage received (e.g. part of root zone removed due to excavation, compaction of root zone due to vehicular access or construction, etc.). The inventory shall document the type of treatment that damaged trees received. A *sample* inventory follows which is not meant to be comprehensive.

XYZ Project – TREE INVENTORY of Health, Damage, Repair and Removal					
Prepared by XYZ Arborist, License/Certification No.; Date					
Tree No.	Tree ID	Caliper Inches Remain	Caliper Inches Removed	Status	Treatment*
01	Live Oak	26		Protected; no change	M
02	Live Oak		10	Removed per plans	-
03	Red Oak	12		Damage - 20% of root zone removed	RP, CT, M

04	Cedar Elm	14		Damage – 30% of root zone removed	RP, CT, M
05	Hackberry		15	Removed due to ice storm damage	--
06	Pecan	24		Removed 2 limbs for construction access	M, W
07	Post Oak	12		Damage – root zone compaction	Aeration, M
08	Live Oak	18		Damage – canopy loss, large branch broken by concrete truck	M, WP, RP
Etcetera…					
TOTAL INCHES REMOVED			25		

**A*Aeration – Performed hydraulic aeration of root zone, 24" on center.*

**CT – Performed canopy trimming to remove branches proportional to root loss*

**M – Mulch applied to root zone*

**RP – Root pruning and root stimulant applied*

**W, WP – Branch trimmed and Wound paint applied for Quercus*

Describe other treatments

2. The inventory shall include photos of damaged and trees to show status of health, damage, and signs of insect, disease, mite, pests, mistletoe, mosses, lichen or stress/decline. Submit at least four (4) photos per tree from various angles/viewpoints arranged on 8-1/2 x 11 format with trees labeled corresponding to "Tree Inventory" and site plan. Use a digital camera with at least 5.0 megapixels of resolution to document observations.
3. Submit inventory with corresponding photos in digital format (pdf) and with one copy printed on 8-1/2 x 11 paper and organized into three-hole binder. The four (4) photos per tree shall be organized onto one (1) sheet of paper.
4. Tree photographs must be accompanied by assessment of tree health and existing damage by the Contractor's ISA Certified Arborist.
5. The photo documentation and assessment will serve as a bench mark for future comparisons when a tree is damaged or in decline after any on-site clearing, grubbing, grading, or other work activity.
6. Receive approval of tree photo documentation prior to starting tree protection and site work.
7. Proceeding with site work without approval on pre-construction tree assessment from the Owner's Authorized Representative will make the Contractor responsible for existing damage.
8. The inventory shall include photos of tree protection fencing in place prior to site work at all locations. Include at least four (4) photos of fencing in place prior to construction activities at each location.
9. Monthly Tree Assessments shall be performed by the Contractor's arborist throughout the duration of construction and landscape establishment period. Monthly Tree Assessments shall be submitted in accordance with submittal requirements.
10. Submit inventory as work progresses and at end of project as part of Final Acceptance.
11. Prior to Closeout and with approval of the Owner' Representative a final Post-Construction Tree Assessment shall be performed. The Post Construction Tree Assessment shall be performed no more than two (2) months prior to Project Closeout.

1.4 ARBORIST INVOLVEMENT AND QUALIFICATIONS

A. Submit resume and relevant tree preservation experience of ISA Certified Arborist prior to commencing work. Arborist shall have a minimum of ten (10) years of experience in tree preservation and care. The Arborist shall submit ten (10) example tree preservation projects along with the project site address and project representative's name and phone number.

B. Submit manufacturer's product information for root sealant, limb sealant, root stimulant, or other item recommended by the Arborist.

C. The Contractor is required to his Arborist prior to any construction activity near the protected trees. The Contractor Arborist's report shall be the guide for any construction activity within the vicinity of trees identified for preservation.

D. The Arborist shall be required to regularly monitor the health of the trees being preserved. The Arborist shall inspect trees monthly and issue monthly assessment reports documenting tree health and tree care measures employed to preserve or enhance the tree's health.

1.5 SEQUENCING

A. Coordinate installation of protection devices and other related units of Work specified in other Sections to ensure that protection of existing trees is complete prior to any site work, demolition, grading or construction activities.

B. Trees designated for root or branch pruning must be pruned prior to commencing site work or demolition.

1.6 DAMAGES

A. Trees that are designated to remain but, during the course of construction, are removed, severely damaged, in significant decline or have died due to Contractor's work or neglect shall be replaced and/or damages paid by the Contractor to the Owner per the schedule below at the Contractor's expense.

B. For trees four (4) inch caliper or greater, the Owner's Authorized Representative will assess the following damages for damaged, dead or dying, or removed trees to be paid by the Contractor to the Owner.

Tree size – Diameter/Caliper in Inches	Replacement Tree or Value Each tree
Equal to 4 and up to 6	$ 1,500.00
Equal to 6 and up to 8	$ 3,000.00
Greater than 8 and up to 12	$ 6,000.00
Greater than 12 inches	$ 1,000 per caliper inch

Size will be determined by measuring caliper at twelve (12) inches above grade for trees from four (4) to twelve (12) inch caliper and at six (6) inches above grade for trees from zero (0) to four (4) inch in caliper.

Trees that are larger than twelve (12) inch in caliper shall be measured at four (4) feet above natural ground elevation, or from top of stump, if removed.

Multi-trunk trees shall be measured at twelve (12) inches above grade of each trunk. The largest trunk's diameter shall be counted as 100% caliper; the remaining trunks shall be counted at 50% caliper. In the event the tree cannot be measured, the diameter values as stated on the drawings plus two (2) inches will be used for the determination.

C. For Damaged trees twelve (12) inch caliper and greater – If a major branch is damaged, the cost will be assessed by the percentage of the tree canopy that is lost. For example, if the loss of a branch results in one-fifth of the canopy loss, then the penalty on a twenty (20) inch tree would be one-fifth or $4,000.00.

D. Slight Damage: shall be defined as damage that may heal.

1. Examples include but are not limited to: scaring of the trunk into the cambial layer one-half (½) inch to two (2) inches in width but less than one-third (1/3) trunk circumference or breaking of limbs less than two (2) inches in diameter or limbs less than one-third (1/3) trunk caliper, whichever is less.

2. Slight damage shall also include removal or lying down of protective tree fencing prior to end of construction, storing equipment or supplies within the critical root zone (CRZ), or disposing of paint or concrete within the CRZ but not closer to the trunk than 50% radius of the CRZ. Slight damage to trees shall be assessed at a rate of $100.00 for each instance. Each day tree fencing is not properly placed, equipment or supplies are stored within CRZ or fill is stored within the CRZ shall be considered one instance.

E. Moderate Damage: shall be defined as damage that contributes to the poor health and reduced longevity of the tree.
   1. Examples include but are not limited to: scaring of the trunk into the cambial layer greater than two (2) inches but less than one-third (1/3) the trunk circumference or breaking of limbs more than two (2) inches in diameter but less than one-third (1/3) trunk caliper.
   2. Moderate damage shall also include compaction of soil, grading or filling in 20% of the CRZ on one of four sides but outside the 50% radius of the CRZ, disposing of paint or concrete within 50% radius of the CRZ. Moderate damages shall be calculated at a rate of one-half (½) the assessed value of the tree per each instance of damage.

F. Severe Damage: shall include removal or damage no defined as slight or moderate.
   1. Examples include but are not limited to: scaring of the trunk to the cambial layer greater than one-third (1/3) the trunk circumference, uprooting or causing a tree to lean, damage to a scaffolding branch or branch greater than one-third (1/3) of trunk caliper.
   2. Severe damage shall also include compaction of soil, grading or filling more than 20% of the CRZ, or within 50% radius of the CRZ or on more than one (1) of four (4) sides. Cutting one-third (1/3) of the buttress roots within three (3) times the distance of the DBH of the trunk, or cutting four (4) roots four (4) inches or greater in diameter within four (4) foot of the trunk shall also be considered severe damage.
   3. Severely damaged trees shall be designated by the Owner's Authorized Representative and shall be scheduled for removal. The Contractor shall pay the Owner penalty as described in the table above.

G. Assessment of Tree Mitigation: The Owner's Authorized Representative opinion is final regarding tree damage penalties. The Owner's Authorized Representative my exercise the right to stop any work if any level of tree damages are being incurred due to the execution of the work until the Contractor and develop a work plan which prevents further damage to the existing trees.

H. Trees that must be removed due to damage caused by the Contractor shall be removed at the Contractor's expense.

I. All damages shall be paid to the Owner. Failure to replace or pay for damaged trees shall result in a breach of contract and the Contractor will be automatically assessed damages. Damages as described herein shall be deducted from payments otherwise due to the Contractor.

1.7 WATER

Potable water is available on site. If potable water is not available, contractor shall provide watering by means approved by the Owner or Contractor.

PART 2 - PRODUCTS

2.1 WOUND PAINT

For trees within protection fencing area that may need limb pruning/removal, use petroleum or latex base tree wound paint, dark gray, brown or black in color. Spray type paints are acceptable for use on genus Quercus only.

2.2 TREE PROTECTION FENCING

A. Refer to the drawings for the location of proposed tree protection fencing.

B. Fencing: Non-movable chain link fencing.
   1. All elements hot dip galvanized and unless otherwise shown.
   2. All elements consist of the following:
      a. Chain link fencing: Nine (9) gauge, two (2) inch mesh, four (4) foot height.
      b. Posts: two and three-eighths (2 3/8) inches outside diameter, minimum, steel driven and set a minimum of two (2) feet into ground. Posts are set maximum eight (8) feet on center.
      c. Brace rails: one and five-eighths (1 5/8) inch outside diameter, minimum.
      d. Stretcher bars: one-quarter (1/4) inch by three-quarter (3/4) inch, minimum.

C. Orange Safety Fencing for trees (as shown on plans):
   1. Orange safety fencing: polyvinyl mesh, four (4) foot height.
   2. Posts: Metal T-posts, minimum of four (4) foot above finished grade and two (2) feet below grade.

D. Refer to drawings for additional fencing requirements.

E. Temporary enclosures and wrapping
   1. The Contractor shall protect tree trunks and root zones from damage. If fencing is not possible due to proximity of construction, then the Contractor is obligated to wrap the trunk with material sufficient to protect the trunk from any damage. The Contractor is obligated to protect the root zone from compaction and damage. The Contractor may use 2x4 pieces wired together to protect the trunk to a minimum height of eight (8) feet above grade. Mulch, gravel and plywood boards should be used to cover 100% of the root zone.
   2. Miscellaneous materials: burlap, coarsely shredded hardwood mulch, septic (rounded) gravel.
   3. The Contractor shall be aware and flag, if necessary, existing overhead canopies of trees to remain. Equipment shall operate with lowered boom or cranes to protect the existing tree canopies from damage.

2.3 MULCH AND COMPOST

A. Mulch – Commercially available decomposed coarsely shredded hardwood mulch at three (3) inch depth. Mulch shall have been decomposing for a minimum of sixty (60) days.

B. Shredded tree mulch – Undecomposed, twice shredded hardwood mulch from on-site trees that do not include invasive tree species. This mulch must be utilized with a compost bottom layer that shall be one-half (1/2) to one (1) inch and the undecomposed hardwood added for a minimum three (3) inch combined thickness.

C. Compost - commercially available, mature, fully decomposed compost that complies with Section 32 9200 Turf and Grasses.

2.4 MISCELLANEOUS PRODUCTS

A. Tree Fertilizer: Fertilize all trees with a combination of PHC for trees 27-9-9 and Mycor Tree Injectable. Mix 8 pounds of PHC for trees and A and B packets of Mycor Tree Injectable per one hundred (100) gallons of water.

B. Herbicides, Insecticides, Miticides and Fungicides: Legal commercial quality non-staining materials with original manufacturers' containers, properly labeled with guaranteed analysis, least toxic required.

C. Water: Clean fresh, free of substances toxic to plant growth.

D. Sterilant: Use a horticulturally accepted sterilant for sterilizing pruning equipment.

E. Root Sealant: Use a horticulturally accepted sealant appropriate for each species of tree.

F. Erosion Control Net (Jute Mesh): Shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and four (4) feet wide with mesh openings of approximately one (1) inch square.

G. Plywood: three-quarter (3/4) inch non-treated.

2.5 MACHINERY AND EQUIPMENT

A. Machinery or tools requirements listed under this Section are NOT intended to be restrictive of specific manufacturers or models, unless so stated. Specific mention of the manufacturers is intended as a guide to illustrate the final product of the maintenance operations desired.

B. All equipment and pruning tools shall be maintained in a safe working condition and cutting edges shall be sharp at all times.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify trees to remain and trees to remove with Owner’s Authorized Representative. Verify health of trees to remain and provide photo documentation prior to commencing demolition or site work.

B. Verify locations of existing utilities in area of tree removal and root grinding. Contractor shall protect all utility lines to remain.

C. Verity locations of existing utilities and old pavements to be removed in areas of trees to remain. Contractor shall protect tree's root systems.

D. Verify staging of access into site for removal or trees, and protection of trees and areas to be preserved. Utilize existing pavement surfaces to be demolished to prevent compaction of soils into protected areas.

E. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

3.2 TREE PRESERVATION

A. Protect and preserve trees, understory trees, shrubs, native grasses, and plants not to be removed by the use of fencing, temporary enclosures, wrapping or other means. TREE PROTECTION MUST OCCUR PRIOR TO ANY SITE WORK, DEMOLITION, EXISTING ABANDONED UTILITY REMOVAL, OR GRADING.

B. Abandoned Utilities to be Removed: Determine locations of underground utilities and perform work in a manner which is intended to avoid possible damage to trees and protected vegetation. Hand excavate or use air-spade technology where required.

C. Tree protection must receive approval of the Owner's Authorized Representative prior to starting any site work.

D. Protected trees shown to remain must maintain a full 75% existing undisturbed root zone minimum to be counted as a protected site tree per the local city code or ordinance.

E. Protect trees shown with approved fencing as indicated on the drawings and as needed to protect from construction activities.

F. Per assessment report, protect existing understory trees and shrubs to remain under and adjacent to existing trees to remain.

G. Repair injuries, abrasions and other damage to plants by cleanly removing broken members, loose and torn bark, and shape edges in order to permit drainage of rainwater from wounds. Paint wounds with an approved tree wound paint. Provide photo documentation of all tree injuries and repairs.

H. Where depth of soil over root system of existing plantings is to be modified by final grading, provide the following:

1. Where increase of one (1) foot or more in elevation is shown, spread continuous layer of rock aggregate, graded one quarter (1/4) inch to two (2) inches, six (6) inches deep from trunk to drip line of branches prior to installation of fill.

2. Provide proper aeration by installing within perimeter of spread, a system of four (4) inch clay drain tile. Install vertically flush with soil surface and penetrating into layer of aggregate fill.

I. Install tree guard fencing at a minimum of three (3) feet past the tree drip line or as noted on the drawings.

J. Do not install gates in tree guard fencing. Do not stack or store any equipment inside the tree fence.

K. Do not clean construction equipment, dump liquids, nor perform field maintenance on vehicles in the vicinity of the trees to be preserved.

L. Apply three (3) inches of coarsely shredded hardwood mulch over tree root zone within fencing, unless shown otherwise.

M. Install plywood over mulch in areas reflected on plans for access between the tree protection fencing and the face of building or edge of retaining wall construction.

N. Trees inside fencing with native turf areas to remain: DO NOT install mulch or disturb soils in areas shown without mulch due to in-situ soils ability to percolate and drain.

3.3 TREE, LIMB, AND VEGETATION REMOVAL

A. Receive approval from the Owner's Authorized Representative in the field for trees and vegetation to be removed. Trees that have died or have been approved for removal shall be removed by felling with chain saws. Fell trees to avoid injuring protected trees and vegetation or damaging utilities and existing pavement or structures. Use felling methods that comply with OSHA and American Association of Nurserymen.

B. Undergrowth identified and designated for removal within existing tree stands to be preserved shall be removed by hand with machinery and tools that do not harm the root systems, trunks, limbs, or any other part of the trees, understory trees, understory shrubs or native grasses designated to be preserved.

C. Grind stumps to a depth of eighteen (18) inches within a three (3) foot diameter of the trunk in areas where rough grading does not exceed two (2) feet of cut. Remove ground mulch from area and fill hole with select fill or site stockpiled topsoil compacted to 90% proctor density. Trees will not need to have stumps ground that are removed within area of building construction and excavation or where rough grading exceeds two (2) feet of cut.

D. Trees within heavily rooted zones of other trees will have stumps ground to same depth as above, but grind main root laterals out three (3) feet from tree. DO NOT grind over or into other tree's root systems.

E. Arborist shall prune trees to remove limbs and branches that hinder Contractor's work. Owner's Authorized Representative shall approve any pruning that removes more than ten (10) percent of the tree's canopy.

F. Prune branches of trees per approved horticultural practices, for balanced overall canopy appearance, and to prevent one-sided canopy pruning to provide for:

1. Construction equipment access clearance to fourteen (14) feet height from finished grades.
2. Building vertical face clearance to allow scaffolding, lifts and equipment access.
3. Building projected finished roof or parapet elevation clearance of five (5) feet.
4. Fire truck access lanes and drives clearance of fourteen (14) feet above finished pavement elevation.

G. Prune trees to remove dead wood, broken branched, mistletoe and suckers from canopies as needed. Thin prune by removing no more than twenty (20) percent of growth. Sterilize pruning tools between individual plants to keep down spread of disease.

H. Neatly cut limbs and branches to be trimmed or removed close to the bole of the tree or main branches. Paint cuts more than one and one-quarter (1 1/4) inches in diameter with an approved tree wound paint. Use 3-cut process to remove branches.

I. Limb up trees to provide seven (7) foot minimum clearance over adjacent pedestrian walks, plazas, or accessible pavements to be constructed. Tree shall be limbed up by Arborist to provide balanced shape and to allow for interior branch development.

J. Remove poison ivy and other vines from tree trunks, treat and remove roots of ivy to prevent reestablishment (If applicable).

K. Hand grub to remove small seedling trees, excessive surface vegetative debris, seeds, nuts and trash. Retain a minimum layer or naturally decomposed surface litter over top of existing grade below tree canopy. Grubbing shall not extend into the surface roots of the tree to remain to prevent damage to the surface roots. Apply coarsely shredded hardwood mulch over root zone if area previously had excessive debris depth to help retain surface moisture over root zone.

L. Remove all branches and debris. Legally dispose of vegetation, branches and debris off site.

M. Leave site in a clean and orderly manner.

3.4 ROOT PRUNING

A. Root pruning as indicated on the drawings must occur prior grading or excavation in the root zone.

B. Arborist – Major root pruning (one (1) inch caliper and larger) should be supervised by an ISA Certified Arborist where indicated on the plan or if roots are exposed due to grading or excavation. Use sharp instruments that leave a clean cut, with no ragged edges.

C. Root pruning guidelines:

1. Do not mechanically trench under trees, Trench using Air Spade Technology offered by Root Flare Services, Dallas, TX (or approved equal), hand dig or bore underneath. If roots greater than one (1) inch are encountered and severed, dig back along the root and find solid root wood, then cut flush and treat with an acceptable root sealant immediately. If the roots cannot be treated immediately, cover with moist burlap to prevent desiccation until they can be treated.
2. Any roots broken and disturbed during construction trenching operations shall be immediately cleanly cut and sprayed with root sealant. Do not leave uncut, frayed roots without immediate treatment. Owner is to inspect any trench before filling occurs.
3. Temporarily cover exposed roots with wet burlap to prevent roots from drying out.
4. Do not remove more than 25 % of the tree's roots, with no more than 20% from one side.

5. For trees twelve (12) inches in diameter and less, roots should not be removed within four (4) feet of the outer edge of the tree trunk base. Trees other than Post Oaks with diameter more than twelve (12) inches should be allowed an additional twelve (12) inches for every three (3) inches of trunk diameter measured at a point three (3) feet above the ground. Root prune all trees adjacent to proposed pavement locations.
6. Oak trees with diameter more than twelve (12) inches should be allowed an additional twelve (12) inches for every one (1) inch of trunk diameter measured at a point three (3) feet above the ground.
7. Root prune all trees adjacent to proposed pavement and excavation locations with proper pruning technique to provide clean cuts at roots with no ragged edges. Do not cut within five (5) feet of trunk.

D. Arborist will review root pruning prior to backfilling.

E. Backfill the excavation as soon as possible after sealing cuts with root sealant and water the soil around the roots to avoid leaving air pockets.

F. Backfill with five (5) parts native topsoil and one (1) part compost.

G. Apply root fertilizer / stimulator to root zone of trees where root pruning has occurred. Apply fertilizer at rates recommended by manufacturer. Inject fertilizer at depths prescribed by manufacturer.

H. The Arborist must receive field approval from Owner's Authorized Representative or the Landscape Architect for tree and root pruning not shown in the drawings.

3.5 BORING NEAR TREES

A. Bores within the root zone of large trees shall be horizontal directional bores. For pipe installation, mechanically bore the tunnel under the roots with a horizontal directional drill and hydraulic or pneumatic air excavation technology. In all cases, install the utility pipe immediately, backfill with soil and soak within the same day.

B. Installation shall be tunnel bored beneath the tree and roots per the following chart:

Trenching Distance	
When the Tree Diameter (at 4.5' height) is	Trenching will be Replaced with Boring at this Min. Distance (10x tree diameter) from the Face of the Tree in any Direction
6-9" measured at 6"	5– 8'
10-14" measured at 54"	10 – 13'
15-19" measured at 54"	14- 16'
19-24" measured at 54"	17-19'
Over 25" measured at 54"	20'+
Depth of Tunneling	
9" or less measured at 6"	2.0'
10-14" measured at 54"	2.5'
15-19" measured at 54"	3.0'
More than 19" measured at 54" depth of tunnel	3.5'

Bore pits shall be located at a minimum distance as specified by trenching distance table above.

3.6 WATERING

A. The Contractor shall provide watering as needed to keep existing trees to remain in vigorous condition.

B. The Contractor shall water protected trees during construction by deep root watering trees once every two weeks during the months of June, July, August, and September. Should drought of more than three (3) weeks occur from October through May, the Contractor shall provide additional deep root watering of protected trees as needed to keep trees in healthy, growing condition. A dripping hose or gator bag or other means may be used to deep root water the trees. Soil should be saturated within the drip line after deep root watering.

C. For large masses of protected trees, water trees that are located along the outside edge of protected area as described above.

3.7 MAINTENANCE OF EXISTING TREES

A. Trees shall be continuously and routinely inspected for distress caused by construction activities. Notify Owner's Authorized Representative at first sign of distress.

B. Maintain fence taut, stable and secure until soil preparation and seeding activity is needed within the fenced area.

C. The Contractor shall maintain a three (3) inch cover of mulch on the tree root zone though out construction on individual trees. After initial mulch application re-apply mulch twice per year. Mulch shall be refreshed to specified depth within seven (7) calendar days of January 1 and July 1. Use erosion control net (jute mesh) as needed to secure mulch in place from potential heavy erosion adjacent to drainage.

D. Remove mulch when sodding commences within tree root zone.

E. For masses of protected trees, unmown grass should be left within fifteen (15) feet of the trunk line along the outside edge of the trees.

F. Native and existing turf grasses are to be retained and maintained, if necessary, during project construction period. If grass stops growing within tree protective fencing, of if the tree shows signs of stress such as leaf drop, sucker growth, wilting, or if tree shows signs of insects or disease, the Contractor shall notify the Owner immediately. It is the Contractor's responsibility to maintain the health of the trees during the construction period.

G. Any Fire Ant mounds around or on top of a tree root zone of a specimen tree shall be treated immediately and the mound removed physically. Do not allow the mound to build on the tree trunk as this will cover the tree root flare and possibly cause injury or death. Ensure that any chemical application to the Fire Ant mound is safe for application atop tree root zones. Ant mounds do not need to be treated in tree masses.

3.8 DISPOSAL

A. Haul off and legally dispose of any debris from the work of this section.

B. Dispose of debris off the Site only with permission of property owner where such debris is to be deposited and in accordance with codes and regulations of the jurisdictional authorities.

C. Burning and burying debris on the Worksite is prohibited.

3.9 CLEAN-UP

Remove and dispose of any debris, trash, protective materials, enclosures and fencing upon completion of the Work.

3.10 FINAL ACCEPTANCE

A. The trees designated for protection will be examined as part of final acceptance when all site work has reached final acceptance.

B. The Arborist shall issue a final Post Construction Tree Assessment regarding the status of the tree health for each specimen tree and for the large tree groupings. The report should identify if future care is required to maintain the health of the specimen trees. The report should identify what specific treatment the trees should receive coordinated with a time schedule to the treatment to promote tree health.

C. If grading impacts the critical root zone, the Contractor's Arborist will be required to report specifically on the impacted tree. The Arborist shall recommend tree treatment and maintenance after final acceptance.

D. Request inspection for final acceptance at least thirty (30) calendar days from project close out.

E. Receive approval from the Owner's Authorized Representative for the work of this section completed.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:
1. Demolition and removal of selected portions of exterior or interior of building or structure and site elements.

B. Related Requirements:
1. Section 02 82 13 “Asbestos Removal” for asbestos-containing building materials abatement

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner as indicated.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage; prepare for reuse; and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.4 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.
1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.
6. Review and finalize protection requirements.
7. Review procedures for noise control and dust control.
8. Review storage, protection, and accounting for items to be removed for salvage or reinstallation.
9. Review areas of project where hazardous materials are suspected to be present and discuss sequence of work to ensure that abatement is complete prior to general demolition.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Statements:
1. For refrigerant recovery technician.

B. Engineering Survey: Submit engineering survey of condition of building.

C. Survey of Existing Conditions: Submit survey.

D. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection , for dust control. Indicate proposed locations and construction of barriers.

E. Schedule of Selective Demolition Activities: Indicate the following:
1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.

2. Temporary interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed in accordance with EPA regulations. Include name and address of technician and date refrigerant was recovered.

G. Statement of Removal of Hazardous Materials: Signed by appropriate Hazardous Materials Specialists stating that asbestos containing materials that were present are completely removed in accordance with codes and state and federal guidelines and regulations.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Universal certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

A. Owner will not occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
1. Before selective demolition, Owner will remove the following items:

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials:
1. Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
a. Do not disturb hazardous materials or items suspected of containing hazardous materials. Removal of hazardous materials to be performed by Hazardous Materials Specialist as specified in Section 02 82 13 “Asbestos Removal.”

E. On-site sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify asbestos abatement is complete, documented, and building and structures are free of asbestos containing materials.

B. Verify that utilities have been disconnected and capped before starting selective demolition operations.

C. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

D. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
   1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video. Comply with Section 01 32 33 "Photographic Documentation."
   1. Inventory and record the condition of items to be removed for salvage or reinstallation. Photograph or video conditions that might be misconstrued as damage caused by removal.
   2. Photograph or video existing conditions of adjoining construction including finish surfaces, that might be misconstrued as damage caused by selective demolition operations or removal of items for salvage or reinstallation.

3.2 PREPARATION

A. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

B. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location and cleaned and reinstalled in their original locations after selective demolition operations are complete.

D. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment in accordance with 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND BUILDING SYSTEMS

A. Existing Services/Systems to Remain: Maintain utilities and building systems and equipment to remain and protect against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utilities and building systems serving areas to be selectively demolished.
   1. Arrange to shut off utilities with utility companies.
   2. If disconnection of utilities and building systems will affect adjacent occupied parts of the building, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to those parts of the building.
   3. Demolish and remove existing building systems, equipment, and components indicated on Drawings to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment and components.

4. Remove and reinstall/salvage existing building systems, equipment, and components indicated on drawings to be removed and reinstalled or removed and salvaged:
   a. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment and components; when appropriate, reinstall, reconnect, and make equipment operational.
   b. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and components and deliver to Owner.

3.4 SALVAGE/REINSTALL

A. Removed and Salvaged Items:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

B. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 12 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete:
   1. Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive in accordance with recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 02 82 13

ASBESTOS REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Asbestos-Containing Building Materials Abatement in accordance with attached “Project Manual for Asbestos-Containing Building Materials Abatement, L.L. Hotchkiss Elementary School” by Benas Environmental Services, Inc., Benas Project No. BA-24-1703.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

PROJECT MANUAL

FOR

ASBESTOS-CONTAINING BUILDING MATERIALS ABATEMENT

L. L. HOTCHKISS ELEMENTARY SCHOOL

6929 TOWN NORTH DRIVE
DALLAS, TEXAS 75218

BENAS PROJECT No. BA-24-1703

VOLUME 1 OF 1

BENAS
ENVIRONMENTAL SERVICES, INC
Environmental Consultants and Engineers

BENAS
ENVIRONMENTAL SERVICES, INC
Environmental Consultants and Engineers

ENVIRONMENTAL CONSULTANTS

324 CROOKED TREE COURT
COPPELL, TEXAS 75019
PHONE: 972/393-0128
FAX: 972/393-0793
INTERNET WEB SITE: WWW.BENAS.COM

ASBESTOS CONSULTANTS

LEAD-BASED PAINT CONSULTANTS

IN-DOOR AIR QUALITY CONSULTANTS

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November 13, 2024

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS AND ENGINEERS

ASBESTOS ABATEMENT PROJECT DESIGN & TECHNICAL SPECIFICATIONS

FOR:

L. L. HOTCHKISS ELEMENTARY SCHOOL
6929 TOWN NORTH DRIVE
DALLAS, TEXAS 75218

PREPARED FOR:

DALLAS INDEPENDENT SCHOOL DISTRICT (DISD)
DALLAS ISD CONSTRUCTION SERVICES DIVISION
LINUS D. WRIGHT DALLAS ISD ADMINISTRATION BUILDING
9400 CENTRAL EXPRESSWAY, SUITE 800
DALLAS, TEXAS 75231
ATTENTION: MR. TERRENCE MACK, CBRE/VANIR JV DESIGN MANAGER

PREPARED BY:

EPHRAIM N. OKOTCHA "EO"
INDIVIDUAL ASBESTOS CONSULTANT
TDSHS LICENSE NUMBER 10-5399

BENAS ENVIRONMENTAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS
POST OFFICE BOX 739
COPPELL, TEXAS 75019
PHONE: 972/393-0128
FAX: 972/393-0793

INTERNET WEB ADDRESS: WWW.BENAS.COM EMAIL ADDRESS: EO@BENAS.COM.

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ATTACHMENTS:

Laboratory Test Results and Analysis of Bulk Samples by Polarized Light Microscopy **(PLM)** and Chain-Of-Custody Forms.

Computer Aided Design Drawings for Abatement Work Areas with ACM Quantities.

Photographic Documentation of Representative Bulk Samples Collected and Analyzed.

EXECUTIVE SUMMARY

The Dallas Independent School District **(DISD)** is seeking to remove asbestos-containing building materials **(ACM)** as specified. This abatement project involves the complete and total removal of all designated asbestos-containing building materials in and outside the buildings at this facility, which could impact scheduled renovation and/or demolition activities. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

The areas for specific asbestos abatement are described in the Scope of Work and the drawings contained in these technical specifications. The schedule for the execution of the removal project shall be contained in the abatement notifications which shall be filed with the Texas Department of State Health Services **(TDSHS)** prior to the start of any abatement work. Any abatement project to be performed for this facility shall be strictly conducted according to the start and stop dates contained in the notifications to the TDSHS and these specifications **(No Exceptions)**. Information available to BENAS indicates that all the buildings at this facility, including the administrative offices, as well as all other buildings at this facility may be scheduled for future renovation and/or demotion activities. All detected and designated ACM at these buildings, as well as others that may be located underneath concrete structures and fixtures which may impact any renovation and/or demolition work shall be removed prior to the renovation and/or demolition activities.

Any **on-going renovation and/or demolition activities shall stop immediately if any suspect materials underneath the surface(s) are discovered; bulk samples of such suspect materials shall be collected and analyzed for the presence, or absence thereof asbestos fibers prior to the continuation of the renovation and/or demolition activities. No Exceptions.**

This project is considered to be asbestos abatement prior to building renovation and/or demolition work to meet current TDSHS notification requirements. Proper interpretation of the current National Emission Standards for Hazardous Air Pollutants **(NESHAP)** regulations, as well as the current Texas Asbestos Health Protection Rules **(TAHPR)** must be observed for this distinction. BENAS Environmental Services, Inc. from Coppell, Texas, shall be the Owner's representative **(Consultant)** on this project. The testing laboratory **(industrial hygiene services)** selected by the Owner is also BENAS Environmental Services, Inc.

END OF SECTION

TECHNICAL SPECIFICATIONS

SPECIAL CONDITIONS

The construction general contractor **(GC)** and the chosen asbestos abatement contractor shall notify BENAS Environmental Services, Inc. **(BENAS)** if any areas including walls, ceilings, floors, rest rooms, custodial closets, chases and other mechanical areas not already included in the drawings and specifications are to be impacted in any form or manner prior to any activities that might disturb any ACM in any portion(s) in the buildings prior to and during the course of the renovation and/or demolition work. All renovation and/or demolition activities shall stop anytime suspected asbestos-containing building materials which may be located underneath surfaces are discovered. The consultant shall collect additional bulk samples of the suspected material(s) to rebut the presence of asbestos in that material. **No Exceptions.**

The chosen asbestos abatement contractor shall comply with all federal, state, and local regulations and rules which guide asbestos abatement in the State of Texas, including but are not limited to those detailed in these technical specifications, NESHAP, TAHPR, Occupational Safety and Health Administration **(OSHA)**, Texas Commission on Environmental Quality **(TCEQ)**, and National Institute for Occupational Health and Safety **(NISOH)** Regulations; and all others. The following is required of the chosen asbestos abatement contractor for this project:

Multiple Mobilizations:

The chosen abatement contractor shall provide "Alternate Pricing" **(Quotes)** for multiple mobilizations throughout the duration of this project. All renovation and/or demolition activities for the buildings at this facility shall be coordinated with the Building Owner **(District)**, Dallas ISD Construction Services Division, the General Contractor **(GC)** executing the renovation and/or demolition of the buildings, including the roofs, the Architectural Firm, the project management firm – CBRE/Vanir Joint Venture Program Management Services, and the Consultant **(BENAS)** at all times. **No Exceptions.**

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

Waste Handling and Disposal

1. The chosen asbestos abatement contractor shall provide a "Closed Metal **(Steel)** Disposal Dumpster" on site everyday throughout the duration of the abatement project. This dumpster must be locked at the end of each workday such that there is no public access to asbestos waste stored in the dumpster.

2. Each dumpster shall be full prior to pick-up for disposal by the abatement contractor, or a subcontractor retained by the abatement contractor.

3. All disposal manifests shall be type-written such that all entries are legible through all copies of the waste disposal manifest document.

4. The manifest for each load of waste shall be signed by the Consultant, or the On-Site Project Manager retained by the Consultant on behalf of the Owner, prior to leaving the job site.

5. One copy of the document **(equivalent of the Green Copy)** shall remain with the Consultant or Project Manager prior to departure of the truck dumpster from the site.

6. Each load of waste that leaves the job site shall be taken straight to the approved asbestos disposal landfill selected by the abatement contractor as documented in the Notifications.

7. A copy of the receipt from the disposal landfill shall be returned to the Consultant or Project Manager next day **(Within 24-Hours)** immediately following disposal. No subsequent load of waste shall leave the job site **(School)** premises without the receipt of the previous load which documented proper disposal. **No Exceptions.**

8. All original copies of the waste disposal manifests shall be sent to the Owner during submittal of the 'Close-Out Documents' by the abatement contractor.

9. Failure to follow the above stipulated procedures shall be grounds for work stoppage and possible contract termination. **No Exceptions.**

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

The abatement contractor shall protect all surfaces near or adjacent to all abatement work areas, especially the walls, floors, decks, and ceiling near the immediate work locations from any damages, including but are not limited to water and/or structural damages. Any damages to any surfaces shall be repaired and/or replaced by the abatement contractor at his/her own cost. **No Exceptions.**

OSHA Personal Compliance Monitoring:

The selected abatement contractor shall conduct OSHA Mandatory Personal Compliance Air Monitoring on at least 25% of his workers every day, or a minimum of two samples per shift throughout the duration of the abatement project. If more than one crew or shift is performed simultaneously, a minimum of 25% of the workers in each crew or shift shall be monitored per OSHA regulations and these specifications. Abatement activities for the non-friable ACM Floor Tiles and Black Mastic, glazing compounds on interior and exterior windows and door frames and glass panes, caulking on cabinet works, sealant on wood cove-base, as well as black mastic behind chalk boards, and others may and can be conducted with the use of Half-Face Negative Pressure Demand Air-Purifying Respirators **(Half-Face Masks).** However, all workers shall don-on the Power Air Purifying Respirators **(PAPR)** during the removal of all friable ACM Thermal Systems Insulation , as well as the 1' X 1' Stock-On Ceiling Tiles and DOT Mastic. The half-face respirator has a protection factor of ten (10); while that of the PAPR is 1,000. This means that the fiber concentration inside these respirators is reduced ten and one-thousand times, respectively, the outside fiber concentration. These respirators are adequate to protect the abatement workers against possible asbestos exposure throughout the duration of the abatement work.

The security of any section(s) of the building(s) and/or areas where abatement operations are in progress shall be the responsibility of the abatement contractor throughout the duration of the abatement work for that section of the facility. The contractor shall secure the building(s) and/or areas at the end of each work shift or day. Missing or stolen of on-site equipment, including those of the Owner, general contractor, the abatement contractor, the consultant, sub-contractors, or anyone else authorized to be on site, is not the responsibility of the building owner/manager, or the consultant. Personnel and visitors' safety during this abatement project shall be the responsibility of the abatement contractor. The contractor shall ensure that all persons, including all workers, the personnel of the Owner, architect, program management firm, consultant and/or air monitoring firm, and other authorized visitors entering or leaving the work areas during this project are safe. The contractor shall provide on-site security throughout the duration of this project if necessary in compliance with these specifications and the contract documents.

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All vehicles including those of the abatement contractor's personnel operated within the premises of the L. L. Hotchkiss Elementary School facility shall be insured in accordance with the State of Texas Department of Public Safety **(DPS)** regulations and requirements. Proof of liability insurance and driver license shall be produced at the request of any authorized staff, especially those overseeing this project. **No Exceptions.** The use of foul language(s) of any type, in any setting, is forbidden of all persons within the premises of the L. L. Hotchkiss Elementary School facility. Those affected include, but are not limited to the abatement contractor, his/her personnel, and/or subcontractor(s) retained by the abatement contractor, any visitors of the contractor and/or subcontractor(s). ***No Exceptions.***

It is absolutely the responsibility of the abatement contractor to verify both quantities and/or assumed quantities of the ACM in all designated locations, and site conditions prior to bidding. The consultant does not guarantee the drawings to be fully accurate, and/or to scale. Failure to verify all quantities and site conditions SHALL NOT relieve the abatement contractor the obligation to complete this project as, and in the manner specified.

END OF SECTION

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

1.0 SCOPE OF WORK

The following is a *"Scope of Work"* to be performed on this project:

L. L. HOTCHKISS ELEMENTARY SCHOOL

1. Level 1 Unit A – Containments #1 and 2:

Removal and proper disposal of **approximately 12,488 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 5,422 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 1,216 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 432 square feet of non-friable ACM Plaster Ceiling (Plaster); and approximately 1,162 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); located throughout the interior surfaces in Level 1 - Unit A at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in two full containment work area enclosures **(Containments 1 and 2)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 8)**.

Also, the abatement contractor shall remove and properly dispose **approximately 119 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 186 linear feet of non-friable ACM Caulking on Exterior Building Penetrations Joints (Caulking); located throughout the exterior walls of the buildings in Level 1 Unit A at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit A described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 8)**.

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2. Level 1 Unit B – Containments #3 - 6:

Removal and proper disposal of **approximately 233 linear feet of friable ACM Thermal Systems Insulation (TSI); approximately 2,986 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 4903 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 1,260 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 480 square feet of non-friable ACM Plaster Ceiling (Plaster); approximately 560 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); and approximately 64 square feet of non-friable ACM Sink Putty (Sink Putty); located throughout the interior surfaces in Level 1 Unit B at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in four full containment work area enclosures **(Containments 3 - 6)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 9)**.

Also, the abatement contractor shall remove and properly dispose **approximately 60 linear feet of non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows (Caulking and Glazing); approximately 120 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 209 linear feet of non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints (Caulking and Sealant); located throughout the exterior walls of the buildings in Level 1 Unit B at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit B described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 9)**.

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

2. Level 1 Unit C – Containments #7 and 8:

Removal and proper disposal of **approximately 12,256 square feet of friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic (DOT Mastic); approximately 6,204 square feet of non-friable ACM Floor Tiles and Black Mastic (FT/BM); approximately 2,805 square feet of non-friable ACM Chalk Board Black Mastic (Sealant); approximately 192 square feet of non-friable ACM Plaster Ceiling (Plaster); approximately 1,189 linear feet of non-friable ACM Caulking on Cabinet Works (Caulking); and approximately 48 square feet of non-friable ACM Sink Putty (Sink Putty); located throughout the interior surfaces in Level 1 - Unit C at the L. L. Hotchkiss Elementary School** Facility**.** All the ACM enumerated above shall be removed in two full containment work area enclosures **(Containments 7 and 8)** using wet methods with full negative pressure ventilation systems and full engineering controls **(See Drawing – Figure 10)**.

Also, the abatement contractor shall remove and properly dispose **approximately 120 linear feet of non-friable ACM Caulking on Interior and Exterior Door Frames (Caulking); and approximately 220 linear feet of non-friable ACM Caulking on Exterior Building Penetration Joints (Caulking); located throughout the exterior walls of the buildings in Level 1 Unit C at the L. L. Hotchkiss Elementary School Facility.** All the ACM located outside of Level 1 Unit C described above shall be removed by the National Emissions Standards for Hazardous Air Pollutant **(NESHAP)** Methods. No containment work area enclosures shall be constructed or installed for NESPAH related work operations **(See Drawing – Figure 10)**.

5. Crawl Space Work Area – Containment #10:

Removal and proper disposal of **approximately 4,386 linear feet of friable ACM Thermal Systems Insulation (TSI); in the Crawl Space Underneath all original buildings at the L. L. Hotchkiss Elementary School Facility.** The ACM in Crawl Space can be removed in one full containment work area enclosure, with full negative pressure ventilation systems and wet methods. The abatement contractor may choose to conduct glove bag procedures for the Crawl Space work area; however, the entire Crawl Space shall be cleared with Transmission Electron Microscopic Sampling and Analysis. No Exceptions. **(Figure 11).**

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All the ACM located in the interior surfaces of these buildings shall be removed in nine full containment work area enclosures using wet methods with full negative pressure ventilation systems and full engineering controls. Also, all NESHAP Methods and protocols shall be strictly adhered to, for all exterior abatement operations **(No Exceptions)**. Furthermore, the contractor shall construct approximately nine **(Equal Number)** of three-staged wet decontamination facilities, plus a bag-out chamber for each of the above-described full containment work area enclosures for the interior abatement work. Ambient and personal air monitoring shall be conducted throughout the duration of the gross removal and detailed cleaning operations.

Some of the abatement work can be conducted with the use of the half face negative pressure demand respirators, including the removal of ACM Floor Tiles and Black Mastic, Black Mastic behind Chalk Boards, Caulking on Cabinet Works, Sink Putty underneath Hand-Wash Basin, Interior and Exterior Window Caulking and Glass Glazing, Caulking on Interior and Exterior Door Frames, and Caulking and Sealant on Exterior Building Penetration Joints. This respirator has a protection factor of ten **(10)**, which means that the fiber concentration inside the respirator **(Mask)** is reduced ten **(10)** times the outside fiber concentration.

However, the Power Air-Purifying Respirators **(PAPR)** shall be utilized during the removal of any friable and some non-friable ACM in the building interior, including the Thermal Systems Insulation, and 1' X 1' Stock-On Tiles on the Walls and Ceiling in the interior of these buildings. This respirator has a protection factor of one-thousand **(1,000)** by NIOSH Standards, which means that the fiber concentration inside the respirator **(Mask)** is reduced one-thousand **(1,000)** times the outside fiber concentration. The asbestos abatement contractor shall conduct OSHA mandatory personal air monitoring for its workers each day throughout the duration of the abatement work. Historical exposure data shall not be permitted for the documentation of worker exposure for this project. **No Exceptions.**

END OF SECTION

Ephraim N. Okotcha "EO," License No: 10-5399 Ephraim Okotcha

Each Full Containment Work Area Enclosure Shall Consist of:

Two-layers of 6-mil fire-retardant polyethylene sheeting covering all the walls where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting covering the Ceiling where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting covering the floors where and when necessary

Two-layers of 6-mil fire-retardant polyethylene sheeting shall be utilized to construct a separate bag-out chamber attached to each full containment work area enclosure

One layer of 6-mil fire-retardant polyethylene sheeting shall be utilized as critical barrier for all immovable objects and fixtures, holes, air conditioning ventilation units, including supply and return grills etc. for each containment work area enclosure.

As previously noted, a full 3-staged wet decontamination corridor shall be constructed for each full containment work area enclosure in the interior of these buildings **(See Drawings)**. The decontamination facility shall consist of an equipment room (**dirty room**), a shower room, a clean room, plus a bag-out chamber. Each compartment shall be separated by air locks. Each decontamination corridor shall be equipped with hot water, shampoo, soap, and other necessary amenities for proper workers' decontamination. All work areas shall be completely and adequately wetted down with amended water prior to the start of the preparation and construction of each containment work area. **No Exceptions.** As many Air-Filtration Devices **(AFDs)** as necessary **(adequate number to be determined by the consultant)** shall be utilized in each containment work area enclosure during this abatement project **(See Drawings)**. The manometer reading for each containment work area shall be a minimum **–0.020** inch of water pressure differential.

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Each AFD shall be capable of exhausting air at 2,000 cubic feet per minute **(CFM)**. A minimum of four **(4)** air changes per hour is required from each operational AFD for this project. The contractor shall stop all abatement activities whenever the manometer reading is below **–0.020** inch of water pressure differential. The manometer equipment shall be calibrated each day prior to the start of any abatement operations. Should the contractor work more than one shift per day or at a time, all manometers shall be calibrated before the start of work for each shift. The electronic manometer equipment shall be equipped with a printer and programmed to print out the pressure readings every two minutes at a minimum.

One functional AFD unit shall be stationed as a stand-by unit in each containment work area enclosure at all times throughout the duration of the abatement project as an emergency backup unit. Also, one AFD unit shall be stationed inside each containment as a scrubber to ensure there are no dead-spaces within the contained work area. **No Exceptions.** All removal work shall be done by hand scrapping. No mechanical equipment shall be utilized during this abatement project. Any methods other than those specified herein shall be with the approval of the building owner and the consultant. The consultant shall perform initial exposure assessment by background ambient air monitoring in each work area to determine initial respiratory protection requirements.

ACM waste generated during this abatement project shall be disposed of in an approved landfill, such as DFW Disposal Landfill in Lewisville, Texas. Each load of waste taken out of this facility during this project shall have a separate **Waste Disposal Manifest**. All double-bagged waste shall be labeled with the generator's name, address, telephone number and the contact person. The consultant or owner shall sign every waste manifest. The original copy from the landfill shall be delivered to the owner during final submittals with other close-out documents. **No Exceptions.**

The abatement contractor, his supervisors and workers must be licensed and certified by the TDSHS to perform asbestos abatement operations in the State of Texas, in accordance with all applicable federal, state, and local regulations and these specifications which guide the handling of asbestos abatement in the State of Texas. All licenses and certifications must be current. **No Exceptions**.

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

All clearance air testing shall be by aggressive methods for this project. Project air samples collected throughout this project shall be analyzed by Phase Contrast Microscopy (PCM). All project air samples collected throughout this project shall be analyzed by a TDSHS licensed asbestos PCM laboratory. Clearance air samples collected for this project shall be analyzed by Transmission Electron Microscopy (TEM). A minimum of five clearance air samples shall be collected and analyzed for each contained work area.

No clearance air sample(s) collected and analyzed during this project shall contain fiber levels greater than 70 Structures in accordance with these specifications. Re-testing costs including the consultant's time and material expenses shall be at the expense of the abatement contractor. The consultant's time and material expenses shall not exceed $125/Hour or $1,000 for an eight-hour shift, per these specifications. The testing laboratories shall participate in an approved quality assurance quality control programs (QAQC), such as Proficiency Analytical Testing (PAT), or the Asbestos Analyst Registry (AAR) administered by the American Industrial Hygiene Association (AIHA).

When the area is certified acceptable by the consultant in writing, the contractor may dismantle the containment work area enclosure in a manner to ensure no re-contamination occurs. The dismantled enclosure shall be disposed of as asbestos waste.

******REPEAT******

It is absolutely the responsibility of the abatement contractor to verify site conditions and all quantities. Failure to verify site conditions and all quantities shall not relieve the abatement contractor the obligation to complete this abatement work as specified.

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

The following Glove-Bag Procedures shall be strictly adhered to at all times during this abatement project:

Glove-Bag Procedures for Pipe Lagging Removal:

A typical glove bag consists of between 3-12 mil-polyethylene or polyvinyl chloride **(PVC)** which is fitted with long sleeve gloves, a tool pouch, a small opening for water sprayers and HEPA vacuum nozzles.

Materials necessary to conduct a standard glove-bag operation include:

a. A 3-12 mil Polyethylene sheeting or PVC Glove-bag
b. A 2-3 gallon garden pump sprayer
c. Smoke tubes with aspirator bulb
d. Wire saw or Flexi-saw.
e. HEPA–filtered vacuum cleaner.
f. Tin snips, where aluminum jackets are present.

g. A 4-6 mil polyethylene sheeting for drop cloth.
h. Duct Tape **(approximately three (3) inches in width)**
i. Dual cartridge respirators with high efficiency cartridges
j. A wettable cloth or other patching materials
k. Asbestos danger signs and labels
l. Amended water **(surfactant)**
m. Materials from re-insulation, where necessary
n. Polyethylene disposal bags **(6-mil thick)** properly labeled per OSHA, EPA, and DOT Regulations
o. Rags for clean-up work

A glove-bag operation typically requires two workers. A third worker is usually necessary to carry out certain important functions which include: providing supplies, keeping unwanted visited out of the restricted work area, and sometimes to conduct both ambient air and OSHA personal compliance monitoring.

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All workers mentioned above must receive appropriate training to perform glove-bag operations, participate in the necessary respiratory protection and medical surveillance programs. All tools, materials and supplies needed for the glove-bag work should be brought into the work area. The work area must be demarcated with caution tapes and asbestos danger barrier tapes. Also, danger signs should be posted at the perimeter to restrict entry to the work area.

The heating ventilation and air conditioning **(HVAC)** for the immediate work area should be shot-off if possible. A remote decontamination facility should be installed as close to the glove-bag work area as possible. Emergency procedures should be implemented in the event the glove-bag ruptures. These procedures include wet wipe **(Cleaning)** all surfaces, HEPA vacuuming and employee wipe down in the immediate location before proceeding to the nearby decontamination unit. Glove-bag work should never be conducted if the pipe is heated up to temperatures of 150 degree-F and above, since typical polyethylene plastic will melt.

Glove-bag Removal Procedures:

1. Mix water with surfactant **(Usually Soap)** in the 2-3 gallon garden sprayer according to Manufacturer's directions.

2. Each worker should don-on high efficiency cartridge respirator which is approved for asbestos removal work. The respirator must be adequate to address the asbestos dust exposure levels expected within the immediate work area, with an aim not to exceed the permissible exposure limit **(PEL)** set by OSHA. The respirator must be fit-tested and checked for face-fit with each worker.

3. Each worker should don-on one disposable full-body Tyvek suit, with the hood over the respirator straps.

4. Check the area(s) or damage(s) to the pipe where the glove-bag work is to be performed. Wrap and secure the two ends of the area on the pipe that need to be removed, if TSI material is damaged, lagging and hanging. High asbestos dust exposure levels and contamination have often been the results of TSI material becoming loose due to the glove-bag work.

5. Place one layer of 6-mil polyethylene sheeting on the floor under the area where the glove-bag work is to be performed, even if the insulation on the pipe is undamaged. Failure to locate a drop cloth has also resulted in numerous and severe exposure levels of airborne asbestos dust during a glove-bag operation.

6. Open the top of the glove-bag and cut down the sides to accommodate the size of the pipe with approximately two inches longer than the diameter of the pipe. This should permit movement within the glove-bag during gross removal work and detailed-cleaning of the pipe surfaces. Some bags have zippers or two-sided tape on top and straps at each end to facilitate glove-bag installation on the pipe.

7. Insert all the necessary tools required for work into the provided pouch inside the glove-bag. The tools that should be in the pouch include utility knives, wettable cloth, tin snips, wire-cutters, clean-up rags, flexi-saw, scrub or wire brush, and any other tool that a worker may need to perform work.

8. Cut out a Donut Shape with the inner diameter ½ inch smaller than the diameter of the pipe beneath the insulation. The outer diameter of the donut should be three inches longer than the diameter of the pipe insulation being removed. Also, cut a slit in each of the two donuts so they can be slipped around the pipe.

9. Place one strip of duct tape along the edge of the open tip slit of the glove-bag for reinforcement. Place the glove-bag around the section of the pipe insulation to be removed and seal up at both ends, especially if the bag has two-sided tape.

10. Fold the flap back and tape it down with a strip of duct tape to provide adequate seal of the top of the glove-bag, with duct tape seal at the two ends of the glove-bag to the pipe.

11. Place the smoke tube and aspirator bulb into the water porthole inside the glove-bag. Squeeze the bulb to fill bag with smoke. Remove the tube and twist the water porthole closed. While holding the water porthole tightly, squeeze the glove-bag and look for leaking smoke, usually at the top and ends of the glove-bag. If leaks are found, they should be resealed and retested until the glove-bag is leak free.

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12. Place the wand from the water sprayer through the water porthole. With duct tape, seal the water porthole tightly around the wand with no air leakage.

13. One worker shall place his hands into the long-sleeved gloves while the second worker directs the water sprayer at the site of the removal work. In the event the pipe is covered with aluminum jacket; the worker should use the wire cutter to cut any bands and tin snips to remove the aluminum jacket. Caution must be exercised not to cut the glove-bag with the sharp edges of the aluminum jacket, as well as other sharp objects.

14. The exposed insulation should be cut with the flexi-saw at each end of the section being removed. The second worker should continuously spray water on the TSI material being removed throughout the operation to reduce the incidence of high levels of air borne asbestos fibers.

15. With the two ends of the section cut, another cut should be made along the top side of the pipe from end to end using a utility knife. Water spraying by the second worker continues. Caution must be exercised so that the cutting or the utility knife did not puncture the glove-bag.

16. Gently lift the TSI material off the pipe and place it in the bottom of the glove-bag. With either the wire or scrub brush, thoroughly brush the surfaces of the pipe and wipe down the exposed pipes.

17. Wet the donut-shaped wettable cloth over the exposed ends of the remaining insulation on the pipe **(e.g., CP-11)**.

18. Remove the water wand from the water porthole and replace with the nozzle of the HEPA vacuum cleaner. Turn on the vacuum cleaner until the glove-bag is collapsed. Remove the vacuum cleaner and twist the water porthole until it is closed, and seal up with duct tape.

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19. Pull the tools through the glove from outside of the bag and away from the glove-bag. Tape over the twisted section of the glove arm and make a cut within the twisted section. The contaminated tools could be placed into the next glove-bag without cleaning or emptied into a bucket full of water. Any materials that cannot be cleaned and properly decontaminated should be disposed of as asbestos waste, including used rags, scrub brush, etc.

20. While the removed waste is located at the bottom of the glove-bag, twist the bag several times and tape over with duct tape. HEPA vacuum all surfaces and also suctions air out of the glove-bag.

21. Slip a 6-mil asbestos marked disposal bag over the glove-bag, while the glove-bag is still attached to the pipe. Remove duct tape and open the top of the glove-bag and fold it down into the disposal bag. Also, remove the disposal Tyvek suit and place inside the glove-bag.

22. Twist the top of disposal bag until closed, fold over in gooseneck style and seal with duct tape, without the outermost bag labeled according to OSHA, EPA, and DOT regulations.

23. With a clean damp cloth rag, wipe the exterior of the respirator and replace it with an appropriate respirator container or bag, and leave the immediate work area.

24. All asbestos containing waste must be disposed of in EPA approved landfill in accordance with USEPA regulations. Air monitoring and project management shall be conducted by a qualified person throughout the duration of the glove-bag and clearance following the work completion.

End of Glove-Bag Procedures.

END OF SECTION

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

General Notes:

The schedule for this abatement project shall be detailed in the notifications filed with the TDSHS. Work hours shall begin at 8:00 a.m. through 5:00 p.m. Monday through Friday, unless as otherwise ordered by the school district and/or the construction services division.

The chosen abatement contractor shall provide enough workers each day for the performance of the abatement work, in order to complete the project within the notification schedules to the TDSHS and these specifications.

Hours outside those mentioned above should be with the approval of the building Owner and the consultant.

The contractor shall provide his own OSHA mandatory personal compliance monitoring for his workers, in accordance with federal **(OSHA)** and TDSHS regulations, as well as these specifications. ***No Exceptions.***

BENAS may elect to perform OSHA personal compliance monitoring for the abatement contractor's personnel, if requested.

For Contractor to Perform Own OSHA Monitoring, the following shall Apply:

The contractor's air monitor technician to be utilized for the collection of personal air samples must be currently licensed and certified by the State of Texas **(TDSHS)**. The contractor shall monitor a minimum of 25% of his workers every day or shift throughout this project duration, per OSHA regulations and these specifications. All previous day's air sample results shall be ready and posted at the entrance(s) into the decontamination chamber prior to the start of abatement activities each day throughout the duration of this project. No abatement activities shall commence without the previous day's results. ***No Exceptions.***

A copy of the previous day's air samples results shall be made available to the consultant each day before the start of abatement operations.

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Calibration of the personal air sampling pumps shall be performed each day in the presence of the consultant.

Quality control protocol including blind recount, coefficient of variation for the PCM analyst shall be provided to the consultant each day prior to the start of abatement activities for that day. ***No Exceptions.***

Historical exposure data ***SHALL NOT*** be allowed for the documentation of worker exposure throughout the duration of this abatement project, in accordance with these specifications and the contract documents.

Contractor may use existing water and electricity from the site. A licensed electrician must supervise any and all electrical work that is required during the normal operation of the project. The work includes but is not limited to, insulating, or removing new or existing light fixtures and/or transformers; establishing temporary electrical service; or insulation of temporary lights. Also, the contractor shall provide all water hoses in OSHA approved connectors and accessories in order to provide water at the needed locations throughout the abatement project.

NOTE: If the owner is unable to provide electric power or water supply for this project, the contractor shall provide his/her own electric power by generators, etc. and adequate water supply for the abatement work.

** **A mandatory pre-construction meeting shall be held at the project site location prior to the start of abatement activities. The chosen abatement contractor's competent person, *On-Site Supervisor(s)* shall be in attendance at this meeting. This meeting can be scheduled on the same day as the start date for this abatement work in accordance with the notification schedules filed with the TDSHS and these technical specifications.**

END OF SECTION

Ephraim N. Okotcha "EO", License No: 10-5399 Ephraim Okotcha

GENERAL OVERVIEW

The purpose of this asbestos abatement project entails the complete removal of all designated friable and non-friable ACM in the interior and exterior surfaces, including the crawl space underneath the original buildings located at the L. L. Hotchkiss Elementary School facility. This abatement project involves the complete and total removal of all designated asbestos-containing building materials in and outside the buildings at this facility, which could impact scheduled renovation and/or demolition activities. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

All work shall be performed in compliance with these specifications, the United States Environmental Protection Agency **(USEPA)**, and National Emissions Standards for Hazardous Air Pollutants **(NESHAP**) Methods and Protocols. Also, Occupational Safety and Health Administration **(OSHA)**, Texas Asbestos Health Protection Rules/Act (**TAHPR**), Texas Commission on Environmental Quality **(TCEQ)**, and any other applicable federal, state, and local governmental regulatory agencies' requirements must be complied with. Furthermore, the recommendations of the National Institute for Occupational Safety and Health **(NIOSH)** with regards to respiratory protection program, the collection and analysis of air samples before, during and after the abatement work shall be strictly adhered to.

Finally, this project shall be completed strictly according to the detailed requirements of these specifications and the contract documents. In any event where the requirements of these specifications and contract documents are in conflict with applicable federal, state, or local regulations guiding the handling and abatement of ACM in the State of Texas, the most stringent requirements shall apply.

OBJECTIVES

The objective of this project is to safely remove all designated friable and non-friable ACM in the interior and exterior, plus the crawl space underneath all original buildings located at the L. L. Hotchkiss Elementary School facility. The identified building materials which contain regulated asbestos at this facility include but are not limited to friable ACM Thermal Systems Insulation **(TSI)** on Elbows, T-Fitting Mud Packs, and Pipe-Runs; non-friable ACM Plaster Ceiling; non-friable ACM Floor Tiles and Black Mastic **(FT/BM)**; friable and non-friable ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic **(DOT Mastic)**; and non-friable ACM Chalk Board Black Mastic and Sealant **(Sealant)**.

Also detected and present in these buildings are non-friable ACM Caulking on Cabinet Works **(Caulking)**; non-friable ACM Sealer on Sink Putty **(Sealant)**; non-friable ACM Caulking and Glazing Compounds on Interior and Exterior Windows **(Caulking and Glazing)**; non-friable ACM Caulking on Interior and Exterior Door Frames **(Caulking)**; and non-friable ACM Caulking and Sealant on Exterior Building Penetration Joints **(Sealant)** located throughout the buildings at this facility.

Effort shall be made to:

1. Remove all specified ACM from the above-described property interior areas.

2. Prevent any person or persons from inhaling asbestos fibers.

3. Prevent any asbestos contamination of adjacent work areas, and the general environment throughout the project duration.

4. Ensure all asbestos wastes are disposed of completely and properly and to provide the Owner with documentation indicating proper disposal.

5. Maintain a safe working environment throughout the duration of the project.

6. Accurately document all project activities.

2.0 CONTRACTOR'S RESPONSIBILITIES

All abatement contractors are directed to carefully examine these specifications prior to bidding and before the start of abatement operations, as well as during the course of asbestos abatement activities to ensure that adequate resources are devoted to meet the approved schedules, contract documents, notifications, and these specifications. The chosen asbestos abatement contractor is responsible for carefully examining the site conditions and all quantities prior to the start of abatement work. Failure to verify all quantities and site conditions shall not relieve the contractor the obligation and responsibility to complete this abatement project as specified in the contract documents and these specifications.

2.1 Coordination with Independent Testing Laboratory

A. The asbestos abatement contractor shall fully cooperate with the independent testing laboratory **(Consultant)** personnel in providing access to all work locations.

B. The contractor shall furnish incidental labor facilities to:

   i) Provide access to all work locations to be tested and

   ii) Facilitate inspections and testings.

C. The contractor shall notify the testing laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

D. Payment for laboratory time if the work area is not ready for testing when scheduled shall be at the contractor's expense. Laboratory’s time and materials expenses shall not exceed $125.00 per hour, or $1,000 for an eight-hour work shift.

2.2 Notification

The contractor is responsible for ensuring that proper notifications have been filed with all regulatory agencies having authority over proposed abatement work, including but are not limited to the city, county, state, and/or federal agencies, especially the TDSHS. The building Owner, the consultant and/or the abatement contractor can file the necessary notification schedules to the TDSHS; however, the Owner is responsible for the payment of notification fees to the TDSHS.

2.3 Materials and Equipment

The contractor shall provide all items, articles, materials, operations, or methods listed or mentioned, including all labor, materials, equipment, applicable permits and notifications, and all incidentals necessary and required for their use to complete the abatement work specified in the manner and time specified. The contractor shall supply all protective equipment **(protective clothing, respirators, cover glasses, steel toe boots, etc.)** for all personnel entering any area exposed to asbestos dusts, including the Owner, personnel of the testing laboratory and authorized visitors.

2.4 Contractor's Effort

The contractor shall provide all personnel; equipment, supplies and facilities necessary to complete this project as specified in the detailed Scope of Work for this project **(See Scope of Work)*.***

2.5 Personnel

2.5.1 Supervisor

A. The on-site supervisor(s) must be currently licensed with the State of Texas Department of State Health Services to manage any asbestos abatement operations for this project.
B. The supervisor(s) must be present at the project site 100% of the time during the active removal phase of this project. Also, the supervisor **SHALL** enter into the containment work area enclosure at least 25% of the time during active removal operations, in accordance with TDSHS regulations and these specifications.

2.5.2 Employee Conduct

A. Dallas ISD Policies and Procedures regarding Safety and Communications shall be in force at all times during this abatement project. Dallas ISD Safety Guidelines shall be strictly adhered to, throughout the duration of this project. Any employee whose conduct is offensive to the Owner or the consultant, or any employee apprehended on Owner-owned or controlled property with alcoholic beverage, or any form of controlled substance on his person, or is suspected of having consumed the same will be brought to the attention of the contractor's on-site supervisor. The supervisor shall take immediate action(s) appropriate to the circumstances. Such action(s) shall include but are not limited to dismissal from the premises.

B. Any person found to be deliberately disposing of asbestos waste in any manner other than those outlined in these specifications, or who is recklessly exposing himself, fellow employees, or the general public to asbestos materials, or engaging in activities that are unnecessarily hazardous to himself, fellow employees, or the general public shall be brought to the attention of the contractor's supervisor. The supervisor shall take immediate action(s) appropriate to include but are not limited to dismissal from the premises.

C. Smoking, eating, drinking or the application of cosmetics within the restricted work areas during active abatement operations are prohibited and shall not be permitted.

2.6 Temporary Facilities and Controls

2.6.1 Water for Construction

The Owner may provide water to be used during the abatement project. The contractor shall provide temporary facilities or other items required to properly transport the water to the location(s) where it is needed, including water hoses and airless sprayers where necessary.

If the Owner is unable to provide water for construction or abatement operations, the contractor shall provide own water for all construction activities during this project in accordance with the contract documents and these specifications.

2.6.2 Electricity for Construction

The Owner may provide electric energy as required for all branches of the work, to operate equipment and to provide artificial lighting. The contractor shall provide temporary wiring and outlets as required. All electrical sources must be equipped with ground fault interrupter system **(GFI)**. If the Owner is unable to provide electric energy **(power)** for construction or abatement operations, the contractor shall provide own electrical energy **(power)** for all construction activities during this project in accordance with the contract documents and these specifications. Any electrical work that is required during the normal operation of this project must be conducted and supervised by licensed electricians. The work includes but is not limited to insulating or removing new or existing light fixtures and/or transformers; establishing temporary electrical services; or insulation of temporary electrical fixtures.

2.6.3 Handling Materials

The contractor shall properly care for and protect materials and equipment at the job site. Placement of building materials and equipment at the site shall be subject to the approval by the Owner.

2.6.4 Cleaning

The contractor shall keep the premises clean at all times during the abatement operations. Upon completion of all abatement activities, the contractor shall ensure that the areas surrounding the project are in a neat and clean condition as approved by the Owner.

2.6.5 Barricades, Walkways and Work Area Barriers

The Contractor Shall:

1) Maintain adequate barricades and enclosed walkways at all times to protect the workmen and the general public from injury.

2) Erect and maintain containment work areas with full three-stage wet decontamination facilities, which shall include an equipment room **(dirty room)**, shower room and a clean room, plus a bag-out chamber.

   The decontamination chambers shall be constructed with two layers of 6-mil fire-retardant resilient polyethylene sheeting barriers to prevent access to any asbestos dusts and/or materials at the work areas. Any barriers that may be visible to the general public shall be covered with 6-mil Black Polyethylene Sheeting. **No Exceptions**.

3) Upon completion of the abatement work at any and all location(s), the contractor shall remove all polyethylene sheeting barriers and all other items from the project site.

2.6.6 Signs

A. No signs or advertisements shall be displayed without the approval of the Owner.

B. The location of the signs if any, must be approved by the Owner and/or Consultant working for the Owner.

2.6.7 Security

The Contractor shall provide adequate security to ensure that:

1. Restricted asbestos abatement areas are not entered by unauthorized persons.

2. Unauthorized persons are prevented from access to any asbestos-containing waste materials.

4) Every person who enters any restricted asbestos abatement Work areas is logged in and out.

2.6.8 Asbestos Waste Storage

Asbestos waste must be removed daily from the abatement areas. Temporary on-site storage of waste near and/or within the immediate abatement areas will be permitted in containers secured from the general public **(truck, dumpster, etc.)**. Asbestos wastes **(bags, drums, etc.)** shall not be stored in direct contact with the ground.

2.6.9 Restrooms

The Owner's restroom facilities shall not be available for the abatement contractor's use for this project. The contractor shall provide own rest room throughout the duration of this project.

2.6.10 Notifications, Permits, Warning Signs, Labels and Posters

The Contractor shall perform the following tasks:

1) Ensure proper notifications to the TDSHS and any other federal, regional, state, and/or local authorities having jurisdiction over the project within time frames specified by the individual authority.

2) The Owner is responsible for the payment of necessary notification fees to TDSHS.

3) Secure all the permits and exemptions required for the work, including disposal of asbestos in an approved landfill.

4) Provide the names, addresses and telephone numbers of approved waste disposal site(s). Provide signed copies of hazardous waste disposal manifests issued by the TCEQ which document proper waste disposal in the State of Texas and deliver original copies to the Owner during close-out following the completion of the abatement project.

5) Erect warning signs around the work areas, and also at every potential point of entry into the restricted work areas from the outside. The warning signs shall be a bright color so that they will be easily noticed. The size of the sign and the lettering shall be no less than OSHA requirements.

6) Label all plastic bags and drums utilized to transport contaminated material(s) to the landfill as required by regulations. Provide any signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn the general public (people) of the hazards from asbestos exposure.

<u>All signs shall be in English and Spanish Languages:</u>

a. Per OSHA Regulations: 29 CFR 1926.1101, warning signs shall Read:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

b. Per OSHA Regulations: 29 CFR 1926.1101, warning signs shall Read:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

c. Per U.S. Department of Transportation, warning labels shall Read:

R Q HAZARDOUS
SUBSTANCES,
SOLID, NOS,
ORM-E, NA 9188
(ASBESTOS)

2.6.11 Emergency Precautions

A. The Contractor shall establish emergency exits from the work area.

B. The Contractor shall be prepared to administer first aid to injured personnel after decontamination from the exclusion zone. Seriously injured personnel shall be treated immediately or evacuated without decontamination. When an injury occurs, the Contractor shall stop work and implement fiber reduction techniques **(e.g., amended water spraying and hosing down)** until the injured person has been removed from the work area(s).

2.6.12 Respiratory Protection

The minimum respiratory protection requirements for this project are summarized as follows:

1. Air Purifying Respirators may be used (**negative pressure-demand half-face or full-face masks only)** where the concentration of fibers in the work area may reasonably be expected not to exceed 0.010 fibers per cubic centimeter of air **(0.010 f/cc)**. The protection factor for the half-face mask shall be 10, in accordance with NIOSH, OSHA Standards and these specifications.

2. Powered Air Purifying Respirators **(PAPRs)** may be used where the concentration of fibers in the work area may reasonably be expected not to exceed 0.100 fibers per cubic centimeter of air **(0.100 f/cc)**. The protection factor for the PAPR shall be 1,000, in accordance with NIOSH, OSHA Standards and these specifications.

3. Type "C" Positive Supplied Air or Self-Contained Breathing Apparatus **(SCBA)** air with continuous flow or pressure demand clasp must be used where fiber concentration in the work area can reasonably be expected to exceed 3.00 fibers per cubic centimeter of air **(3.00 f/cc)**.

NOTE: The above-described respiratory protection is based on an eight-hour time-weighted average **(TWA)** or a ceiling concentration.

1. If any air samples collected during the abatement process have elevated fiber levels in excess of the limits permissible for the type of respirator being used, respiratory protection must be upgraded. All abatement activities shall be stopped until fiber concentration in that work area is brought down to acceptable levels. It is the responsibility of the contractor to secure enough and approved respiratory protective devices available to complete the abatement project on schedule for any foreseeable contingency.

2. If Type "C" Supplied Air or SCBA type Respirator is used, at least two spare units provided by the contractor shall be available at all times for use in the case of emergency, and/or by the Owner, Owner's Representative, or any other authorized personnel.

The Type "C" Respirator shall be worn with a belt to minimize the possibility of dislocating the facemask when the hose is snagged in the work area.

2.6.13 Disposal Activities

A. It is the responsibility of the contractor to determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The contractor must comply fully with these regulations and all United States Department of Transportation **(USDOT)**, State, Local and USEPA requirements, especially waste handling requirements stipulated by the TCEQ.

B. All containers of asbestos wastes shall be decontaminated prior to loading onto the vehicle transporting the material to the landfill. Wastes shall be bagged inside the contained or restricted work area and placed in a second bag or drum, which must be decontaminated in the contamination-reduction zone **(the decontamination unit)** before transfer into the dumpster. Alternative methods shall be considered if shown as effective as this method.

C. The contractor shall dispose of asbestos waste from this project in landfills approved by the TCEQ as authorized disposal facilities for asbestos. All double-bagged ACM waste must be marked with the "Originator's **(Owner)** name, address and telephone number. The contractor shall employ only a licensed asbestos transporter for this effort. Disposing or attempting to dispose of asbestos waste via sanitary sewers, city waste systems or by placing in unoccupied area is prohibited and will be grounds for immediate cessation of work under this contract until the material is recovered and disposed of correctly and disciplinary actions are taken.

D. The contractor shall document actual disposal of the waste at the designated landfill by completing all asbestos waste disposal manifests and appropriate chains-of-custody and forwarding the originals to the Owner during close-out following the completion of the project.

C. **Scaffolding:** Scaffolding as required to accomplish the specified work shall meet all applicable safety regulations, especially the OSHA standards.

2.7 Execution

2.7.1 Pre-Asbestos Abatement Preparations

A. Prior to any abatement work in any area, the contractor shall seal-off the entire work area to anybody other than trained personnel and authorized visitor(s); erect signs around the perimeter in accordance with USEPA, NESHAP, OSHA, TDSHS and these specifications; and maintain a log of all people entering and exiting the workplace.

B. Thoroughly decontaminate through wet cleaning and/or HEPA vacuuming all equipment and supplies used during the course of the abatement project.

2.7.2 Utilities

The contractor shall provide all necessary connections for temporary utilities in the workplace during the abatement work. Temporary electrical power shall be utilized in accordance with OSHA and Electrical Code for Wet Environment.

2.7.3 Asbestos Removal

A. All ACM shall be removed according to the stipulations of these specifications.

B. Immediately following removal, the wetted asbestos shall be packed into labeled six-mil plastic bags to prevent the material from drying. The excess air in the bags should be exhausted in the work area prior to sealing the bags.

Pack and seal all bagged materials in drums and/or containers which are also labeled or alternatively sealed in double bags of six-mil plastic. Thoroughly clean the exterior of the bags or sealed drums prior to loading onto the truck for transportation to the landfill. Alternative procedures must be approved in writing by the consultant before work starts.

C. Disposal shall be in a landfill meeting USEPA, Department of Transportation **(DOT)**, TDSHS and TCEQ requirements. The contractor shall not throw bags into the landfill in a manner that may cause the bags to burst open. If the bags cannot be taken out of the drums undamaged, then include the disposal of the drums with the bags. Ensure that the bags are not opened in the process.

D. All used plastic, tapes, cleaning materials; clothing and filters shall be treated and disposed of as asbestos waste materials.

2.7.4 Final Asbestos Decontamination

After the removal of asbestos has been completed and before the removal of any barriers, the entire work area shall be thoroughly wet-cleaned and/or vacuumed with HEPA filtered vacuum cleaners. All equipment used in the work areas such as scaffolds, ladders, vacuum cleaners, masks, hard hats, etc., shall be thoroughly decontaminated through wet cleaning, HEPA vacuumed prior to removal from the work area.

After detailed cleaning has been completed, the consultant shall perform a visual inspection to ensure that all ACM and contaminated debris have been properly removed and the entire restricted work area is clean.

NOTE: It should be stated that abatement work area fiber levels are counted according to the recommended A-Counting Rules of the NIOSH 7400 Methods. These methods do not distinguish between asbestos and non-asbestos fibers.

When the Owner's representative **(Consultant)** certifies that the containment work area enclosure is acceptable in writing, the contractor may dismantle the remainder of the barricades. The tape barricades shall be disposed of as asbestos waste.

2.7.5 Post-Abatement Submittals

The contractor shall provide a final report which contains signed copies of the hazardous waste disposal manifests, OSHA mandatory personnel compliance air monitoring records, copies of required insurance certificates, and copies of the daily project logs. A copy of the contractor's final report shall be made available to the consultant and the building Owner.

3.0 LABORATORY RESPONSIBILITIES

Except as otherwise specified the Owner shall separately employ the services of an Independent Testing Laboratory **(Laboratory)** to perform sufficient ambient air monitoring to determine if the contractor is complying with the requirements of these specifications, as well as federal, state, and local regulations guiding asbestos handling and abatement in the State of Texas. Teaming arrangements between the abatement contractor and the testing laboratory are permitted in this circumstance, but separate employment by the Owner is required.

The laboratory shall perform air monitoring and testing during abatement work and cleaning operations. A Texas licensed asbestos PCM Laboratory shall analyze all the abatement work area samples.

1. The laboratory shall conduct air monitoring in accordance with the method prescribed by Section 1926.1101 of the OSHA regulations.

3.1 Laboratory Duties

A. Cooperate with the Contractor; provide qualified personnel after due notice.

B. Perform specified ambient air sampling and testing; comply with specified standards **(See Section 7.0)**; and ascertain compliance of materials and work procedures with requirement of the contract documents and technical specifications.

C. Promptly notify the contractor and the Owner of observed irregularities or deficiencies of work or products.

D. Stop all abatement operations if gross negligence and irregularities are observed, or for non-compliance with regulated, recommended and/or applicable work practices and procedures, as well as these specifications.

E. Promptly submit written report of each test and inspection; one copy to Owner and contractor. Each report shall include:

1. Date Issued.

2. Project title, number and building identification.

3. Laboratory name, address, and telephone number(s).

4. Name and signature of a laboratory inspector and/or microscopist.

5. Date and time of sampling or inspection.

6. Location of sample or test in the project.

7. Type of inspection or test.

8. Results of tests and compliance with Contract Documents.

F. Perform additional tests as required by the Owner.

3.2 Authority of the Laboratory

The Laboratory is authorized to:

1. Release, revoke, alter or enlarge on the requirements of the scope of work and applicable specifications;

2. Approve or accept any portions of the work.

4.0 OWNER'S RESPRESENTATIVE (CONSULTANT)

4.1 Pre-Asbestos Abatement Preparations

The consultant shall inspect the work site prior to the commencement of abatement activities to document conditions which might adversely impact the contractor's ability to meet his obligations.

4.2 Authority to Stop Work

The Owner or Owner's representative **(Consultant)** has the authority to stop the abatement work at any time he determines that conditions are not within the specifications and applicable regulations. The cessation of work shall continue until conditions have been corrected; and corrective steps have been taken to the satisfaction of the consultant. Standby time required to resolve violations shall be at the contractor's expense.

5.0 PROJECT COORDINATION AND PROCEDURES

5.1 Project Coordination

The contractor shall provide a full-time Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, and disposal procedures in the State of Texas. This person is the Competent Person as set forth in OSHA 29CFR 1926.1101 and is the contractor’s representative responsible for compliance with all applicable federal, state, and local regulations and must meet the criteria for the TDSHS licensing requirements.

Also, this person must have had a minimum of five (5) years of on-the-job experience and meet any additional requirements set forth in OSHA 29CFR 1926.1101 as amended June 29, 1998, or thereafter.

5.2 Special Reports

Except as otherwise indicated, the superintendent shall submit special reports directly to the consultant within one-hour of occurrence requiring special attention with a copy to the building Owner and all others affected by the special occurrence.

5.3 Reporting Unusual Events

When an event of unusual nature occurs at the site, the superintendent shall prepare and submit a special report listing the chain of events, persons participating, and response by contractor's personnel, evaluation of results or effects, and similar pertinent information. If such an event(s) is known or predictable in advance, the contractor's superintendent shall advise the consultant at the earliest possible time.

5.4 Reporting Accidents

The superintendent shall prepare and submit reports to the consultant of accidents on site. Record and document data and action; and comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

5.5 Contingency Plans

The superintendent shall prepare contingency plans for emergencies including fire, accidents, power failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in the plan's specific procedures for decontamination or work area isolation. ** Note that nothing in these specifications shall impede existing safety or the pursuit of adequate medical attention in the event of an emergency.

5.6 Emergency Numbers

The superintendent shall provide emergency numbers to the consultant during pre-construction meeting and post them in room of contractor's staging area; on heavy equipment and other approved locations as applicable. Telephone numbers and locations of emergency services including but are not limited to fire, ambulance, doctor, hospital, police, power-generating company, telephone company, and poison control center.

5.7 Submittals

Prior to the start of work, the superintendent shall submit the following to the consultant for review. No work shall begin until these submittals are reviewed and returned by Owner.

1. Contingency Plans for emergency actions
2. Telephone numbers and locations of emergency services
3. Notifications to be sent to entities at the work site
4. Copy of notifications filed with all appropriate authorities
5. Construction schedule and plan of action
6. Other abatement submittals

6.0 OTHER

General Applicability of Codes, Regulations and Standards

Except to the extent that more explicit or stringent requirements are directly specified in the contract documents, all applicable codes, regulations, and standards have the same force and effect. They are also made a part of the contract documents by reference as if they are copied into it, or as if published copies are bound here with.

Applicable Publications

The publications listed below form a part of these specifications by reference and are as if copied into it and the contract documents. The publications are referenced in text by basic designation only.

1. **Environmental Protection Agency (EPA):** Regulations for Asbestos (Code of Federal Regulations Title 40, Part 61).

2. **Occupational Safety and Health Administration (OSHA):** Asbestos Regulations (Code of Federal Regulations Title: 29CFR, Part 1926.1101).

3. **National Institute for Occupational Safety and Health (NIOSH):** "Respiratory Protection....A Guide for the Employee"....

4. **American National Standards Institute (ANSI):** Z86.1-1973...Commodity Specification for Air...

5. **Code of Federal Regulations (CFR):**

    a. ***29 CFR 1926.1101***, Occupational Safety and Health Act **(OSHA)**.

    b. ***20 CFR 1910.20, Subpart C***, General Safety and Health Provisions.

    c. ***40 CFR 61, A and B;*** U.S. Environmental protection Agency Regulations for Asbestos.

    d. ***40 CFR 61, Part III***; National Emission Standards for Hazardous Air Pollutants; Asbestos **NESHAP** Revision; Final Rule, November 20, 1990.

    e. 34 CFR 61, Parts 230 and 231, Appendix B, Procedures for Containing and Removing Building Materials Containing Asbestos: Federal Register, Volume 45, N0. 182, Page 61961, September 17, 1980.

6. ***Texas Department of State Health Services***, Division of Occupational Health, Texas Asbestos Health Protection Rules, May 29, 1998, Texas Civil Statutes, Article 4477-3a, Section 12.

7. Resilient Floor Covering Institute Recommended Work Practices for the Removal of Resilient Floor Coverings and Addenda, July 1990.

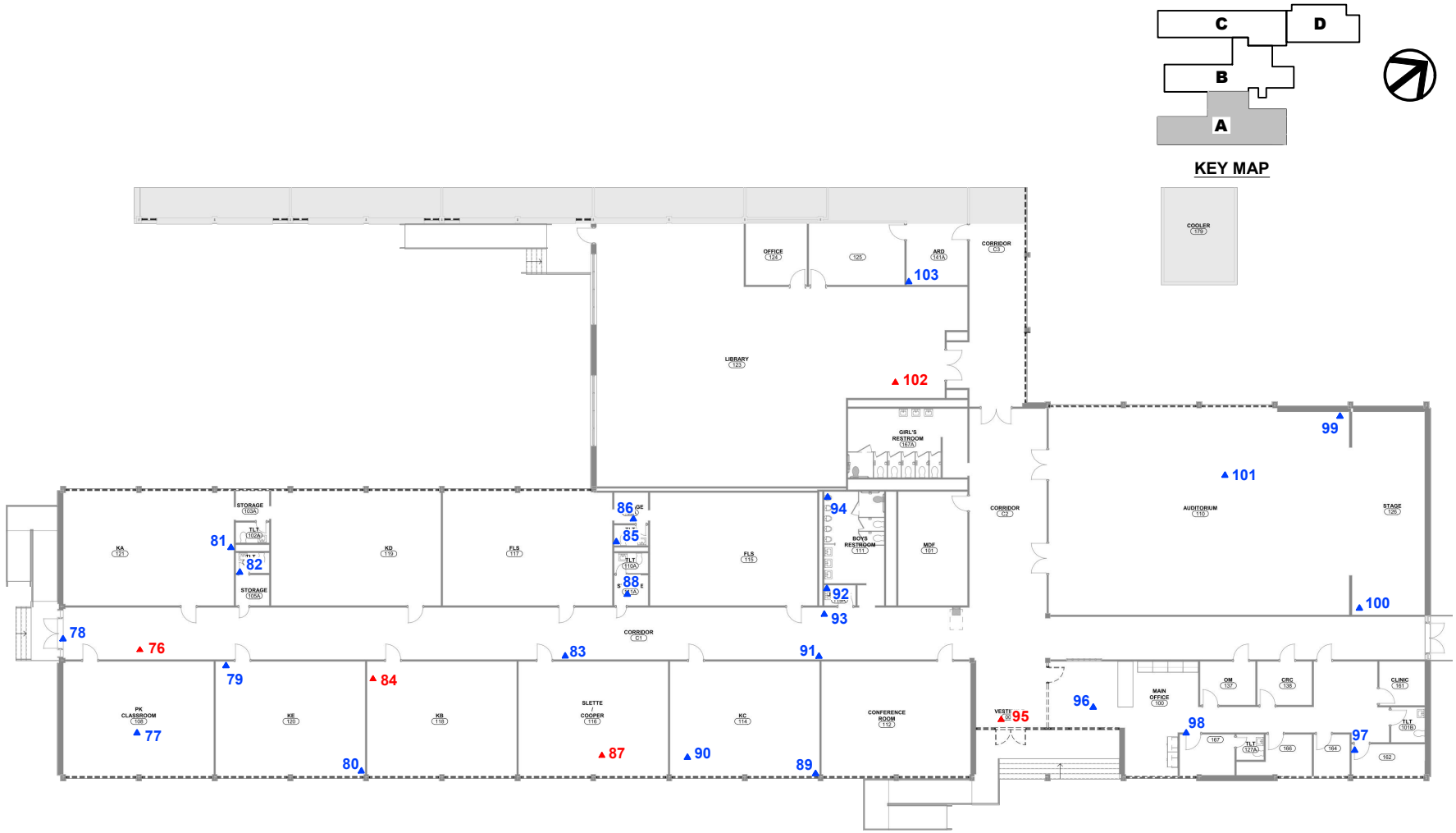
8. ***Texas Commission on Environmental Quality***

    Municipal Solid Waste Division; 30 TAC 330.136(b) (3) pertaining to non-friable Asbestos-Containing Building materials 'Must go to an approved Landfill'.

RESULTS OF LABORATORY TEST AND ANALYSIS OF BULK SAMPLES BY POLARIZED LIGHT MICROSCOPY AND CHAIN-OF-CUSTODY FORMS

COMPUTER AIDED DESIGN DRAWINGS (CADD) FOR THE ABATEMENT WORK AREAS WITH QUANTITIES OF THE ACM

PHOTOGRAPHIC DOCUMENTATION OF REPRESENTATIVE BULK SAMPLES COLLECTED AND ANALYZED



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT A

FIGURE 1

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

BENAS Environmental Services, Inc.

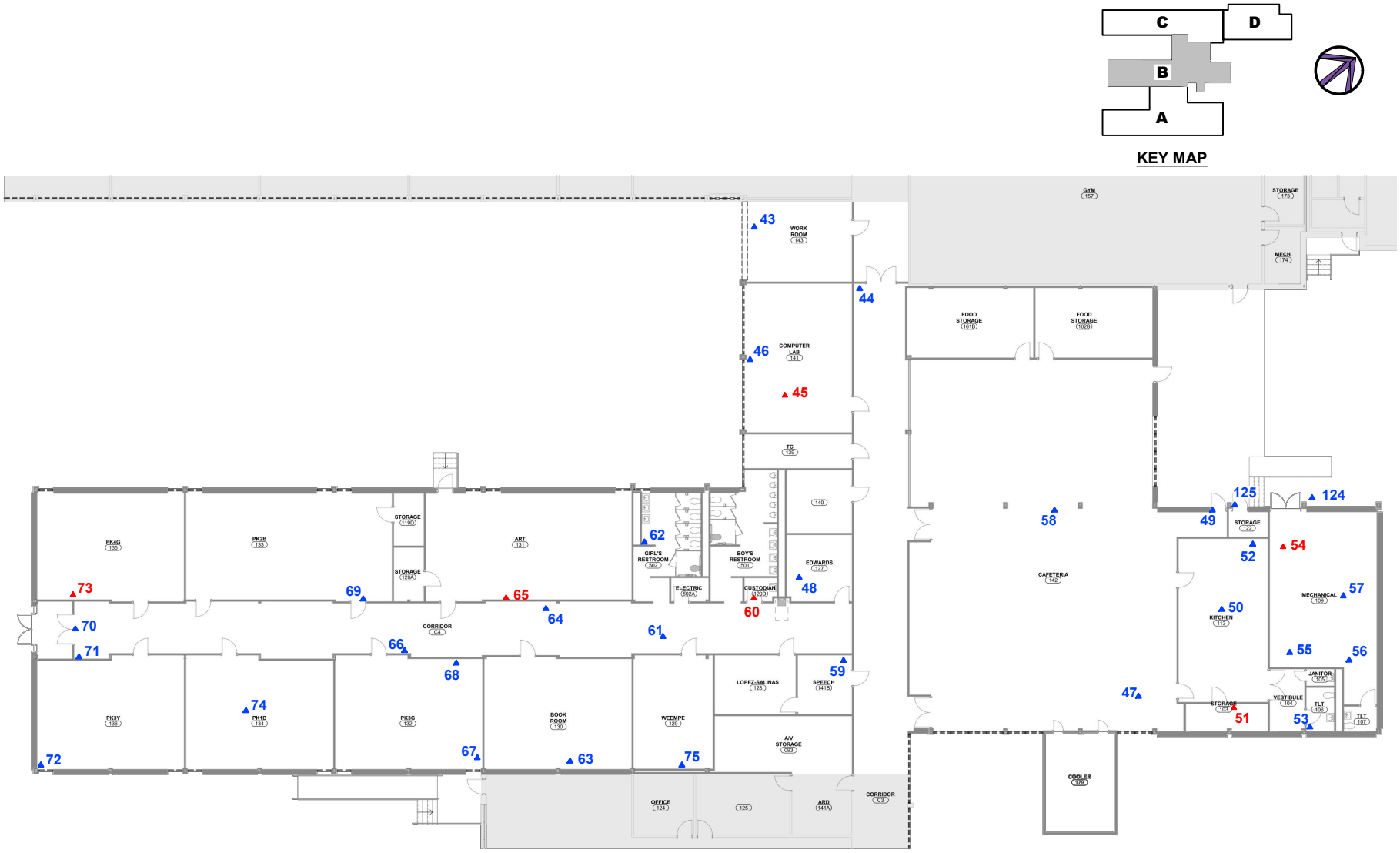
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019

PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT B

FIGURE 2

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

BENAS Environmental Services, Inc.

ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019

PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

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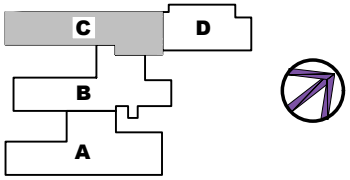
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 1 - UNIT C

FIGURE 3

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

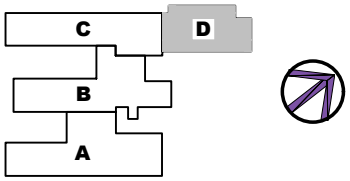
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- Non-ACM Sample
- ACM Sample

LEVEL 1 - UNIT D

FIGURE 4

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

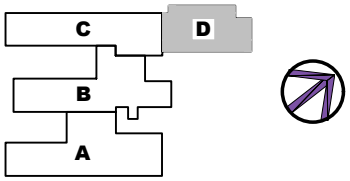
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

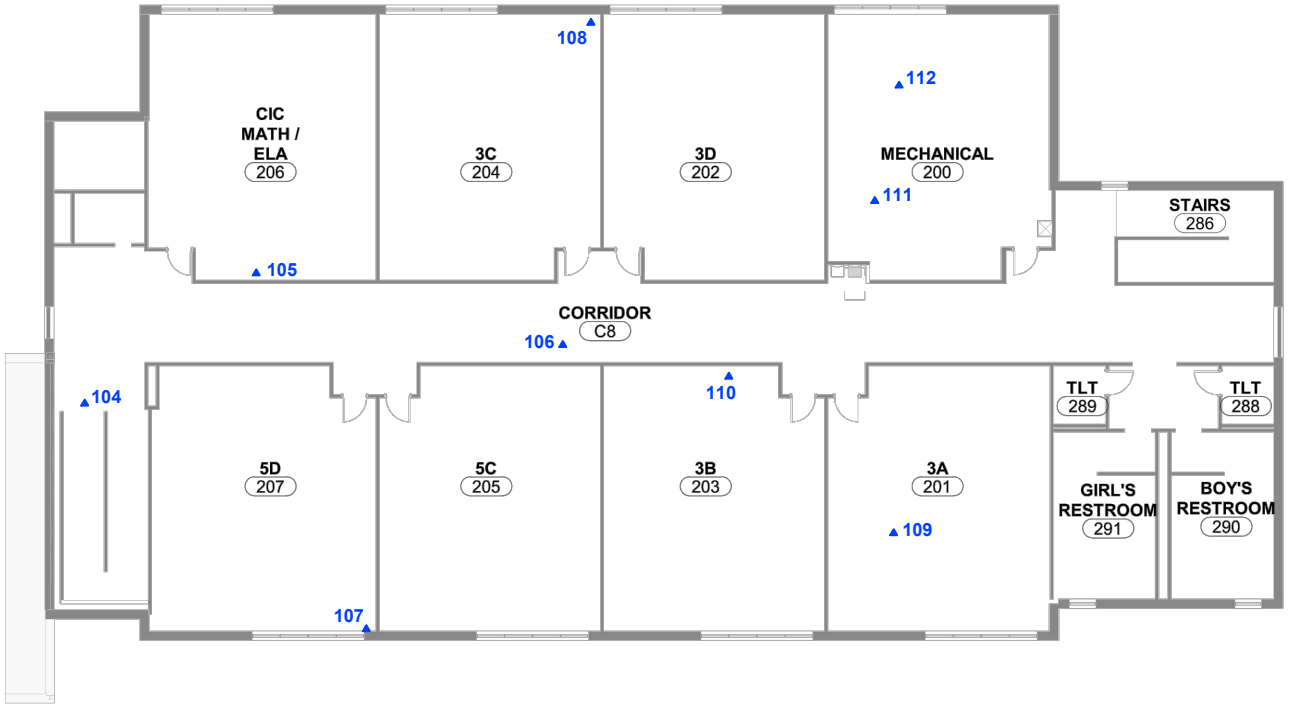
APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



KEY MAP



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

LEVEL 2 - UNIT D

FIGURE 5

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

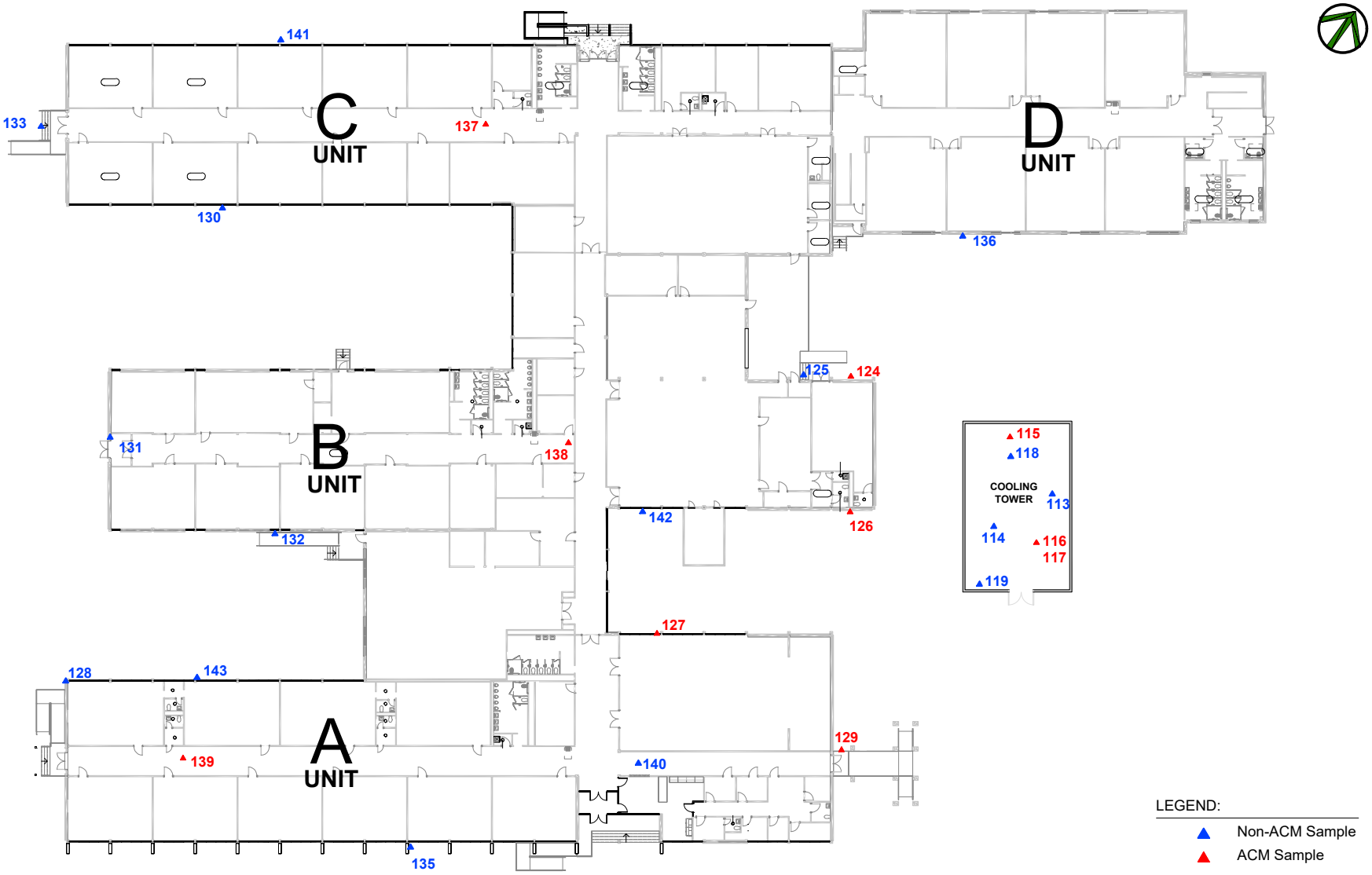
BENAS Project No.: BA-24-1703

BENAS
Environmental Services, Inc.
ENVIRONMENTAL CONSULTANTS
P.O. BOX 739
COPPELL, TEXAS 75019
PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399



LEGEND:

- ▲ Non-ACM Sample
- ▲ ACM Sample

COOLING TOWER, BUILDING EXTERIOR & CRAWLSPACE

FIGURE 6

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

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APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
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Prepared by: BENAS Environmental Services, Inc. 10-0173
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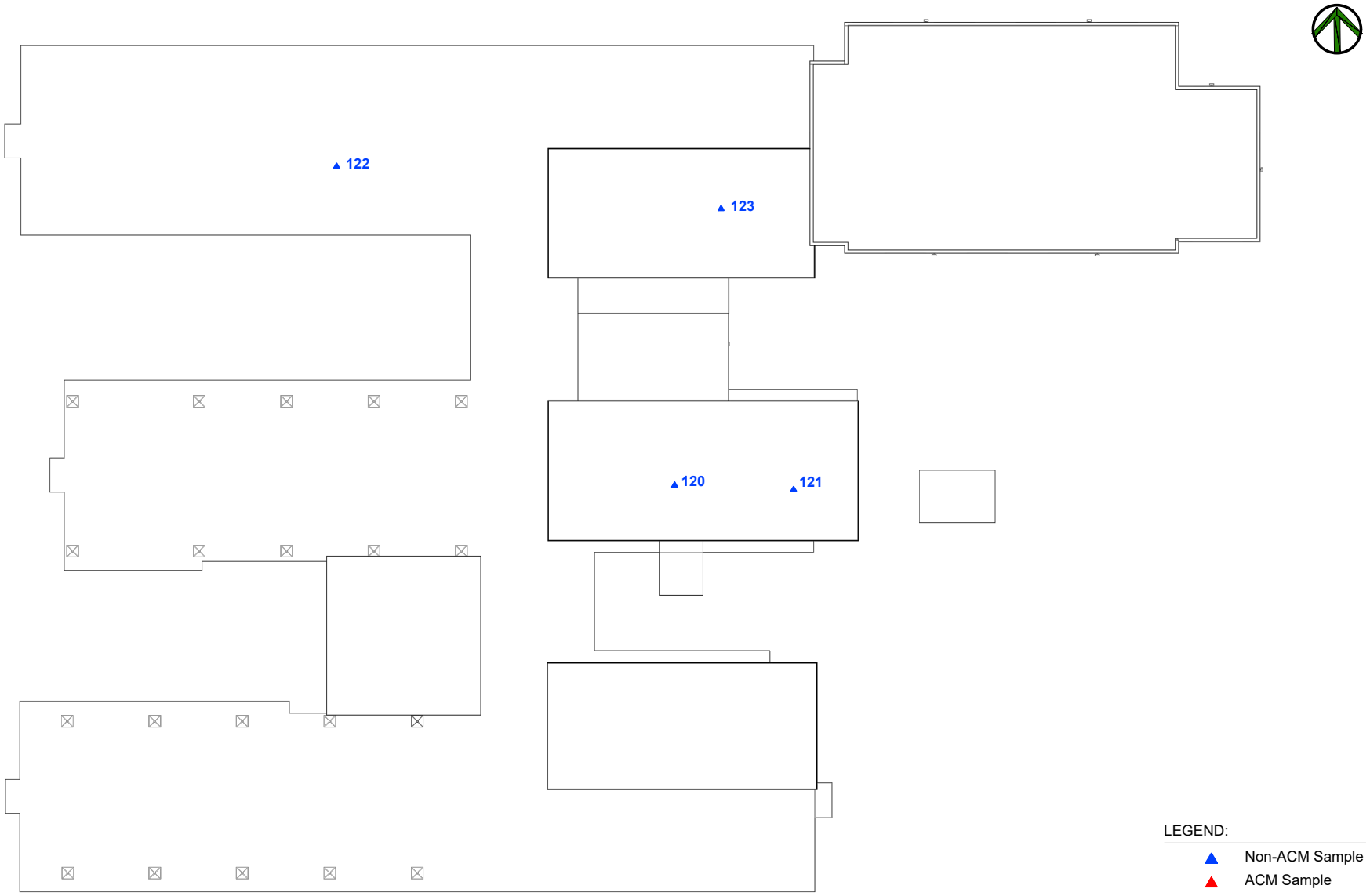

LEGEND:

- Non-ACM Sample
- ACM Sample

ROOF

FIGURE 7

Comprehensive Asbestos-Containing Building Materials Investigation

L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

BENAS Project No.: BA-24-1703

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PHONE: (972) 393-0128 FAX: (972) 393-0793

APPROXIMATE SAMPLE LOCATIONS MAP

Prepared for: Dallas Independent School District (DISD)
Attention: Mr. Terrance Mack, Design Manager
CBRE/VANIR Joint Venture

Prepared by: BENAS Environmental Services, Inc. 10-0173
Ephraim N. Okotcha "EO" Texas Licensed Consultant:10-5399

PLM REPORT SUMMARY

Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307241	1	Off-white 12" X 12" Floor Tiles & Mastic - Hallway, Double Doors Exit underneath Foot Mat	None Detected - Floor Tile None Detected - Black Mastic
CL1307242	2	1' X 1' Stick-on Ceiling Tiles & Dot Mastic - Classroom 155, Center Section	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1307243	3	Wood Cove Base Sealant - Hallway outside Classroom 154	None Detected - White Sealant
CL1307244	4	White 2' X 2' Drop Ceiling Tiles - Classroom 152 North Section	None Detected
CL1307245	5	Student Locker Caulking - Hallway outside Classrooms 152 & 150	None Detected
CL1307246	6	Interior Window Caulking - Classroom 153 Back North Window at Frame	None Detected
CL1307247	7	Cabinet Caulking - Classroom 150 Front Section at Cabinet Works	None Detected
CL1307248	8	Interior Window Glass Glazing - Classroom 151 Extreme Southwest Section at Window Glass Pane	None Detected
CL1307249	9	1' X 1' Stick-on Ceiling Tiles & Dot Mastic - Classroom 148, Front Entry Section	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1307250	10	Off-white 12" X 12" Floor Tiles & Mastic - Classroom 149, Back Southeast Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1307251	11	Transition Door Strip - Classroom 146, Entrance Doorway	None Detected - Transition Strip None Detected - Yellow Mastic
CL1307252	12	White Plaster Wall - Classroom 146, Front Entry above Cabinet Works	None Detected - Paint Layer None Detected - Plaster
CL1307253	13	Furr Down Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 146, Back Northwest Corner at Furr Down	None Detected - Paint Texture
CL1307254	14	Building Joint Sealant - Classroom 144A at Back Wall	None Detected - White Sealant
CL1307255	15	Spray-applied Ceiling Texture - IDF Room Front Entrance Section at Ceiling	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

PLM REPORT SUMMARY

Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307256	16	Mastic underneath Black Rubber Cove Base - Classroom 144A, Back Southeast Section	None Detected - Cove Base None Detected - Tan Mastic
CL1307257	17	Interior Window Caulking - Boys' Restroom Back Window near Urinals	None Detected
CL1307258	18	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Boys' Restroom Entrance Section near Hand Wash Basins	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound
CL1307259	19	Wall Ceramic Tile & Grout - Boys' Restroom Back Exit Doorway at Extreme Corner	None Detected - Ceramic Tile None Detected - Grout
CL1307260	20	Floor Ceramic Tile & Grout - Boys' Restroom 2nd Stall	None Detected - Ceramic Tile None Detected - Grout
CL1307261	21	Ceramic Cove Base Sealant - Hallway near Custodial Closet 159A at Column	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1307262	22	Student Locker Caulking - Hallway, between Classrooms 144 & 146	None Detected
CL1307263	23	White Wall Ceramic Tile & Grout - Faculty Lounge Room 156 Restroom	None Detected - Ceramic Tile None Detected - Grout
CL1307264	24	Grey-ish Floor Ceramic Tile & Grout - Faculty Lounge Room 156 Restroom	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1307265	25	White 2' X 2' Drop Ceiling Tile - Faculty Lounge Room, Center Section	None Detected
CL1307266	26	Transition Door Strip - Gymnasium, Equipment Storage Room at Door Strip	None Detected - Transition Strip None Detected - Yellow Mastic
CL1307267	27	White CMU & Mortar - Gymnasium, Electrical Room 157A Back Corner	None Detected - Paint Layer None Detected - CMU Block None Detected - Mortar
CL1307268	28	Interior Brick & Mortar - Gymnasium, Extreme Northwest Corner at Front Wall	None Detected - Paint Layer None Detected - Mortar

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1307269	29	White Plaster Ceiling - Custodial Closet 159A Front Section at Ceiling	3% Chrysotile - Tan Caulking None Detected - Paint Layer None Detected - Plaster
CL1307270	30	Carpet Mastic - Executive Office 159 Middle North Section	None Detected - Carpet None Detected - Yellow Mastic
CL1308602	31	Transition Door Strip - Hallway at Doorway to Reading Laboratory Room 160	None Detected - Transition Strip None Detected - Yellow Mastic None Detected - Floor Tile None Detected - Yellow Mastic
CL1308603	32	White Wall Texture, Joint Compound, & Sheetrock Mud - Lobby Entrance to New Wing Building	None Detected - Paint Texture
CL1308604	33	Off-white 12" X 12" Floor Tile & Mastic - Classroom 162, Extreme Southeast Corner underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1308605	34	White 2' X 2' Drop Ceiling Tile - Classroom 165, Center Section	None Detected
CL1308606	35	Black Sink Putty - Classroom 164, Front Wall underneath Hand Wash Basin	None Detected
CL1308607	36	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 69, Extreme Southeast Corner at Wall	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308608	37	White 2' X 2' Drop Ceiling Tile - Hallway between Classrooms 166 & 167	None Detected
CL1308609	38	Metal Duct Work Vibrations Isolator (expansion booth) - Mechanical 1 Room 168	None Detected
CL1308610	39	White TSI Wrap & White Mastic - Mechanical 1 Room 168	None Detected - White Mastic None Detected - Wrap None Detected - Insulation

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308611	40	Transition Door Strip - Doorway Entrance to Custodial Closet	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308612	41	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Girls' Restroom, Extreme Southeast Corner at Ceiling	None Detected - Paint Layer None Detected - Paper None Detected - Wallboard Material
CL1308613	42	Wall Ceramic Tile & Grout - Men's Restroom at Junction behind Dresser	None Detected - Ceramic Tile None Detected - Grout
CL1308614	43	Pure White 12" X 12" Floor Tile & Black Mastic - Teachers' Work/Copy Room	None Detected - Floor Tile None Detected - Black Mastic
CL1308615	44	Building Demarcation Sealant - Hallway outside Computer Room at Junction	None Detected - Black Sealant
CL1308616	45	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Computer Room, Center Section	None Detected - Ceiling Tile 3% Chrysotile - Brown Mastic
CL1308617	46	Interior Window Caulking - Computer Laboratory Room at Back Window Frame	None Detected - Caulking 1 None Detected - Caulking 2
CL1308618	47	White 2' X 4' Drop Ceiling Tile - Cafeteria Room above Ceiling near Kitchen	None Detected
CL1308619	48	Sink Putty - Executive Office 127 underneath Hand Wash Basin	None Detected
CL1308620	49	Terrazzo Flooring - Cafeteria Room near Back Exit Door	None Detected
CL1308621	50	Terrazzo Flooring - Kitchen, Middle Floor Drain	None Detected
CL1308622	51	Interior Door Caulking - Kitchen, Door to Storage Room	5% Chrysotile
CL1308623	52	Wall Ceramic Tile & Grout - Kitchen, Extreme Southeast Corner near Sinks	None Detected - Tile None Detected - Grout
CL1308624	53	Plaster Ceiling - Kitchen Restroom near Entry Doorway	None Detected - Plaster
CL1308625	54	TSI & Wrap on Pipe Run - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap 15% Amosite - Insulation

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308626	55	TSI & Wrap on Elbow - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap None Detected - Insulation
CL1308627	56	TSI & Wrap on T-Fittings - Basement Boiler/Sprinkler Room	None Detected - Paint Layer None Detected - Cotton Wrap None Detected - Insulation
CL1308628	57	Gasket Insulation - Basement Boiler/Sprinkler Room	None Detected
CL1308629	58	Transition Floor Strip - Cafeteria Main at Transition Strip to Extension	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308630	59	White Wall Texture, Joint Compound, & Sheetrock Mud - Executive Office 128 at Front Corner	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308631	60	Green 9" X 9" Floor Tile & Black Mastic - Custodial Closet 138 North Section	7% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
CL1308632	61	Type 2 White 2' X 2' Drop Ceiling Tile - Hallway between Custodial Room & Conference Room 128	None Detected
CL1308633	62	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Girls' Restroom Middle Section at Ceiling	None Detected - Paint Texture None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308634	63	Off-white 12" X 12" Floor Tile & Mastic - Classroom 130, Back Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1308635	64	Student Locker Caulking - Hallway across Classroom 130	None Detected
CL1308636	65	Black Sink Putty - Art Room 131, Front Wall underneath Hand Wash Basin	3% Chrysotile
CL1308637	66	12" X 12" Floor Tile & Black Mastic - Hallway outside Classroom 132	None Detected - Floor Tile None Detected - Black Mastic

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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1339 Motor Circle
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Client: BENAS Environmental Services, Inc.
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Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1308638	67	Ceramic Cove Base Tile & Grout - Teachers' Lounge Room, Extreme Southeast Corner	None Detected - Ceramic Tile None Detected - Grout
CL1308639	68	White Sink Putty - Teachers' Lounge Room Northeast Corner underneath Hand Wash Basin	None Detected
CL1308640	69	Transition Door Strip - Science Laboratory 133 at Front Doorway	None Detected - Transition Strip None Detected - Yellow Mastic
CL1308641	70	12" X 12" Floor Tile & Black Mastic - Hallway at Double Doors Exit	None Detected - Floor Tile None Detected - Black Mastic
CL1308642	71	Interior Door Caulking - Hallway at Double Doors Exit	None Detected
CL1308643	72	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 136, Extreme Southwest Corner	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1308644	73	White Sink Putty - Classroom 136, Front Wall underneath Hand Wash Basin	7% Chrysotile
CL1308645	74	Type 2 White 2' X 2' Drop Ceiling Tile - Classroom 134, Center Section	None Detected
CL1308646	75	Mastic underneath Rubber Cove Base - Book Room 129, Back Section at Wall	None Detected - Cove Base None Detected - Yellow Mastic
CL1309262	76	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Hallway near Double Doors Exit & Heater Unit	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309263	77	White 2' X 2' Drop Ceiling Tile - Classroom 122 Center Southeast Section	None Detected
CL1309264	78	12" X 12" Floor Tile & Mastic - Hallway at Double Doors Exit underneath Foot Mat	None Detected - Floor Tile None Detected - Black Mastic
CL1309265	79	Interior Door Caulking - Classroom 120 at Front Entrance	None Detected - Paint Layer
CL1309266	80	Interior Window Caulking - Classroom 120 Extreme Back Southeast Corner at Window	None Detected - Silver Sealant None Detected - Caulking

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309267	81	Grey-ish Cove Base Ceramic Tile & Grout - Classroom 121, Front right Wall underneath Chalkboard	None Detected - Ceramic Tile None Detected - Grout
CL1309268	82	White Wall Ceramic Tile & Grout - Classroom 119 Restroom, Back Wall behind Toilet	None Detected - Ceramic Tile None Detected - Grout
CL1309269	83	Student Locker Caulking - Hallway between Classrooms 116 & 118	None Detected - White Sealant
CL1309270	84	Cabinet Caulking - Classroom 118 at Front Door Entrance	3% Chrysotile
CL1309271	85	Grey-ish Floor Ceramic Tile & Grout - Classroom 117 Restroom underneath Hand Wash Basin	None Detected - Ceramic Tile None Detected - Grout None Detected - Thinset
CL1309272	86	Interior Door Caulking - Classroom 117, Doorway to Restroom	None Detected - Paint Layer None Detected - Plaster
CL1309273	87	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Classroom 116 Southeast corner above Drop Ceiling Tiles	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309274	88	12" X 12" Floor Tile & Mastic - Accessible Staff Restroom at Lobby Area	None Detected - Floor Tile <1% Chrysotile - Black Mastic
CL1309275	89	White Plaster Wall - Classroom 114, Extreme Southeast Corner behind Cabinet	None Detected - Paint Layer None Detected - Silver Sealant None Detected - Plaster
CL1309276	90	White 12" X 12" Floor Tile & Mastic - Classroom 114, Front Section	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309277	91	Student Locker Caulking - Hallway outside Classroom 115 at Student Lockers	None Detected - Silver Sealant
CL1309278	92	White Plaster Ceiling - Custodial Closet 113 at Northwest Corner Ceiling	None Detected - Paint Layer None Detected - Plaster
CL1309279	93	Building Demarcation Sealant - Hallway at Building Demarcation near Custodial Closet 113	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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Cates Laboratories
1339 Motor Circle
Dallas, Texas 75207 (214) 920-5006

NVLAP Lab No. 200569-0
TDSHS License No. 30-0287

Client: BENAS Environmental Services, Inc.
Project (Line 1): L.L. Hotchkiss Elementary School
Project (Line 2): 6929 Town North Drive, Dallas, TX
Project No: BA-24-1703
Identification: Asbestos, Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
EPA Method 600/R-93/116

Lab Job No.: PLM-38673
Set No.: 55769 - 56122
Report Date: 11/6/2024
Sample Date: 10/17/2024-10/24/2024

On 10/18/2024–11/5/2024, one-hundred forty-three (143) bulk samples were submitted by Ephraim Okotcha of BENAS Environmental for asbestos analysis by PLM/DS. Copies of the lab data sheets are attached; additional information may be found therein. The results are summarized below:

Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309280	94	White Ceiling Texture, Joint Compound, & Sheetrock Mud - Boys' Restroom, Extreme Northwest Corner	None Detected - Paint Layer None Detected - Paper None Detected - Wallboard Material
CL1309281	95	12" X 12" Floor Tile & Black Mastic - Hallway at Front Entrance Lobby underneath Foot Mat	None Detected - Floor Tile 3% Chrysotile - Black Mastic
CL1309282	96	White 2' X 2' Drop Ceiling Tile - Min Office at Reception Area	None Detected
CL1309283	97	White Wall Texture, Joint Compound, & Sheetrock Mud - Administrative Offices, Back Storage Room behind Door	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1309284	98	Black Transition Door Strip - Administrative Offices, Entrance to Executive Office	None Detected
CL1309285	99	Carpet Mastic - Auditorium, Back Door Exit Section	None Detected - Carpet
CL1309286	100	White CMU & Mortar - Auditorium, Stage near Double Doors Exit	None Detected - Paint Layer None Detected - CMU Block None Detected - Mortar
CL1309287	101	Black Transition Door Strip - Auditorium, Middle Section at Aisle	None Detected
CL1309288	102	1' X 1' Stick-on Ceiling Tile & Dot Mastic - Media Room (library), from Entry at Lower Ceiling	None Detected - Ceiling Tile 2% Chrysotile - Brown Mastic
CL1309289	103	White Wall Texture, Joint Compound, & Sheetrock - Executive Office Entrance to Community Liaison Office 141A	None Detected - Paint Texture None Detected - Joint Tape None Detected - Joint Compound None Detected - Paper None Detected - Wallboard Material
CL1309290	104	White 12" X 12" Floor Tile & Mastic - 2nd Floor, Lobby Area near Elevator, underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309291	105	Black Sink Putty - Classroom 206 Computer Laboratory underneath Hand Wash Basin	None Detected

These samples were analyzed by layers. The overall percent asbestos for the sample is reported when relevant. The EPA considers a material to be asbestos containing only if it contains greater than one percent asbestos by Calibrated Visual Area Estimation (CVAE). EPA regulations also indicate that Regulated Asbestos Containing Materials (RACM) – materials that are friable or may become friable – be further analyzed by point counting when the results indicate less than ten percent asbestos by CVAE. CatesLab utilizes CVAE on a routine basis and does not include point counting unless specifically requested by the client. The results may not be reproduced except in full.

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1309292	106	White 2' X 2' Drop Ceiling Tiles - Hallway, Mid Point between Classroom 202 & 203	None Detected
CL1309293	107	White Wall Texture, Joint Compound, & Sheetrock Mud - Classroom 205, Extreme Southeast Corner behind TV Stand	None Detected - Paint Texture
CL1309294	108	Mastic underneath Brown-ish Rubber Cove Base - Classroom 204, Extreme Northeast Corner at Wall	None Detected - Cove Base None Detected - Yellow Mastic
CL1309295	109	12" X 12" Floor Tile & Mastic - Classroom 201 Middle Section underneath Carpeting	None Detected - Floor Tile None Detected - Yellow Mastic
CL1309296	110	Black Sink Putty - Classroom 203, Front Wall underneath Hand Wash Basin	None Detected
CL1310218	111	White Wrap & White Mastic - 2nd Floor Mechanical Room	None Detected - White Mastic None Detected - Wrap None Detected - Insulation
CL1310219	112	Black Metal Duct Vibration Isolator (expansion booth) - 2nd Floor Mechanical Room	None Detected
CL1310220	113	Roof Profile Core Sample - Chiller Building Top Roof	None Detected - White Sealant None Detected - Roof Membrane None Detected - Roofing Foam
CL1310221	114	Cooling Tower Metal Base Sealant - Chiller Building Top Roof	None Detected - White Sealant None Detected - Roof Membrane None Detected - Roofing Foam
CL1310222	115	TSI on Elbow w/White Wrap - Inside Chiller Room	5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Insulation
CL1310223	116	TSI on Pipe Runs w/White Wrap - Inside Chiller Room	None Detected - Paint Layer 5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Insulation

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EPA Method 600/R-93/116

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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1310224	117	TSI on T-Fittings w/White Canvas - Inside Chiller Room	5% Chrysotile - White Mastic None Detected - Cotton Wrap None Detected - Wrap None Detected - Insulation
CL1310225	118	Gasket Insulation - Inside Chiller Room	None Detected
CL1310226	119	White Wall Texture, Joint Compound, & Sheetrock Mud - Inside Chiller Room	None Detected - Wall Covering None Detected - Paper None Detected - Wallboard Material
CL1310227	120	Roof Profile Core Sample - Top Roofs of Buildings	None Detected - Roofing Membrane None Detected - Felt Backing None Detected - Roofing Foam None Detected - Roofing Insulation
CL1310228	121	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310229	122	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310230	123	HVAC & Exhaust Fan Base Sealant - Top Roofs of Buildings	None Detected - Black Sealant
CL1310231	124	Exterior Window Caulking - Building Exterior	3% Chrysotile
CL1310232	125	Exterior Door Caulking - Building Exterior	None Detected - Caulking 1 None Detected - Caulking 2
CL1310233	126	Exterior Building Penetration Sealant - Building Exterior	10% Chrysotile - Grey Sealant
CL1310234	127	Exterior Building Penetration Sealant - Building Exterior	10% Chrysotile - Grey Sealant
CL1310235	128	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310236	129	Exterior Door Caulking - Building Exterior	10% Chrysotile
CL1310237	130	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310238	131	Exterior Building Penetration Sealant - Building Exterior	None Detected - Paint Layer None Detected - Plaster

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Lab Job No.: PLM-38673
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Lab Sample No.	Client Field I.D.	Sample Description/Location	Asbestos Content
CL1310239	132	Exterior White Plaster on Columns - Building Exterior	None Detected - Paint Texture None Detected - Plaster
CL1310240	133	Exterior White Plaster on Ceiling - Building Exterior	None Detected - Paint Texture None Detected - Plaster
CL1310241	134	Exterior Building Penetration Sealant - Building Exterior	None Detected - Silver Sealant
CL1310242	135	Exterior Light Brown-ish Brick & Mortar - Building Exterior	None Detected - Brick None Detected - Mortar
CL1310243	136	Exterior Window Frame Black Sealant - Building Exterior	None Detected
CL1310244	137	TSI on Pipe Runs w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 20% Chrysotile - Insulation
CL1310245	138	TSI on Elbows w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 20% Chrysotile - Insulation
CL1310246	139	TSI on T-Fittings w/Black Wrap - Crawlspace underneath Original Buildings	None Detected - Black Mastic None Detected - Cotton Wrap 25% Amosite - Insulation
CL1310247	140	Debris on Polyethylene Sheeting - Crawlspace underneath Original Buildings	None Detected
CL1315599	141	Exterior Window Caulking	None Detected
CL1315600	142	Exterior Window Caulking	None Detected
CL1315601	143	Exterior Window Caulking	None Detected

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STATEMENT OF LABORATORY ACCREDITATION

The samples were analyzed in general accordance with the procedures outlined in the U.S. EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), or the current U.S. EPA method (EPA Method 600/R-93/116) for the analysis of asbestos in building materials, by polarized light microscopy. The results of each bulk sample relate only to the material tested and the results shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Specific questions concerning bulk sample results shall be directed to the Laboratory Director.

Analyst: Kathy Schosek, Liliana Castillo, Curtis Grigg, John R. Cates





Laboratory Director: John R. Cates, P.G.



Approved Signatory:

NVLAP®

TESTING
NVLAP LAB CODE 200569-0

BENAS ENVIRONMENTAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS
P. O. BOX 739
COPPELL, TEXAS 75019

PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town Drive
Dallas, Texas 75231

Sample Date 10/17/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
1	Hallway, Double-Doors Exit Underneath Foot Mat	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
2	Class Room 155, Center Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
3	Hallway Outside Class Room 154	Wood Cove-Base Sealant	Non-Friable	Good
4	Class Room 152 North Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
5	Hallway Outside Class Rooms 152 and 150	Student Locker Caulking	Non-Friable	Good
6	Class Room 153 Back North Window @ Frame	Interior Window Caulking	Non-Friable	Good
7	Class Room 150 Front Section @ Cabinet Works	Cabinet Caulking	Non-Friable	Good
8	Class Room 151 Extreme Southwest Section @ Window Glass Pane	Interior Window Glass Glazing	Non-Friable	Good
9	Class Room 148, Front Entry Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
10	Class Room 149, Back Southeast Section	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
11	Class Room 146 Entrance Doorway	Transition Door Strip	Non-Friable	Good
12	Class Room 146 Front Entry Above Cabinet Works	White Plaster Wall	Non-Friable	Good
13	Class Room 146 Back Northwest Corner @ Furr-Down	Furr-Down Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
14	Class Room 144A @ Back Wall	Building Joint Sealant	Non-Friable	Good
15	IDF Room Front Entrance Section @ Ceiling	Spray-Applied Ceiling **(SAC)** Texture	Friable	Good

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SETUP BY: **Signature: Ephraim N. Okotcha "EO"** **DATE/TIME: 10/17/2024**

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LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

ANALYZED BY:_____ **DATE/TIME:**_____

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16	Class Room 144A Back Southeast Section	Mastic Underneath Black Rubber Cove-Base	Non-Friable	Good
17	Boy's Rest Room Back Window Near Urinals	Interior Window Caulking	Non-Friable	Good
18	Boy's Rest Room Entrance Section Near Hand-Wash Basins	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
19	Boy's Rest Room Back Exit Doorway @ Extreme Corner	Wall Ceramic Tiles and Grout	Non-Friable	Good
20	Boy's Rest Room 2nd Stall	Floor Ceramic Tiles and Grout	Non-Friable	Good
21	Hallway Near Custodial Closet 159A @ Column	Ceramic Cove-Base Sealant	Non-Friable	Good
22	Hallway, Between Class Rooms 144 and 146	Student Locker Caulking	Non-Friable	Good
23	Faculty Lounge Room 156 Rest Room	White Wall Ceramic Tiles and Grout	Non-Friable	Good
24	Faculty Lounge Room 156 Rest Room	Greyish Floor Ceramic Tiles and Grout	Non-Friable	Good
25	Faculty Lounge Room, Center Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
26	Gymnasium, Equipment Storage Room @ Door Strip	Transition Door Strip	Non-Friable	Good
27	Gymnasium, Electrical Room 157A Back Corner	White Concrete Masonry Units (CMU) and Mortar	Non-Friable	
28	Gymnasium, Extreme Northwest Corner @ Front Wall	Interior Brick and Mortar	Non-Friable	Good
29	Custodial Closet 159A Front Section @ Ceiling	White Plaster Ceiling	Non-Friable	Good
30	Executive Office 159 Middle North Section	Carpet Mastic	Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
31	Hallway @ Door Way to Reading Laboratory Room 160	Transition Door Strip	Non-Friable	Good
32	Lobby Entrance to New Wing Building	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
33	Class Room 162, Extreme Southeast Corner Underneath Carpeting	Off-White 12" X12" Floor Tiles and Mastic	Non-Friable	Good
34	Class Room 165, Center Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
35	Class Room 164, Front Wall Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good
36	Class Room 69, Extreme Southeast Corner @ Wall	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
37	Hallway Between Class Rooms 166 and 167	White 2' X 2' Drop Ceiling Tiles	Friable	Good
38	Mechanical #1 Room 168	Metal Duct Work Vibration Isolator (Expansion Booth)	Non-Friable	Good
39	Mechanical #1 Room 168	White TSI Wrap and White Mastic	Non-Friable	Good
40	Doorway Entrance to Custodial Closet	Transition Door Strip	Non-Friable	Good
41	Girl's Rest Room, Extreme Southeast Corner @ Ceiling	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
42	Men's Rest Room @ Junction Behind Dresser	Wall Ceramic Tiles and Grout	Non-Friable	Good
43	Teacher's Work/Copy Room	Pure White 12" X12" Floor Tiles and Black Mastic	Non-Friable	Good
44	Hallway Outside Computer Room @ Junction	Building Demarcation Sealant	Non-Friable	Good
45	Computer Room, Center Section	1' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
46	Computer Laboratory Room @ Back Window Frame	Interior Window Caulking	Non-Friable	Good
47	Cafeteria Room Above Ceiling Near Kitchen	White 2' X 4' Drop Ceiling Tiles	Friable	Good
48	Executive Office 127 Underneath Hand-Wash Basin	Sink Putty	Non-Friable	Good
49	Cafeteria Room Near Back Exit Door	Terrazzo Flooring	Non-Friable	Good
50	Kitchen, Middle Floor Drain	Terrazzo Flooring	Non-Friable	Good
51	Kitchen, Door to Storage Room	Interior Door Caulking	Non-Friable	Good
52	Kitchen, Extreme Southeast Corner Near Sinks	Wall Ceramic Tiles and Grout	Non-Friable	Good
53	Kitchen Rest Room Near Entry Doorway	Plaster Ceiling	Non-Friable	Good
54	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on Pipe-Run	Friable/Non-Friable	Good
55	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on Elbow	Friable/Non-Friable	Good
56	Basement Boiler/Sprinkler Room	Thermal Systems Insulation **(TSI)** and Wrap on T-Fittings	Friable/Non-Friable	Good
57	Basement Boiler/Sprinkler Room	Gasket Insulation	Non-Friable	Good
58	Cafeteria Main @ Transition Strip to Extension	Transition Floor Strip	Non-Friable	Good
59	Executive Office 128 @ Front Corner	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
60	Custodial Closet 138 North Section	Green 9" X 9" Floor Tiles and Black Mastic	Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
61	Hallway Between Custodial Room and Conference Room 128	Type 2 White 2' X 2' Drop Ceiling Tiles	Friable	Good
62	Girl's Rest Room Middle Section @ Ceiling	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
63	Class Room 130, Back Section	Off-White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
64	Hallway Across Class Room 130	Student Locker Caulking	Non-Friable	Good
65	Art Room 131, Front Wall Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good
66	Hallway Outside Class Room 132	12" X 12' Floor Tiles and Black Mastic	Non-Friable	Good
67	Teachers' Lounge Room, Extreme Southeast Corner	Ceramic Cove-Base Tiles and Grout	Non-Friable	Good
68	Teacher's Lounge Room Northeast Corner Underneath Hand-Wash Basin	White Sink Putty	Non-Friable	Good
69	Science Laboratory Room 133 @ Front Doorway	Transition Door Strip	Non-Friable	Good
70	Hallway @ Double-Doors Exit	12" X 12' Floor Tiles and Black Mastic	Non-Friable	Good
71	Hallway @ Double-Doors Exit	Interior Door Caulking	Non-Friable	Good
72	Class Room 136, Extreme Southwest Corner	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
73	Class Room 136, Front Wall Underneath Hand-Wash Basin	White Sink Putty	Non-Friable	Good
74	Class Room 134, Center Section	Type 2 White 2' X 2' Drop Ceiling Tiles	Friable	Good
75	Book Room 129, Back Section @ Wall	Mastic Underneath Rubber Cove-Base	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUS40

SETUP BY: Signature: Ephraim N. Okotcha "EO" DATE/TIME: 10/18/2024

RETRIEVED BY: Signature: Ephraim N. Okotcha "EO" DATE/TIME: 10/18/2024

TRANSPORTED: Signature: Ephraim N. Okotcha "EO" DATE/TIME: 10/18/2024

LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

ANALYZED BY:_____ **DATE/TIME:**_____

BENAS ENVIRONMENTAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS
P. O. BOX 739
COPPELL, TEXAS 75019

PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

Sample Date 10/22/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
76	Hallway Near Double-Doors Exit and Heater Unit	1'" X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
77	Class Room 122 Center Southeast Section	White 2' X 2' Drop Ceiling Tiles	Friable	Good
78	Hallway @ Double-Doors Exit Underneath Foor Mat	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
79	Class Room 120 @ Front Entrance	Interior Door Caulking	Non-Friable	Good
80	Class Room 120 Extreme Back Southeast Corner @ Window	Interior Window Caulking	Non-Friable	Good
81	Class Room 121, Front Right Wall Underneath Chalk Board	Greyish Cove-Base Ceramic Tiles and Grout	Non-Friable	Good
82	Class Room 119 Rest Room, Back Wall Behind Toilet	White Wall Ceramic Tiles and Grout	Non-Friable	Good
83	Hallway Between Class Rooms 116 and 118	Student Locker Caulking	Non-Friable	Good
84	Class Room 118 @ Front Door Entrance	Cabinet Caulking	Non-Friable	Good
85	Class Room 117 Rest Room Underneath Hand-Wash Basin	Greyish Floor Ceramic Tiles and Grout	Non-Friable	Good
86	Class Room 117, Doorway to Rest Room	Interior Door Caulking	Non-Friable	Good
87	Class Room 116 Southeast Corner Above Drop Ceiling Tiles	1'" X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
88	Accessible Staff Rest Room @ Lobby Area	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
89	Class Room 114, Extreme Southeast Corner Behind Cabinet	White Plaster Wall	Non-Friable	Good
90	Class Room 114, Front Section	White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
91	Hallway Outside Class Room 115 @ Student Lockers	Student Locker Caulking	Non-Friable	Good
92	Custodial Closet 113 @ Northwest Corner Ceiling	White Plaster Ceiling	Non-Friable	Good
93	Hallway @ Building Demarcation Near Custodial Closet 113	Building Demarcation Sealant	Non-Friable	Good
94	Boy's Rest Room, Extreme Northwest Corner	White Ceiling Texture Joint Compound and Sheetrock Mud	Friable	Good
95	Hallway @ Front Entrance Lobby Underneath Foot Mat	12" X 12" Floor Tiles and Black Mastic	Non-Friable	Good
96	Min Office @ Reception Area	White 2" X 2' Drop Ceiling Tiles	Friable	Good
97	Administrative Offices, Back Storage Room Behind Door	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
98	Administrative Offices, Entrance to Executive Office	Black Transition Door Strip	Non-Friable	Good
99	Auditorium, Back Door Exit Section	Carpet Mastic	Friable/Non-Friable	Good
100	Auditorium, Stage Near Double-Doors Exit	White Concrete Masonry Units (CMU) and Mortar	Non-Friable	Good
101	Auditorium, Middle Section @ Isle	Black Transition Door Strip	Non-Friable	Good
102	Media Room (Library), From Entry @ Lower Ceiling Area	1"' X 1' Stock-On Ceiling Tiles and DOT Mastic	Friable/Non-Friable	Good
103	Executive Office Entrance to Community Liaison Office 141A	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
104	2nd Floor: Lobby Area Near Elevator, Underneath Carpeting	White 12" X 12" Floor Tiles and Mastic	Non-Friable	Good
105	Class Room 206 Computer Laboratory Underneath Hand-Wash Basin	Black Sink Putty	Non-Friable	Good

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
106	Hallway, Mid Point Between Class Rooms 202 and 203	White 2' X 2' Drop Ceiling Tiles	Friable	Good
107	Class Room 205, Extreme Southeast Corner Behind TV Stand	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
108	Class Room 204, Extreme Northeast Corner @ Wall	Mastic Underneath Brownish Rubber Cove Base	Non-Friable	Good
109	Class Room 201 Middle Section Underneath Carpeting	12" X 12" Floor Tiles and Mastic	Non-Friable	Good
110	Class Room 203, Front Wall Underneath Hand-Wash Basin	Black sink Putty	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUS 40

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SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
111	Second Floor Mechanical Room	White Wrap and White Mastic	Non-Friable	Good
112	Second Floor Mechanical Room	Black Metal Duct Vibration Isolator (Expansion Booth	Non-Friable	Good
113	Chiller Building Top Roof	Roof Profile Core Sample	Non-Friable	Good
114	Chiller Building Top Roof	Cooling Tower Metal Base Sealanr	Non-Friable	Good
115	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on Elbow with White Wrap	Friable/Non-Friable	Good
116	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on Pipe-Runs/White Wrap	Friable/Non-Friable	Good
117	Inside Chiller Room	Thermal Systems Insulation **(TSI)** on T-Fittings/White Canva	Friable/Non-Friable	Good
118	Inside Chiller Room	Gasket Insulation	Non-Friable	Good
119	Inside Chiller Room	White Wall Texture Joint Compound and Sheetrock Mud	Friable	Good
120	Top Roofs of Buildings	Roof Profile Core Sample	Non-Friable	Good
121	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
122	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
123	Top Roofs of Buildings	HVAC and Exhaust Fan-Base Sealant	Non-Friable	Good
124	Building Exterior	Exterior Window Caulking	Non-Friable	Good
125	Building Exterior	Exterior Door Caulking	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
126	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
127	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
128	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
129	Building Exterior	Exterior Door Caulking	Non-Friable	Good
130	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
131	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
132	Building Exterior	Exterior White Plaster on Columns	Non-Friable	Good
133	Building Exterior	Exterior White Plaster on Ceiling	Non-Friable	Good
134	Building Exterior	Exterior Building Penetration Selant	Non-Friable	Good
135	Building Exterior	Exterior Light Brownish Brick and Mortar	Non-Friable	Good
136	Building Exterior	Exterior Window Frame Black Sealer	Non-Friable	Good
137	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on Pipe-Runs/Black Wrap	Friable/Non-Friable	Good
138	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on Elbows Black Wrap	Friable/Non-Friable	Good
139	Crawl Space Underneath Original Buildings	Thermal Systems Insulation **(TSI)** on T-Fittings/Black Wrap	Friable/Non-Friable	Good
140	Crawl Space Underneath Original Buildings	Debris on Polyethylene Sheeting	Friable/Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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COPPELL, TEXAS 75019

PROJECT NO: BA-24-1703

PROJECT NAME L. L. Hotchkiss Elementary School
6929 Town North Drive
Dallas, Texas 75231

Sample Date 11/05/2024

2-Day Turn-Around Time

ASBESTOS FIELD SAMPLE LOG

SPECIALISTS IN ASBESTOS, LEAD-BASED PAINT and PHASES I and II ENVIRONMENTAL REAL ESTATE ASSESSMENTS AND CONSULTING SERVICES

SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	FRIABLE OR NON-FRIABLE	CONDITION
141	Building Exterior	Exterior Window Caulking	Non-Friable	Good
142	Building Exterior	Exterior Window Caulking	Non-Friable	Good
143	Building Exterior	Exterior Window Caulking	Non-Friable	Good

CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY CHAIN-OF-CUSTODY

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LABORATORY CUSTODY

RECEIVED BY:_____ **DATE/TIME:**_____

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1. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM OFF-WHITE 12" X 12" FLOOR TILES AND BLACK MASTIC LOCATED IN SEVERAL AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



2. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



3. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM COVE-BASE CERAMIC TILES AND GROUT LOCATED ON THE BOTTOM WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



4. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE 2' X 2' DROP CEILING TILES LOCATED THROUGHOUT INTERIOR CEILING SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



5. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM STUDENT LOCKER CAULKING LOCATED IN VARIOUS HALLWAYS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



6. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM INTERIOR WINDOW CAULKING LOCATED ON VARIOUS AREAS THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



7. View of Representative (Typical) Sample of Non-ACM Cabinet Works Caulking Located in Various Areas Throughout Interior Wall Surfaces in Buildings at L. L. Hotchkiss Elementary School



8. View of More Representative (Typical) Sample of ACM 1' X 1' Stock-On Ceiling Tiles and DOT Mastic Located in Various Areas Throughout the Buildings at L. L. Hotchkiss Elementary School



9. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM TRANSITION DOOR STRIP LOCATED ON THE BOTTOM DOOR ENTRANCES TO VARIOUS ROOMS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



10. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM FURR-DOWN WALL TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED THROUGHOUT INTERIOR WALLS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



11. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM INTERIOR BUILDING JOINT SEALANT LOCATED THROUGHOUT THE INTERIOR IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



12. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WALL TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



13. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM MASTIC UNDERNEATH BLACK RUBBER COVE-BASE LOCATED ON BOTTOM WALLS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



14. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE CEILING TEXTURE JOINT COMPOUND AND SHEETROCK MUD LOCATED ON CEILING SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



15. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WALL CERAMIC TILES AND GROUT LOCATED IN VARIOUS WET AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



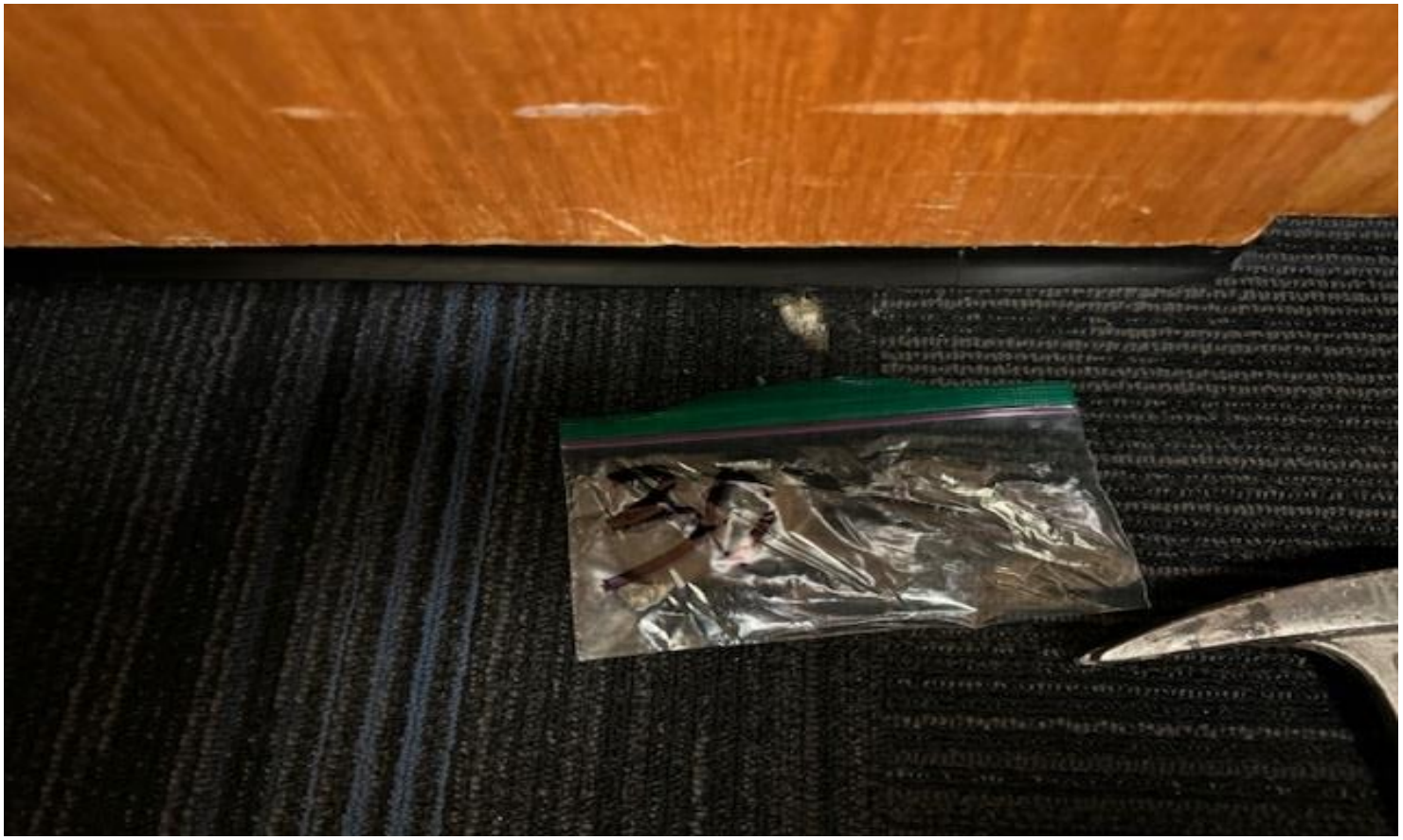
16. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM FLOOR CERAMIC TILES AND GROUT LOCATED IN VARIOUS WET AREAS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



17. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE CONCRETE MASONRY UNITS (CMU) AND MORTAR LOCATED ON INTERIOR WALLS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



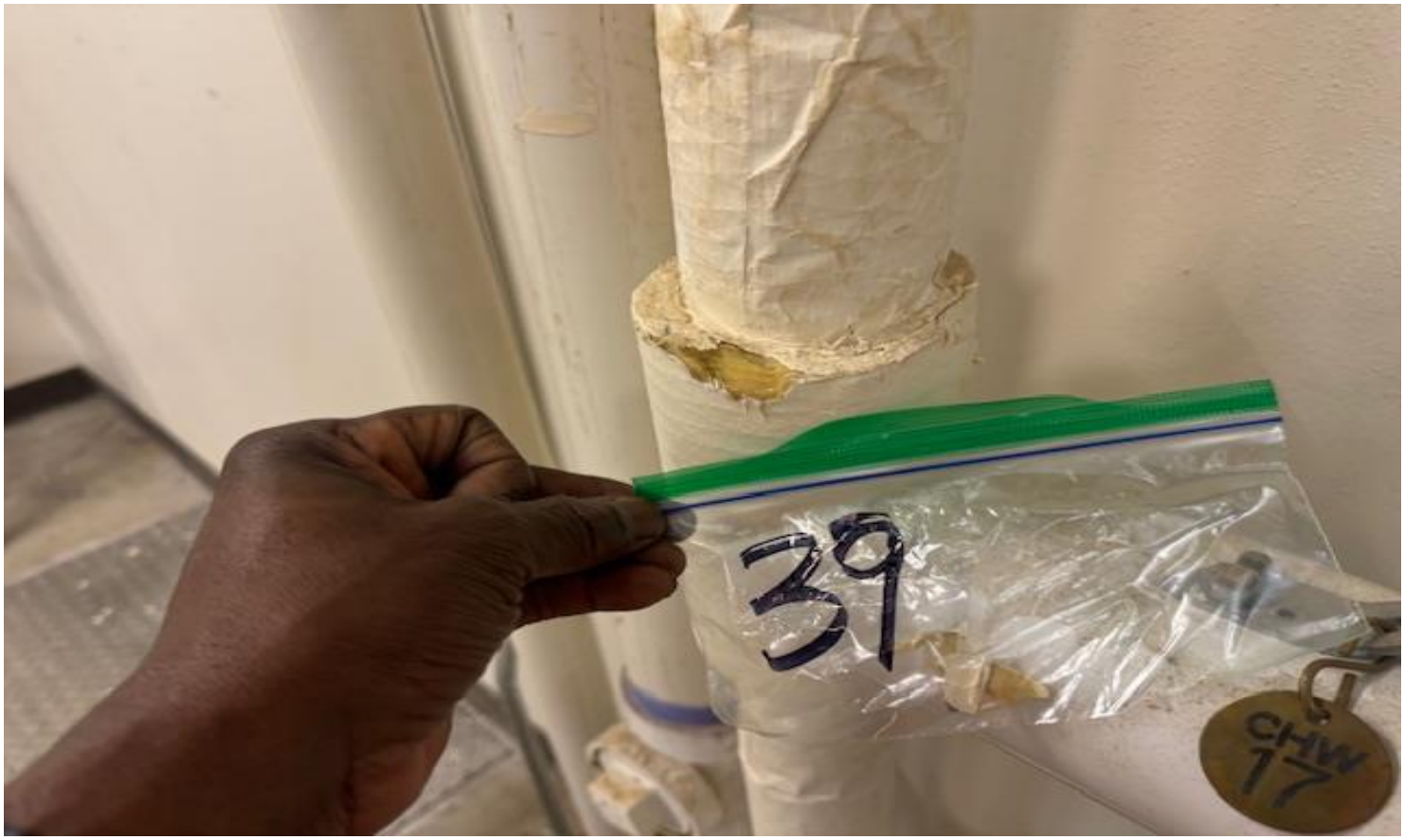
18. VIEW OF REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM INTERIOR BRICK AND MORTAR LOCATED ON VARIOUS INTERIOR WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



19. VIEW OF REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM CARPET MASTIC LOCATED IN SEVERAL EXECUTIVE OFFICE AND OTHERS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



20. VIEW OF MORE REPRESENTATION (TYPICAL) SAMPLE OF NON-ACM METAL DUCT WORK VIBRATION ISOLATOR LOCATED IN VARIOUS MECHANICAL ROOM THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



21. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE TSI WRAP AND WHITE MASTIC LOCATED IN MECHANICAL ROOMS AND ABOVE THE CEILING THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



22. **VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM PURE WHITE 12" X 12" FLOOR TILES AND BLACK MASTIC LOCATED IN THE TEACHER'S LOUNGE IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL**



23. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM BUILDING DEMARCATION SEALANT LOCATED IN VARIOUS AREAS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



24. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



25. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GREYISH TERRAZZO FLOORING LOCATED IN VARIOUS WET FLOOR AND WALL SURFACES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



26. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM INTERIOR DOOR CAULKING LOCATED ON SOME INTERIOR AND EXTERIOR DOOR FRAMES THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



27. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM PLASTER CEILING LOCATED ON CEILING SURFACES IN CLOSETS AND OTHER AREA THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



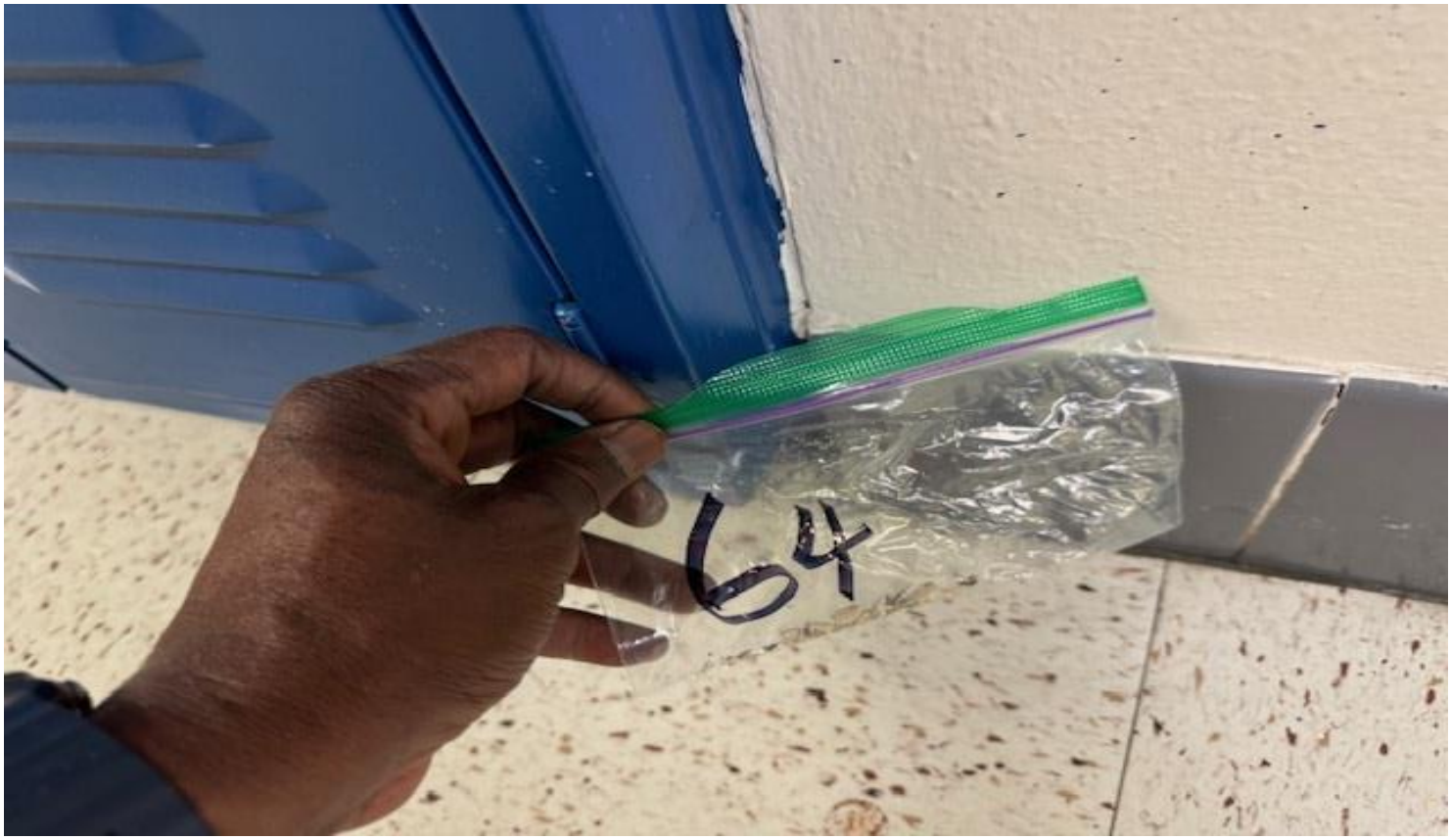
28. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) AND WHITE WRAP LOCATED IN THE BOILER ROOM AND OTHER AREAS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



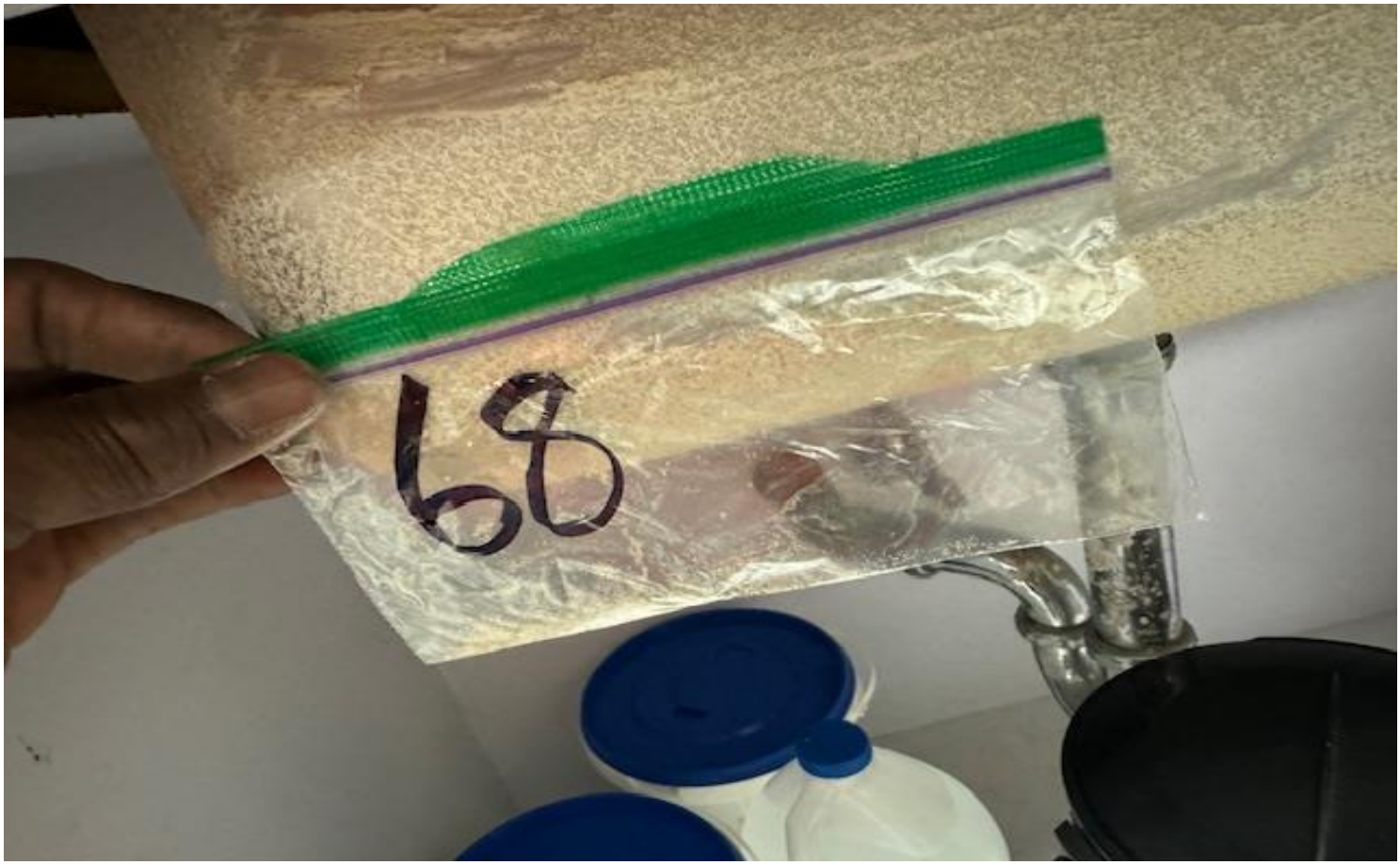
29. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GASKET INSULATION LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



30 VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM GREEN 9" X 9" FLOOR TILES AND BLACK MASTIC LOCATED IN SOME AREAS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



31. View of Representative (Typical) Sample of Non-ACM Caulking on Student Lockers Located Throughout the Buildings at L. L. Hotchkiss Elementary School



32. View of Representative (Typical) Sample of ACM White Sink Putty Located in Various Areas in Buildings at L. L. Hotchkiss Elementary School



33. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



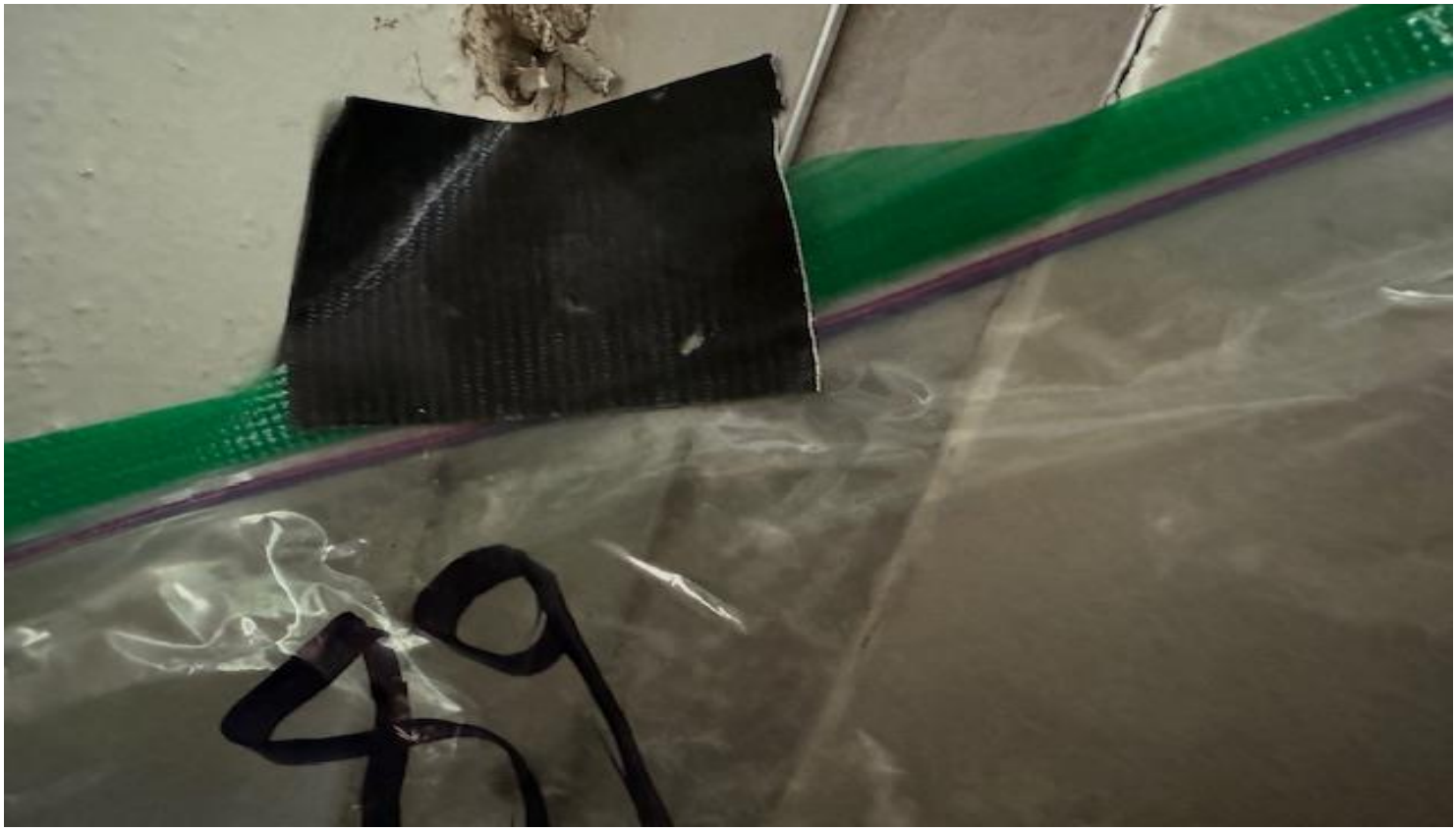
34. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM CABINET WORKS CAULKING LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



35. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM GREY FLOOR CERAMIC TILES AND GROUT LOCATED IN SEVERAL WET AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



36. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM 1' X 1' STOCK-ON CEILING TILES AND DOT MASTIC LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



37. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE PLASTER WALL LOCATED THROUGHOUT INTERIOR WALL SURFACES IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



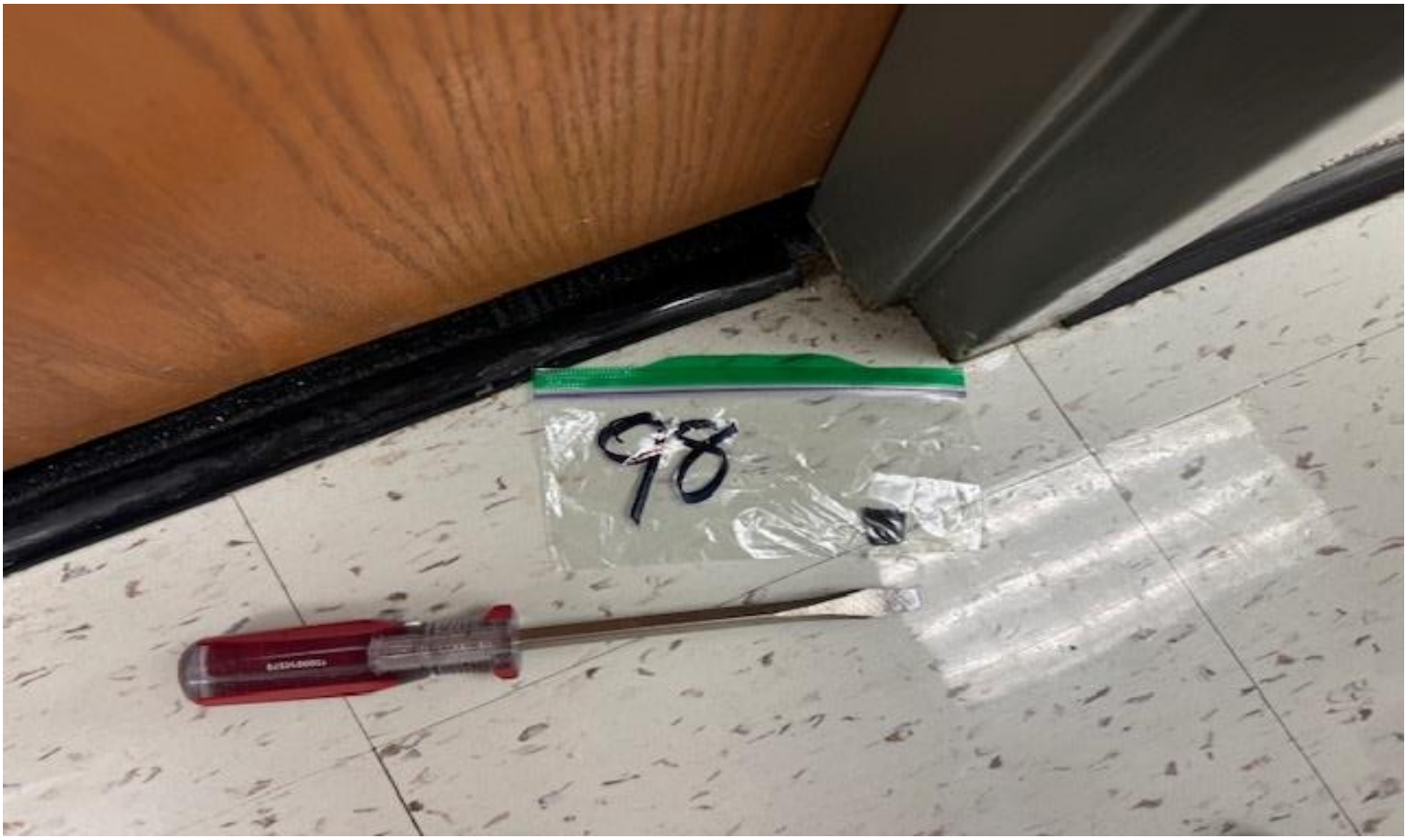
38. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM BUILDING DEMARCATION SEALANT LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



39. View of Representative (Typical) Sample of ACM 12" X 12" Floor Tiles and Black Mastic Located Throughout Hallways and Other Functional Areas in Buildings at L. L. Hotchkiss Elementary School



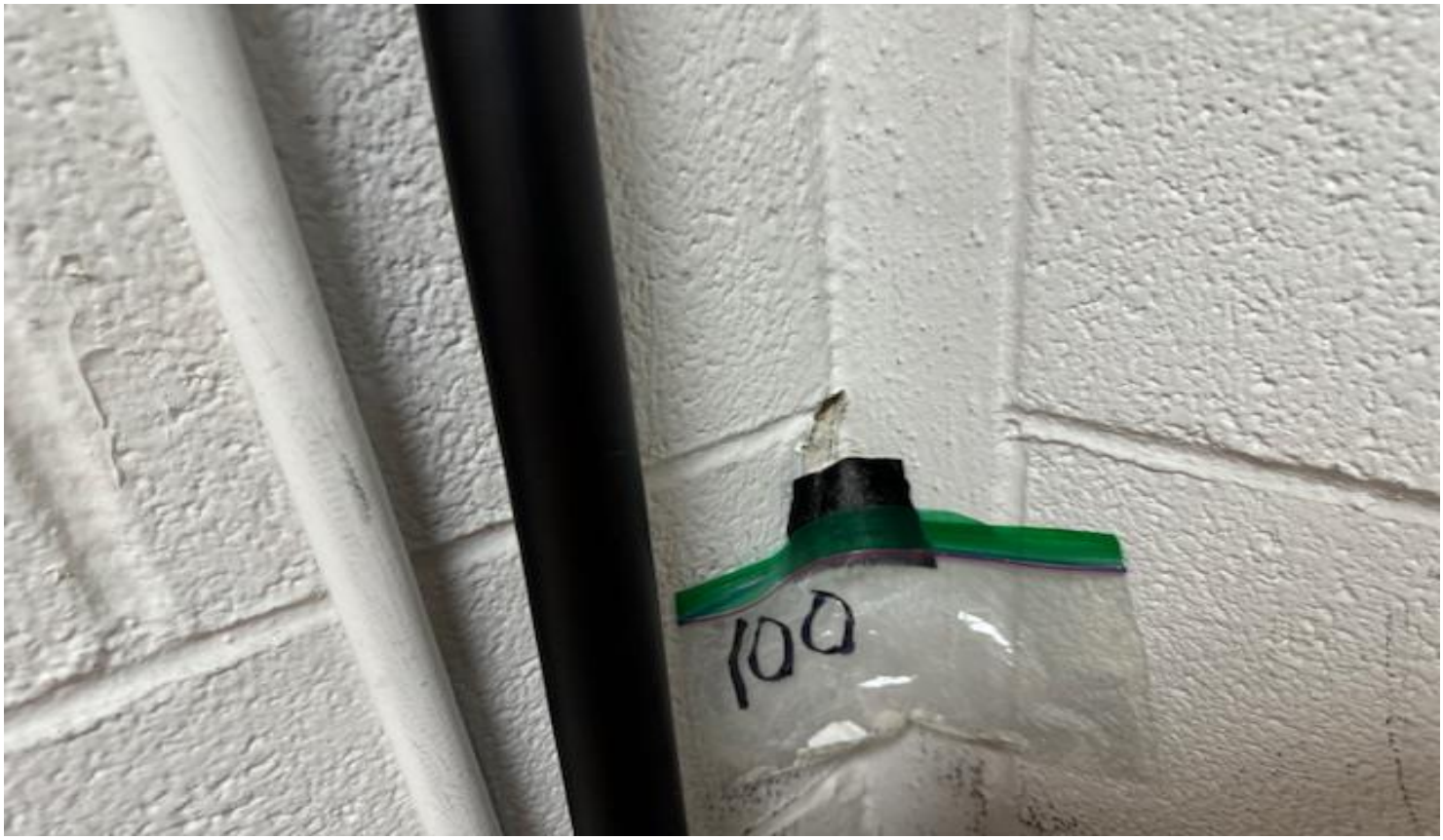
40. View of Representative (Typical) Sample of Non-ACM Wall Texture Joint Compound and Sheetrock Mud Located on Interior Wall Surfaces Throughout the Buildings at L. L. Hotchkiss Elementary School



41. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM TRANSITION DOOR STRIP LOCATED AT VARIOUS DOOR STRIPS THROUGHOUT THE BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



42. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM CARPET MASTIC LOCATED ON IN VARIOUS EXECUTIVE OFFICES AND OTHER AREAS THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



43. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE CONCRETE MASONRY UNITS (CMU) AND MORTAR LOCATED ON INTERIOR WALL SURFACES THROUGHOUT BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



44. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM WHITE TSI WRAP AND WHITE MASTIC LOCATED ON SEVERAL PIPING NETWORK THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



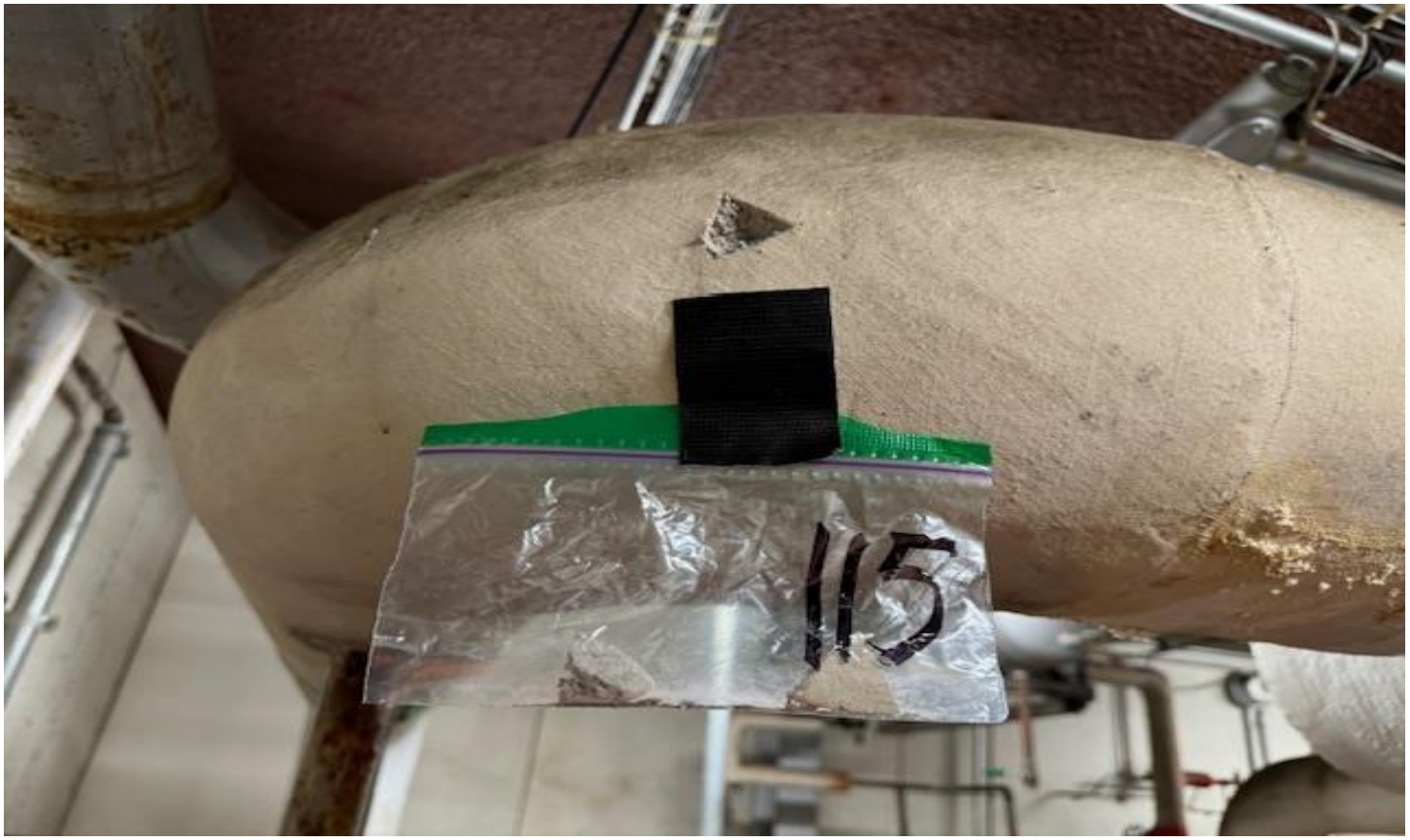
45. View of More Representative (Typical) Sample of Non-ACM Metal Duct Work Vibration Isolator (Expansion Booth) Located in Mechanical Room Throughout the Buildings at L. L. Hotchkiss Elementary School



46 View of More Representative (Typical) Sample of Non-ACM Roof Profile Core Sample Located on Roof Top on the Chiller Building at L. L. Hotchkiss Elementary School



47 VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM COOLING TOWER METAL-BASE SEALANT LOCATED ON TOP ROOF ON THE CHILLER BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



48. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) ON ELBOWS LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



49. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) ON PIPE-RUNS LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



50 VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) ON PIPE-RUNS LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IN A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



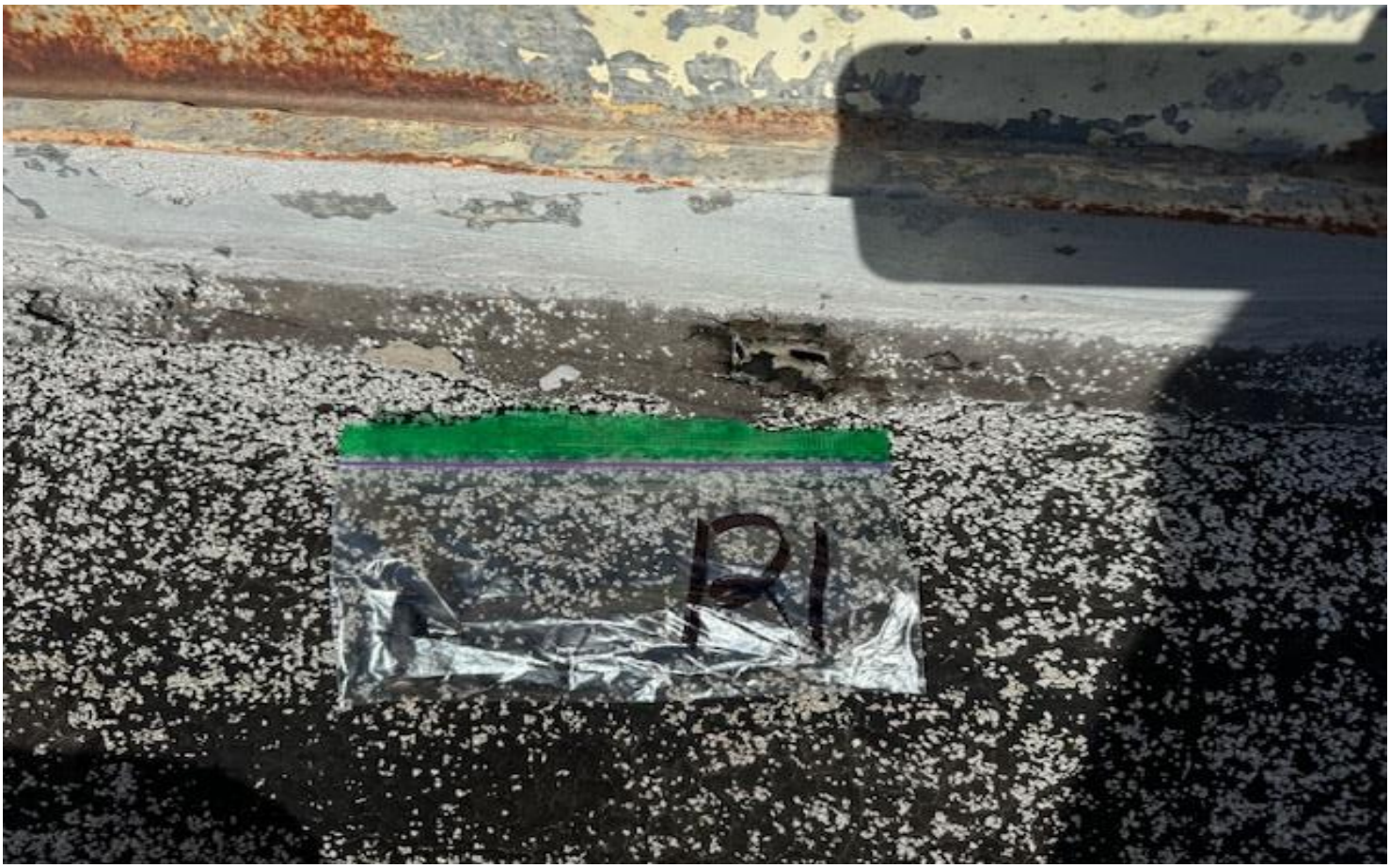
51 VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM THERMAL GASKET INSULATION LOCATED IN VARIOUS AREAS BASEMENT AND OTHER MECHANICAL AREAS IN BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



52 VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM SHEETROCK WALL BOARD LOCATED IN BASEMENT BOILER/SPRINKLER ROOM IS A BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



53 View of More Representative (Typical) Sample of Non-ACM Roof Profile Core Sample Located on Various Roof Tops Throughout Buildings at L. L. Hotchkiss Elementary School



54. View of Representative (Typical) Sample of Non-ACM HVAC and Exhaust Fan-Base Sealant Located in Various Roof Tops Throughout the Buildings at L. L. Hotchkiss Elementary School



55. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM WINDOW CAULKING LOCATED ON VARIOUS EXTERIOR WALL SURFACES ON BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



56. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM BUILDING PENETRATION SEALANT LOCATED ON SEVERAL EXTERIOR WALL SURFACES ON BUILDING AT L. L. HOTCHKISS ELEMENTARY SCHOOL



57. View of More Representative (Typical) Sample of ACM Building Penetration Sealant Located on Several Exterior Wall Surfaces on Building at L. L. Hotchkiss Elementary School



58. View of Representative (Typical) Sample of Non-ACM Light Brick and Mortar Located on Exterior Wall Surfaces Throughout Buildings at L. L. Hotchkiss Elementary School



59. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF ACM CAULKING ON DOOR FRAMES LOCATED ON EXTERIOR WALL SURFACES THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



60. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM PLASTER WALLS LOCATED THROUGHOUT EXTERIOR WALL SURFACES ON BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



61. VIEW OF REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM PLASTER CEILING LOCATED THROUGHOUT EXTERIOR SURFACES ON BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



62. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF ACM THERMAL SYSTEMS INSULATION (TSI) AND WRAP LOCATED IN THE CRAWL SPACE UNDERNEATH BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



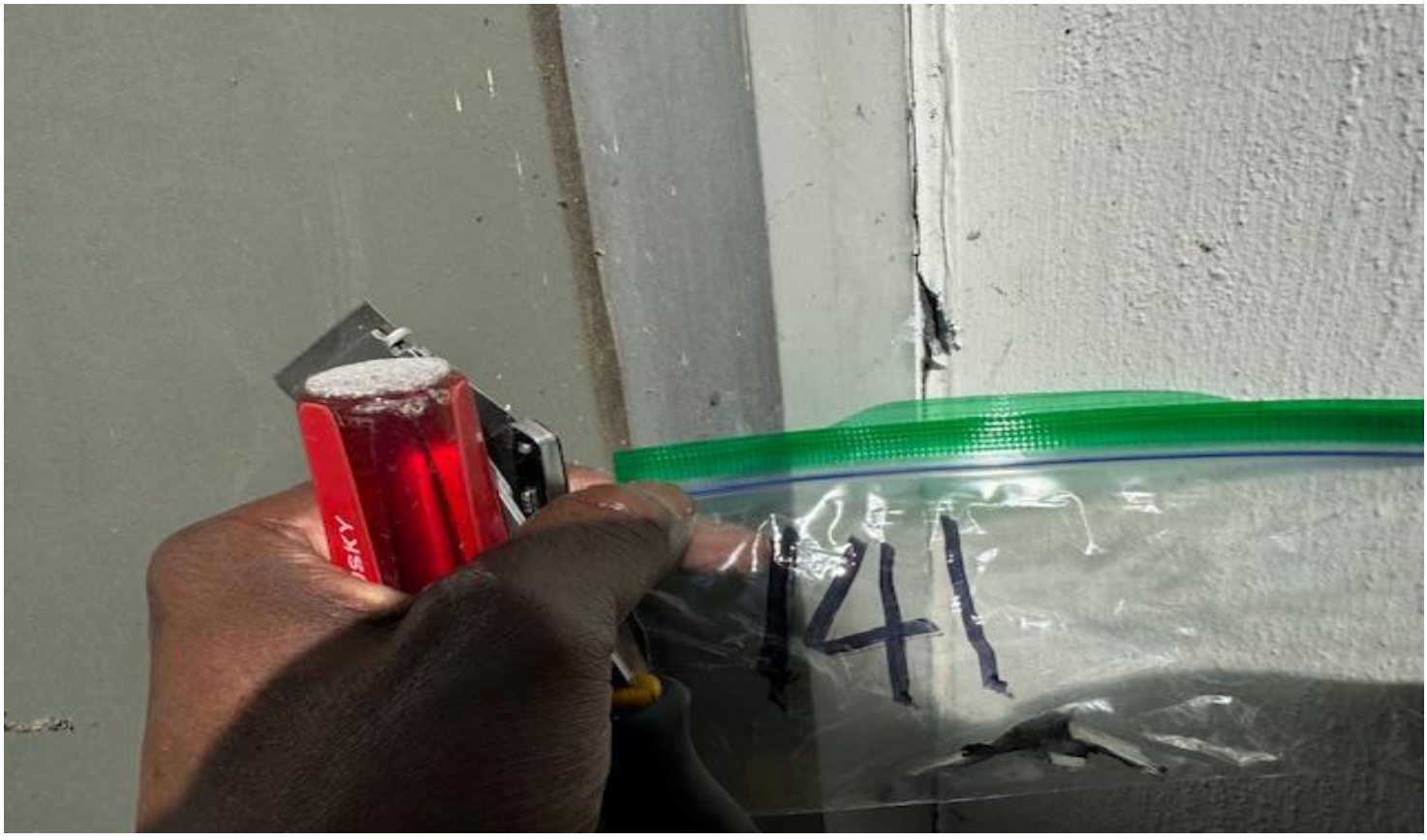
63. VIEW OF REPRESENTATIVE (TYPICAL) MADE-SAFE AREAS LOCATED IN THE CRAWL SPACE UNDERNEATH BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



64. VIEW OF MORE REPRESENTATIVE (TYPICAL) MADE-SAFE AREAS LOCATED IN THE CRAWL SPACE UNDERNEATH BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



65. VIEW OF MORE REPRESENTATIVE (TYPICAL) MADE-SAFE AREAS LOCATED IN THE CRAWL SPACE UNDERNEATH BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL



66. VIEW OF MORE REPRESENTATIVE (TYPICAL) SAMPLE OF NON-ACM EXTERIOR WINDOW CAULKING LOCATED ON SEVERAL EXTERIOR WALL SURFACES THROUGHOUT BUILDINGS AT L. L. HOTCHKISS ELEMENTARY SCHOOL

Texas Department of State Health Services

BENAS ENVIRONMENTAL SERVICES INCORPORATED

is certified to perform as an

Asbestos Consultant Agency

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1954 and Title 12, Texas Administrative Code, Chapter 295 relating to Texas Asbestos Health Protection, as long as this license is not suspended or revoked.

License Number: 100173

Expiration Date: 05/10/2022

John Hellerstedt, M.D.,
Commissioner of Health

Control Number: 97292

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE

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Texas Department of State Health Services

BENAS ENVIRONMENTAL SERVICES INCORPORATED

is certified to perform as an

Asbestos Laboratory

PCM

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1954 and Title 12, Texas Administrative Code, Chapter 295 relating to Texas Asbestos Health Protection, as long as this license is not suspended or revoked.

License Number: 300148

Expiration Date: 06/13/2023

John Hellerstedt, M.D.,
Commissioner of Health

Control Number: 96544

(Void After Expiration Date)

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CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 05/11/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Environmental Insurance Service P.O. Box 29235 Austin, TX 78755 512/422-8252	**CONTACT NAME:** Wade T Owens **PHONE (A/C, No, Ext):** **FAX (A/C, No):** **E-MAIL ADDRESS:** wadetowens@gmail.com
INSURED Benas Environmental Services Inc 324 Crooked Tree Court Coppell, TX 75019	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** INSURER A: United Specialty Insurance Company — 12537 INSURER B: Texas Mutual Insurance Company — 22945 INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	X COMMERCIAL GENERAL LIABILITY					EACH OCCURRENCE	$ 2,000,000
	CLAIMS-MADE X OCCUR					DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
	X Contractor's Pollution Liab Incl					MED EXP (Any one person)	$ 5,000
A	X E&O/Prof Liab - Claims Made		CCP914239	8-29-20	8-29-21	PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:					GENERAL AGGREGATE	$ 2,000,000
	POLICY PRO-JECT LOC					PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:						$
	AUTOMOBILE LIABILITY					COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO					BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS					BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS					PROPERTY DAMAGE (Per accident)	$
							$
	UMBRELLA LIAB OCCUR					EACH OCCURRENCE	$ 1,000,000
A	X EXCESS LIAB CLAIMS-MADE		CCP914240	8-29-20	8-29-21	AGGREGATE	$ 1,000,000
	DED RETENTION $						$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	Y / N				X PER STATUTE / OTH-ER	
B	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	N / A	0001155456	3-30-21	3-30-22	E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below					E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
						E.L. DISEASE - POLICY LIMIT	$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

30 day notice of cancellation to certificate holder

CERTIFICATE HOLDER

Texas Department of State Health Services
P.O. Box 149347
Austin, TX 78714

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Texas Department of State Health Services

BE IT KNOWN THAT

BENAS ENVIRONMENTAL SERVICES INCORPORATED

is certified to perform as a

Lead Firm

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1955 and Title 25, Texas Administrative Code, Chapter 295 relating to Texas Environmental Lead Reduction, as long as this license is not suspended or revoked.

Certification Number: 2110696

Expiration Date: 01/20/2022

John Hellerstedt, M.D.,
Commissioner of Health

Control Number: 7149

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE

SEE BACK

Franchise Tax Account Status

As of : 05/11/2021 12:28:08

This page is valid for most business transactions but is not sufficient for filings with the Secretary of State

BENAS ENVIRONMENTAL SERVICES, INCORPORATED

Texas Taxpayer Number	17525671248
Mailing Address	PO BOX 739 COPPELL, TX 75019-0710
Right to Transact Business in Texas	ACTIVE
State of Formation	TX
Effective SOS Registration Date	11/10/1994
Texas SOS File Number	0133355700
Registered Agent Name	EPHRAIM NGOZI OKOTCHA
Registered Office Street Address	13919 BROOKGREEN DR. DALLAS, TX 75240

Small Business Enterprise (SBE)
BENAS Environmental Services, Inc.

BENAS Environmental Services, Inc.

has filed with the Agency an Affidavit as defined by NCTRCA Small Business Enterprise (SBE) Policies & Procedures and is hereby certified to provide service(s) in the following areas:

NAICS 541620: ENVIRONMENTAL CONSULTING SERVICES
NAICS 562910: REMEDIATION SERVICES

This Certification commences May 17, 2021 and supersedes any registration or listing previously issued. This certification must be updated every two years by submission of an Annual Update Affidavit. At any time there is a change in ownership, control of the firm or operation, notification must be made immediately to the North Central Texas Regional Certification Agency for eligibility evaluation.

Certification Expiration: May 31, 2023
Issued Date: May 17, 2021
CERTIFICATION NO. BMSB71712N0523

Certification Administrator

Minority Business Enterprise (MBE)
BENAS Environmental Services, Inc.

BENAS Environmental Services, Inc.

has filed with the Agency an Affidavit as defined by NCTRCA Minority Business Enterprise (MBE) Policies & Procedures and is hereby certified to provide service(s) in the following areas:

NAICS 541620: ENVIRONMENTAL CONSULTING SERVICES
NAICS 562910: REMEDIATION SERVICES

This Certification commences May 17, 2021 and supersedes any registration or listing previously issued. This certification must be updated every two years by submission of an Annual Update Affidavit. At any time there is a change in ownership, control of the firm or operation, notification must be made immediately to the North Central Texas Regional Certification Agency for eligibility evaluation.

Certification Expiration: May 31, 2023
Issued Date: May 17, 2021
CERTIFICATION NO. BMMB46892N0523

Certification Administrator

CMBL/HUB Vendor Detail

Vendor ID / Vendor Number	1752567124800 / 63935
Vendor Name	BENAS ENVIRONMENTAL SERVICES,
Vendor Address	INCORPORATED P. O. BOX 739 COPPELL, TX 75019 USA
County	DALLAS
Contact	Pres./EPHRAIM OKOTCHA
Phone/Fax	972-393-0128 / 972-393-0793
Email Address	EO@BENAS.COM
Website	http://www.benas.com
Business Description	ENVIRONMENTAL ENGINEERING AND CONSULTING SERVICES, INDUSTRIAL HYGIENE SERVICES, ASBESTOS AND LEAD-BASED PAINT CONSULTANTS, INDOOR AIR QUALITY
Business Category	Architectural/Engineering And Surveying (05)
Small Business	Y
Service Disabled Veteran	No
CMBL Status	Inactive (F -Deleted for non-payment of annual fee)
Date Removed From CMBL	14-AUG-2004
HUB Status	Active Bidder (A-Approved; Active Texas certified HUB)
HUB Expires	21-FEB-2024
HUB Eligibility	BL (Black American)
HUB Gender	M

Commodity items shown above are available for district(s) 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

CATES' LICENSES AND CERTIFICATIONS

CATES LABORATORIES

CERTIFICATIONS & ACCREDITATIONS

NVLAP Accreditation



(assets/NVLAP_Certificate_2065644.pdf)

Historically Underutilized Business Certification



(assets/2015-2019_HUB_Cert-color.pdf)

Small Business Enterprise Certification



(assets/SBE_Certification_2017-18.pdf)

Disadvantaged Business Enterprise Certification - Texas



(assets/DBE_Certification_2017-18.pdf)

Small Business Enterprise TxDOT Certification



(assets/Cates_Laboratories_SBE_TxDOT.pdf)

Women-Owned Business Enterprise Certification



(assets/WBE_Certification_2017-18.pdf)

Disadvantaged Business Enterprise Certification - Florida



(assets/FL_-_DBE_Certificate.pdf)

LICENSES

TDSHS - Asbestos Analysis License



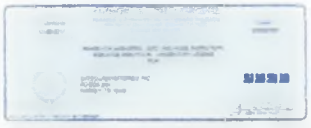
(assets/TDSHS_Lab_License_2017-19.pdf)

TDSHS - Mold Analysis License



(assets/Mold_Analysis_License-2017-19.pdf)

Virginia Lab License



(assets/VA_Lab_License_2018.pdf)

Arizona Lab License

Arizona Department of Health Services

AZ0948

Cates Laboratories, Inc.
Asbestos - Mold - Petrography

1339 Motor Circle
Dallas, TX 75207

Phone 214-920-5006
Fax 1-972-767-0167

admin@cateslab.com
(mailto:admin@cateslab.com)

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SECTION 03 11 13

STRUCTURAL CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Shoring, formwork and re-shoring of structure.
2. Furnish, install and removal of concrete formwork.

1.2 REFERENCES

A. Codes and Specifications
1. American Concrete Institute (ACI)
a. ACI 117, Specification for Tolerances for Concrete Construction and Materials
b. ACI 301, Specifications for Structural Concrete
c. ACI 318, Building Code Requirements for Structural Concrete
d. ACI 347R, Guide to Formwork for Concrete
2. Concrete Reinforcing Steel Institute (CRSI)
a. Manual of Standard Practice
3. American Society for Testing Materials (ASTM)
a. ASTM C203, Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
b. ASTM D1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
c. ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

1.3 SUBMITTALS

A. Shop Drawings:
1. Submit shop drawings for formwork.
2. Submit description of shoring, re-shoring and backshoring procedures, indicating magnitude of loads assumed, signed and sealed by licensed design engineer
3. Submit size and layout of sleeves and openings in structural members, required by trades, prior to releasing reinforcing, formwork and studrail shop drawings for fabrication.

B. Construction Joints: Submit diagrams of construction joints.

C. Form Ties: For Architecturally exposed concrete, submit layout of form tie spacing.

D. Product Data:
1. Form release agent
2. Fiberboard void forms
3. Void retainer panels
4. Vapor retarder

E. Unless otherwise indicated, submit the following for each type of product provided under Work of this Section:
1. Product Disclosure:
a. If available, provide product specific Type III, third party certified, Environmental Product Declaration (EPD) for each product in which product manufacturer is explicitly recognized as a participant by program operator.
b. If available, provide third party verified Corporate Sustainability Report (CSR) for each product that covers at least 90 percent of product contents.
c. If available, provide published Health Product Declaration (HPD) for each product documenting the role, amount, and health hazards for every product ingredient.
2. Recycled Content:
a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
b. Indicate material cost of product less labor included in Project.

c. If recycled content is part of an assembly, indicate percentage of pre-consumer and post-consumer recycled contents in assembly by weight.

3. Local / Regional Materials:
   a. Indicate extraction, manufacture, and purchase location of products; indicate distance between points of extraction, manufacture, and purchase and Project site.
   b. Indicate material cost less labor of products extracted, manufactured, and purchased within 100 miles of Project site.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials off ground and protected from weather.
   1. Prevent warpage, twisting and excessive moisture gain of wood materials.
   2. Discard damaged or deformed materials.

B. Protect smooth faces of form liner materials from abrasion, denting or scarring during handling.

PART 2 - PRODUCTS

2.1 GENERAL

A. Design, erect, shore, brace and maintain formwork according to ACI 301 to withstand vertical, lateral, static, dynamic and construction loads applied prior to concrete structure reaching adequate strength to support such loads.

B. Limit form deflections to provide smooth, straight surfaces without unsightly bulges and deformations.

C. Limit form deformations for architecturally exposed surfaces to 0.0025 times the span of each component (facing material, studs and walers).

2.2 MATERIALS

A. Wood forms for unexposed concrete surfaces: No. 2 Southern Yellow Pine or Douglas Fir dressed to uniform and smooth contact surfaces.

B. Wood forms for concrete surfaces exposed to view: Commercial Standard Douglas Fir concrete form plywood, moisture resistant, not less than 5 plies, and minimum thickness of 9/16 inch. Line forms with one of the following:
   1. Plywood: Commercial Standard Douglas Fir, concrete form, exterior, 3 ply, not less 1/4 inch thick with one smooth face.
   2. Fiberboard: Treated, hard pressed fiberboard, moisture resistant, not less than 3/16 inch thick with one smooth side.

C. Void retainers:
   1. Precast Concrete Panels. 1 ½ inches thick, 3000 psi lightweight or normal weight concrete, reinforced with 4x4-W1.4 welded wire mesh.
   2. Lightweight, ribbed, high density or high molecular weight polyethylene or panels specially made to prevent migration of backfill soil under foundation elements. Required minimum panel height: 14 inches for 8 inch void space and smaller; 20 inches for larger than 8 inch and up to 12 inch void space; 26 inches for larger than 12 inch and up to 16 inch void space.
      a. Example product: Motzblock distributed by CAM-Crete, LLC
      b. Example product: SureRetainer by VoidFormProducts

2.3 MANUFACTURED UNITS

A. Fiberboard void forms (void boxes): manufactured using corrugated paper material with water resistant fiberboard material exterior, capable of supporting weight of wet concrete without crushing but non-durable in long-term (deteriorates over time with absorption of moisture). Void forms to be laminated using moisture resistant adhesive.
   1. Provide premanufactured shapes required (rectangular, etc.)
   2. Provide special shapes adjacent to round or skewed components.
      a. Do not cut fiberboard void forms in field.
   3. Provide caps at each end of units.
   4. Provide a layer of protective cover board over void forms to distribute working load and protect void forms from puncture and other damage during concrete placement.

a. Example cover board: ¼ inch minimum thickness hardboard/fiberboard

2.4 ACCESSORIES

A. Form ties: bolt rods or patented devices of sufficient strength to withstand pressure due to wet concrete (3000 pounds minimum tensile strength); adjustable in length, and removable to depth of at least 1 inch from face of concrete.
1. Equip ties for exposed concrete surfaces with plastic cones 5/8 inch in diameter.
2. Do not use wire ties, or makeshift ties that leave unsightly marks or depressions on face of concrete.

B. Form release agent:
1. Does not bond with, stain, or adversely affect concrete surfaces.
2. Meets acceptable air quality standards.

2.5 PRODUCT DOCUMENTATION

A. In coordination with Project sustainability goals, provide products with third-party certified Type III Environmental Product Declarations (EPDs) in accordance with ISO 14025 that document product's environmental impacts associated with material extraction, energy use, chemical makeup, waste generation, and emissions.

B. In coordination with Project sustainability goals, provide products with third-party verified corporate sustainability reports (CSRs) that document material supply chains and extraction operations.

C. In coordination with Project sustainability goals, provide products with published Health Product Declarations (HPDs) that document chemical inventory of product to at least 0.1 percent.

2.6 ENVIRONMENTALLY PREFERABLE PRODUCTS

A. In coordination with Project sustainability goals, provide products with environmental impacts below industry average in the following categories:
1. Global warming potential
2. Depletion of stratospheric ozone layer
3. Acidification of land and water sources
4. Eutrophication
5. Formation of tropospheric ozone
6. Depletion of nonrenewable resources

B. In coordination with Project sustainability goals, provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of pre-consumer recycled content constitutes at least 25 percent of total value of materials in Project.

C. In coordination with Project sustainability goals, ensure that products are sourced from manufacturers with third-party validated health, safety, and risk programs.

D. In coordination with Project sustainability goals, provide products and materials that promote good indoor environmental quality (EQ) and promote efficiencies in operational performance.

E. In coordination with Project sustainability goals, provide materials and products sourced within 100 miles of Project site.

PART 3 - EXECUTION

3.1 DESIGN AND CONSTRUCTION

A. Design formwork for concrete elements to have correct dimension, shape, alignment, elevation, and position with dimensional tolerances conforming to ACI 117. Reference ACI 347R.

B. Design formwork to safely support vertical and lateral loads until such loads can be supported by concrete structure. Carry vertical and lateral loads to ground by formwork system or by in-place construction of adequate strength.

C. Form sides of concrete elements unless specifically noted or shown otherwise.
1. Dimensional tolerances to conform to ACI 117.
2. Repair bulges, offsets and formwork conditions that would cause beam sides to become skewed or wider than void box bottom forms prior to placing concrete.

D. Construct forms to required shapes, lines and dimensions; provide necessary studs, walers, ties, centering, molds and supports.
   1. Install forms sufficiently tight to prevent leakage of mortar.
   2. Construct forms to be easily removable without damage to finished surfaces.
   3. Provide forms without unsightly marks or deformations on exposed faces.
   4. Thoroughly clean forms of concrete laitance before re-use.
   5. Provide clean-outs at base of vertical forms for removal of foreign materials before concrete placement.

E. Tying of forms: provide sufficient form ties to prevent bulging or collapse of forms under weight of wet concrete.
   1. Place ties in uniform and orderly pattern.
   2. Lubricate ties to prevent bonding with concrete.

F. Special features: place in forms any wood strips, blocking, molding, and liners necessary to produce required shapes.
   1. Attach feature strips to forms in a manner that will not leave unsightly marks on exposed concrete surfaces.
   2. Coat wood strips, blocking and molding with form sealer.
   3. Provide 3/4 inch chamfer strips along edges of permanently exposed concrete unless noted otherwise.
   4. Provide dove-tailed anchor slots coordinated with masonry.

G. Coatings:
   1. Coat contact surfaces of wood forms with form release agent before each use and before placing reinforcement.
   2. Apply form release agent per manufacturer’s recommendations.
   3. Do not allow excess release agent to accumulate in forms or to contact hardened concrete against which fresh concrete will be placed.
   4. Remove release agent from reinforcement before placing concrete.

H. Fiberboard Void Boxes:
   1. Ensure subgrade is clean and dry before installing void boxes.
   2. Place void cartons tightly end-to-end.
   3. Place and arrange void cartons so that horizontal concrete surfaces that would otherwise be in contact with soil are protected by void boxes. Protect cartons from rain and mud.
   4. Secure void cartons firmly in place so that position will not be altered by activities of workmen or placement of concrete. Secure with waterproof tape.
   5. Do not cut fiberboard void box components in field.
   6. Replace partially or wholly collapsed cartons.
   7. Install vapor retarder in accordance with ASTM E1643
   8. Install protective cover board according to manufacturer's instructions.

I. Void Retainers:
   1. Prior to installing retainers, inspect void spaces to ensure voids are intact and that concrete or other material has not entered void space.
      a. Where void space is not intact, remove excess concrete or other material prior to installing void retainers.
   2. Install void retainers as shown or in accordance with manufacturer's written instructions, including overlap on side of beam or wall and penetration into subgrade. Where discrepancies occur, the most stringent shall govern.
   3. Cut retainer material for tight fit at corners. Tape corners to ensure panels remain accurately in place during backfilling and that backfill soil does not enter void space.
   4. Monitor performance of retainer panels continuously during backfilling. If panels shift, or soil enters void space, stop work and adjust installation to assure satisfactory performance.
   5. Void height tolerance: plus 2 inches, minus 0 inches of required height.

3.2 REMOVAL OF FORMS

A. Remove forms completely, unless specifically required otherwise.

B. Remove forms carefully to avoid damage to concrete surfaces.

C. Do not remove forms until concrete is adequately set.

1. Clamps and tie rods may be loosened after 24 hours following placement of concrete.
   a. Maintain sufficient ties to hold forms in place.
   b. Withdraw through-wall ties toward the inside (or unexposed) face of walls and beams.
   c. Prevent spalling during tie removal.
2. Use concrete strength tests as evidence that concrete has adequately set for form removal.
   a. Minimum strength is 75 percent of design strength.

D. Remove forms sequentially and in small units to prevent shock, overload or undue eccentricity in structure. Do not store materials or place heavy equipment on structures of which forms have been removed unless concrete strength is equal to design strength, or re-shores are installed. Remove forms in a manner that does not require a large portion of the structure to be self-supporting (i.e. a full bay of framing). Install re-shores immediately as form removal progresses.

E. Do not remove forms until supporting structures are permanently in place and full strength.

F. Re-shore structure required to support subsequent construction. Install re-shores plumb and tight to structure and concentric with form supports. Provide re-shore materials with safe load capacity sufficient for transfer of required loads. Re-shore sufficient levels of structure so that imposed loads due to forms, wet concrete and construction loads do not exceed the combined live load capacity of levels to which re-shores extend. Space re-shores sufficiently close together to provide uniform distribution of load to supporting structure.

END OF SECTION

SECTION 03 11 15

EXPANDED POLYSTYRENE FOAM BLOCK FORMWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections: 03 11 13 Structural Concrete Forming

1.2 REFERENCES

A. ASTM D6817 - Standard Specification for Rigid Cellular Polystyrene Geofoam

1.3 SUBMITTALS

A. Shop Drawings: Show layout and dimensions of Expanded Polystyrene (EPS) foam block fill areas. Indicate location, size, and elevation. Provide cross section of area indicating height and depth. Provide plan view of each layer of foam block with each part identified and dimensioned. Show attachment method and configuation.

B. Product Data for listed materials including:
   1. Physical properties in compliance with ASTM D6817 Type EPS15, unless noted otherwise.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver EPS foam labeled with material type.

B. Prior to installation, store above ground and protected from moisture and sunlight.

C. Do not expose product to open flame or other ignition sources.

D. Do not deliver product to Project site before installation time.

E. Complete installation and concealment of product in each area of construction as rapidly as possible.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Molded, Rigid Cellular Expanded Polystyrene Blocks: Comply with manufacturer's requirements, conform to ASTM D6817.

B. Adhesive: non-solvent based polyurethane adhesive.

C. GeoGripper Plates: Use to restrain EPS Geofoam from moving laterally in layer over layer applications.
   1. Made of galvanized or stainless steel with two-sided multi-barbed design capable of piercing geofoam.

D. Treat EPS foam blocks with a tested and proven termite treatment by manufacturer for below grade applications, 3 year minimum field exposure. Use EPA registered treatment meeting requirements of ICC ES EG239 and recognized in an ICC ES report.

2.2 FABRICATION

A. Fabricate blocks square and true to dimension.
   1. Factory cut blocks for delivery to jobsite and installation without need for excessive field cutting.
   2. Ramp areas: fabricate block with slope consistent with ramp slope requirements.

B. Marking and Identification: Mark blocks with Section Layer I.D. letter and part number identification corresponding to shop drawing layout and EPS schedule.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's EPS foam product data; including technical bulletins.

3.2 STORAGE

A. Ballast: Ballast EPS foam to prevent displacement by wind or high water conditions during storage and placement.

3.3 GENERAL INSTALLATION

A. Examine supporting substrate and abutting structural framing for compliance with requirements for elevations, installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions are corrected.

B. Install system in compliance with Contract Documents and installation/shop drawings as prepared by manufacturer.

C. Blocks to be adhered to base slab and to one another along horizontal surface with continuous minimum 1 inch wide strip of adhesive. Adhesive to be placed 2 inches from perimeter of each side of each block and at 8 inches on center each way.

D. Installation to be completed by experienced craftsmen trained to do this type of Work.

3.4 PROTECTION & SAFETY

A. Protection: Protect installed product and finish surfaces from damage during construction.

B. Do not weld with torch in same room as installed or stored EPS. Protect EPS against ignition.

END OF SECTION

SECTION 03 15 19

CAST-IN ANCHORS AND EMBEDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Steel assemblies to be embedded
2. Anchors
3. Inserts

1.2 REFERENCES (Latest Edition)

A. Codes and Specifications
1. Concrete Reinforcing Steel Institute (CRSI)
a. Manual of Standard Practice.
2. American Institute of Steel Construction (AISC)
a. AISC 360, Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
3. American Welding Society (AWS)
a. AWS D1.1, Structural Welding Code - Steel.
b. AWS D1.4, Structural Welding Code - Reinforcing Steel.
c. AWS D1.8, Structural Welding Code – Seismic Supplement
4. American Concrete Institute (ACI)
a. ACI 318, Building Code Requirements for Reinforced Concrete.
b. SP-066, ACI Detailing Manual
5. American Society for Testing and Materials (ASTM)
a. ASTM A29, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought.
b. ASTM A36, Standard Specification for Carbon Structural Steel.
c. ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
d. ASTM A283, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
e. ASTM A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
f. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
g. ASTM A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
h. ASTM A1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
i. ASTM A1011, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
j. ASTM F3125, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

1.3 SUBMITTALS

A. Product Data
1. Submit manufacturer's data indicating product compliance for the following:
a. Headed stud anchors
b. Deformed bar anchors
c. Rust inhibitor
d. Zinc coating
e. Threaded inserts
f. Anchor slots

B. Shop Drawings:

1. Submit shop and installation drawings for review by Architect, including:
   a. Shop and field connection details
   b. Material grades and sizes
   c. Details of fabrication
2. Do not begin fabrication prior to review of shop drawings.
3. Review of shop drawings is for member sizes, spacings, detail, and general compliance with Contract Documents only.
4. Material quantities, lengths, fit, verification of job conditions, and coordination with other trades are responsibility of Contractor.

C. When requested by Owner or Architect, submit welders' certifications.

1.4 QUALITY ASSURANCE

A. Qualifications
1. Fabricator:
   a. Minimum of 3 years of experience in related or similar work.
2. Welders:
   a. Certified for type of welding required within previous 6 months.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store fabricated assemblies and inserts under cover and off ground to protect against corrosion prior to placement.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Shapes
1. Plates and bars: ASTM A572 Grade 50
2. HSS: ASTM A500 Grade C
3. M, S, HP and L: ASTM A572 Grade 50
4. W, WT, C and MC: ASTM A992

B. Anchor Rods
1. Anchor Rods: ASTM F1554
2. Plate Washers: ASTM A572 Grade 50
   a. ASTM F844 washers are not allowed unless approved by Architect prior to fabrication.
      1) Use of ASTM F844 washers requires adherence to tighter tolerances per AISC Steel Construction Manual.
      2) Not allowed at lateral column bases.
3. Heavy Hex Nuts: ASTM A563

C. Reinforcing Bars
1. Deformed Bars: ASTM A615 of required grades.
2. Welded Wire Reinforcement: Conform to ASTM A1064.
3. Bars to be welded: ASTM A706 of required grades.

D. Fusion Welded Anchors
1. Headed Stud Anchors: Conform to ASTM A29, Grades 1010 through 1020, Type B, with sizes and lengths as shown, and conforming to AWS D1.1, Section 7.
2. Deformed Bar Anchors: Low carbon steel, conforming with ASTM A1064, with sizes and lengths as shown.
   a. Example product: Type DA, as manufactured by Blue Arc Stud Welding Division of Erico Industries.

E. Welding Electrodes:
1. Conform to AISC and AWS Specifications
2. Use E70 electrodes unless noted otherwise.
3. Use E80 electrodes for welding of ASTM A706 rebar.

F. Coatings
1. Rust Inhibitor:
   a. Example product: Hi-Build Epoxoline as manufactured by Tnemec Co.
2. Hot-dip Galvanizing: Conform to ASTM A153.

3. Cold Galvanizing:
   a. Example product: Galvilite as manufactured by ZRC WORLDWIDE

G. Inserts
1. Threaded Inserts: Rated for tensile strength of bolt size required (ultimate strength).
2. Anchor Slots to receive inserts for anchoring masonry units, cast stone, and marble to concrete: One inch wide, 7/8 inch deep, continuous No. 24 gauge, galvanized sheet steel, dovetailed slots, complete with felt lining.
   a. Example manufacturer: Hohmann & Barnard, Inc., New York, N.Y.
3. Miscellaneous: PVC pipes, or other special inserts as shown, or as required by other trades.

2.2 FABRICATION

A. Fabricate and assemble structural steel items in shop. Carefully and accurately shear, flame cut, and chip materials as required. Cut, drill, or punch holes at right angles to surface of metal. Do not enlarge holes by burning. Cut holes cleanly without torn or ragged edges. Weld in accordance with AISC Specifications and with AWS D1.1 and D1.4. Permit only AWS certified welders to perform welds.

B. Weld deformed bar anchors and headed stud anchors by full-fusion process. Weld in accordance with manufacturer's recommendations regarding equipment, conditions of material, and temperature.
1. Example processes:
   a. Nelson Stud Welding Company
   b. KSM Welding Services Division, Omark Industries.

C. Hot-dip galvanize steel assemblies and accessories exposed to weather or soil. Hot-dip galvanize steel embeds used within crawl space environments.

D. Plainly mark and match-mark assemblies and inserts to correspond to placement drawings and diagrams.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Clean assemblies and inserts of corrosion, dirt, oil, grease and laitance before placing in forms.

B. Place assemblies and inserts in forms and securely anchor in required positions with correct orientations. Use templates, diagrams and instructions provided by Fabricator for proper alignment and positioning.

3.2 FIELD QUALITY CONTROL

A. Laboratory Testing: provide independent testing laboratory services as follows:
1. Inspect steel fabrications for sizes, spacings and general quality of fabrication.
2. Inspect welding of steel fabrications for size, length and quality.
3. Inspect positioning of assemblies and inserts in forms.
4. Visually inspect welds at anchors and shear stud connectors. Test studs which do not appear to have full sound 360 degree fillet weld at base. Test by bending 15 degrees. Replace studs which fail this test.

B. Afford full cooperation and access to Work to testing laboratory and provide adequate notice to laboratory of when Work is ready for testing and inspection so that services can be carried out in full, allowing sufficient time for making corrections without delaying progress of Work.

3.3 ADJUSTING

A. Field Touch Up
1. Use cold galvanizing compound in accordance with manufacturer's recommendations for field touch-up.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Preparation of shop drawings
2. Fabrication and placement of reinforcing

B. Products Furnished, not Installed Under This Section
1. Pier reinforcing

1.2 REFERENCES

A. Codes and Specifications
1. American Concrete Institute (ACI)
a. ACI 318, Building Code Requirements for Reinforced Concrete
b. SP-066, ACI Detailing Manual
2. Concrete Reinforcing Steel Institute (CRSI)
a. Manual of Standard Practice
b. RB4.1, Supports for Reinforcement Used in Concrete
3. American Welding Society (AWS)
a. AWS D1.1, Structural Welding Code - Steel
b. AWS D1.4, Structural Welding Code - Reinforcing Steel
4. American Society for Testing Materials (ASTM)
a. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
b. ASTM A1044, Standard Specification for Steel Stud Assemblies for Shear Reinforcement of Concrete
c. ASTM A1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
d. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
e. ASTM A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
f. ASTM A775, Standard Specification for Epoxy-Coated Steel Reinforcing Bars
g. ASTM A767, Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
h. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
i. ASTM D3963, Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars

1.3 SUBMITTALS

A. Shop Drawings
1. Submit shop and installation drawings for review by Architect, including:
a. Reinforcing sizes and quantities
b. Reinforcing lengths and bending details
c. Placement instructions
d. Details and spacing of reinforcing supports
e. References to reinforcing designations in Contract Documents
f. Notes regarding reinforcing placement
g. Material grades
2. Review of Shop Drawings will be for reinforcing sizes, spacing, and general detail only; excluding quantities, lengths and fit of materials.
3. Do not use reproductions of Contract Documents for shop drawings.

B. Quality Control Submittals
1. Submit certified mill reports, evidencing compliance with Specification requirements.

2. Submit laboratory testing and inspection reports.

C. Unless otherwise indicated, submit the following for each type of product provided under Work of this Section:
   1. Product Disclosure:
      a. If available, provide product specific Type III, third party certified, Environmental Product Declaration (EPD) for each product in which product manufacturer is explicitly recognized as a participant by program operator.
      b. If available, provide third party verified Corporate Sustainability Report (CSR) for each product that covers at least 90 percent of product contents.
      c. If available, provide published Health Product Declaration (HPD) for each product documenting role, amount, and health hazards for every product ingredient.
   2. Recycled Content:
      a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
      b. Indicate material cost of product less labor included in Project.
      c. If recycled content is part of an assembly, indicate percentage of pre-consumer and post-consumer recycled contents in assembly by weight.
   3. Local / Regional Materials:
      a. Indicate extraction, manufacture, and purchase location of products; indicate distance between points of extraction, manufacture, and purchase and Project site.
      b. Indicate material cost less labor of products extracted, manufactured, and purchased within 100 miles of Project site.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in tagged bundles grouped by reinforcing size and length.

B. Store reinforcing on skids off ground and stacked to permit drainage. Prevent build-up of rust and dirt on reinforcing. Protect reinforcing from contamination that would prevent bonding of concrete.

C. Do not bend, twist or warp reinforcing during handling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Reinforcing Steel
   1. Deformed bars: new billet steel conforming to ASTM A615 of required grades.
   2. Smooth bars: conform to ASTM A615
   3. Welded wire reinforcement: conform to ASTM A1064.
   4. Reinforcing bars to be welded: conform to ASTM A706.

2.2 ACCESSORIES

A. Concrete bricks or chairs with bearing plates: Provide where supports are in contact with soil or vapor barrier.

B. Plastic-tipped chairs in conformance with CRSI RB4.1.Provide of suitable color where concrete soffits will be exposed to view.

2.3 PRODUCT DOCUMENTATION

A. In coordination with Project sustainability goals, provide products with third-party certified Type III Environmental Product Declarations (EPDs) in accordance with ISO 14025 that document product's environmental impacts associated with material extraction, energy use, chemical makeup, waste generation, and emissions.

B. In coordination with Project sustainability goals, provide products with third-party verified corporate sustainability reports (CSRs) that document material supply chains and extraction operations.

C. In coordination with Project sustainability goals, provide products with published Health Product Declarations (HPDs) that document chemical inventory of product to at least 0.1 percent.

2.4 ENVIRONMENTALLY PREFERABLE PRODUCTS

A. In coordination with Project sustainability goals, provide products with environmental impacts below industry average in the following categories:
   1. Global warming potential
   2. Depletion of stratospheric ozone layer
   3. Acidification of land and water sources
   4. Eutrophication
   5. Formation of tropospheric ozone
   6. Depletion of nonrenewable resources

B. In coordination with Project sustainability goals, provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of pre-consumer recycled content constitutes at least 25 percent of total value of materials in Project.

C. In coordination with Project sustainability goals, ensure that products are sourced from manufacturers with third-party validated health, safety, and risk programs.

D. In coordination with Project sustainability goals, provide products and materials that promote good indoor environmental quality (EQ) and promote efficiencies in operational performance.

E. In coordination with Project sustainability goals, provide materials and products sourced within 100 miles of Project site.

2.5 FABRICATION

A. Shop Fabrication
   1. Cut reinforcing to required lengths
   2. Bend reinforcing cold with suitable equipment. Do not heat or stretch material. Provide bend radii and extensions in conformance with ACI 318.
   3. Do not use reinforcing with kinks or unrequired bends.
   4. Do not re-straighten reinforcing bent more than 30 degrees.

B. Tolerances: conform to ACI 318.

C. Marking: mark reinforcing to correspond with shop drawings.

D. Provide uncoated bars unless noted otherwise.

2.6 SOURCE QUALITY CONTROL

A. Testing Laboratory Services
   1. Inspect fabricating and bending procedures
   2. Inspect fabricated materials

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean reinforcing of ice, dirt, loose rust, mill scale, oil, and grease.

3.2 PLACEMENT

A. Place reinforcing of required sizes and quantities in proper position within forms. Use supports and spacers to maintain position before and during concrete placement.
   1. Do not place reinforcing supports against exposed faces of precast panels, beams, walls or copings.
   2. Support concrete reinforcing in conformance with CRSI RB4.1

B. Secure reinforcing in position with wire ties complying with ACI 318.
   1. Clip or bend tails of tie wire away from exposed faces, do not leave tie wire within 1 1/2" of any exposed surface.

C. Concrete Cover: comply with ACI 318 and Contract Documents.

D. Maintain position of reinforcing mats in walls with metal spacers between mats.

E. Tolerances
   1. Concrete cover to unformed surfaces
      a. Members 8 inches deep or less: plus 1/4 inch
      b. Members more than 8 inches deep: plus 1/2 inch

2. Concrete cover to formed surfaces: plus 1/4 inch
3. Longitudinal location of bends and ends of reinforcement: plus 2 inches
4. Spacing between reinforcing bars: 1/4 inch

F. Support reinforcing in slabs-on-grade and slabs-on-deck on bolsters or blocks. Do not lift reinforcing during concrete placement.

3.3 COLD BENDING OF BARS IN FIELD

A. Dowels connecting concrete of different pour sequences may be bent in field to facilitate form placement and removal with the following conditions:
1. Maximum bar size is #5
2. Maximum bend angle is 90 degrees
3. Bars may be bent and straightened one time only

3.4 FIELD QUALITY CONTROL

A. Testing Laboratory Services
1. Inspect reinforcing sizes, quantities and placement.
2. Inspect support and securement of reinforcing.
3. Inspect condition of reinforcing.

END OF SECTION

SECTION 03 31 00

STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Design of concrete mixes
2. Furnishing and placing cast-in-place concrete
3. Curing and finishing of concrete

B. Products Furnished, not Installed, under this Section
1. Concrete for drilled piers

1.2 REFERENCES

A. American Concrete Institute (ACI)
1. ACI 117, Specification for Tolerances for Concrete Construction and Materials
2. ACI 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
3. ACI 213, Guide for Structural Lightweight – Aggregate Concrete
4. ACI 214, Guide to Evaluation of Strength Test Results of Concrete
5. ACI 301, Specifications for Structural Concrete
6. ACI 302.1, Guide to Concrete Floor and Slab Construction
7. ACI 304, Guide for Measuring, Mixing, Transporting, and Placing Concrete
8. ACI 305.1, Specification for Hot Weather Concreting
9. ACI 306.1, Standard Specification for Cold Weather Concreting
10. ACI 308, Guide to External Curing of Concrete
11. ACI 309, Guide for Consolidation of Concrete
12. ACI 318, Building Code Requirements for Structural Concrete and Commentary
13. MNL-15, Field Reference Manual

B. American Society for Testing and Materials (ASTM)
1. ASTM C31, Standard Method of Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33, Standard Specification for Concrete Aggregates.
3. ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42, Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94, Standard Specification for Ready-Mixed Concrete.
6. ASTM C138, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
7. ASTM C143, Standard Test Method for Slump of Portland Cement Concrete.
8. ASTM C150, Standard Specification for Portland Cement.
9. ASTM C156, Standard Test Method for Water Retention by Concrete Curing Materials.
10. ASTM C171, Standard Specification for Sheet Materials for Curing Concrete.
11. ASTM C172, Standard Method of Sampling Fresh Concrete.
12. ASTM C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
13. ASTM C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
14. ASTM C260, Standard Specification for Air- Entraining Admixtures for Concrete.
15. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
16. ASTM C330, Standard Specification for Lightweight Aggregates for Structural Concrete.
17. ASTM C494, Standard Specification for Chemical Admixtures for Concrete.
18. ASTM C567, Test for Unit Weight of Structural Lightweight Concrete.
19. ASTM C618, Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
20. ASTM C989, Standard Specification for Slag Cement for Use in Concrete and Mortars.

21. ASTM C1017, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
22. ASTM C1064, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
23. ASTM C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
24. ASTM C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
25. ASTM C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
26. ASTM E1155, Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound) Units.
27. ASTM E1745, Standard Specification for Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

C. Corps of Engineers (CRD)
1. CRD-C13, Standard Specification for Air- Entraining Admixtures for Concrete.
2. CRD-C572, Specifications for Polyvinyl Chloride Water Stops.
3. CRD-C621, Corps of Engineers Specification for Non-Shrink Grout.

1.3 SUBMITTALS

A. Product Data: submit manufacturer’s data indicating product compliance for the following:
1. Admixtures
2. Floor hardener
3. Curing compound
4. Curing and Sealing compound
5. Vapor Retarder

B. Material Certifications: submit certifications showing compliance for the following:
1. Portland cement
2. Fly ash
3. Slag cement
4. Sieve analyses for structural concrete aggregates:
   a. Coarse aggregate
   b. Fine aggregate

C. Structural Concrete Mix Designs for each class of concrete

D. Concrete Delivery Tickets: Submit sample ready-mixed concrete delivery tickets in accordance with ASTM C94 for each class of concrete.

E. Construction Joints: submit drawings indicating proposed construction joint locations.

F. Unless otherwise indicated, submit the following for each type of product provided under Work of this Section:
1. Product Disclosure:
   a. If available, provide product specific Type III, third party certified, Environmental Product Declaration (EPD) for each product in which product manufacturer is explicitly recognized as a participant by program operator.
   b. If available, provide third party verified Corporate Sustainability Report (CSR) for each product that covers at least 90 percent of product contents.
   c. If available, provide published Health Product Declaration (HPD) for each product documenting role, amount, and health hazards for every product ingredient.
2. Recycled Content:
   a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
   b. Indicate material cost of product less labor included in Project.
   c. If recycled content is part of an assembly, indicate percentage of pre-consumer and post-consumer recycled contents in assembly by weight.
3. Local / Regional Materials:
   a. Indicate extraction, manufacture, and purchase location of products; indicate distance between points of extraction, manufacture, and purchase and Project site.
   b. Indicate material cost less labor of products extracted, manufactured, and purchased within 100 miles of Project site.

1.4 QUALITY ASSURANCE

A. Batch Plant Qualifications: Conform to National Ready-Mixed Concrete Association certification requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Transporting: Ready-mixed concrete supplier to have sufficient capacity and adequate facilities to provide continuous delivery at rate required for continuous placement throughout sequence of placement.

B. Storage of Materials
   1. Store cement in weather tight buildings or bins which prevent intrusion of moisture or contaminants. Store different types of cement in separate facilities.
   2. Stockpile aggregates to prevent segregation and contamination with other materials. Thaw frozen aggregates before use.
   3. Drain sand to uniform moisture content before use.
   4. Store admixtures securely to prevent contamination, evaporation, damage or temperature variation in excess of range recommended by manufacturer.
   5. Store waterstops under cover to prevent exposure to sunlight, moisture, soil and other deleterious materials.

C. Delivery: Truck mixers, agitators and non-agitating units: Conform to ASTM C94

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ardex Americas

B. Dayton Superior

C. Euclid Chemical Company

D. W.R. Grace & Company

E. SpecChem

F. BASF

G. W.R. Meadows

H. Sika Corporation

I. Sonneborn

2.2 MATERIALS

A. Cementitious materials
   1. Portland cement: Conform to ASTM C150, Type I, II or III Portland Cement.
   2. Blended hydraulic cement: Conform to ASTM C595 Type IL
   3. Fly Ash: Conform to ASTM C618, carbon content not greater than 3 percent by volume.
   4. Slag Cement: Conform to ASTM C989.

B. Fine aggregate: Conform to ASTM C33, natural bank or river sand, washed and screened, consisting of hard, durable, uncoated particles free of deleterious matter, and graded from coarse to fine to produce a minimum percentage of voids.

C. Coarse aggregate: Conform to ASTM C33, gravel or crushed stone, suitably processed, washed and screened; consisting of hard, durable particles without adherent coatings.

D. Coarse aggregate for lightweight concrete: Conform to ASTM C330.

E. Water: Conform to ASTM C1602.

F. Admixtures: Conform to ASTM C494, Type A through G, and used strictly in accordance with manufacturer’s recommendations.

G. Air Entraining Admixtures: Conform to ASTM C260 and CRD-C13.

H. Calcium chloride thiocyanates or admixture containing more than 0.05 percent chloride ions not permitted in concrete mixtures.

I. Admixtures containing chlorides not permitted in concrete poured on metal floor deck, nor in post-tensioned concrete.

2.3 CURING AND FINISHING PRODUCTS

A. Liquid Curing Compound
1. Conform to ASTM C309, Types 1 and 1D, Class B
2. Meet federal and state VOC/AIM regulations.
3. Dissipating resin type, which chemically breaks down after approximately 8 weeks.
4. Does not inhibit bonding of flooring adhesives.
5. Does not inhibit bond breaker, where applicable.
6. Sodium silicates prohibited.
7. Use on interior slabs receiving subsequent floor coverings and parking structures.

B. Curing and Sealing Compounds:
1. Conform to ASTM C1315, Type 1, Class A.
2. Minimum 25 percent solids by volume.
3. Moisture loss not more than 0.30 Kg/M2 when applied at 300 square feet per gallon.
4. Meet federal and state VOC/AIM regulations
5. Do not use in tilt-up construction

C. Evaporation Retardant:
1. Thin, continuous film which prevents rapid moisture loss from concrete surface.
2. Use in concrete operations performed in direct sun, wind, or high temperatures.

D. Waterproof Paper:
1. Waterproof paper for curing concrete: 2 ply fiber-reinforced, asphaltic kraft paper conforming to ASTM C171.

E. Floor Hardener:
1. Penetrating liquid for subsequent application
2. Non-staining
3. Combination curing compound and hardener not permitted.

F. Cement Floor Leveling Compound: Free flowing, self-leveling, pumpable, cementitious compound specially formulated for feather-edge application.

G. Liquid Densifier / Sealer:
1. Siliconate based sealer that penetrates concrete surfaces, increases abrasion resistance, and provides a “low sheen” surface.
2. Clear, non-yellowing, fast curing, chemically neutral, without oils, fillers, extenders and stabilizers.
3. Does not inhibit bonding of flooring adhesives.
4. Does not inhibit bond breaker, where applicable.

H. Comply with applicable air-quality and environmental regulations.

2.4 PRODUCT DOCUMENTATION

A. In coordination with Project sustainability goals, provide products with third-party certified Type III Environmental Product Declarations (EPDs) in accordance with ISO 14025 that document product’s environmental impacts associated with material extraction, energy use, chemical makeup, waste generation, and emissions.

B. In coordination with Project sustainability goals, provide products with third-party verified corporate sustainability reports (CSRs) that document material supply chains and extraction operations.

C. In coordination with Project sustainability goals, provide products with published Health Product Declarations (HPDs) that document chemical inventory of product to at least 0.1 percent.

2.5 ENVIRONMENTALLY PREFERABLE PRODUCTS

A. In coordination with Project sustainability goals, provide products with environmental impacts below industry average in the following categories:
1. Global warming potential
2. Depletion of stratospheric ozone layer
3. Acidification of land and water sources

4. Eutrophication
5. Formation of tropospheric ozone
6. Depletion of nonrenewable resources

B. In coordination with Project sustainability goals, provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of pre-consumer recycled content constitutes at least 25 percent of total value of materials in Project.

C. In coordination with Project sustainability goals, ensure that products are sourced from manufacturers with third-party validated health, safety, and risk programs.

D. In coordination with Project sustainability goals, provide products and materials that promote good indoor environmental quality (EQ) and promote efficiencies in operational performance.

E. In coordination with Project sustainability goals, provide materials and products sourced within 100 miles of Project site.

2.6 CONCRETE MIXES

A. General: Compose concrete of cementitious materials, fine aggregate, coarse aggregate, water, and admixtures where applicable. Design concrete mixes to be workable and appropriate for each application, to bond readily to reinforcement, without segregation or formation of excessive free water on surfaces.

B. Strength Gain: design concrete mixes to obtain required strength in 28 days or less from date of placement.

C. Selection of Proportions
1. Determine ingredient proportions in accordance with ACI 301 to provide required strength, slump, resistance to weathering, placeability, durability and surface hardness for each class of concrete.
2. Provide admixtures as required or appropriate to enhance workability, control set or improve strength.
3. Minimum Cement Content: Cement content not less than 320 pounds per cubic yard
4. Supplementary cementitious materials (fly ash and slag cement)
   a. Percentage of supplementary cementitious materials not to exceed 25 percent of total cementitious content by weight
   b. Fly ash not permitted in architecturally exposed concrete
   c. Supplementary cementitious materials not permitted in concrete receiving dry shake floor hardeners

D. Required Average Strength for Mix Design:
Where suitable strength test records for concrete production facility are available, design strength may be based on standard deviation in accordance with ACI 301.
Where strength test records are not available, base design strength on the following:

Specified Strength F'c - psi	Required Average Strength F'cr - psi
F'c <3000	F'c + 1000
3000 <= F'c <=5000	F'c + 1200
F'c > 5000	1.10 F'c + 700

E. Documentation of Average Strength: provide evidence of average strength for each class of concrete in accordance with ACI 301 by field strength tests, strength test records or trial mixtures.

F. Concrete Mix Designs: submit mix designs for each class of concrete.
1. Indicate the following for each mix design:
   a. Class designation
   b. Proportions of cement, supplementary cementitious materials, fine and coarse aggregates, and water
   c. Water-cement ratio, design strength, slump, and air content
   d. Type of cement, supplementary cementitious materials and aggregates
   e. Type and dosage of admixtures
2. Adjust mix designs as required by weather and jobsite conditions to maintain specified strengths throughout course of Work without additional cost to Owner.

3. As strength data becomes available during progress of Work, mix designs may be adjusted in accordance with ACI 301.
4. Provide mix with target slump not to exceed 8 inches with no visible signs of segregation.

2.7 PRODUCTION OF CONCRETE

A. Do not mix concrete for placement until:
1. Mix designs and corresponding strength tests reflect that each proposed mix will develop strengths required
2. Mix designs have been reviewed for compliance.

B. Batching and Mixing:
1. Batch and mix ready-mixed concrete in accordance with ASTM C94.
2. Batch site-mixed concrete with scales accurate to within 0.4 percent of their total capacities. Consistently measure ingredients within 1 percent for concrete and water, 2 percent for aggregates and 3 percent for admixtures during operation of batching equipment. Mix site-batched concrete in accordance ACI 301.

C. Admixtures: Charge air-entraining admixtures and other chemical admixtures into mixer as solutions and accurately measure by means of a mechanical dispenser. Consider solution as part of mixing water.

2.8 SOURCE QUALITY CONTROL

A. Laboratory Inspection
1. Verify required plant certifications
2. Inspect batching equipment periodically
3. Inspect batching and loading of transit-mix trucks at start of each production day.

B. Materials Testing
1. Sieve analysis of aggregates

PART 3 - EXECUTION

3.1 PREPARATION

A. Do not begin delivery of concrete materials until formwork, reinforcement, and embedded items are complete, properly positioned and secured in place.
1. Remove snow, ice, debris and excessive water from forms.
2. Pre-wet soil and sand subgrades and surfaces of precast concrete to receive fresh concrete.
3. Position and secure expansion joint materials, anchors, waterstops, screeds, control joint forms, and expansion caps on slip-dowels.
4. Remove hardened concrete and foreign materials from inner surfaces of conveying equipment, formwork and reinforcing.

B. Prepare and have ready in good working condition chutes, tremies, pumps, buggies, vibrators and other equipment necessary for orderly and continuous concrete placement.

C. Where carton-form void forms are used, inspect condition before placing concrete. Replace crushed or weakened boxes and tape joints. Repair sides of grade beam and wall excavations so that not more than 3 inches of ground is visible beyond void box edges.

D. Inspect and repair vapor retarder where applicable.

3.2 INSTALLATION

A. Conveying:
1. Prevent separation, segregation and loss of ingredients.
2. Convey concrete from mixer to place of final deposit as rapidly as possible.
3. Take special precautions with belt conveyors to prevent segregation of ingredients, drying and rise in temperature during conveying.
4. Use pumps or pneumatic equipment with adequate pumping capacity. Do not exceed 2 inches of slump loss due to pumping. Do not convey concrete through pipes made of aluminum or aluminum alloy.
5. Thoroughly clean conveying equipment at end of each placement sequence.

B. Depositing:

1. Place concrete continuously in horizontal layers not more than 12 inches deep. Exercise care to avoid seams or weakened planes within concrete. Deposit concrete into, not away from, previously deposited concrete.
2. Do not place fresh concrete against concrete that would result in cold joints.
3. Do not place concrete which has partially set or that contains foreign material.
4. Avoid splashing forms and reinforcing with concrete.
5. Place concrete in forms as near as practicable to final position. Do not transport concrete in forms with vibrators or screeds.
6. Do not drop concrete directly into standing water. Use a tremie with outlet near bottom of place of deposit.
7. Use tremies, chutes or hoppers to place concrete where a vertical drop greater than 5 feet is required.
8. Do not place concrete when slump tests indicate plasticity greater than required limits.
9. Continuously monitor condition of void box forms during placement of concrete. Avoid piling concrete on void forms. Replace void boxes that partially or wholly collapse under weight of concrete.
10. Indiscriminate addition of water to increase slump is prohibited. When concrete arrives at jobsite with slump below that suitable for placing, water may be added only if neither maximum permissible water-cement ratio nor maximum slump is exceeded.

C. Consolidating:
1. Conform to ACI 309
2. As soon as concrete is deposited, thoroughly agitate by means of mechanical vibrators and suitable hand tools, to work mixture well into parts and corners of forms, and entirely around reinforcement and inserts.
3. Use mechanical vibrators with minimum frequency of 7000 revolutions per minute.
4. Do not over-vibrate concrete or use vibrators to transport concrete within forms. Insert vibrators vertically at frequent intervals, do not drag vibrators through concrete.
5. Do not insert vibrators into lower courses that have begun to set.
6. Maintain spare vibrators on job site during concrete placing operations.

D. Placement against hardened concrete:
1. Remove laitance and thoroughly clean and dampen surface of hardened concrete before placement of fresh concrete.
2. If bond is required, roughen surface in an acceptable manner that exposes coarse aggregate and does not leave laitance, loose aggregate particles, or damaged concrete at surface.
3.

3.3 APPLICATION

A. Construction joints:
1. Each unit of structure (beam, column, pier, footing, joist, slab, or wall) to be monolithic in construction unless noted otherwise.
2. Locate construction joints only as shown in structural Contract Documents or approved submittals.
   a. Do not locate construction joints between lateral bracing elements of walls and columns.
   b. For conventionally reinforced beams, joists and slabs, locate construction joints in middle third of span.
   c. For post-tensioned construction, coordinate location of construction joints with post-tensioning supplier.
   d. Provide plumb and level construction joints. Avoid irregular lines at horizontal construction joints in exposed concrete faces.
   e. Provide shear keys and waterstops as required in construction joints.

B. Weather Conditions:
1. Cold Weather:
   a. Conform to ACI 306 when air temperature has fallen, or is expected to fall, below 40 degrees Fahrenheit within 3 days of concrete placement.
   b. Concrete mixture temperature can be adjusted by adding uniformly heated water and/or aggregates that conform to ACI requirements.
   c. Maintain temperature of deposited concrete between 50 degrees Fahrenheit and 70 degrees Fahrenheit for a minimum of 7 days after placement.

d. Clear surfaces to receive concrete and spaces to be filled with concrete of snow, ice, and standing water before placement.
e. Discuss cold weather concreting methods with Architect prior to concrete placement.

2. Hot Weather:
a. Conform to ACI 305, when ambient temperature is 80 degrees Fahrenheit or higher.
b. Maximum allowable fresh concrete temperature is 95 degrees Fahrenheit, unless one of the following has been submitted to and approved by Architect:
1) Letter written by concrete supplier guaranteeing performance of a higher fresh concrete temperature based on past field experience with similar production conditions, materials, constituent proportions and temperatures, and delivery times.
2) Preconstruction testing of concrete mixture at higher fresh concrete temperature in accordance with ACI 305.1 satisfies project requirements for fresh concrete properties and specified strength.
c. Concrete mixture temperature can be adjusted by adding chilled water, substituting portions of mixing water with chipped or shaved ice, or other methods that conform to ACI requirements.
d. Control concrete surface bleed-water evaporation with application of evaporation reducers, plastic sheeting, fog spray, or wind breaks.
e. Discuss hot weather concreting methods with Architect prior to concrete placement.

C. Slab Thickness
1. Allowable deviation from cross sectional dimensions
a. Suspended slabs: minus ¼ inch
b. Slabs on ground:
1) Average of samples: minus 3/8 inch
2) Individual sample: minus ¾ inch

D. Slab Flatness and Levelness:
1. Definitions:
a. Floor Flatness (F_F) – Variation between points separated by 2 feet as calculated by ASTM E1155
b. Floor Levelness (F_L) – Variation between points spaced 10 feet apart as calculated by ASTM E1155
c. Specified Overall Value (SOV) –Composite value of all F-Numbers for test sections of a test surface calculated in accordance with ASTM E1155.
d. Minimum Local Value (MLV) –Minimum F-Number value permitted for an individual test section, calculated in accordance with ASTM E1155.
e. Test Surface - Entire extents of one continuous concrete slab placement.
f. Test Section – A subdivision of the test surface where measurements are taken to collect data for the test surface.
2. Slab flatness and levelness measurements:
a. Measure where requested by Owner, at Owner's expense.
b. Measure within 72 hours of slab finishing for slabs on ground. Measure before stressing post-tensioning tendons, removing supporting formwork or removing shoring for elevated slabs.
c. Testing personnel shall complete manufacturer’s training for equipment being used to take flatness and levelness measurements.
d. Subdivide Test Surface into Test Sections in accordance with ASTM E1155. Take measurements of Test Sections in accordance with ASTM E1155.
e. Required minimum flatness and levelness values:
1) Typical slab
a) Slab-on-Grade / Slab-on-void cartons
I) Specified Overall Value – F_F 25 / F_L 20
II) Minimum Local Value – F_F 15 / F_L 12
3. Reporting: Include the following in slab flatness and levelness reports:
a. Reporting requirements of ASTM E1155
b. Floor plan showing boundary limits of each test surface and each test section with sample measurement lines numbered and locations identified on plan. Indicate locations of deficient test sections on floor plan drawing.
c. A plot of slab surface profile elevation as a function of horizontal distance for each sample measurement line.

d. Listing of the maximum (+ or -) q value (profile curvature value) for each sample measurement line, along with location ID.
e. Statistical amount of floor test surface area not in compliance with the specified SOV.

3.4 FINISHING EXPOSED CONCRETE SURFACES

A. General
1. Conform to ACI 302.1.
2. Double screed slabs at required elevations.
3. Provide camber as required.
4. Apply finishing products and cure in accordance with manufacturers' recommendations.

B. Slab Surfaces
1. Scratch Finish
a. Locations
1) Surfaces receiving topping slabs
2) Final finish where topping slabs, waterproofing membrane or roofing is placed over finished surface.
b. Method: Place, consolidate, strike off, and level concrete. Cut high spots and fill low spots. Roughen surface with stiff brushes or rakes before concrete becomes too stiff to brush or rake.
2. Float finish
a. Locations -Walks, steps, and surfaces receiving waterproofing, roofing, insulation, or sand-bed terrazzo.
b. Method – Place, consolidate, strike off, and level concrete. Cut high spots and fill low spots. Do not perform further finishing operations until concrete is ready for floating. Floating with hand float, bladed power float equipped with float shoes, or powered disk float. Begin floating when bleed water sheen has disappeared and surface has stiffened sufficiently to permit operation of selected float apparatus. Unless otherwise specified, produce finish that will meet tolerance requirements of ACI 117 for conventional surfaces.
3. Trowel Finish
a. Locations – Interior floors.
b. Method: Float then trowel concrete surface. Unless otherwise specified, conform to tolerances for a flat surface in accordance with ACI 117. Addition of water to surface to facilitate finishing is prohibited. Do not apply hard-troweled finish to concrete with total air content greater than 3 percent.
4. Broom or belt finish:
a. Locations: For parking slabs and exterior surfaces including slabs, ramps, walkways, and steps.
b. Method: After concrete has received float finish, give concrete surface a coarse-scored texture by drawing a broom or burlap belt across surface.
c. Provide mockup of concrete finish for Architect and Owner approval.
5. Nonslip finish
a. Locations: Interior pan type stair treads and platforms, exterior concrete stair treads, ramps, and where specified.
b. Method: Broom or belt finish, or dry-shake finish
1) For dry-shake finish, give surface a dry-shake application of crushed aluminum oxide, at a rate of at least 25 pounds per 100 square feet, unless otherwise specified.
c. Provide mockup of concrete finish for Architect and Owner approval.

C. Saw-Cutting Concrete Slabs-on-Grade (see drawings for locations)
1. Saw joints as soon as possible after finishing, but only after concrete is hard enough. Concrete is hard enough when saw blade does not dislodge aggregate and when edges of sawcut do not ravel.
2. Provide joints a minimum of 1/4 inch wide and 1/4 of slab thickness deep unless noted otherwise.
3. Formed strips may be used in lieu of saw-cutting in same locations and to equal depth as sawn joints.

D. Formed Surfaces
1. General: Solidly fill holes resulting from removal of bolts or tie rods with cement grout. Fill holes passing entirely through concrete members from inside face with a plunger-type grease gun or other device to force grout through to outside face.

2. Rough Form Finish
   a. Locations: For surfaces not exposed to view.
   b. Remove fins exceeding 1/4 inch in height, and grind bulges that interfere with other trades.
   c. Fill holes and honeycombs.
3. Smooth Form Finish
   a. Locations: For surfaces exposed to view.
   b. Remove fins, bulges and unsightly form marks.
   c. Fill holes and honeycombs to match surrounding concrete surfaces.
   d. Provide rubbed finish where satisfactory form finish cannot be achieved.
4. Rubbed Finish
   a. Locations: For surfaces exposed to view.
   b. Apply finish as soon as possible after casting concrete, no later than one day following form removal.
   c. Wet surface and rub with carborundum brick or other abrasive to produce uniform color and texture.
   d. Patch and dress form tie holes and honeycombs to match color and texture of surrounding concrete.

3.5 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical damage. Conform to ACI 308.

B. Protect surfaces not in contact with forms from moisture loss with one of the following methods immediately after finishing and continuing for a period of at least 7 days:
   1. Ponding or continuous sprinkling
   2. Application of absorptive mats or fabric kept continuously wet
   3. Application of sand kept continuously wet
   4. Continuous application of steam or mist
   5. Application of waterproof sheet materials
   6. Application of curing compound in conformance with ASTM C309. Apply curing compounds in accordance with manufacturer's recommendations.
      a. Do not use curing compound on any surface against which additional concrete is to be placed or other material is to be bonded, unless it is proven that compound will not inhibit bonding, or positive measures are taken to completely remove compound from areas to received bonded materials.

C. Protect surfaces cast against forms from moisture loss by keeping forms wet until removed. After form removal, protect exposed surfaces from moisture loss by one of the methods specified for surfaces not in contact with forms

D. Continue curing for a period of 7 days for Type I cement, 3 days for Type III cement, or until tests indicate that concrete has attained 70 percent of required strength.

3.6 FIELD QUALITY CONTROL

A. Laboratory Testing and Inspection
   1. Concrete Compression Testing: Secure composite samples in accordance with ASTM C172. Take samples for strength tests of each mix design placed each day at the following intervals:
      a. not less than once daily,
      b. nor less than once for each 150 cubic yards of concrete,
      c. nor less than once for each 5,000 square feet of surface area for slabs or walls.
   2. Mold and cure specimens from each sample in accordance with ASTM C31. Test concrete specimens in accordance with ASTM C39. A single strength test consists of one of the following:
      a. Four 6 inch by 12 inch cylinders: one cylinder tested at 7 days, two cylinders tested at 28 days, one cylinder held in reserve if needed.
      b. Five 4 inch by 8 inch cylinders: one cylinder tested at 7 days, three cylinders tested at 28 days, one cylinder held in reserve if needed.
   3. Determine slump for each strength test and whenever consistency of concrete appears to vary, in accordance with ASTM C143. Ready mix trucks with Verifi Slump Management System, or approved equal, are permitted.
   4. Determine total air content of concrete sample for each strength test.
      a. Conform to ASTM C231 for normal weight concrete

b. Conform to ASTM C138 or C173 for lightweight concrete.
5. Determine concrete temperature by ASTM C1064 for each strength test.
6. Inspection and Monitoring:
   a. Water additions during transit permitted in accordance with ASTM C94, with trucks equipped with automated slump and water management systems, such as Verifi Slump Management System.
   b. Monitor addition of water to concrete at job site and length of time concrete is allowed to remain in truck during pour.
   c. Certify each delivery ticket indicating class of concrete delivered or poured, amount of water added, time at which cement and aggregate were discharged into truck, and time at which concrete was discharged from truck.

B. Contractor's Responsibilities
1. Furnish necessary labor to assist testing agency in obtaining and handling samples at job-site.
2. Advise testing agency 24 hours in advance of operations to allow for assignment of testing personnel and testing.
3. Provide and maintain for use of testing agency adequate facilities for proper curing of concrete test specimens on project site in accordance with ASTM C31.
4. Burden of proof of structural adequacy where strength tests fail to meet criteria

C. Evaluation and Acceptance:
1. Strength test is defined as the average of one of the following, made from the same concrete sample tested at 28 days or as determined by Architect:
   a. Two 6 inch by 12 inch cylinders
   b. Three 4 inch by 8 inch cylinders
2. Strength level of a given class of concrete will be considered satisfactory if each of the following requirements are met for that class of concrete:
   a. Average of any three consecutive strength test results equals or exceeds specified strength.
   b. No strength test result falls below specified strength by more than 500 psi when specified strength is 5,000 psi or less, or by more than 10 percent of specified strength when specified strength is greater than 5,000 psi.
3. Concrete strength tests made and tested by testing laboratory are sole criteria of concrete strength unless in-situ tests are made in accordance with Building Code by a qualified independent testing laboratory. Concrete for which strength tests do not meet criteria for acceptance is considered inadequate until proven otherwise.
4. Where strength tests fail to meet criteria specified herein:
   a. Architect is sole judge of structural adequacy of concrete
   b. Additional strength evaluations of hardened concrete:
      1) Architect may request core testing in conformance with ACI 301 at no additional cost to Owner
      2) Nondestructive testing is not acceptable for determining in-place strength.
   c. If Architect determines, based on strength evaluation testing, that structure is of inadequate strength: repair or remove and replace portions of structure in question, as directed by Architect, at no additional expense to Owner.
   d. If strength tests fall below specified strength, but not so low as to cause concern for structural adequacy, Architect may request improved conditions of curing or modification of design mixes to improve strength.

3.7 CLEANING AND REPAIR

A. Upon completion of work, perform the following cleaning and repair procedure:
1. Remove forms, equipment, protective coverings and resulting rubbish from premises.
2. Sweep with ordinary broom and remove mortar, concrete droppings, loose dirt, and mud.
3. Wash concrete floors and platforms with soapsuds and scrub with steel fiber brush.
4. Mop up suds and flush surfaces with clean water.
   a. Provide adequate measures during scrubbing, mopping, and flushing operations to keep excessive or injurious amounts of water off floors.
5. Promptly, effectively and satisfactorily repair any damage occasioned to such floors by or on account of such operations.
6. Leave finished concrete surfaces in clean condition.

B. Remove concrete not required by Contract Documents caused by overpour, bulging or collapse of forms or error in form construction.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 - GENERAL

A. Section Includes:
1. Concrete masonry units.
2. Clay face brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry-joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.

B. Products Installed but not Furnished under This Section:
1. Cast-stone trim in unit masonry.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: For the following:
1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
a. Show locations of control joints including additional proposed locations that may not be indicated on the Drawings.
2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

D. Samples for Verification: For each type and color of the following:
1. Clay face brick, in the form of straps of five or more bricks.
2. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of the following:
1. Masonry units.
a. Include data on material properties.
b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
c. For exposed brick, include test report for efflorescence according to ASTM C 67.
2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

5. Grout mixes. Include description of type and proportions of ingredients.
6. Reinforcing bars.
7. Joint reinforcement.
8. Anchors, ties, and metal accessories.

B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.

1.6 QUALITY ASSURANCE

A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 01 40 00 "Quality Requirements" for mockups.
1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 36 inches (900 mm) long by 36 inches (900 mm) high by full thickness.
2. Clean one-half of exposed faces of panels with masonry cleaner indicated.
3. Protect approved sample panels from the elements with weather-resistant membrane.
4. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe, and hold cover in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.3 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   2. Provide square-edged units for outside corners unless otherwise indicated.

B. CMUs: ASTM C90.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa).
   2. Density Classification: Lightweight unless otherwise indicated.
   3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
   4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.4 BRCK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
   1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
   2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
   3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
   4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Clay Face Brick: Facing brick complying with ASTM C216.
   1. Grade: SW.
   2. Type: FBS.
   3. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67.

4. Efflorescence: Provide brick that has been tested according to ASTM C67 and is rated "not effloresced."
5. Application: Use where brick is exposed unless otherwise indicated.
6. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C 91/C 91M.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Cemex S.A.B. de C.V.
b. Essroc.
c. Holcim (US) Inc.
d. Lafarge North America Inc.
e. Lehigh Hanson; Heidelberg Cement Group.

E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.
1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
a. Davis Colors; True Tone Mortar Colors.
b. Euclid Chemical Company (The); an RPM company.
c. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
d. Solomon Colors, Inc; Solomon Colors Mortar Colors.

F. Colored Cement Products: Packaged blend made from portland cement and hydrated lime or masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
1. Colored Portland Cement-Lime Mix:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Essroc.
2) Holcim (US) Inc.
3) Lafarge North America Inc.
4) Lehigh Hanson; Heidelberg Cement Group.
2. Colored Masonry Cement:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Cemex S.A.B. de C.V.
2) Essroc.
3) Holcim (US) Inc.
4) Lafarge North America Inc.
5) Lehigh Hanson; Heidelberg Cement Group.
3. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
4. Pigments shall not exceed 10 percent of portland cement by weight.
5. Pigments shall not exceed 5 percent of masonry cement by weight.

G. Aggregate for Mortar: ASTM C144.
1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4-inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.

H. Aggregate for Grout: ASTM C404.

I. Water: Potable.

2.6 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60 (Grade 420).

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77 mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Dur-O-Wal; a Hohmann & Barnard company.
b. Heckmann Building Products, Inc.
c. Hohmann & Barnard, Inc.
d. Lock Rite.
e. Wire-Bond.

C. Vertical Reinforcement: Unless noted otherwise on Structural Drawings, the minimum vertical reinforcement at concrete unit masonry wall shall be #4 bars at 32 inches o.c. with #4 by 48-inch dowels at 32 inches o.c. aligned with grouted cells.

D. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
1. Exterior Walls: Hot-dip galvanized carbon steel.
2. Wire Size for Side Rods: 0.148-inch (3.77 mm) diameter.
3. Wire Size for Cross Rods: 0.148-inch (3.77 mm) diameter.
4. Wire Size for Veneer Ties: 0.148-inch (3.77 mm) diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
6. Provide in lengths of not less than 10 feet (3 m).

2.7 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into veneer but with at least a 5/8-inch (16 mm) cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Corrugated-Metal Ties: Not allowed.

D. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.
1. Where wythes do not align or are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm).
2. Wire: Fabricate from 3/16-inch- (4.76 mm-) diameter, hot-dip galvanized steel wire.

E. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.105-inch- (2.66 mm-) thick steel sheet, galvanized after fabrication.
3. Fabricate wire ties from 0.187-inch- (4.76 mm-) diameter, hot-dip galvanized-steel wire unless otherwise indicated.

2.8 EMBEDDED FLASHING MATERIALS

A. Flexible Flashing: Use the following unless otherwise indicated:
1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch (1.02 mm).

a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
   1) Carlisle Coatings & Waterproofing Inc.; CCW-705-TWF Thru-Wall Flashing.
   2) GCP Applied Technologies Inc.; Perm-A-Barrier Wall Flashing.
   3) Heckmann Building Products, Inc.; No. 82 Rubberized-Asphalt Thru-Wall Flashing.
   4) Hohmann & Barnard, Inc.; TeXtroflash.
   5) Polyguard Products, Inc.; Polyguard 400.
   6) W. R. Meadows, Inc.; Air-Shield Thru-Wall Flashing.

b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

C. Termination Bars for Flexible Flashing: Stainless steel bars 0.075 inch by 1 inch (1.90 mm by 25 mm).

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane , or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

D. Weep/Cavity Vent Products: Use the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
   a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
      1) 3Gen.
      2) Heckmann Building Products, Inc.; No. 85 Cell Vent.
      3) Hohmann & Barnard, Inc.; QV Quadro-Vent.
      4) Wire-Bond; #3601 Cell Vent
      5) Mortar Net Solutions; CellVent.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
   a. 3Gen.
   b. Heckmann Building Products, Inc.; #84 WallDefender.
   c. Hohmann & Barnard, Inc.; Mortar Trap.
   d. Mortar Net Solutions; MortarNet.
   e. Wire-Bond; Cavity Net DT (3611D).
2. Configuration: Provide one of the following:
   a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. Diedrich Technologies, Inc., a Hohmann & Barnard company.

b. EaCo Chem, Inc.
c. PROSOCO, Inc.

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
1. Use portland cement-lime or masonry cement mortar unless otherwise indicated.

B. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.
3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.

C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
1. Pigments shall not exceed 10 percent of portland cement by weight.
2. Pigments shall not exceed 5 percent of masonry cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints with the following units:
a. Clay face brick.
b. Cast-stone trim units.

D. Grout for Unit Masonry: Comply with ASTM C476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12 mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12 mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12 mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less-than-nominal 4-inch (100 mm) horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches (100 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:
1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.
4. Rake out mortar joints for pointing with sealant.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
1. Fasten screw-attached anchors to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than one anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.

B. Provide not less than 2 inches (50 mm) of airspace between back of masonry veneer and face of masonry backup.
1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.7 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
1. Space reinforcement not more than 16 inches (406 mm) o.c.

B. Interrupt joint reinforcement at control joints unless otherwise indicated.

C. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:
   1. Install preformed control-joint gaskets designed to fit standard sash block.

C. Form expansion joints in brick as follows:
   1. Build in compressible joint fillers where indicated.

3.9 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
   2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of masonry at least 8 inches (200 mm). Fasten upper edge of flexible flashing to masonry through termination bar.
   3. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
   1. Use specified weep/cavity vent products to form weep holes.
   2. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.

E. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.10 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches (1520 mm) .

3.11 FIELD QUALITY CONTROL

A. Testing Prior to Construction: One set of tests.

B. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.

C. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.

D. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.

E. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.

3.12 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
   4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.13 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

SECTION 04 72 00

CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cast-stone trim.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. For cast-stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: Show fabrication and installation details for cast-stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces. Also include setting shims and buttons as required to support loads.
1. Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist indicated or code required loads.

D. Samples for Verification:
1. For each color and texture of cast stone required, 10 inches (250 mm) square in size.
2. For each trim shape required, 10 inches (250 mm) in length.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute.

B. Mockups: Furnish cast stone for installation in mockups specified in Section 04 20 00 "Unit Masonry."

C. Test sealants to ensure compatibility with cast stone. Provide confirmation in writing.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work.

B. Pack, handle, and ship cast-stone units in suitable packs or pallets.
1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast-stone units if required, using dollies with wood supports.
2. Store cast-stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

1.5 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Cast Stone: Obtain cast-stone units from single source from single manufacturer.

2.2 CAST-STONE MATERIALS

A. General: Comply with ASTM C 1364.

B. Portland Cement: ASTM C 150/C 150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C 114. Provide natural color or white cement as required to produce cast-stone color indicated.

C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33/C 33M; gradation and colors as needed to produce required cast-stone textures and colors.

D. Fine Aggregates: Natural sand or crushed stone complying with ASTM C 33/C 33M, gradation and colors as needed to produce required cast-stone textures and colors.

E. Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

F. Admixtures: Use only admixtures specified or approved in writing by Architect.
   1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
   2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
   3. Air-Entraining Admixture: ASTM C 260/C 260M. Add to mixes for units exposed to the exterior at manufacturer's prescribed rate to result in an air content of 4 to 6 percent, except do not add to zero-slump concrete mixes.

G. Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M, Grade 60 (Grade 420). Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches (38 mm) of cast-stone material.
   1. Galvanized Coating: ASTM A 767/A 767M.

H. Embedded Anchors and Other Inserts: Fabricated from steel complying with ASTM A 36/A 36M and hot-dip galvanized to comply with ASTM A 123/A 123M.

2.3 CAST-STONE UNITS

A. Cast-Stone Units: Comply with ASTM C 1364.
   1. Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.

B. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
   1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
   2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
   3. Provide drips on projecting elements unless otherwise indicated.

C. Fabrication Tolerances:
1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch (3 mm).
2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater, but in no case by more than 1/4 inch (6 mm).
3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater.
4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch (3 mm) on formed surfaces of units and 3/8 inch (10 mm) on unformed surfaces.

D. Cure Units as Follows:
1. Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
2. Keep units damp and continue curing to comply with referenced standards.

E. Clean units after curing to remove cement film from surfaces to be exposed to view.

F. Colors and Textures: As scheduled.

2.4 MORTAR MATERIALS

A. Comply with requirements in Section 04 20 00 "Unit Masonry" for mortar.

2.5 ACCESSORIES

A. Anchors: Type and size indicated, fabricated from steel complying with ASTM A 36/A 36M and hot-dip galvanized to comply with ASTM A 123/A 123M.

B. Dowels: 1/2-inch- (12-mm-) diameter round bars, fabricated from steel complying with ASTM A 36/A 36M and hot-dip galvanized to comply with ASTM A 123/A 123M.

C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cast-stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Diedrich Technologies, Inc.; a division of Sandell Construction Solutions.
b. EaCo Chem, Inc.
c. PROSOCO, Inc.

2.6 MORTAR MIXES

A. Comply with requirements in Section 04 20 00 "Unit Masonry" for mortar mixes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING CAST STONE IN MORTAR

A. Install cast-stone units to comply with requirements in Section 04 20 00 "Unit Masonry."

B. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
2. Coordinate installation of cast stone with installation of flashing specified in other Sections.

C. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

D. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
   1. Keep joints free of mortar and other rigid materials.
   2. Build in compressible foam-plastic joint fillers where indicated.
   3. Form joint of width indicated, but not less than 3/8 inch (10 mm).
   4. Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
   5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 07 92 00 "Joint Sealants."

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.

B. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.

C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.

D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except where variation is due to warpage of units within tolerances specified.

3.4 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Structural steel as defined in AISC 303
2. Shear stud connectors
3. Miscellaneous angles and plates
4. Laboratory testing and inspection
5. Shop painting

1.2 REFERENCE STANDARDS (Latest Edition)

A. American Institute of Steel Construction, AISC:
1. AISC Steel Construction Manual
2. AISC 360, Specification for Structural Steel Buildings
3. AISC 303, Code of Standard Practice for Steel Buildings and Bridges.
4. RCSC Specification for Structural Joints Using High-Strength Bolts

B. American Society for Testing and Materials:
1. ASTM A29, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
2. ASTM A36, Standard Specification for Carbon Structural Steel
3. ASTM A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
4. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
5. ASTM A123, Standard Specification for Zinc (Hot-Dip Galvanizing) Coatings on Iron and Steel Products
6. ASTM A143, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
7. ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
8. ASTM A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
9. ASTM A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
10. ASTM F3125, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
11. ASTM F436, Standard Specification for Hardened Steel Washers
12. ASTM A449, Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
13. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
14. ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
15. ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
16. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
17. ASTM A786, Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates
18. ASTM A992, Standard Specification for Structural Steel Shapes
19. ASTM A1085, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
20. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
21. ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus
22. ASTM D522, Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

C. American Welding Society:
   1. AWS D1.1, Structural Welding Code - Steel
   2. AWS D1.3, Structural Welding Code - Sheet Steel
   3. AWS D1.8, Structural Welding Code – Seismic Supplement

D. Industrial Fasteners Institute:
   1. Book of Fastener Standards

E. The Society for Protective Coatings, SSPC:
   1. SSPC Painting Manual, Volume 1, Good Painting Practice
   2. SSPC Painting Manual, Volume 2, Systems and Specifications

1.3 SUBMITTALS

A. Shop Drawings: Submit detailed shop and installation drawings showing shop and erection details including member sizes, grades of materials, details of fabrication and erection, and end connections.
   1. Do not begin fabrication of materials prior to review of shop drawings.
   2. Review of shop drawings is for member sizes, spacings, detail, and general compliance with Contract Documents only.
   3. Engineering calculations for connections requiring design, signed and sealed by licensed engineer.
   4. Clearly note slip critical connection requirements.
   5. Reproductions of Contract Documents are not acceptable for use as shop drawings.
   6. Material quantities, lengths, fit, verification of job conditions and coordination with other trades are responsibility of Contractor.

B. Erection Procedure: Submit descriptive data illustrating general procedure for erection of structural steel including sequence of work, proposed schedule and details of temporary staying and bracing.

C. Submit Mill Certifications showing compliance of materials with ASTM and AISC Specifications.

D. Submit Mill Certifications (Manufacturer's Inspection Certificates) for bolts, nuts and washers.

E. Submit manufacturer’s data sheets or certified test results indicating compliance with requirements for manufactured components.

F. Unless otherwise indicated, submit the following for each type of product provided under Work of this Section:
   1. Product Disclosure:
      a. If available, provide product specific Type III, third party certified, Environmental Product Declaration (EPD) for each product in which product manufacturer is explicitly recognized as a participant by program operator.
      b. If available, provide third party verified Corporate Sustainability Report (CSR) for each product that covers at least 90 percent of product contents.
      c. If available, provide published Health Product Declaration (HPD) for each product documenting role, amount, and health hazards for every product ingredient.
   2. Recycled Content:
      a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
      b. Indicate material cost of product less labor included in Project.
      c. If recycled content is part of an assembly, indicate percentage of pre-consumer and post-consumer recycled contents in assembly by weight.
   3. Local / Regional Materials:
      a. Indicate extraction, manufacture, and purchase location of products; indicate distance between points of extraction, manufacture, and purchase and Project site.
      b. Indicate material cost less labor of products extracted, manufactured, and purchased within 100 miles of Project site.

1.4 QUALIFICATIONS

A. Fabricator
   1. Not less than 5 years of experience fabricating structural steel for projects of similar size and complexity.

B. Detailer
   1. Not less than 5 years of experience detailing structural steel for projects of similar size and complexity.

C. Erector
   1. Not less than 5 years of experience erecting structural steel for projects of similar size and complexity.

D. Welding
   1. Qualified in accordance with AWS D1.1.
   2. Maintain AWS certification throughout duration of Project.
   3. If requested by Architect, submit identifying stenciled test coupons made by operator whose workmanship is subject to question. If reasonable doubt of proficiency exists, re-qualify and certify welder by independent Testing Laboratory at no additional expense to Owner.
   4. Work suspected of deficient quality may be subject to removal of coupons from any location on any joint for testing. Remove sections of welds found defective and properly reweld before proceeding with work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of anchor rods and other anchorage assemblies to be embedded in concrete or masonry construction. Provide setting drawings, instructions and templates required for proper placement of anchor rods and embeds.

B. Sequence shipments of fabricated steel to expedite erection and minimize field handling of material.

C. Store structural steel above ground on skids or platforms. Protect steel from corrosion. Store packaged materials in unbroken containers.

D. Ensure coatings of low-hydrogen electrodes are thoroughly dry when used. Use electrodes taken from hermetically sealed packages within 4 hours, or dry in accordance with AWS D1.1 before use. Do not use electrodes of any type that have been wet.

E. Do not store materials on structure in a way that may overload members or supporting structures.

F. Do not bend or damage materials during shipment, handling and erection.

G. Store fasteners in protected place in sealed containers with manufacturer’s labels intact.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel, normal grade: ASTM A36

B. High Strength Structural Steel: ASTM A572

C. High Strength Structural Steel (W and WT Sections): ASTM A992

D. Steel Pipes: ASTM A53

E. Hollow Structural Sections (HSS) – Round or Rectangular: ASTM A500

F. Erection Bolts: ASTM A307

G. Bolts: ASTM F3125
   1. Manufacturer's symbol and grade markings must appear on bolts and nuts.

H. Anchor Rods: ASTM F1554

I. Washers: ANSI B27.2 Type A.

J. Welding Electrodes:
   1. Conform to AISC and AWS Specifications.
   2. Use E70 electrodes unless noted otherwise.
   3. Use E80 electrodes for welding of ASTM A706 rebar.

K. Coatings
   1. Shop Primer:
      a. Comply with SSPC-SP2.
      b. Compatible with top coatings.
   2. Zinc-Coating for Structural Steel: Conform to ASTM A123 and A143.
   3. Zinc coating for threaded products: Conform to ASTM A153.
      a. Do not galvanize grade A490 bolts.
   4. Cold Galvanizing: Conform to ASTM A780
      a. Example Product: ZRC Galvilite

2.2 PRODUCT DOCUMENTATION

A. In coordination with Project sustainability goals, provide products with third-party certified Type III Environmental Product Declarations (EPDs) in accordance with ISO 14025 that document product's environmental impacts associated with material extraction, energy use, chemical makeup, waste generation, and emissions.

B. In coordination with Project sustainability goals, provide products with third-party verified corporate sustainability reports (CSRs) that document material supply chains and extraction operations.

C. In coordination with Project sustainability goals, provide products with published Health Product Declarations (HPDs) that document chemical inventory of the product to at least 0.1 percent.

2.3 ENVIRONMENTALLY PREFERABLE PRODUCTS

A. In coordination with Project sustainability goals, provide products with environmental impacts below industry average in the following categories:
   1. Global warming potential
   2. Depletion of stratospheric ozone layer
   3. Acidification of land and water sources
   4. Eutrophication
   5. Formation of tropospheric ozone
   6. Depletion of nonrenewable resources

B. In coordination with Project sustainability goals, provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of pre-consumer recycled content constitutes at least 25 percent of total value of materials in Project.

C. In coordination with Project sustainability goals, ensure that products are sourced from manufacturers with third-party validated health, safety, and risk programs.

D. In coordination with Project sustainability goals, provide products and materials that promote good indoor environmental quality (EQ) and promote efficiencies in operational performance.

E. In coordination with Project sustainability goals, provide materials and products sourced within 100 miles of Project site.

2.4 DESIGN OF CONNECTIONS

A. Do not alter fully detailed connections without written approval. Where approved, design alternate connections to meet required capacities.

B. Design schematically detailed connections to meet required capacities.

C. Design connections to meet the following requirements:
   1. Completely and clearly detailed on shop drawings submittal.
   2. Minimum simple shear connection requirements, unless noted otherwise:
      a. 3/8 inch thick plate at shear plate connections
      b. 5/16 inch thick angles at double angle connections
      c. Minimum two ¾" ASTM F3125 bolts
   3. Moment connections to develop 100 percent of the flexural capacity of member.

D. Do not use welds in combination with bolts in same face of any connection.

E. Design connection at ends of tension or compression members to develop force due to provided design load. Where no design load is provided, design connections for 100 percent of tension capacity of member.

2.5 FABRICATION

A. Fabricate in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Structural steel
   1. Provide members of required sizes, weights, shapes and lengths.
      a. Do not alter member shapes or lengths or enlarge bolt holes in field for proper fit; return materials to fabrication shop for correction where required.
      b. Do not splice members to achieve required lengths unless approved by Architect. Member splices approved for convenience of fabricator or erector allowed only at no additional cost to Owner.

2. Prior to fabrication; straighten materials, remove twists/bends, and clean faying surfaces of scale and rust.
3. Mark and match mark pieces where field assembly is required.
4. Camber structural steel members where shown. Mark beams indicating direction of specified or natural camber. Fabricate beams with camber in the upward direction.

C. Joints:
1. Prepare bearing surfaces of compression joints by milling, sawing, or other suitable means.

D. Thermal Cutting: Use mechanically guided thermal cutting when feasible.
a. Plane thermally cut edges to be welded in accordance with AWS D1.1/D1.1M.

E. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
1. Hole sizes to conform to AISC specifications.
2. Holes for anchor rods in base plates may be oversized in accordance with AISC Specifications. Provide washers as indicated.
3. Short-slotted holes:
a. Do not use short-slotted holes at trusses or primary lateral frame connections (collectors, vertical braces, moment frames, etc).
b. Where short-slotted holes are permitted:
1) Orient short-slotted holes perpendicular to load direction.
2) When slotted holes occur in an outer ply, provide washer to completely cover bolt hole.

F. Cleaning:
1. Clean and prepare surfaces in accordance with SSPC standards.
2. Clean and prepare surfaces to receive paint per SSPC-SP2.

2.6 SHOP CONNECTIONS

A. Welded Connections: Comply with AWS D1.1 and AISC 360 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints using High-Strength Bolts" for bolt, washer, and joint type used.
1. Joint types:
a. Snug-Tight Joint
1) Provide snug-tight joints unless noted otherwise.
b. Pretensioned Joint
1) Provide only where approved by Architect
2. Provide beveled washers for surfaces out of parallel more than 1:20.
3. Provide bolts lengths such that sufficient thread engagement is achieved by bolt threads extending beyond or at least flush with the outer face of the nut.
4. Store and handle bolts in accordance with referenced standards.

C. Finger-Tight Connections:
1. Provide where noted
2. Finger-tighten nut, loosen half-turn, and disturb threads or apply thread compound to prevent nut from backing off.

2.7 COATINGS

A. SHOP COATING
1. Apply standard, rust-inhibiting primer to structural steel members, except:
a. Surfaces to be welded
b. Members to be encased in concrete
c. Members to be fireproofed
d. Surfaces to receive shear stud connectors
2. Cleaning
a. Clean surfaces to remain uncoated in accordance with SSPC SP-2.
b. Clean surfaces to be coated in accordance with SSPC SP-2.
c. Clean surfaces to be galvanized in accordance with SSPC SP-6.
3. Provide minimum dry coating thickness of 1 mil.

4. Repair damaged coating prior to delivery.

B. GALVANIZING
1. Comply with ASTM A123.
2. Galvanize steel members exposed to weather.
a. Fill exposed vent and drain holes unless they function as weep holes, by plugging with zinc and filing smooth.
3. Galvanize shelf angles supporting masonry or stone.

2.8 SOURCE QUALITY CONTROL

A. Shop Tests and Inspections
1. Allow Testing Laboratory access to materials in fabrication for shop tests and inspections.
2. Bolted Connections: Inspect and test bolted connections in accordance with RCSC Specification for Structural Joints Using High-Strength Bolts
3. Welded Connections: Inspect and test welded connections in accordance with AWS D1.1.
a. Perform non-destructive testing on welds not passing visual inspection.
b. Perform non-destructive testing on 100 percent of CJP welds
4. Remove and replace connections found to be faulty at no additional cost to Owner.
5. Measure camber in the fabricator's shop in the unstressed condition
6. Reinspect corrective measures required at no additional cost to Owner.
7. Prepare test and inspection reports.

B. Testing Laboratory not required to perform shop tests and inspections if fabricator participates in AISC Quality Certification Program and is designated as AISC Certified.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify condition and position of anchor rods, embeds and bearing surfaces prior to commencing erection.

B. Correct misaligned or missing components prior to commencing erection.

3.2 ERECTION

A. The erector is responsible for means, methods and safety of erection of structural steel frame.

B. Erect structural steel in accordance with AISC Specifications. Erect Work plumb, square, true to line, level and in proper position and orientation.

C. Provide temporary bracing to maintain stability of framework during erection for stresses and loads due to erection equipment and its operation, weight of structure, wind, and temporary loads imposed during erection. Check and adjust bracing frequently during progress of erection and assembly. Maintain temporary bracing until all components of structure required for lateral stability are in place and final connections made.

D. Do not stack materials on partially completed framework, or in a manner to cause damage or overloading of structure.

E. Maintain tolerances per AISC 303.
1. In addition to requirements of AISC 303, maintain column plumbness of:
a. 1:500 maximum variation of working line from plumb line
b. 1 inch maximum overall displacement from established column line

F. Field Assembly:
1. Assemble steel framework accurately to lines and elevations indicated and within specified tolerances. Align and adjust members forming parts of a completed frame before fastening.
2. Thoroughly clean bearing surfaces and surfaces to be in permanent contact before assembly.
3. Baseplates
a. Set plates for structural members on wedges, shims, or setting nuts as required.
b. Snug-tighten anchor rods after supported members have been positioned and plumbed.
c. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain.
d. Weld plate washers to base plates where required.
4. Adjust bolt holes requiring enlargement only by reaming, not by drifting or burning.

5. Erection bolts may be tightened and left in place, except in architecturally exposed work. Fill holes left from removed bolts by plug welding. Grind welds smooth where architecturally exposed.
6. For members damaged during handling, submit corrective measures to Architect for approval, or replace without additional cost to Owner.
7. Splice members only where indicated.
8. Fit column compression joints and base plates in full contact bearing, with gaps not exceeding 1/16 inch, per the specification.

3.3 FIELD CONNECTIONS

A. Welded Connections: Comply with AWS D1.1 and AISC 360 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

B. Welded Connections of Galvanized Steel:
   1. Conform to AWS D19.0 for welding of zinc coated members.
   2. Cold galvanize welded connections after welding is complete.

C. Bolted Connections: Comply with RCSC's "Specification for Structural Joints using High-Strength Bolts" for bolt, washer, and joint type used.
   1. Joint types:
      a. Snug-Tight Joint
         1) Provide snug-tight joints unless noted otherwise.
      b. Pretensioned Joint
         1) Provide only where approved by Architect
   2. Provide beveled washers for surfaces out of parallel more than 1:20.
   3. Provide bolts lengths such that sufficient thread engagement is achieved by bolt threads extending beyond or at least flush with the outer face of the nut.
   4. Store and handle bolts in accordance with referenced standards.

D. Finger-Tight Connections:
   1. Provide where noted
   2. Finger-tighten nut, loosen half-turn, and disturb threads or apply thread compound to prevent nut from backing off.

3.4 COATING REPAIR

A. Repair damaged or missing galvanizing in accordance with ASTM A780.

B. Where primer is damaged or missing, clean and repair to match shop coating.

C. Clean and prime field welds as required to match shop coating.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Steel framing and supports for countertops.
2. Steel framing and supports for mechanical and electrical equipment.
3. Steel framing and supports for applications where framing and supports are not specified in other Sections.
4. Miscellaneous steel trim.
5. Loose bearing and leveling plates for applications where they are not specified in other Sections.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
1. Nonslip aggregates and nonslip-aggregate surface finishes.
2. Paint products.
3. Grout.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for all items listed in summary above:

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

C. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
1. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 2 (A4).

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

F. Post-Installed Anchors: Torque-controlled expansion anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.4 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with Division 09 Section(s) on Painting.

B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2 inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
1. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

2.7 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim.

2.8 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

2.9 BRAKE METAL

A. Material: Galvanized steel formed in press brake.

B. Thickness: As indicated.

C. Finish: Field Painted.

D. Texture: Smooth.

E. Profile: As indicated.

2.10 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with universal shop primer unless zinc-rich primer is indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

SECTION 05 52 13

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Steel railings.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:
1. Manufacturer's product lines of mechanically connected railings.
2. Fasteners.
3. Post-installed anchors.
4. Shop primer.
5. Nonshrink, nonmetallic grout.
6. Metal finishes.
7. Paint products.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist indicated or code required loads.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

C. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
   a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
   b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
   a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
   b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.3 STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A500/A500M (cold formed).

C. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A36/A36M.

E. Cast Iron Fittings: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

2.4 FASTENERS

A. Fastener Materials:
1. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
2. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:
1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
1. Material for Exterior Locations Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primers: Provide primers that comply with Section 09 91 13 "Exterior Painting."

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.
1. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.
1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 welds; good appearance, completely sanded joint, some undercutting and pinholes okay.

I. Form changes in direction as follows:
1. As detailed.
2. By bending.

J. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

L. Flanges, Fittings, and Anchors: Provide flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

N. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

2.7 STEEL AND IRON FINISHES

A. Galvanized Railings:
1. Hot-dip galvanize steel railings, including hardware, after fabrication.
2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
4. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner and as follows.
1. Comply with SSPC-SP 16.

D. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.
1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

3.3 ANCHORING POSTS

A. Use stainless steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

3.4 ATTACHING RAILINGS

A. Anchor railing ends to concrete and masonry with sleeves concealed within railing ends and anchored to wall construction with anchors and bolts.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.

3.5 REPAIR

A. Touchup Painting:
   1. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 13 "Exterior Painting."

3.6 CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 06 10 53

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Rooftop equipment bases and support curbs.
2. Wood blocking and nailers.
3. Plywood backing panels.

1.2 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”
3. Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:
1. Preservative-treated wood.
2. Fire-retardant-treated wood.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat all miscellaneous carpentry unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Other concealed locations.

B. Miscellaneous Lumber Items: Construction or No. 2grade lumber of any species.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Screws for Fastening to Metal Framing: ASTM C 1002 or ASTM C 954, length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 as appropriate for the substrate.
1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.7 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

2. ICC-ES evaluation report for fastener.

J. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 41 13

WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Wood cabinets for transparent finish.
2. Wood materials.
3. Cabinet hardware and accessories.
4. Miscellaneous materials.
5. Shop finishing.

B. Work of this section is affected by alternates. Refer to Section 01 23 00" Alternates."

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.3 ACTION SUBMITTALS

A. Product Data:
1. Wood cabinets for transparent finish.
2. Wood materials.
3. Cabinet hardware and accessories.
4. Miscellaneous materials.
5. Shop finishing.

B. Product Data Submittals: For each product.

C. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the "2015 TX-CHPS Criteria: New Construction and Renovation."

D. Shop Drawings: For architectural cabinets.
1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in architectural cabinets.
5. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

E. Samples: For each exposed product and for each color and finish specified, in manufacturer's standard size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For the following:
1. Composite wood products.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Licensed participant in AWI's Quality Certification Program.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockups of typical architectural cabinets as shown on Drawings.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINETS

A. Source Limitations: Engage a qualified woodworking firm to assume responsibility for production of architectural cabinets with sequence-matched wood veneers.

2.2 CABINETS, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of architectural cabinets indicated for construction, finishes, installation, and other requirements.
   1. The Contract Documents contain requirements that are more stringent than the referenced woodwork quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

A. Architectural Woodwork Standards Grade: Custom.

B. Type of Construction: Frameless.

C. Door and Drawer-Front Style: As indicated on Drawings.
   1. Reveal Dimension: As indicated on Drawings.

D. Wood for Exposed Surfaces:
   1. Species and Cut: Red oak unless otherwise noted to match existing.
   2. Grain Direction: Vertically for drawer fronts, doors, and fixed panels.
   3. Matching of Veneer Leaves: Book match.
   4. Veneer Matching within Panel Face: Center-balance match.

E. Semiexposed Surfaces:
   1. Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces.
   2. Drawer Subfronts, Backs, and Sides: Solid-hardwood lumber, stained to match species indicated for exposed surfaces.
   3. Drawer Bottoms: Hardwood plywood.

F. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.

G. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners.

2.4 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
2. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
2. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

2.5 CABINET HARDWARE AND ACCESSORIES

A. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00 "Door Hardware."

B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening, self-closing.

C. Wire Pulls: Back mounted, solid metal, 5 inches (127 mm) long, 2-1/2 inches (63.5 mm) deep, and 5/16 inch (8 mm) in diameter.

D. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

E. Shelf Rests: ANSI/BHMA A156.9, B04013; metal.

F. Drawer Slides: ANSI/BHMA A156.9, soft-close type.
1. Standard Duty (Grade 1 and Grade 2): Side mount.
2. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount.
a. Type: Full extension.
b. Material: Epoxy-coated polymer slides.
c. Motion Feature: soft close dampener; self-closing mechanism.
3. Pencil drawers not more than 3 inches (75 mm) high and not more than 24 inches (600 mm) wide, provide 50 lb (22.7 kg) load capacity.
4. General purpose drawers more than 3 inches (75 mm) high, but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide 75 lb (34 kg) load capacity.
5. File drawers more than 6 inches (150 mm) high or more than 24 inches (600 mm) wide, provide 100 lb (45 kg) load capacity.
6. Lateral file drawers more than 6 inches (150 mm) high and more than 24 inches (600 mm) but not more than 30 inches (762 mm) wide, provide 150 lb (68 kg) load capacity.
7. Lateral file drawers more than 6 inches (150 mm) high and more than 30 inches (762 mm) wide, provide 200 lb (90.7 kg) load capacity.
8. Computer keyboard tray, provide 75 lb (34 kg) load capacity.

G. Door Locks: ANSI/BHMA A156.11, E07121.

H. Drawer Locks: ANSI/BHMA A156.11, E07041.

I. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA finish number indicated.
1. Satin Stainless Steel: ANSI/BHMA 630 or as otherwise selected by Architect.

K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.6 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.7 FABRICATION

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated. Ease edges and corners to 1/16-inch (1.5-mm) radius unless otherwise indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.8 SHOP FINISHING

A. Finish architectural cabinets at manufacturer's shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural cabinets, as applicable to each unit of work.
1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.

C. Transparent Finish:
1. Architectural Woodwork Standards Grade: Custom .
2. Finish: System - 11, catalyzed polyurethane.
3. Staining: As scheduled.
4. Filled Finish for Open-Grain Woods: After staining, apply wash-coat sealer and allow to dry. Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
5. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D523.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with cabinet surface.
1. For shop-finished items, use filler matching finish of items being installed.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
3. Maintain veneer sequence matching of cabinets with transparent finish.
4. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.

E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.
   1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces. Touch up finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 07 01 53

ROOF MODIFICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes the following:
1. Patching of existing roofing system where required due to roof top unit replacement.
2. Protection of existing roofing system that is not to be modified or disturbed.

1.2 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: Roofing membrane, surfacing, and components and accessories between deck and roofing membrane.

C. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

D. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.4 SYSTEM DESCRIPTION

A. Provide products required by manufacturers to be fully compatible with each other and with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

B. Provide new roof membrane, insulation, and flashing to accommodate damage occurring from roof mounted equipment removal .

C. Performance Requirements: Prevent water infiltration through roof membrane penetrations or modifications resulting from work described in Contract Documents.

D. Industry Standards: Conform to NRCA - Roofing and Waterproofing Manual, except where more stringent requirements are indicated.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product specified.
1. Include list of materials and data sheets describing physical characteristics and performance criteria for materials proposed for use as well as applicable standards met by each product.

B. Shop Drawings: Submit details for this specific project indicating construction at penetrations, terminations, flashings, drains, and tie-in to existing roof.

1.6 INFORMATIONAL SUBMITTALS

A. Photographs or Video: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by roofing modification operations. Submit before Work begins.

B. Certifications specified in Quality Assurance article.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals specified in Section 01 78 23 “Operation and Maintenance Data.”

B. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roof installation.

C. Warranty: Submit specified warranty in accordance with Section 01 77 00 “Closeout Procedures.”

1.8 QUALITY ASSURANCE

A. Applicator Qualifications: Approved by manufacturer for making modifications and repairs to roofing prior to execution of this Contract.
   1. Minimum 5 years documented experience in roofing repairs of this type of roof.
   2. Include list of completed projects having similar scope of work identified by name, location, date, reference name, and phone number.

B. Materials Removal Firm: Company specializing in performing the work of this Section with minimum 5 years documented experience.

C. Certifications:
   1. Submit manufacturer's certification stating materials ordered and supplied are compatible with existing roofing system. Submit manufacturer's project registration form indicating that manufacturer has reviewed Project and will issue a warranty to cover repairs upon successful completion of installation.
   2. Submit manufacturer's approval of applicator.
   3. Certify materials shipped to Project site meet roof manufacturer's published performance standards and requirements of this Specification.
   4. State that membrane manufacturer approves of insulation type and method of installation.

D. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.9 PROJECT CONDITIONS

A. Owner may occupy portions of building immediately below roofing modification area. Conduct roof modifications so Owner's operations will not be disrupted. Provide Owner with not less than two weeks notice of activities that may affect Owner's operations.
   1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or fire-detection equipment if needed, and evacuate occupants from below the work area if desired.
   2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area. Verify that occupants below work area have been evacuated prior to proceeding with work over impaired deck area.

B. Protect building where roofing is scheduled to be modified, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from modification operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Owner assumes no responsibility for condition of areas to be modified.
   1. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

E. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.

F. Weather Limitations: Proceed with roofing modification work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.
   1. Emergency Equipment: Maintain on site equipment necessary to apply emergency temporary edge seal in event of sudden storms or inclement weather.
   2. Maintain continuous temporary protection prior to and during cutting and patching work.

G. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in Work.
   1. Hazardous materials will be removed by Owner before start of the Work. Existing roof will be left no less watertight than before removal.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

1.10 SEQUENCING AND SCHEDULING

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Coordinate work with other affected mechanical and electrical work associated with roof penetrations.

1.11 WARRANTY

A. Upon completion of Work and prior to final payment, furnish written warranty signed by installer and Contractor stating that for two-year period from date of Substantial Completion of Building repairs and maintenance will be made to maintain roofing and flashings in watertight condition.

PART 2 - PRODUCTS

2.1 INFILL AND PATCHING MATERIALS

A. Use infill and patching materials, including sheet and adhesive materials, flashings, roof surfacing, fasteners, adhesives, and accessories, matching existing membrane roofing system materials, unless otherwise indicated.

2.2 AUXILIARY MATERIALS

A. General: Auxiliary preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system

B. Insulation: Type used in original roof construction in thickness necessary to achieve satisfactory repair of membrane with no ponded water.

C. Wood Blocking and Nailers: As specified in Division 06.

D. Metal Flashing Sheet: Match existing.

E. Mechanical Fasteners and Disks: Appropriate for purpose intended and approved by UL or FM; length required for thickness of materials, fluoropolymer finish complete with disks; manufacturer as required by membrane manufacturer.

F. Ballast, if present on existing roof system: Type required to match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions under which roofing modifications will be performed with Installer present for compliance with requirements.

B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.

C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thicknesses of insulation required.

D. Do not proceed with installation until unsatisfactory conditions have been corrected.

E. Do not apply roofing materials to damp, frozen, dirty, dusty or other surface conditions which are unacceptable to manufacturer or applicator.

3.2 PREPARATION

A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prepare roof surfaces as recommended by manufacturer of original installation.

C. Protect existing membrane roofing system that is indicated not to be modified.
   1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
   2. Maintain temporary protection and leave in place until replacement roofing has been completed.

D. Coordinate with Owner to shut down air intake equipment in vicinity of Work. Cover air intake louvers before proceeding with roof modification work that could affect indoor air quality or activate smoke detectors in the ductwork.

E. During removal operations, furnish sufficient and suitable materials on site to facilitate rapid installation of temporary protection in event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
   1. If roof drains will be temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

G. Verify that rooftop utilities and service piping have been shut off before commencing Work.

3.3 PROTECTION

A. Protect existing building surfaces against damage from roofing installation.

B. Provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after removal of selected portions of existing membrane roofing system, and inspection and repair, if needed, of deck, fill in the tear-off areas to match existing membrane roofing system construction.
   1. Install new roofing membrane patch over roof infill area. If new roofing membrane is installed same day tear-off is made, roofing membrane patch is not required.

3.5 FLASHING AND REPAIR WORK

A. General: Perform work in accordance with instructions and recommendations of manufacturer of original installation materials.

B. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.

C. Clean substrate of contaminants such as dirt, debris, oil, and grease that can affect adhesion of roof patching materials.

D. Cut holes for penetrations neatly and in accordance with cutting and patching specified in Section 01 73 00 “Execution."

E. Where continuity of existing fastener pattern has been interrupted by cutting and patching work, provide additional uplift securement for existing roofing system with new screws and plates applied to each roof zone to comply with same wind uplift requirements as specified for new roofing work.

F. Lay base flashing and seal down to membrane and penetration.

G. Strip in flashing with multiple layers of felt and bitumen on built up systems and with one layer of sheet material on single ply systems.

H. Counterflash as required.

I. Make watertight.

J. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.

3.6 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
   1. Notify Architect and Owner 48 hours in advance of the date and time of inspection.

B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.7 DISPOSAL

A. Collect and place demolished materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on site.
   1. Storage or sale of demolished items or materials on site will not be permitted.

B. Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 07 19 00

WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes penetrating water-repellent treatments for the following vertical and horizontal surfaces:
   1. Cast stone.
   2. Concrete unit masonry.
   3. Clay brick masonry.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's printed statement of VOC content.
   2. Include manufacturer's recommended number of coats for each type of substrate and spreading rate for each separate coat.

B. Samples: For each type of water repellent and substrate indicated, 12 by 12 inches (300 by 300 mm) in size, with specified water-repellent treatment applied to half of each Sample.

C. Sustainable Design Submittals:
   1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
   2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of water repellent.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.

B. Mockups: Prepare mockups of each required water repellent on each type of substrate required to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Locate mockups as directed by Architect.
      a. Size: 10 sq. ft. (9.3 sq. m) each.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:
   1. Concrete surfaces and mortar have cured for not less than 28 days.
   2. Ambient temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C) and will remain so for 24 hours.
   3. Substrate is not frozen and substrate-surface temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C).
   4. Rain or snow is not predicted within 24 hours.

5. Not less than 24 hours have passed since surfaces were last wet.
6. Windy conditions do not exist that might cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agree(s) to repair or replace materials that fail to maintain water repellency specified in "Performance Requirements" Article within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance: Water repellents shall meet the following performance requirements as determined by preconstruction testing on manufacturer's standard substrates representing those indicated for this Project.

B. Water Absorption: Minimum 80 percent reduction of water absorption after 24 hours for treated compared to untreated specimens when tested according to the following:
1. Cast Stone: ASTM C 1195.
2. Concrete Masonry Units: ASTM C 140.
3. Clay Brick: ASTM C 67.

C. Water-Vapor Transmission: Comply with one or both of the following:
1. Maximum 10 percent reduction water-vapor transmission of treated compared to untreated specimens, according to ASTM E 96/E 96M.
2. Minimum 80 percent water-vapor transmission of treated compared to untreated specimens, according to ASTM D 1653.

D. Water Penetration and Leakage through Masonry: Minimum 90 percent reduction in leakage rate of treated compared to untreated specimens, according to ASTM E 514/E 514M.

E. Durability: Maximum 5 percent loss of water-repellent performance after 2500 hours of weathering according to ASTM G 154 compared to water-repellent-treated specimens before weathering.

2.2 PENETRATING WATER REPELLENTS

A. Siloxane, Penetrating Water Repellent: Clear, containing 10 percent or more solids of oligomerous alkylalkoxysiloxanes; with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier; and with 600 g/L or less of VOCs.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Conproco Corporation; Conpro Shield MX.
b. Specco Industries, Inc; Waterstopper S-20.

B. Silane/Siloxane-Blend, Penetrating Water Repellent: Clear, silane and siloxane blend with 400 g/L or less of VOCs.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Master Builders Solutions; MasterProtect H 185.
b. Euclid Chemical Company (The); an RPM company; Baracade WB 244.
c. L&M Construction Chemicals, Inc; Aquapel.
d. Pecora Corporation; KlereSeal 920-W.
e. Tnemec Inc; Series 633 Prime-A-Pell H2O.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.
1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in three representative locations by method recommended by manufacturer.
2. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
3. Verify that required repairs are complete, cured, and dry before applying water repellent.

B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. New Construction and Repairs: Allow concrete and other cementitious materials to age before application of water repellent, according to repellent manufacturer's written instructions.

B. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions and as follows:
1. Cast Stone andConcrete Unit Masonry: Remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents according to ASTM E 1857.
2. Clay Brick Masonry: Pressurized water cleaning in accordance with ASTM D 5703.

C. Protect adjoining work, including mortar and sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live vegetation.

D. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.

E. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

3.3 APPLICATION

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Apply coating of water repellent on surfaces to be treated using 15 psi- (103 kPa-) pressure spray with a fan-type spray nozzle to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.
1. Cast Stone: At Contractor's option, first application of water repellent may be completed before installing units. Mask mortar and sealant bond surfaces to prevent water repellent from migrating onto joint surfaces. Remove masking after repellent has cured.

C. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.4 FIELD QUALITY CONTROL

A. Testing of Water-Repellent Material:
1. Engage the services of a qualified testing agency to sample water-repellent material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance of water-repellent material with product requirements.
3. Owner may direct Contractor to stop applying water repellents if test results show material being used does not comply with product requirements. Contractor shall remove noncomplying material from Project site, pay for testing, and correct deficiency of surfaces treated with rejected materials, as approved by Architect..

B. Coverage Test: In the presence of Architect, hose down a dry, repellent-treated surface to verify complete and uniform product application. A change in surface color will indicate incomplete application.
1. Notify Architect seven days in advance of the dates and times when surfaces will be tested.
2. Reapply water repellent until coverage test indicates complete coverage.

3.5 CLEANING

A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application, as approved by Architect.

B. Comply with manufacturer's written cleaning instructions.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Glass-fiber blanket.
2. Mineral-wool board.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation to confirm that Insulation contains low or no formaldehyde and is certified by Greenguard Certified for Children & Schools (www.greenguard.org).
2. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
3. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”
4. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
5. Laboratory Test Reports: For insulation, indicating compliance with requirements for low-emitting materials.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

A. Insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
1. Products: Subject to compliance with requirements, provide one of the following:
a. CertainTeed Saint Gobain; NoiseReducer Sound Attenuation and Acoustical Ceiling Batts.
b. Johns Manville; JM Unfaced Formaldehyde Free Fiberglass Insulation.
c. Knauf Insulation; EcoBatt Insulation Unfaced.
d. Owens Corning; EcoTouch PINK FIBERGLAS Insulation.

2.2 MINERAL-WOOL BOARD

A. Insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Mineral-Wool Board, Types IA and IB, Unfaced: ASTM C 612, Types IA and IB; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Nominal density of 4 lb/cu. ft. (64 kg/cu. m).
1. Products: Subject to compliance with requirements, provide one of the following:
a. Johns Manville; Min-Wool Curtainwall 80 Unfaced.

b. ROCKWOOL;Curtainrock 80.
c. Thermafiber, Inc.; an Owens Corning company; FireSpan 90.

2.3 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
1. Products: Subject to compliance with requirements, provide one of the following:
a. AGM Industries, Inc; Series T TACTOO Insul-Hangers.
b. Gemco; Spindle Type.
2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation.

B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 1 inch (25 mm) between face of insulation and substrate to which anchor is attached.
1. Products: Subject to compliance with requirements, provide the following:
a. Gemco; Clutch Clip.

C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.
1. Products: Subject to compliance with requirements, provide one of the following:
a. AGM Industries, Inc; TACTOO Adhesive.
b. Gemco; Tuff Bond Hanger Adhesive.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:
1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
1. Adhesives shall have a VOC content of 70 g/L or less.

C. Hexagonal Wire Mesh:
1. Hot dip galvanized.
2. Wire Gage: 13 mm.
3. Aperture: 2-1/2 inches.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
   1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
   2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
   4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
   1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
   2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 INSTALLATION AT WINDOW SYSTEM

A. Install board insulation in window construction as indicated on Drawings.
   1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
   2. Install insulation to fit snugly without bowing.

3.5 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Nonstaining silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Butyl joint sealants.
5. Latex joint sealants.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

B. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

C. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

D. Product Certificates:
1. Certifying the non-metallic plumbing piping system and the fire sprinkler piping system manufacturers evaluated and approved the joint sealant products for installation with or near its piping system.
2. Certifying the joint sealant products comply with NFPA 13 requirements for material compatibility with non-metallic pipe and tubing.

E. Field-Adhesion-Test Reports: For each sealant application tested.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
   1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
   3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with masonry substrates.
   4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
   5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
   7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
   1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
   2. Conduct field tests for each kind of sealant and joint substrate.
   3. Notify Architect seven days in advance of dates and times when test joints will be erected.
   4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
      a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
         1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
   6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 COORDINATION

A. Ensure joint sealant products are coordinated and compatible with the non-metallic plumbing piping system and the fire sprinkler piping system.

1.9 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: From date of Substantial Completion.
      a. Urethane Sealants: 10 years.
      b. Silicone Sealants: 20 years.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
   1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
   1. For penetrations involving CPVC piping, provide through-penetration firestop systems which include materials that have been tested to be compatible with CPVC piping.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Dow Corning Corporation; 795 Silicone Building Sealant.
      b. GE Construction Sealants; Momentive Performance Materials Inc; SCS9000 SilPruf NB.
      c. Pecora Corporation; 864NST.
      d. Sika Corporation Industry Products; Silasil WS-295 FPS,
      e. Tremco Inc., Tremco CS&W Group; Spectrem.

2.3 URETHANE JOIT SEALANTS

A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Master Builders Solutions Construction Systems US, LLC; MasterSeal TX1.
      b. C.R. Laurence Co, Inc.; CRL M64.
      c. Pecora Corporation; DynaTrol I-XL.
      d. Sika Corporation Industry Products; Sikaflex Textured Sealant.
      e. Tremco Inc., Tremco CS&W Group; Vulkem 116.

B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Master Builders Solutions Construction Systems US, LLC; MasterSeal SL 1.
      b. Pecora Corporation; Urexpan NR-201.
      c. Sika Corporation Industry Products; Sikaflex 1c SL.

2.4 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. C.R. Laurence Co, Inc.; CRL 33S Silicone.
b. Dow Corning Corporation; 786 Silicone Sealant.
c. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
d. Pecora Corporation; Pecora 898NST.
e. Sika Corporation Industry Products; Sikasil GP.
f. Tremco Inc., Tremco CS&W Group; Tremsil 200.

2.5 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.
1. Products: Subject to compliance with requirements, provide one of the following:
a. C.R. Laurence Co, Inc.; CRL 777 Butyl Rubber (VOC: 240 g/L).
b. Pecora Corporation; BC-158 (VOC: <250 g/L).
c. Tremco Inc., Tremco CS&W Group; Butyl Sealant (VOC: 232 g/L)

2.6 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. C.R. Laurence Co, Inc.; CRL 321 (VOC: 22 g/L).
b. Pecora Corporation; AC-20 (VOC: 20 g/L).
c. Tremco Incorporated; Tremflex 834 (VOC: 31 g/L).

2.7 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Alcot Plastics Ltd.; Alcot Plastics Backer Rod.
b. Master Builders Solutions; MasterSeal 920.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
   2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
      a. Concrete.
      b. Masonry.
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
      a. Metal.
      b. Glass.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
   4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
   5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
      a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
   1. Extent of Testing: Test completed and cured sealant joints as follows:
      a. Perform 10tests for the first 1000 feet (300 m)of joint length for each kind of sealant and joint substrate.
      b. Perform one test for each 1000 feet (300 m)of joint length thereafter or one test per each floor per elevation.
   2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
      a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   3. Inspect tested joints and report on the following:
      a. Whether sealants filled joint cavities and are free of voids.
      b. Whether sealant dimensions and configurations comply with specified requirements.
      c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
   4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
   5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
a. Control and expansion joints in unit masonry.
b. Joints between different materials listed above.
c. Perimeter joints between materials listed above and frames of openings.
d. Control and expansion joints in overhead surfaces.
e. Other joints as indicated on Drawings.
2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
a. Isolation joints in cast-in-place concrete slabs.
b. Control and expansion joints in ceramic tile flooring.
c. Other joints as indicated on Drawings.
2. Joint Sealant: Urethane, S, P, 25, T, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Ceramic tile control and expansion joints.
c. Vertical joints on exposed surfaces of walls and partitions.
d. Other joints as indicated on Drawings.
2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
c. Other joints as indicated on Drawings.
2. Joint Sealant: Acrylic latex.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Tile control and expansion joints where indicated.
c. Other joints as indicated on Drawings.
2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

F. Joint-Sealant Application: Concealed mastics.
1. Joint Locations:
a. Aluminum thresholds.
b. Other joints as indicated on Drawings.
2. Joint Sealant: Butyl-rubber based.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 07 92 19

ACOUSTICAL JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Acoustical joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants, showing full range of available colors for each product exposed to view.

D. Acoustical Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:
1. Product Test Reports: For each type of acoustical joint sealant, for tests performed by qualified testing agency.

B. Sample warranties.

1.4 COORDINATION

A. Ensure joint sealant products are coordinated and compatible with the non-metallic plumbing piping system and the fire sprinkler piping system.

1.5 CLOSEOUT SUBMITTALS

A. Warranty Documentation:
1. Manufacturers' special warranties.
2. Installer's special warranties.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained between 40 and 95 deg F (4 and 35 deg C).
1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 35 and 100 deg F (2 and 38 deg C).

1.8 WARRANTY

A. Installer's Special Warranty: Installer agrees to repair or replace acoustical joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

B. Manufacturer's Special Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACOUSTICAL JOINT SEALANTS

A. Acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies in accordance with ASTM E90.

B. Compatibility: Provide sealants composed of components that are compatible with each other, substrates forming openings, and items penetrating sealant under conditions of service and application.
   1. For penetrations involving CPVC piping, provide sealants which include materials that have been tested to be compatible with CPVC piping.

C. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C834.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. GE Construction Sealants; Momentive Performance Materials Inc.
      b. Hilti, Inc.
      c. Pecora Corporation; Pecora AIS-919 Acoustical and Insulation Latex Sealant.
      d. Tremco Incorporated.
      e. United States Gypsum Company; SHEETROCK Acoustical Sealant.
   2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.

D. Acoustical Sealant for Concealed Joints: Manufacturer's standard nonsag, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber acoustical sealant.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. GE Construction Sealants; Momentive Performance Materials Inc.
      b. Hilti, Inc.
      c. Pecora Corporation; Pecora AIS-919 Acoustical and Insulation Latex Sealant.
      d. Tremco Incorporated.
      e. United States Gypsum Company; SHEETROCK Acoustical Sealant

2.2 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by acoustical joint-sealant manufacturer where required for adhesion of sealant to joint substrates.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where recommended by acoustical joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.

B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C919, ASTM C1193, and manufacturer's written instructions for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of acoustical joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect acoustical joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Interior standard frames.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, and finishes.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: Include the following:
1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
2. Locations of reinforcement and preparations for hardware.
3. Details of each different wall opening condition.
4. Details of anchorages, joints, field splices, and connections.
5. Details of accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal frames vertically under cover at Project site with head up. Place on minimum 4-inch-(102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
1. Republic Doors and Frames.
2. Steelcraft; an Allegion brand.

3. Ceco Door; ASSA ABLOY.
4. Curries Company; ASSA ABLOY.
5. DE LA FONTAINE.
6. Fleming Door Products Ltd.; Assa Abloy Group Company.
7. Gensteel Doors, Inc.
8. Hollow Metal Xpress.
9. Mesker Door Inc.

2.2 INTERIOR STANDARD STEEL FRAMES

A. Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Frames: SDI A250.8, Level 2; SDI A250.4, Level B..
1. Frames:
   a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
   b. Construction: Face welded.
2. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:
1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

2.4 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.5 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

B. Hardware Preparation: Factory prepare hollow-metal frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
   1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
   2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
   1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. General: Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with SDI A250.11.
   1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
      a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
      b. Install frames with removable stops located on secure side of opening.
   2. Floor Anchors: Secure with postinstalled expansion anchors.
      a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
   3. Solidly pack mineral-fiber insulation inside frames.
   4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
   5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
      a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
      c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.3 CLEANING AND TOUCHUP

A. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Five-ply flush wood veneer-faced doors for transparent finish.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:
1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Factory-machining criteria.
5. Factory- finishing specifications.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
4. Dimensions and locations of blocking for hardware attachment.
5. Dimensions and locations of mortises and holes for hardware.
6. Clearances and undercuts.
7. Requirements for veneer matching.
8. Doors to be factory finished and application requirements.

D. Samples for Verification:
1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.3 CLOSEOUT SUBMITTALS

A. Special warranties.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Delamination of veneer.
      b. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
      c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards" and WDMA I.S. 1A.
   1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

2.3 FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Eggers Industries.
      b. Lambton Doors.
      c. Oshkosh Door Company.
      d. VT Industries Inc.
   2. Performance Grade: WDMA I.S. 1A Heavy Duty .
   3. Architectural Woodwork Standards Grade: Custom.
   4. Faces: Single-ply, wood veneer not less than 1/50 inch (0.508 mm) thick.
      a. Species and Cut: Match existing .
      b. Match between Veneer Leaves: Book match unless otherwise indicated.
      c. Assembly of Veneer Leaves on Door Faces: Center-balance match.
      d. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
   5. Exposed Vertical and Top Edges: Same species as faces or a compatible species - Architectural Woodwork Standards edge Type A .
   6. Core for Non-Fire-Rated Doors: ANSI A208.1, Grade LD-1 particleboard.
      a. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
   7. Core for Non-Fire-Rated Doors: WDMA I.S. 10 structural composite lumber.
      a. Screw Withdrawal, Face: 700 lbf (3100 N).
      b. Screw Withdrawal, Edge: 400 lbf (1780 N).
      c. Top and Bottom Rails: 2-3/8 inches minimum.
      d. Stiles: 2-1/1 inch minimum.
   8. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.4 LIGHT FRAMES

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
   1. Wood Species: Same species as door faces .
   2. Profile: Manufacturer's standard shape.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.
   1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.
   1. Locate hardware to comply with DHI-WDHS-3.
   2. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
   3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
   4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

C. Openings: Factory cut and trim openings through doors.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."

2.6 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.
   1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   2. Finish faces, all four edges, edges of cutouts, and mortises.
   3. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Factory finish doors to match existing doors

C. Transparent Finish:
   1. Architectural Woodwork Standards Grade: Custom.
   2. Finish: WDMA I.S. 1A TR-6 Catalyzed Polyurethane.
   3. Staining: Match existing.
   4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
   5. Sheen: Match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.
   1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
   2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 08 71 00 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Storefront framing.
2. Manual-swing entrance doors.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.
e. Flashing and drainage.
3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
4. Include point-to-point wiring diagrams showing the following:
a. Power requirements for each electrically operated door hardware.
b. Location and types of switches, signal device, conduit sizes, and number and size of wires.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction Laboratory Mockup Testing Submittals:
1. Testing Program: Developed specifically for Project.
2. Test Reports: Prepared by a qualified preconstruction testing agency for each mockup test.
3. Record Drawings: As-built drawings of preconstruction laboratory mockups showing changes made during preconstruction laboratory mockup testing.

B. Qualification Data: For Installer and field testing agency.

C. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
   1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

D. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by a qualified testing agency.

E. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and has a minimum of 10 years' experience in storefront installation.

B. Prime installer to be on site during installation.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including, but not limited to, excessive deflection.
      b. Noise or vibration created by wind and thermal and structural movements.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      d. Water penetration through fixed glazing and framing areas.
      e. Failure of operating components.
   2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing, and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design aluminum-framed entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
   2. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Noise or vibration created by wind and thermal and structural movements.
      d. Loosening or weakening of fasteners, attachments, and other components.
      e. Failure of operating units.

C. Structural Loads:
   1. Wind Loads: As indicated on Drawings.
   2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:
   1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
   2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
      a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.
   3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
      a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 11 feet 8-1/4 inches (3.6 m) or 1/175 times span, for spans of less than 11 feet 8-1/4 inches (3.6 m).

E. Structural: Test according to ASTM E 330/E 330M as follows:
   1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
   2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
   3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
   1. Fixed Framing and Glass Area:
      a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
   2. Entrance Doors:
      a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. (2.54 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
   1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).

H. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:
   1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
   2. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

I. Energy Performance: Certify and label energy performance according to NFRC as follows:
   1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor in accordance with building code requirements.
   2. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have SHGC in accordance with building code requirements.
   3. Condensation Resistance: Fixed glazing and framing areas as a system shall have an NFRC-certified condensation resistance rating of no less than 25 as determined according to NFRC 500.

J. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
   2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
      a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
      b. Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C).
      c. Interior Ambient-Air Temperature: 75 deg F (24 deg C).

2.3 STOREFRONT SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Arcadia, Inc.
2. Kawneer North America; an Alcoa company.
3. Leed Himmel Industries, Inc.
4. Oldcastle BuildingEnvelope.
5. Pittco Architectural Metals, Inc.
6. Tubelite Inc.
7. U.S. Aluminum; a brand of C.R. Laurence.

B. Basis-of-Design Products:
1. Exterior Storefront System:
a. Kawneer; Trifab VG 451.
2. Interior Storefront System:
a. Kawneer; Trifab 400.

C. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Exterior Framing Construction: Thermally broken.
2. Interior Vestibule Framing Construction: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides.
4. Glazing Plane: Center.
5. Finish: Clear anodic finish.
6. Fabrication Method: Field-fabricated stick system.
7. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
8. Steel Reinforcement: As required by manufacturer.

D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 INFILL PANELS

A. Subject to compliance with these specifications, provide the following:
1. Mapes Architectural Panels; Mapeshape Infill Panel
2. Dimensions: As shown on Drawings.
3. Color: As selected by Architect from Manufacturer’s standard and custom catalogs
4. As selected by Architect from Manufacturer’s standard and custom catalogs

2.5 07 42 1308 51 13ENTRANCE DOOR SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Arcadia, Inc.
2. Kawneer North America; an Alcoa company.
3. Leed Himmel Industries, Inc.
4. Oldcastle BuildingEnvelope.
5. Pittco Architectural Metals, Inc.
6. Tubelite Inc.
7. U.S. Aluminum; a brand of C.R. Laurence.

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
2. Door Design: Wide stile; 8-inch nominal width.
a. Bottom Rail: 10 inches.
b. Vertical Stile: 5 inches.
c. Top Rail: 5 inches.

3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
   a. Provide nonremovable glazing stops on outside of door.

2.6 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 71 00 "Door Hardware."

B. General: Provide entrance door hardware and entrance door hardware sets indicated in "Entrance Door Hardware Sets" Article for each entrance door, to comply with requirements in this Section.
   1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA standard referenced.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
   3. Opening-Force Requirements:
      a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
      b. Accessible Interior Doors: Not more than 5 lbf (22.2 N) to fully open door.

C. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using access door hardware designations as follows:
   1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
   2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

D. Cylinders: As specified in Section 08 71 00 "Door Hardware."

E. Weather Stripping: Manufacturer's standard replaceable components.
   1. Compression Type: Made of ASTM D 2000 molded neoprene or ASTM D 2287 molded PVC.

F. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

G. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (12.7 mm).

2.7 GLAZING

A. Glazing: Comply with Section 08 80 00 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.8 MATERIALS

A. Sheet and Plate: ASTM B 209 (ASTM B 209M).

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).

C. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.

D. Structural Profiles: ASTM B 308/B 308M.

E. Steel Reinforcement:
   1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
   2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
   3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
   4. Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.9 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   2. Reinforce members as required to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads , fabricated from 300 series stainless steel.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, complying with ASTM A 240/A 240M, of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil (0.762 mm) thickness per coat.

E. Rigid PVC Filler.

2.10 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from interior.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Storefront Framing: Fabricate components for assembly using screw-spline system.

F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
   1. At interior and exterior doors, provide compression weather stripping at fixed stops.

G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
   1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
   2. At exterior doors, provide weather sweeps applied to door bottoms.

H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

I. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.11 BRAKE METAL

A. Material: Extruded Aluminum.

B. Thickness:0.090 inches (2.38mm) unless noted otherwise.

C. Finish: Match storefront.

D. Texture: Smooth.

E. Profile: As indicated.

2.12 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed, as specified in Section 07 92 00 "Joint Sealants," to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 08 80 00 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
3. Alignment:
a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.
   1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
      a. Perform a minimum of two tests in areas as directed by Architect.
   2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
      a. Perform a minimum of two tests in areas as directed by Architect.
   3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. (300 Pa), and shall not evidence water penetration.

C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Furnish and deliver all items of finish hardware required to adequately trim and hang all doors, as is hereinafter specified and listed in the hardware sets. This further includes hardware for doors and frames of unusual profile or shape or other special conditions. The hardware shall be provided with all necessary standard and special fasteners, screws, bolts, expansion shields or anchors to properly secure hardware to its intended door, frame or other surface.

1.2 REFERENCES

A. The following documents should be used in estimating and detailing and considered as a standard of quality and performance:

1.	I.B.C.	International Building Code 2015 Edition.
2.	NFPA-80	Fire Door Windows (current year adopted).
3.	NFPA-101	Life Safety Code (current year adopted).
4.	NFPA-105	Smoke Control Door Assembly (current year adopted).
5.	ANSI-117.1	Providing Accessibility and Usability for Physically Handicapped People (current year adopted).
6.	A.D.A.A.G.	Federal Register for Americans with
7.		Disabilities Act Accessibility Guidelines.
8.	T.A.S.	Texas Accessibility Standards.

1.3 SUBMITTALS

A. General Requirements: Make all submittals in accordance with Section 01 33 00.

B. Schedules: Unless specifically stated, furnish six (6) copies of a completely detailed schedule of finish hardware (see DHI's Sequence and Format of the Hardware Schedule) for approval. Hardware schedule to be complete with Title Page, Door Index/Keying Schedule and Manufacturers legend. After "Approval" provide eight (8) copies, unless otherwise requested, of the corrected, revised and approved schedule for field use, distribution and files. Provide one (1) copy, complete with Catalog Cuts, marked "Installer's Copy" and deliver it to the job site.

C. Product Data: Provide a catalog cut, clearly marked and identified, illustrating and describing each product included in the Hardware Schedule. Formulate these catalog cuts into sets and include a set with each copy of the Hardware Schedule submitted.

D. Samples: If so requested by the Architect, provide a sample of any product or item requested, properly marked and tagged, for the opening for which it is intended. After examination and approval by the Architect, the sample shall be turned over to the General Contractor for incorporation into the project.

E. Templates: When resubmitting "Approved" copies of the Hardware Schedule, provide a complete "Template List" covering the items scheduled. Further and upon request, provide copies of templates to manufacturers or trades, whose work includes preparation of their products, to receive hardware. Provide copies of all such transmittals to the contractor for his files.

F. Keying: Provide a keying schedule, listing the levels of keying, (GGMK, GKD, MKD or KA) as well as an explanation of the key system's function, the key symbols used and the numbers of the doors controlled. This shall be provided in conjunction with the Door Index/Keying Schedule (which lists the door number schedule heading, lock type and individual key symbol and remarks or special instructions) mentioned in above. This project is to be Masterkeyed and/or Grand Masterkeyed and

provide ten (10) grandmaster keys, fifteen (15) master keys and five (5) keys per lockset or cylinder. (SECURITY KEYING)

G. Operations and Maintenance Data: One-hundred-twenty (120) days prior to project completion, provide to DISD LOCKSMITH DEPARTMENT 972-925-5239, a copy of the latest, revised and updated schedule of finish hardware, 100% half size prints, complete with catalog cuts and keying schedule. In addition, furnish one (1) copy of maintenance and parts manuals for those items for which they are readily available and normally provided.

1.4 QUALITY ASSURANCE

A. Substitutions: Request for substitutions shall not be accepted within this project. Architect, owner and Hardware Consultant have selected one (1) specified and two (2) equals listed hereinafter in the Hardware Schedule. By this selection process they have established three (3) equal products for competitive pricing, while insuring no unnecessary delays by a substitution process. If any specified product is listed as a “No Substitution” product, this product will be supplied as specified, with no alteration or request of substitution. The reason for this is to comply with the uniformity established at this project. Parts and supplies are inventoried for these particular products for ease and standardization of replacement.

B. Supplier Qualification: Qualifications of supplier listed below shall meet or exceed those standards and be documented, in writing, upon the request of the Architect:
1. The hardware supplier shall be engaged regularly in the furnishing, delivery and servicing of contract builder's hardware and must be experienced and knowledgeable` in all phases of estimating, detailing, scheduling, master keying, shipping and installation practices.
2. An A.H.C. or equivalent shall be on staff at hardware supplier’s place of business to assist Architect and General Contractor throughout project.

C. Installer Training: Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar with a one-week notice to all parties involved. The seminar is to be conducted on the installation of hardware, specifically of locksets, closers, exit devices, continuous hinges, overhead stops, and access control hardware. Manufacturer’s representative of the above products shall present seminar. Seminar shall be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedules, templates and physical product samples.

1.5 DELIVERY, STORAGE AND HANDLING

A. Marking and Packaging: All items of hardware shall be delivered to the jobsite in the manufacturer’s original cartons or boxes. Each item of hardware shall be marked with the abbreviation set forth on the shop drawings to ensure that the product reaches its installation destination without needing specific hardware product number knowledge.

B. Delivery: The hardware supplier shall coordinate with the General Contractor in order to compile a mutually beneficial delivery schedule, which imposes no hardship on either party. If items of hardware are to be delivered to manufacturers or fabricators for installation on their portion of work, the General Contractor must be advised of such shipments, along with copies of shipping tickets and other documentation, thus transferring responsibility to the manufacturer/fabricator, for care of said hardware.

C. Storage: No hardware is to be delivered to the jobsite until the contractor has provided a dry, secure area with adequate shelving to store the hardware. If requested by the contractor, the hardware supplier shall send a representative to the jobsite to assist in the checking-in and lay out of the hardware at the storage location. This must be done only when a representative of the contractor is present.

D. Warranty: All warranties shall be that of the manufacturer as stated in the most recent product literature. Any evidence of misuse or abuse voids all warranties expressed or implied.

1.6 MAINTENANCE

A. Maintenance Service: If there are any products listed hereinafter that normally require a maintenance or service contract, provide the Owner/Architect with details and costs of said contract.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products listed in the following with an asterisk (*) shall denote specified manufacturers in Hardware Schedule. The remaining two (2) listed manufacturers will be acceptable equals. If only one manufacturer is listed this will be handled as a “No Substitution” specification, as set forth in 1.04 Quality Assurance.

2.2 MATERIALS

A. Screws and Fasteners: Provide all screws and fasteners of the proper size and type to properly anchor or attach the item of hardware scheduled. Provide all fasteners with Phillips head, unless security type screws (spanner-head or torx-head) are hereinafter specified.

B. Hinges: Where hinges are specified, they shall be as follows:
1. On doors to exterior openings and main corridor doors, and other doors of high frequency use, provide a continuous, gear type hinge of appropriate weight as specified.
2. Where regular ball bearing hinges are listed for other doors, provide one hinge for each 30-inch of door height.
3. The width of the hinges shall be sufficient to clear all trim that is mounted to the door frame.
4. Provide hinges with height and weight to match frame prep where existing hollow metal frames are re-used.
a. ACCEPTABLE MANUFACTURERS----Ives*, Stanley, McKinney, Hager.

C. Continuous Hinges: Continuous hinges shall consist of three (3)-interlocking extrusions in a pin-less assembly applied to the full height of the door. All continuous geared hinges shall be manufactured to template screw locations and be non-handed. All mortise hinges and half mortise hinges shall cover and wrap the door edge completely. Doorframe heads shall be extended for clearance on full or half mortise hinges versus downsizing doors for ease of repair and replacement. All frames shall be properly reinforced per manufacturer's standards. Standard warranty shall be for the life of opening.
1. ACCEPTABLE MANUFACTURERS----Ives*, Hager , Pemko, Select, Zero.

D. Electronic Power Transfer: Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware. Locate electric power transfer per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.
1. ACCEPTABLE MANUFACTURERS----Von Duprin (no substitution)

E. Locks: All locks shall incorporate a seven-pin tumbler system core that will be keyed to the existing GRANDMASTER SYSTEM. Provide locks and cylinders complete with keyed construction cores. All locks shall be operational Grade 1 mortise as is hereinafter listed in the Hardware Schedule. Provide L9050 function at Teacher’s Lounge and Administration areas. Provide L9071 function at all classroom doors with locksets.
1. ACCEPTABLE MANUFACTURERS---Schlage* (no substitution)

F. Electronic Locks: Provide motor based electrified locksets with electrified options as scheduled in the hardware sets and comply with the following requirements:
1. Universal input voltage – single chassis accepts 12 or 24V DC to allow for changes in the field without changing lock chassis.

2. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
3. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
4. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
5. Request to Exit Switch (RX) – Modular Design – provide electrified locks capable of using, adding, or changing a modular RX switch without opening the lock case. Monitoring – where scheduled, provide a request to exit (RX) switch that detects rotation of the inside lever.
6. Connections – provide quick-connect Molex system standard.
7. ACCEPTABLE MANUFACTURERS---Schlage* (no substitution)

G. Lock Trim: Mortise locks are to be furnished with lever handle trim (17A), with levers having a return to within 1/2 inch of the door face, as is hereinafter listed in the Hardware Schedule. Provide “N” escutcheons on all new locks for renovation projects where doors are reused.

H. Power Supplies: Provide power supplies approved by manufacturer of supplied electrified hardware. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
1. ACCEPTABLE MANUFACTURERS---Schlage, Von Duprin.

I. Cylinder Housings: Rim and mortise cylinder housings shall be Best. Cams and tailpieces must be coordinated with locking mechanism. Provide blocking rings as required to adapt cylinder housing to the locking mechanism.
1. ACCEPTABLE MANUFACTURERS---Best * (no substitution)

J. Construction Cores: Furnish keyed brass construction cores installed in every cylinder and cylinder housing included in the project. Provide one construction key for each core. All temporary construction cores shall have a minimum of two levels such that a pass key can be issued to individual users limiting access to a single space with a second level “master” of all construction cores that can be issued to school principal and DISD Lock Department. Contractor shall provide master keys per the following schedule:
1. Elementary Schools 6 master keys
2. Middle Schools 8 master keys
3. High Schools 12 master keys
4. ACCEPTABLE MANUFACTURERS---Falcon * (no substitutions)

K. Permanent Cores: Furnish combinated cores so as not to breach security of existing system. CORMAX keying system must be guaranteed of no duplication of existing change keys, master keys or grandmaster keys located in this project. Provide new permanent cores for all new cylinder housings and locks as well as any existing locks that have been modified.
1. ACCEPTABLE MANUFACTURERS---Best * (no substitutions)

L. Flush Bolts: Manual flush bolts to have 12-inch rods for doors 7’6”. Doors over 7’6” high shall have bolts with top rods of 18 inch or 24 inch to allow ease of access to bolt lever. Furnish dust proof strikes for all bottom bolts.
1. ACCEPTABLE MANUFACTURERS---Ives*, Rockwood, Trimco.

M. Automatic Flush Bolts: Bolts are to be adjustable for unusual clearance or conditions and have a thermal lock that automatically locks the inactive door under high heat conditions due to fire. Furnish dust proof strikes for all bottom bolts.
1. ACCEPTABLE MANUFACTURERS---Ives*, Rockwood, Trimco.

N. Door Coordinators: Coordinators to be non-handed and designed to become an integral part of the door frame and engineered to prevent damage in case of abnormal force against the door that is held open.
1. ACCEPTABLE MANUFACTURERS---Ives*, Rockwood, Trimco.

O. Exit Devices and Mullions: Exit Devices shall be rim, mortise or vertical rod type as called for in the Hardware Schedule. All such devices shall be U.L. listed. Interior devices, (except vestibule doors), shall be furnished with lever handle trim, 996-L2, matching lock design unless specified as exit only function. Exterior doors and vestibule doors shall be furnished with VR trim unless specified as exit only function. XP devices shall be furnished at all exterior locations. Provide 330 series push bars at vestibule doors that do not require exit devices. Provide key removable mullions with stabilizers. All devices shall have published three-year warranty. Provide 9949 series devices at interior pairs where specified.
1. ACCEPTABLE MANUFACTURERS---Von Duprin* (no substitution)

P. Door Closers: Door closers shall be of cast iron material and be of rectangular designs and furnished with a full cover and thru-bolts. Provide heavy duty arms on exterior doors. Where required, provide closers templated for 180 degrees of swing. They shall be furnished with backcheck, delayed action, hold-open and advanced backcheck as listed in the Hardware Schedule. Closers shall be mounted out of the line of sight wherever possible (i.e., room side of corridor doors, etc.) with parallel arm mounting on out swinging doors. Mount closers top jamb or on brackets and/or drop plates, where special conditions call for it.
1. ACCEPTABLE MANUFACTURERS----LCN* (no substitution).

Q. Push Plates: Push plates are to be .050 brass, bronze or stainless steel with four (4) beveled edges, drilled and countersunk for screws, as is hereinafter specified in the Hardware Schedule.
1. ACCEPTABLE MANUFACTURERS----Ives*, Rockwood, Trimco.

R. Door Pulls: Door pulls to be ADA compliant with a 2 1/2 inch projection from back of pull to face of door. All door pulls to be thru bolted or back-to-back mounting. All pulls to be supplied with mounting bolts for high abuse areas with a minimum of 3/8 inch - 16 heavy-duty bolts.
1. ACCEPTABLE MANUFACTURERS----Ives*, Rockwood, Trimco.

S. Protective Plates: Protective plates shall be mop (6”), kick (10”) or armor (34”) and shall be .050 brass, bronze or stainless steel, with three (3) beveled edges, drilled and countersunk for screws. Plates to be mounted to avoid louvers and/or glass kits.
1. ACCEPTABLE MANUFACTURERS----Ives*, Rockwood, Trimco.

T. Door Stops and Holders: Where a door strikes a wall at approximately 90 degrees, a suitable door stop shall be provided, either a wall bumper or floor stop. Do not provide floor stops unless they are specifically listed in the hardware sets. If door does not strike a wall, an overhead stop shall be required. Provide Ives FS18L heavy duty floor stops only at exterior doors. Provide proper blocking for wall bumpers at stud walls and in frame and door for overhead stops.
1. ACCEPTABLE MANUFACTURERS----Ives*, Glynn Johnson*, Rixson, Trimco.

U. Thresholds and Weatherstrip: Weatherstripping to have aluminum housing and specified insert and have elongated holes for adjustment. Door sweeps to be surface mounted of aluminum housing with specified insert. Overhead drip caps to be of aluminum, have a 2 1/2-inch projection and be 4 inches wider than the door opening. Thresholds shall be of saddle type with no more than 1/2 inch in rise with stainless steel fasteners.
1. ACCEPTABLE MANUFACTURERS----NGP, Reese, Zero*.

V. Magnetic Holders: Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.
1. ACCEPTABLE MANUFCATURERS----LCN.

W. Door Position Switches: Provide recessed or surface mounted type door position switches as specified. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.
1. ACCEPTABLE MANUFCATURERS----Schlage, GE-Interlogix.

2.3 FINISHES

A. Hardware finishes shall match and be maintained to BHMA symbols, as is specified hereinafter in the Hardware Schedule. A strict adherence to base metals and finish will be mandate.

2.4 KEY CONTROL

A. Provide key cabinet(s) as manufactured of sufficient capacity to handle all keys, plus 50 percent expansion Provide key control cross-reference chart and accountability (sign-out) tags. General Contractor shall install the key cabinet with cabinet set up by Best Access Systems
1. ACCEPTABLE MANUFACTURERS: Telkee, Lund, Key Control.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination of project requirements on site prior to submitting bids will be mandate of all bidders of finish hardware. At this time, suggestions and/or problems will be addressed and answered by the Architect and/or Hardware Consultant. If any decision affects bidding documents, Addenda will be issued of said decision with complete explanation.

3.2 INSTALLATION

A. Installation shall occur with a qualified installer with a minimum five (5) years' experience in the installation of commercial grade hardware. Manufacturer's instructions shall dictate templating and installation.
1. Best Access Systems is to coordinate with DISD on keying system design, provide permanent cores, and key cabinet set up.
2. All costs associated with Best's work shall be the responsibility of the General Contractor.
3. Installation of the permanent cores and keys shall be coordinated with the Owner. All work shall be provided by Dallas Door and Supply. Installation of permanent cores shall be completed prior to Final Completion and paid for by the General Contractor.
4. Best Access Systems to deliver keys directly to the Owner with no 3rd party or General Contractor involvement. Contact Lock Supervisor, Steve Fickel at (972) 925-5239. Once the permanent cores are installed, the District assumes primary responsibility for the security of the building and its contents.
5. Dallas Door and Supply to return construction cores to the General Contractor.
6. General Contractor to deliver to owner at end of project, any special installation tools, hex dogging keys, etc.
7. Renovations to existing facilities where existing doors are to be reused with new locking hardware may require the use of a metal wrap at the lock location to cover any exposed holes from previous lock prep. Existing door jambs shall be prepped to accept flush mounted ANSI strikes. Prep to factory specs.
8. Where existing doors are to be reused with new locking hardware, the district will determine if any deviation from the DISD standard of a mortise lock would be acceptable.
9. Install all door closers with thru-bolts and adjust after HVAC is in operation.
10. Install exit devices with sex, nuts and bolts through all doors.
11. Set thresholds in full bed of exterior grade caulk near interior and exterior edges.

3.3 FIELD QUALITY CONTROL

A. A final inspection shall take place by the hardware installer and hardware supplier to insure correct installation and operation, and check for any damaged or defective items. Observe and inspect that all hardware has been installed to its correct destination in proper working order.

3.4 ADJUSTING AND CLEANING

A. At completion of the installation and before turnover of the project, make final adjustments to door closures and other items of hardware. Leave all hardware clean and fully operable. Should any item be found to be defective, it shall be repaired or replaced as directed.

3.5 PROTECTION

A. Provide protection for all items of hardware during construction to prevent damage or marring of such items. Damaged or disfigured hardware shall be replaced or corrected by the responsible party.

B. Refer to attached document for Door Hardware Schedule.

END OF SECTION

DOOR HARDWARE SCHEDULE

List of Manufacturers

1.	Ives	IVE
2.	Schlage	SCH
3.	LCN	LCN
4.	Von Duprin	VON
5.	Best	BES
6.	Falcon	FAL
7.	Schlage Electronics	SCE
8.	Zero	ZER
9.	Glynn Johnson	GLY

Hardware Sets

OPT0318714
Hardware Group No. C201C
EACH TO HAVE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 17N RX (FAIL SECURE)	626	SCH
1	EA	MORTISE CYLINDER	1E74 X CAM AS REQ	626	BES
1	EA	SFIC CONST. CORE	C607CCA	622	FAL
1	EA	PERMANENT CORE	1C7 (VERIFY WITH OWNER)	626	BES
1	EA	SURFACE CLOSER	4040XP SCUSH X TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	MULTITECH READER	MT SERIES READER BY DIV 28 (COORDINATE WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS)	BLK	SCE
1	EA	DOOR CONTACT	679-05 TYPE AS REQ (COORDINATE FINAL LOCATIONS WITH SECURITY PRIOR TO SUBMITTAL)	WHT	SCE
1	EA	POWER SUPPLY	POWER SUPPLY FOR CARD READER BY ANOTHER SECTION		
1	EA	POWER SUPPLY	PS902 120/240 VAC (COORDINATE POWER SUPPLIES WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.)	LGR	SCE

-INGRESS BY THE CARD READER OR KEY OVERRIDE.
-EGRESS BY THE LEVER.

Hardware Group No. C710AMV
EACH TO HAVE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY HEIGHT AS REQ	628	IVE
1	EA	CONT. HINGE	112XY EPT HEIGHT AS REQ	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954 STAB HEIGHT AS REQ	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-XP99-NL-OP-CON LENGTH AS REQ	626	VON
1	EA	PANIC HARDWARE	XP99-EO LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	1E72	626	BES
1	EA	MORTISE CYLINDER	1E74 X CAM AS REQ	626	BES
2	EA	SFIC CONST. CORE	C607CCA	622	FAL
2	EA	PERMANENT CORE	1C7 (VERIFY WITH OWNER)	626	BES
1	EA	DOOR PULL	VR910 DT	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH X TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	MULLION SEAL	8780N PSA HEIGHT AS REQ	BK	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MANUFACTURER		
1	EA	HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	HARNESS (TO POWER SUPPLY)	CON-6W		SCH
1	EA	MULTITECH READER	MT SERIES READER BY DIV 28 (COORDINATE WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS)	BLK	SCE
2	EA	DOOR CONTACT	679-05 TYPE AS REQ (COORDINATE FINAL LOCATIONS WITH SECURITY PRIOR TO SUBMITTAL)	WHT	SCE
1	EA	POWER SUPPLY	POWER SUPPLY FOR CARD READER BY ANOTHER SECTION		
1	EA	POWER SUPPLY	PS902 900-2RS (COORDINATE POWER SUPPLIES WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.)		VON

-INGRESS BY THE CARD READER OR KEY OVERRIDE.
-EGRESS BY THE PUSH PADS.

Hardware Group No. CR207A
EACH TO HAVE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT HEIGHT AS REQ	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 17N RX	626	SCH
1	EA	MORTISE CYLINDER	1E74 X CAM AS REQ	626	BES
1	EA	SFIC CONST. CORE	C607CCA	622	FAL
1	EA	PERMANENT CORE	1C7 (VERIFY WITH OWNER)	626	BES
1	EA	OH STOP	100S SERIES X SIZE & MOUNTING AS REQ	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA X TBSRT X MTG BRKTS, PLATES AND SPACERS AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	MULTITECH READER	MT SERIES READER BY DIV 28 (COORDINATE WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS)	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05 TYPE AS REQ (COORDINATE FINAL LOCATIONS WITH SECURITY PRIOR TO SUBMITTAL)	WHT	SCE
1	EA	POWER SUPPLY	POWER SUPPLY FOR CARD READER BY ANOTHER SECTION		
1	EA	POWER SUPPLY	PS902 120/240 VAC (COORDINATE POWER SUPPLIES WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.)	LGR	SCE

-INGRESS BY THE CARD READER, REMOTE RELEASE, OR KEY OVERRIDE.
-EGRESS BY THE LEVER.

Hardware Group No. CR714AM
EACH TO HAVE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY EPT HEIGHT AS REQ	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954 STAB HEIGHT AS REQ	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-XP99-NL-OP-CON LENGTH AS REQ	626	VON
1	EA	ELEC PANIC HARDWARE	RX-XP99-EO-CON LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	1E72	626	BES
1	EA	MORTISE CYLINDER	1E74 X CAM AS REQ	626	BES
2	EA	SFIC CONST. CORE	C607CCA	622	FAL
2	EA	PERMANENT CORE	1C7 (VERIFY WITH OWNER)	626	BES
1	EA	DOOR PULL	VR910 DT	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH X TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MANUFACTURER		
2	EA	DOOR SWEEP	8198AA LENGTH AS REQ	AA	ZER
1	EA	THRESHOLD	65A LENGTH AS REQ	A	ZER
2	EA	HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
2	EA	HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	MULTITECH READER	MT SERIES READER BY DIV 28 (COORDINATE WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS)	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
2	EA	DOOR CONTACT	679-05 TYPE AS REQ (COORDINATE FINAL LOCATIONS WITH SECURITY PRIOR TO SUBMITTAL)	WHT	SCE
1	EA	POWER SUPPLY	POWER SUPPLY FOR CARD READER BY ANOTHER SECTION		
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC (COORDINATE POWER SUPPLIES WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.)		VON

-INGRESS BY THE CARD READER, REMOTE RELEASE OR KEY OVERRIDE.
-EGRESS BY THE PUSH PADS.

Hardware Group No. R207A
EACH TO HAVE

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT HEIGHT AS REQ	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 17N RX	626	SCH
1	EA	MORTISE CYLINDER	1E74 X CAM AS REQ	626	BES
1	EA	SFIC CONST. CORE	C607CCA	622	FAL
1	EA	PERMANENT CORE	1C7 (VERIFY WITH OWNER)	626	BES
1	EA	OH STOP	100S SERIES X SIZE & MOUNTING AS REQ	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA X TBSRT X MTG BRKTS, PLATES AND SPACERS AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05 TYPE AS REQ (COORDINATE FINAL LOCATIONS WITH SECURITY PRIOR TO SUBMITTAL)	WHT	SCE
1	EA	POWER SUPPLY	POWER SUPPLY FOR CARD READER BY ANOTHER SECTION		
1	EA	POWER SUPPLY	PS902 120/240 VAC (COORDINATE POWER SUPPLIES WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.)	LGR	SCE

-INGRESS BY THE REMOTE RELEASE OR KEY OVERRIDE.
-EGRESS BY THE LEVER.

END OF DOCUMENT

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Glass for doors and storefront framing.
2. Glazing sealants and accessories.

1.2 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
1. Insulating glass.
2. Acid-etched glass.

D. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

F. Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist indicated or code required loads.

G. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For glass.

C. Preconstruction adhesion and compatibility test report.

D. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
   1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
   2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
   3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
   4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
   5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
   1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.11 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
   1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AGC Glass North America.
2. Cardinal Glass Industries.
3. Guardian Industries Corp.; SunGuard.
4. Oldcastle BuildingEnvelope.
5. Pilkington North America.
6. Viracon, Apogee Enterprises, Inc.
7. Vitro.

B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
1. Obtain tinted glass from single source from single manufacturer.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazing.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
1. Design Wind Pressures: As indicated on Drawings.
2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
1. Minimum Glass Thickness for Exterior Lites: 6 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

C. Acid-Etched Glass: Acid etching with hydrofluoric acid eroding surface of glass panel to create a translucent finish.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) Technoform Glass Insulation NA, Inc.
2) Thermix; a brand of Ensinger USA.
3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS

A. General:
1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Sealant shall have a VOC content of 250 g/L or less.
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Corning Corporation; 790.
b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
c. Bondaflex Sil 290.
d. Pecora Corporation; 890NST.
e. Sikasil WS-290.
f. Tremco Incorporated; Spectrem 1

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
   1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
   2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
   1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

A. Clear fully tempered float glass.
   1. Minimum Thickness: 6 mm.
   2. Acid-etched to give a frosted appearance
      a. Pattern: As selected by Architect.

3.9 INSULATING GLASS SCHEDULE

A. Glass Type : Low-E-coated, tinted insulating glass.
   1. Overall Unit Thickness: 1 inch (25 mm).
   2. Minimum Thickness of Each Glass Lite: 6 mm.

3. Outdoor Lite: Tinted, fully tempered float glass.
   a. Tint Color: As selected by Architect.
4. Interspace Content: Air.
5. Indoor Lite: Clear, fully tempered float glass.
6. Low-E Coating: Sputtered on second surface.
7. Winter Nighttime U-Factor: 0.29 maximum.
8. Safety glazing required.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Framing systems.

1.2 ACTION SUBMITTALS

A. Product Data:
1. Framing systems.
2. Suspension systems.
3. Grid suspension systems.

B. Span and Deflection Design Criteria: Provide height to load deflection charts showing studs supplied conform to deflection limit scheduled and allowed per ASTM C 754.
1. Mark on chart(s) showing all major partitions scheduled conformance with criteria.
2. Submit manufacturer’s certification of stud size, thickness, and spacing complying with performance requirements and selections made by architect are correct for application shown.

C. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.4 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association or be a part of a similar organization that provides verifiable code compliance program.

1.5 SEQUENCING

A. Coordinate placement of concealed internal wall reinforcement, such as backing plates, for items to be attached to metal support systems.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Notify manufacturer of damaged materials received prior to installation.

B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members" and ASTM C645, Section 10, if applicable to local code, unless otherwise indicated.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.

C. Horizontal Deflection:
1. Minimum Base Steel Thickness: 0.0179-inch (25 gauge) unless indicated otherwise on Drawings or below.
2. Interior Metal Stud/Gypsum Board Assemblies, Typical Locations: Withstand lateral loading (air pressure) of 5 psf with deflection limit not more than L/240 of partition height.
3. Interior Metal Stud/Gypsum Board Assemblies at Atriums, Lobbies, Service Corridors, Exit Corridors, Elevator Lobbies, Vertical Shafts, and walls receiving plaster veneer: Withstand lateral loading (air pressure) of 7.5 psf with deflection limit not more than L/360 of partition height.
4. Interior Metal Stud/Gypsum Board Assemblies at Locations with Ceramic Tile or Other Hard Surface Finishes: Withstand typical lateral loading (air pressure) with deflection limit not more than L/360 of partition height, minimum 0.0329-inch (20 gauge) studs at 16 inches on center.
5. Where wall mounted equipment, woodwork, and casework items are indicated or elsewhere as shown on Drawings, provide minimum 0.0568-inch (16 gage) studs.
6. At jambs of openings provide two minimum 0.0329 inch (20 gage) studs.

D. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.

E. Design Loads: As indicated on architectural Drawings or 5 lbf/sq. ft. (239 Pa) minimum as required by the IBC.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with AISI S220 and ASTM C645, Section 10 for conditions indicated.
1. Steel Sheet Components: Comply with AISI S220 and ASTM C645, Section 10 requirements for metal unless otherwise indicated.
2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40 (Z120); or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
b. Coating roll-formed from steel complying with mechanical and chemical requirements of ASTM A1003 with a zinc-based coating.
c. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction

B. Studs and Track: AISI S220 and ASTM C645, Section 10.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. CEMCO.
b. ClarkDietrich
c. Custom Stud, Inc.
d. MarinoWARE.
e. MBA Building Supplies.
f. MRI Steel Framing, LLC.
g. SCAFCO Steel Stud Company.
h. Steel Network, Inc. (The).
i. Telling Industries.
2. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
3. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide one of the following:
1. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) CEMCO.
2) ClarkDietrich.
3) MarinoWARE.
4) MBA Building Supplies.

5) Metal-Lite.
6) SCAFCO Steel Stud Company.
7) Steel Network, Inc. (The).
8) Telling Industries.

D. Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Steel Thickness: 0.0179 inch (0.455 mm).
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ClarkDietrich.
b. MarinoWARE.
c. MRI Steel Framing, LLC.
d. SCAFCO Steel Stud Company.
3. Basis-of-Design Product: ClarkDietrich; Backer Bar and Notched Track.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (1.367-mm) minimum base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ClarkDietrich.
b. MarinoWARE.
c. MRI Steel Framing, LLC.
d. SCAFCO Steel Stud Company
2. Depth: As indicated on Drawings.
3. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.

F. Hat-Shaped, Rigid Furring Channels:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ClarkDietrich.
b. MarinoWARE.
c. MRI Steel Framing, LLC.
d. SCAFCO Steel Stud Company.
2. Minimum Base-Steel Thickness: 0.0179 inch (0.455 mm).
3. Depth: 7/8 inch (22.2 mm).

G. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ClarkDietrich.
b. MarinoWARE.
c. MRI Steel Framing, LLC.
d. SCAFCO Steel Stud Company.
2. Configuration: Asymmetrical.

H. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: As indicated on Drawings.
2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (0.8 mm).
3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.
1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide the following:
1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.
   1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLATION OF FRAMING SYSTEMS

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
   1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
   2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
   3. Tile Backing Panels: As required by horizontal deflection performance requirements unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
   4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Interior gypsum board.
2. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the "2015 TX-CHPS Criteria: New Construction and Renovation."

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
1. Build mockups for the following:
a. Each level of gypsum board finish indicated for use in exposed locations.
b. Each texture finish indicated.
2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. American Gypsum; 5/8 inch FireBloc Type X Gypsum Wallboard.
b. CertainTeed Corporation; Type X Gypsum Board.
c. Georgia-Pacific Building Products; ToughRock Fireguard X Gypsum Board.
d. National Gypsum Company; Gold Bond Brand Fire-Shield Gypsum Board.
e. United States Gypsum Company; USG Imperial Gypsum Base, Firecode X.
2. Thickness: 5/8 inch (15.9 mm) unless otherwise indicated.
3. Long Edges: Tapered.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. CertainTeed Corp.
b. Custom Building Products.
c. National Gypsum Company.
d. USG Corporation.
2. Thickness: 1/2 inch (12.7 mm).
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
a. Cornerbead.
b. Bullnose bead.
c. LC-Bead: J-shaped; exposed long flange receives joint compound.
d. L-Bead: L-shaped; exposed long flange receives joint compound.
e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
f. Expansion (control) joint.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Fry Reglet Corp.
b. Gordon, Inc.
c. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
   a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:
1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

C. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Electrical Box Pads: Putty Pads: Moldable non-curing one component, intumescent, fire-rated material for through-penetration fire stop systems and sound attenuation systems; self-adhering; 1/8-inch thick minimum.

E. Acoustical Sealant: Refer to Section 07 92 19 “Acoustical Joint Sealants.”

F. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ELECTRICAL BOX PADS FOR SMOKE / FIRE-RATED AND STC-RATED WALLS

A. Prior to installing wallboards, install electrical box pads in accordance with manufacturer’s written instructions.

B. Overlap front edge of box so that pad will be compressed around edges of box as gypsum panels are installed.

3.3 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.4 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:
1. Type X: Vertical surfaces unless otherwise indicated.
2. Mold-Resistant Type: As indicated on Drawings.
3. Tile Backer, Cementitious Backer Units:
   a. Tiled walls in toilet room.

B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing)unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:
1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
2. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.5 APPLYING TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at locations indicatedto receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.6 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners unless otherwise indicated.
2. Bullnose Bead: Use where indicated.
3. LC-Bead: Use at exposed panel edges.

4. L-Bead: Use where indicated.
5. U-Bead: Use where indicated.

D. Aluminum Trim: Install in locations indicated on Drawings.

3.7 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Where indicated on Drawings.
3. Level 3: Where indicated on Drawings.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
   a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.8 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for repair and patching of existing interior ceilings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
2. Life Cycle Assessment: Third Party Certified Environmental Product Declaration (EPD)
3. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
4. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Ceiling suspension-system members.
2. Structural members to which suspension systems will be attached.
3. Method of attaching hangers to building structure.
a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
5. Size and location of initial access modules for acoustical panels.
6. Items penetrating finished ceiling and ceiling-mounted items including the following:
a. Lighting fixtures.
b. Diffusers.
c. Grilles.
d. Speakers.
e. Sprinklers.
f. Access panels.
g. Perimeter moldings.
7. Minimum Drawing Scale: 1/4 inch = 1 foot (1:48).

B. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Units: Full-size panels equal to 2percent of quantity installed.

2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
3. Hold-Down Clips: Equal to 2percent of quantity installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Ceiling products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Class A according to ASTM E 1264.
2. Smoke-Developed Index:450 or less.

2.3 ACOUSTICAL PANELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Panel: Match existing.

2.4 METAL SUSPENSION SYSTEM

A. Metal Suspension-System Standard: Match existing. Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
1. Structural Classification: Intermediate -duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Cold-rolled steel or aluminum.
5. Cap Finish: Painted white .

2.5 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
   2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- (2.69-mm-) diameter wire.

C. Hold-Down Clips: Manufacturer's standard hold-down.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. United States Gypsum Company.

B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
   1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils (0.04 mm). Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices

that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Arrange directionally patterned acoustical panels as follows:
   a. As indicated on reflected ceiling plans.
2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.
   a. Hold-Down Clips: Space 24 inches (610 mm) o.c. on all cross runners.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m), non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m), non-cumulative.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Thermoset-rubber base.
   2. Rubber molding accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
   1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
   2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Coordinate mockups in this Section with mockups specified in other Sections.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 THERMOSET-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Burke Mercer Flooring Products; a division of Burke Industries Inc.
2. Flexco.
3. Johnsonite; a Tarkett company.
4. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
1. Style and Location:
a. Style B, Cove: Provide in areas with resilient floor coverings and carpet tile.

C. Thickness: 0.125 inch (3.2 mm).

D. Height: 4 inches (102 mm) unless indicated otherwise.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed or preformed.

G. Inside Corners: Job formed or preformed.

H. Colors: As indicated on Drawings.

2.3 RUBBER MOLDING ACCESSORY

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Roppe Corporation, USA.
2. VPI Corporation.

B. Profile and Dimensions: As indicated.

C. Locations: Provide rubber molding accessories in areas indicated.

D. Colors and Patterns: As selected by Architect from manufacturer’s full line.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
      a. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
      a. Miter corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:
   1. Remove adhesive and other blemishes from surfaces.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Vinyl composition floor tile for patching and repair.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the "2015 TX-CHPS Criteria: New Construction and Renovation."

C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C)or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C)or more than 95 deg F (35 deg C).

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE,

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Armstrong World Industries, Inc.
2. Mannington Mills, Inc.

B. Basis-of-Design Products: Match existing.

C. Tile Standard: ASTM F 1066 Class 2, through pattern.

D. Thickness: 0.125 inch (3.2 mm).

E. Size: 12 by 12 inches (305 by 305 mm).

F. Colors and Patterns: Match existing.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

C. Floor Polish: At vinyl composition tile, provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)in 24 hours.

b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles in pattern of colors and sizes indicated.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:
1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: At vinyl composition tile, remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
1. Apply three coat(s).

E. Cover floor tile until Substantial Completion.

END OF SECTION

SECTION 09 91 13

EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on exterior substrates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
   2. Indicate VOC content.

B. Sustainable Design Submittals:
   1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
   2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”
   3. Health Product Declaration: For each product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Apply coats on Samples in steps to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:
1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.
1. Ten percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Portland Cement Plaster: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

G. Existing Substrates: Clean and prepare surface as recommended by paint manufacturer.

H. Plaster:
   1. Examine plaster surface for damage. Repair gaps, cracks, missing patches, and other damage.
   2. Remove mold and mildew.
   3. Power wash surface with approximately 1,500 psi at a 40 -degree angle. Test cleaning process and receive Architect’s approval prior to cleaning surfaces. Allow to dry thoroughly.
   4. Prepare surface as recommended by paint manufacturer.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
   3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
   4. Paint entire exposed surface of window frames and sashes.
   5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
   1. Paint the following work where exposed to view:
      a. Equipment, including panelboards and switch gear.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Ferrous Metal, Semigloss, Exterior Acrylic-Enamel Finish: Primer is not required on shop-primed items; touch up shop primer where provided.
   1. PPG:
      a. Primer 4020 Pitt-Tech Plus Int./Ext. Primer DTM, 2.5 mils DFT.
      b. Finish Coat: 4216 Pitt-Tech Plus Int./Ext. Semi-Gloss DTM, 2.5 mils DFT.
   2. Sherwin-Williams:
      a. Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series 2.0 - 4.0 mils DFT.
      b. Second Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series 2.5 mils DFT.
   3. Behr:
      a. First Coat: Behr Premium Plus Multi-Surface Primer & Sealer 436, 1.7 mil DFT.
      b. Second Coat: Behr Direct To Metal Semi-Gloss Enamel 3200, 1.45 mils DFT

B. Zinc-Coated (Galvanized) Metal, Semigloss, Exterior Acrylic-Enamel Finish:
   1. PPG:
      a. Primer: 4020 Pitt-Tech Int./Ext. Primer/Finish DTM, 2.5 mils DFT.
      b. Second Coat: 4216 Pitt-Tech Plus Int./Ext. Semi-Gloss DTM, 2.5 mils DFT
      c. Third Coat: Same as second coat.
   2. Sherwin-Williams:
      a. Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series 2.0 - 4.0 mils DFT.
      b. Second Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series 2.5 mils DFT.
      c. Third Coat: Same as second.
   3. Behr:
      a. Behr Premium Plus Multi-Surface Primer & Sealer 436, 1.7 mil DFT.
      b. Behr Direct To Metal Semi-Gloss Enamel 3200, 1.45 mils DFT
      c. Same as second coat.

C. Stucco, Smooth, Elastomeric:
   1. Sherwin-Williams:
      a. Primer: Loxon Acrylic Concrete & Masonry Primer A24W8300.
      b. Second Coat: Sherwin-Williams ConFlex XL High Build Coating A5W451 topcoat.

END OF SECTION

SECTION 09 91 23

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Indicate VOC content.

B. Sustainable Design Submittals:
   1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
   2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the "2015 TX-CHPS Criteria: New Construction and Renovation."
   3. Health Product Declaration: For each product.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Apply coats on Samples in steps to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Behr Process Corporation.
2. PPG Architectural Coatings.
3. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:
1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Shellacs, Clear: 730 g/L.
9. Shellacs, Pigmented: 550 g/L.

C. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Colors: As scheduled.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 SURFACE PREPARATION OF PREVIOUSLY COATED SURFACES

A. General:
1. Remove cracked and deteriorated sealants and calking.
2. Remove chalk deposits and loose, blistered, peeling, scaling, or crazed finish to bare base material or sound substrate by scraping and sanding.
3. Wash surfaces with solution of TSP to remove wax, oil, grease, and other foreign material; rinse, and allow to dry. Exercise caution that TSP solution does not soften existing coating.
4. Abrade glossy surfaces by sanding or wiping with liquid de-glosser.
5. Remove mildew as specified above.
6. Test compatibility of existing coatings by applying new coating to small, inconspicuous area. If new coatings lift or blister existing coatings, request recommendation from Architect.
7. Apply specified primer to surfaces scheduled to receive coatings.

B. Gypsum Wallboard:
1. Fill cracks and voids with spackling compound.
2. Apply primer over bare surfaces and newly applied texture coatings.

C. Metal:
1. Remove rust from surfaces to bare metal in accordance with SP3 "Power Tool Cleaning".
2. Exercise care not to remove galvanizing.
3. Complete preparation as specified for new work.

D. Wood:
1. Fill cracks, crevices and nail holes with putty or wood filler.
2. Apply primer over bare surfaces and filler material.

3.4 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in equipment rooms:
a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.
h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
h. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.5 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 INTERIOR PAINTING SCHEDULE

A. Gypsum Board, Semi-Gloss, Low Odor: 2 finish coats over a primer.
   1. Behr:
      a. Primer: Behr Premium Plus Interior Drywall Primer & Sealer 73, .09 mils DFT
      b. Second Coat: Behr Pro i300 Interior Semi-Gloss 370, 1.45 mils DFT.
      c. Third Coat: Same as second coat.
   2. PPG:
      a. Primer: 6-2 Speedhide Interior Latex Sealer 1.2 mils DFT.
      b. Second Coat: Speedhide Zero Interior Latex semi-Gloss 6-4510XI, 1.3 mils DFT.
      c. Third Coat: Same as second coat.
   3. Sherwin-Williams:
      a. Primer: ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
      b. Second Coat: PorMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series 1.6 mils DFT.
      c. Third Coat: Same as second coat.

B. Ferrous Metal, Semi-Gloss, Acrylic-Enamel Finish: Two finish coats over a primer.
   1. Behr:
      a. Primer: Behr Premium Plus Multi-Surface Primer & Sealer 436, 1.7 mils DFT
      b. Second Coat: Behr Direct To Metal Semi-Gloss Enamel 3200, 1.75 mils DFT
      c. Third Coat: Same as second coat.
   2. PPG:
      a. Primer: 4020 Pitt Tech Plus Acrylic Primer/finish DTM, 3.0 mils DFT.
      b. Second Coat: 90-1110 Pitt-Tech Plus Int./Ext. Semi-Gloss DTM Industrial Enamel. 2.0 mils DTM.
      c. Third Coat: Same as second coat.
   3. Sherwin-Williams:
      a. Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series 2.0 - 4.0 mils DFT.
      b. Second Coat: Pro Industrial Acrylic Semi-Gloss, B66-660 Series 2.5 mils DFT.
      c. Third Coat: Same as second coat.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Identifying devices where shown on the Drawings complete and as specified including the following:
a. Parking signs indicating accessible spaces.
b. Directional and traffic signs.
c. Interior code required signs.
d. Texas Education Agency (TEA) signage on exterior doors.

1.2 SUBMITTALS

A. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.

B. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, accessories, layout, and installation details.

C. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.

B. Manufacturer shall have a minimum of five years experience in the manufacturing of signs specified.

C. Codes and Standards:
1. Panel signs shall have 1/32-inch raised copy and grade 2 Braille, and shall comply with all existing federal, state, and local accessibility standards.
2. Code and Standards: Comply with American with Disabilities Act of 1990, Title 3 Provisions, Public Accommodations and Commercial Facilities. Updated March 15, 2012.
3. Comply with the State of Texas Accessibility Standards, 2012 edition, as administered by the Texas Department of Licensing and Regulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Best Sign Systems, Montrose, Colorado.
2. Mohawk Sign Systems, Schenectady, New York.
3. Nelson-Harkins, Chicago, Illinois.
4. ASI Signs, Dallas, Texas.

2.2 HANDICAPPED PARKING

A. Screen Printed Signs:
1. 18 gage bonderized steel with blue baked enamel finish and white screen printed copy.
2. Copy and Size:
a. "Handicapped Parking Only" – 12 inches by 18 inches.
b. "Van Accessible" – 12 inches by 6 inches.

3. Acceptable Product: Best Traffic Signs No. SS04 with SS52 as required.

B. Post: Galvanized pipe column minimum 9 feet long.

2.3 ROOM SIGNAGE SYSTEMS

A. Basis-of-Design Product: ASI Unframed SP Series Signs with requirements indicated for materials, thickness, finish colors, designs, shapes, sizes and details.

B. Sign Face: Clear acrylic, 0.080-inch thick, matte first surface.
1. Adhesive: Pressure sensitive adhesive film, second surface.

C. Tactile Graphics and Text:
1. Fabrication: Provide tactile copy and grade 2 Braille raised 1/32 inch minimum from plaque first surface by manufacturer's stratification process as follows:
a. Basis-of-Design Product: ASI Intouch, photo-mechanical method.
2. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors.

D. Overall Panel Size: Refer to Drawings.

E. Panel Colors: As selected by Architect.

F. Text or Graphic Colors: As selected by Architect.

G. Letter styles, colors, letter sizes and layout position: As selected by Architect.

H. Installation Method: System SA, silicone adhesive.

2.4 EXTERIOR DIRECTIONAL SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ASI Sign Systems.
2. Charleston Sign Manufacturing.

B. Basis-of-Design Product: Charleston Sign Manufacturing; 325 Flush Series.

C. Substitutions: Submit in accordance with Section 01 25 00 “Substitution Procedures.”

D. Aluminum post and flush panel system.

E. Materials and Fabrication:
1. 3 inches wide, 0.125 inch thick extruded aluminum posts and frames, with 0.090 inch thick aluminum removable panel sign face.
2. Fasteners to be concealed.
3. Surfaces to be finished with acrylic polyurethane with graffiti-resistant clear coat.
4. Colors to be selected by Architect from manufacturer’s standard range of colors, minimum of three colors per sign.

2.5 TEXAS EDUCATION AGENCY SIGNAGE

A. Description: Alpha-numeric signage installed on both sides of all exterior doors, except for main entrance.

B. Material:
1. Sign: Weather-resistant, non-glare acrylic.
2. Letters: Heavy Duty Vinyl, contrasting with sign color.
3. Colors: As selected by Architect.
4. UV Resistant.

C. Size: Minimum 6-inch-tall characters with backing being sized adequately for up to two characters.
1. Provide large letters that are clearly legible and have strong contrast with the backing.

D. Font: As selected by Architect.

E. Mounting: Heavy Duty Adhesive on backing, suitable for material to which sign is being attached.
1. Mount on both sides of each exterior door. Location above or adjacent to door as directed by Architect.
2. In the case of one room having more than one exterior door, only one door needs to be identified.

PART 3 - EXECUTION

3.1 DELIVERY AND STORAGE

A. Deliver and store identifying devices in protective wrappings until ready for installation. Install letters in protective wrappings and remove wrappings just prior to substantial completion.

3.2 INSTALLATION

A. Install signs plumb, level and square and in proper planes with other work, at heights required by accessibility codes and standards.

B. Anchor each plastic laminate sign with adhesive.

C. Install signs with sufficient amount of foam tape for proper installation.

D. Attach as recommended by sign manufacturer.

E. Anchor each sign with adhesive.

F. Coordinate arrival and installation of graphic signs with hardware installation. Graphic signs function as and are coordinated with the hardware as shown on the Drawings.

G. Room name signs shall be placed on the public side of the door except where noted otherwise.

H. Single Door Sign: Provide one sign as specified above, mounted to wall adjacent to door on knob side.

I. Pair of Doors: Provide one sign as specified above, mounted to adjacent wall closest to active leaf of door. Do not install sign where it will be obstructed by door when door is in the 'open' position.

J. Attachment: Mounting to surfaces shall be done by pressure sensitive frame double-faced, 3M-type tape. Signs shall be delivered to the project site with the tape in place and trimmed on each sign, but with the protective paper layer not removed. Paper layer shall be removed just prior to installation of signs.

3.3 EXTERIOR INSTALLATION – PARKING AND DIRECTIONAL SIGNS

A. Mount posts in 12-inch round by 2'-6" deep concrete footing.

B. Handicapped Signs: Mount signs at height to comply with accessibility codes.

3.4 EXTERIOR DOOR SIGNAGE INSTALLATION

A. Install in accordance with Texas Education Association guidelines.

B. Sequence numbering as shown on Drawings.

3.5 COORDINATION

A. Coordinate the installation of the identifying devices with the hardware manufacturer for lockset and knob leave outs as detailed and scheduled.

3.6 DAMAGE

A. Any identifying device which is scratched or defaced will be rejected.

3.7 CLEANING

A. Remove protective materials and clean all signs. Clean surfaces with plain water or water with soap or household detergent.

END OF SECTION

SECTION 10 14 16

PLAQUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes metal plaques.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

C. Shop Drawings: For plaques.
1. Include fabrication and installation details and attachments to other work.
2. Show plaque mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each plaque at least half size.

D. Samples for Verification: For each type of plaque showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
1. Plaques: Full-size Sample.
2. Exposed Accessories: Full-size Sample of each accessory type.
3. Full-size Samples, if approved, will be returned to Contractor for use in the Project.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For plaques to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and Texas Accessibility Standards (TAS).

2.2 PLAQUES

A. Cast Plaque: Cast-metal plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   1. Manufacturers: Subject to compliance with requirements, provide products from one of the following:
      a. A.R.K. Ramos.
      b. Gemini Incorporated.
      c. Matthews International Corporation; Bronze Division.
      d. Metal Arts.
      e. Metallic Arts.
      f. Southwell Company (The).
   2. Plaque Material: Cast aluminum.
   3. Plaque Thickness: 0.25 inch (6.35 mm).
   4. Finishes:
      a. Integral Aluminum Finish: Anodized color as selected by Architect from full range of industry colors and color densities.
      b. Overcoat: Manufacturer's standard baked-on clear coating.
   5. Background Texture: As indicated on Drawings.
   6. Integrally Cast Border Style: As indicated on Drawings.
   7. Applied Frame Material, Style, and Finish: As indicated on Drawings.
   8. Mounting: Concealed studs.
   9. Text and Typeface: Accessible raised characters and Braille as indicated on Drawings.

2.3 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M, alloy and temper recommended by plaque manufacturer for casting process used and for type of use and finish indicated.

B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. Plaque Mounting Fasteners:
      a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.5 FABRICATION

A. General: Provide manufacturer's standard plaques according to requirements indicated.
   1. Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
   2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
   4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   5. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.

6. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:
1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.
b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as plaques are installed.

C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Public-use washroom accessories.
2. Underlavatory guards.

1.2 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

1.3 ACTION SUBMITTALS

A. Product Data Submittals: For each product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

B. Delegated Design Submittals: For grab bars.
1. Include structural design calculations indicating compliance with specified structural-performance requirements.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design accessories and fasteners to comply with the following requirements:
1. Grab Bars: Installed units are able to resist 250 lbf (1112 N) concentrated load applied in any direction and at any point.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.
4. GAMCO Specialty Accessories; a division of Bobrick.
5. Tubular Specialties Manufacturing, Inc.

B. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

C. Grab Bar:
1. Basis-of-Design Product: GAMCO; 150 Series.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. OD: 1-1/4 inches (32 mm).
5. Configuration and Length: As indicated on Drawings.

2.3 UNDERLAVATORY GUARDS

A. Underlavatory Guard:
1. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
2. Material and Finish: Antimicrobial, molded plastic, white.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Plumberex Specialty Products, Inc.
b. Truebro by IPS Corporation.

2.4 MATERIALS

A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- (0.8-mm-) minimum nominal thickness unless otherwise indicated.

B. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 (Z180) hot-dip zinc coating.

C. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

D. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

E. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).

2.5 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
1. Remove temporary labels and protective coatings.

B. Grab Bars: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION

SECTION 10 73 17

PREFABRICATED METAL CANOPIES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of aluminum canopy is shown on Drawings and as specified herein.

B. Definition: Extruded Aluminum Canopy shall consist entirely of extruded aluminum sections (roll-formed not acceptable). System shall consist of heliarc-welded, one-piece rigid structural bents (column and beam assemblies), decking, fascia, accessory items and hardware to provide a complete system.

C. Water shall drain from deck into designated beams and out at grade level of columns through weepholes.

1.2 PERFORMANCE REQUIREMENTS

A. System Performance: Provide canopy system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with building code requirements for geographic area in which work is located and as follows:

B. Edit following subparagraph as required for project.
1. Live Load: As indicated on Drawings.
2. Structural design for wind forces: Comply with ANSI A58.1-1982

C. Edit each of the following subparagraphs as required for project.
1. Base Mean Wind Velocity: As indicated on Drawings.
2. Stability Criteria: Comply with applicable building codes.
3. Design structural members to meet minimum deflection criteria of L/180.
4. Design footings for maximum bearing pressure of 1,500 psf.
5. Dead Load: Weight of structure and all components plus a collateral load of 4 psf; 10 psf dead load minimum.

D. Sizes shown on Drawings are to be considered minimum.

E. Structure shall be capable of sustaining severe icing, hail, and supporting a concentrated load such as being walked upon.

1.3 ACTION SUBMITTALS

A. Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist indicated or code required loads.

B. Shop Drawings: Submit detailed drawings, layout of canopy system, bent locations, identify drain columns and wet bents, mechanical joint locations with complete details, connections, jointing and accessories. Include details of concrete footings and bent anchorage.

C. Sustainable Design Submittals:
1. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.
2. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the “2015 TX-CHPS Criteria: New Construction and Renovation.”

D. Product Data: Submit manufacturer's product data, specifications, component performance data and installation instructions.

1.4 INFORMATIONAL SUBMITTALS

A. Calculations: Provide signed and sealed structural calculations for the proposed canopy, by a professional engineer registered in the state in which the Project is located and who professes his discipline to be structural engineering.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following except as other-wise indicated:
   1. International Building Code, latest addition with amendments, if any.
   2. AWS (American Welding Society) standards for structural aluminum welding.

B. Manufacturer: Obtain aluminum canopy system from only one manufacturer.

C. Installer Qualification: Firm with not less than 3 years' experience in installation of aluminum canopy of type, quantity and installation methods similar to work of this section.

D. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work.

E. Shop Assembly: Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

F. Coordination: Coordinate work of this section with work of other sections which interface with canopy system.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle canopy system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Dittmer Architectural Aluminum
   2. Avadek Walkway Cover Systems & Canopies.
   3. Canopy Solutions.
   4. Mapes Architectural Products.
   5. Superior Metal Products.
   6. Architectural Fabrication.

2.2 MATERIALS

A. Aluminum Extrusions: ASTM B221 alloy 6063 heat treated to a T-6 temper.

B. Aluminum Sheets: ASTM B209, minimum 0.032-inch thickness.

C. Standard Finish for Components:
   1. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

D. Fasteners:
   1. Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8 inch outside dimension, conical washer.
   2. Fascia Rivets: Size 3/16 inch by 1/2-inch grip range aluminum rivets with aluminum mandrel.
   3. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
   4. Tek Screws: not permitted.

E. Warranty:
   1. Manufacturer shall warrant aluminum finish against defects including fading, chipping, cracking, peeling for a period of 10 years.

2.3 FABRICATION

A. Comply with indicated profiles, dimensioned requirements and structural requirements. Provide not less than 6 by 10-inch structural T-frames for main framing and not less than 5 by 9 inch tube purlins. Provide fascia no less than 6-inch round.

B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.

C. All welding to be done by heliarc process.

D. Bents: Consist of shop welded one-piece units. When size of bents does not permit shipment as a welded unit, concealed mechanical joints may be used.

E. Mechanical Joints: Consist of stainless-steel bolts with a minimum of 2 bolts per fastening. Install bolts and nuts in a concealed manner utilizing 1/2-inch thick by 1-1/2-inch aluminum bolt bars welded to structural members.

F. Detail mechanical joints on shop drawings showing locations.

G. Roof Deck: Extruded Aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16'- 0" to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.

H. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.

I. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.

J. Apply a shop-applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine adjacent work for conditions that would prevent quality installation of system.

B. Do not proceed until defects are corrected.

3.2 FIELD DIMENSIONS

A. Field confirm bent locations, dimensions and elevations shown on shop drawings prior to fabrication.

3.3 INSTALLATION

A. Erection: Set roof support frames (bents) into pockets provided in top of footings; set to required elevations, align, plumb and level; and grout in place with 2,000 psi portland cement grout. Assure that grout fills all voids and "keys" to columns. Fill downspout units with grout to bottom of discharge level. Install aluminum deflectors after grouting. Follow manufacturer's instructions. Match to finish and elevation of adjacent sidewalks.

B. Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.

C. Assemble components in a neat, workmanlike manner.

3.4 CLEANING AND PROTECTION

A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.

B. Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

C. Protection: Advise Contractor of protection and surveillance procedures, as required to ensure that work of this section will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 10 73 35

ELECTRONIC MARQUEE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. School marquee with logo and light emitting diode (LED) display.

1.2 ACTION SUBMITTALS

A. Product Data: For each component.

B. Shop Drawings: Detailed shop drawings of marquee, including:
1. Location and placement of text and logo.
2. Details of fastening to cast stone cap.
3. LED display riser diagrams.
4. Electrical wiring.
5. Power requirements, including legs and amps per leg.

1.3 INFORMATIONAL SUBMITTALS

A. LED installation and maintenance manual.

1.4 CLOSEOUT SUBMITTALS

A. LED Operator's Manual.

1.5 SUSTAINABLE DESIGN SUBMITTALS:

A. Provide documentation that products provided within this section support compliance with City of Dallas Green Building Program relative to indigenous materials, recycled content, VOC content, VOC emissions, and prohibition on asbestos added urea formaldehyde.

B. Documentation must also demonstrate that products provided within this section support compliance with the standards established by Collaborative for High Performance Schools in the "2015 TX-CHPS Criteria: New Construction and Renovation."

1.6 QUALITY ASSURANCE

A. LED Manufacturer: Minimum of 15 years' experience in the fabrication and installation of LED displays and have a minimum of 100 outdoor mounted LED displays in operation for at least one year.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Display System: Not impaired by ambient radio signals, magnetic or electromagnetic interference including those from power lines, transformers, and motors.

2.2 MANUFACTURER

A. Products: Subject to compliance with requirements, provide the following for LED Display Matrix:
1. Daktronics GALAXY GS6.

B. Substitutions: Submit in accordance with Section 01 25 00 "Substitution Procedures."

2.3 MARQUEE SIGN

A. Frame: Aluminum.
1. Dimensions: As indicated on Drawings
2. Color: As selected by Architect from manufacturer's standard and premium selection of colors.

B. Sign Face: Translucent white polycarbonate sign face with cut out for LED display panel.
1. Thickness: 1/4-inch.

2. Cut-out: As indicated on Drawings.

C. Cover Panel: Clear polycarbonate cover panel to cover face of sign and LED display.

D. Install panels using sign manufacturer's recommended stainless-steel stand-offs as required to provide open spacing for LED cooling. Coordinate with LED manufacturer on spacing requirements.

E. Graphics and Text:
1. School Logo: As indicated on Drawings.
2. Letters: Opaque vinyl film, unless otherwise indicated.
3. Sizes and Colors: As indicated on Drawings.

2.4 LED DISPLAY

A. Cabinet Dimensions: As indicated on Drawings.

B. LED Display: 31 inches by 97 inches.

C. Maintain minimum 4-inch offset between edge of sign face and LED display.

D. Approximate Active Area: 16.3 square feet.

E. Sides: Two-view, two one-sided displays installed back-to-back, identical display content on both sides.

F. Colors: RGB: One red, one green, one blue.

G. Communications: Ethernet bridge radio.

H. Power: 120/240 VAC, 60 Hz single-phase, including neutral and earth ground.

I. Operational Temperature: Ambient temperature range of minus 40 deg F to plus 120 deg F (minus 40 deg C to plus 50 deg C) and to a 95 percent humidity.

J. Internal Display Component Hardware including nuts, bolts, screws, standoffs, rivets, fasteners: stainless steel, aluminum, nylon, or other durable corrosion-resistant materials suitable for signage application, as recommended by manufacturer.

K. Electrical Display Components: 100 percent solid-state.

L. Confirm resolution and pixel pitch based on viewing distance and angle.

2.5 HOUSING FRAME

A. Display Materials:
1. Constructed of non-corrosive materials or have a protective coating that is anti-corrosive and does not degrade or oxidize.

B. Rear ventilated with adequate ventilation provided using fans.

C. Steel Mounting Points:
1. Adjustable for alternative mounting methods.

D. Lifting supports that can be removed after installation.

E. Exterior Finish: Manufacturer recommended automative grade acrylic urethane paint.

F. Front Face:
1. Provide UV resistance to prevent discoloring.
2. Include horizontal louvers for contrast enhancement.
3. Include vertical ribbing for contrast enhancement.
4. Use surface materials in active LED area, such as, metal, plastic, or other face materials, designed for low sunlight reflectivity.

2.6 DISPLAY COMPONENTS

A. Encapsulated LED display modules and their components in accordance with IP-67 standards.

B. LEDs: Mount on a single Printed Circuit Board (PCB).

C. Display modules in a single display identical in construction and interchangeable.
1. Display able to be field calibrated.

D. Minimum 140-degree horizontal half-intensity viewing angle and a readability angle of 160 degrees horizontal.

E. Display Intensity:
1. Red, Green, Blue (RGB) 10,000 cd/m2 for maximum light output.
2. Red: 4,500 cd/m2 for maximum light output.
3. Amber: 6,000 cd/m2 for maximum light output.

2.7 LIGHT EMITTING DIODES (LED)

A. Non-diffused, ultra-bright, solid-state light emitting diodes.

B. Half-Life: 100,000 hours minimum.

C. Construction:
1. Red LEDs: AlInGaP technology.
2. Green and Blue LEDs: InGaN technology.

2.8 COMMUNICATIONS AND CONTROL

A. DHCP-enabled and allow for static IP addressing.

B. Each single-face display controlled and monitored by its own LED controller.

C. Able to receive instructions from and provide information by accessing the Venus Control Suite using Ethernet Bridge Radio.

2.9 CONTROL SOFTWARE

A. Control Software: Venus Control Suite (VCS) cloud-based solution.
1. Software to be hosted on manufacturer's servers at no cost to customer.
2. Web browser access to the solution to support iOS Safari, Android Chrome, Internet Explorer v11+, Microsoft Edge, Google Chrome, and Mozilla Firefox.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install marquee sign and LED display in accordance with manufacturer instructions.

3.2 DEMONSTRATION AND TRAINING

A. Demonstrate full use of marquee sign to Architect and Owner's personnel in accordance with Section 01 79 00 "Demonstration and Training."

B. Provide full training to Owner's personnel on use, customization, care and maintenance of the LED sign components of marquee sign.

END OF SECTION

SECTION 12 36 23.13

PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Plastic-laminate-clad countertops.
2. Plastic-laminate-clad windowsills.

B. Work of this section is affected by alternates. Refer to Section 01 23 00 “Alternates.”

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plastic-laminate-clad countertops and windowsills.
1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.

C. Samples for Verification: As follows:
1. Plastic Laminates: For each type, color, pattern, and surface finish required, 8 by 10 inches (200 by 250 mm) in size.
2. Wood-Grain Plastic Laminates: For each type, color, pattern, and surface finish required, 12 by 24 inches (300 by 600 mm) in size.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For the following:
1. Composite wood products.
2. High-pressure decorative laminate.
3. Adhesives.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of products.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD COUNTERTOPS AND WINDOWSILLS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.
1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Grade: Custom.

C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Abet Laminati Inc.
b. Formica Corporation.
c. Lamin-Art, Inc.
d. Nevamar; a Panolam Industries International, Inc. brand.
e. Pionite; a Panolam Industries International, Inc. brand.
f. Wilsonart.

D. Basis-of-Design Product: As scheduled.

E. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
1. As scheduled.

F. Edge Treatment: 3-mm (0.12 inch) PVC edging.

G. Core Material: Exterior-grade plywood.

H. Core Material at Sinks: exterior-grade plywood.

I. Core Thickness: 3/4 inch (19 mm).

J. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.
1. Softwood Plywood: DOC PS 1.

2.3 ACCESSORIES

A. Wire-Management Grommets: Circular, molded-plastic grommets and matching plastic caps with slot for wire passage.
1. Products: Subject to compliance with requirements, provide the following:
a. Doug Mockett & Company, Inc.: TG Flip-Top Series.
2. Outside Diameter: 2 inches (51-mm).
3. Color: As selected by Architect from Manufacturer’s full range.

B. Countertop Support Brackets: Steel, 18 inches by 24 inches, minimum 1,000 lb load limit, factory-applied primer for field painting in accordance with Section 09 91 23 "Interior Painting."
1. Acceptable Products:
a. A & M Hardware; Work Station Brackets.
1) Provide manufacturer’s standard factory-applied primer. Refer to Section 09 91 23 “Interior Painting” for finish coat.

2.4 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.
   1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

A. Fabricate countertops and windowsills to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
   1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of cutouts by saturating with varnish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.2 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
   1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
   1. Secure field joints in countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches (3-mm-in-2400-mm) variation from a straight, level plane.
   2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
   3. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semiexposed surfaces.

C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches (1220 mm) o.c. Remove protection at Substantial Completion.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above solid ceilings and within chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for plastic materials:

1. CPVC: Chlorinated polyvinyl chloride plastic.
2. PE: Polyethylene plastic.
3. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:

1. EPDM: Ethylene-propylene-diene terpolymer rubber.
2. NBR: Acrylonitrile-butadiene rubber.

1.2 SUBMITTALS

A. Product Data: For the following:

1. Dielectric fittings.
2. Mechanical sleeve seals.
3. Escutcheons.
4. Supports and anchorages.
5. Roof curbs.
6. Equipment supports.

B. Operations Manual: Include the following:

1. Final processed submittals of all Division 23 specification sections.
2. Subcontractor contact list including name, phone number and e-mail contact information.
3. Valve tag charts.
4. Field reports, including ductwork leakage testing and piping pressure testing.
5. Startup reports for all mechanical equipment.

6. Certifications of piping systems, equipment or systems if specified in the individual specification section.
7. Testing, adjusting and balancing reports.
8. ASME Stamp Certification and Reports: “A”, “S”, or “PP” stamp certificates of authorization.
9. Operations and maintenance information for all equipment.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer’s receipt of submittal.

1. Initial review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal must be delayed for coordination.
2. Concurrent review: Where concurrent review of submittals by Architect/Engineer’s Consultants, Owner or other parties is required, allow 21 days for initial review of each submittal.

D. Submittal Schedule:

1. Contractor shall submit all submittals to the Engineer for initial review within 30 days of award of contract, or within the first 10% of the duration of the project, whichever is less. Submittals which require processing completion prior to 45 days after award of contract shall be scheduled with the Engineer at least 14 days in advance of their requested due date.

1.3 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

D. Roofing Standards: Comply with the following:

1. SMACNA’s “Architectural Sheet Metal Manual” details for fabrication including flanges and cap flashing to coordinate with type of roofing indicated.
2. NRCA’s “Roofing and Waterproof Manual” details for installing units.
3. Existing roofs: Maintain existing roof warranty.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture into the pipe.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

C. Deliver, store and install materials and equipment (including supports and hangers) such that they are maintaining “as-new” condition (e.g. no rust) upon installation and up through the date of Substantial Completion. Account for environmental conditions of the construction site and schedule work accordingly.

D. Do not allow any materials nor equipment to be stored in standing water from a rainstorm.

1.5 COORDINATION

A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for HVAC installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate requirements with all trades for the location and size of access doors and frames necessary to gain access to HVAC items. Coordinate these requirements for all HVAC items that are concealed behind finished surfaces. See Division 08.

D. Existing Utilities: Do not interrupt utilities serving facilities occupied or partially occupied by the Owner or others unless specifically allowed under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify Owner at least seven days in advance of proposed utility interruptions. Identify extent and duration of utility interruptions.
2. Indicate method of proposed utility interruptions in detail.
3. Do not proceed with proposed utility interruptions without Owner's permission.
4. All air handling units, rooftop units, exhaust fans, pumps, chillers, refrigeration equipment, boilers, heat exchangers, fan coil units, cabinet unit heaters, fin tube radiation, steam system components and unit heaters are to remain disabled and off unless TAB personnel are on-site actively testing that particular piece of equipment.
5. Utilization of the permanent installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated and under what limiting conditions along with written agreement to compensate the Owner for utility usage. Limiting conditions shall include specific written listing of all of these features: filtration requirements for all airstreams; fire alarm/smoke detection for all air streams; schedule for preventative maintenance for bearings, seals and other operated equipment features; hours of operation and which hours will be supervised by contractor personnel on site; written confirmation of operability of all equipment control sequences safeties and alarms; and written maintenance recordkeeping at a minimum.

E. New Equipment:

1. All air handling units, rooftop units, exhaust fans, pumps, chillers, refrigeration equipment, boilers, heat exchangers, fan coil units, cabinet unit heaters, fin tube radiation, steam system components and unit heaters are to remain disabled and off unless TAB personnel are on-site actively testing that particular piece of equipment.
2. Utilization of the permanent installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated and under what limiting conditions along with written agreement to compensate the Owner for utility usage. Limiting conditions shall include specific written listing of all of these features: filtration requirements for all airstreams; fire alarm/smoke detection for all air streams; schedule for preventative maintenance for bearings, seals and other operated equipment features; hours of operation and which hours will be supervised by contractor personnel on site; written confirmation of operability of all equipment control sequences safeties and alarms; and written maintenance recordkeeping at a minimum.

F. Coordinate new installations with the existing installations which will remain in place and be reutilized or those that are abandoned in place. Provide transitions and fittings in ductwork and piping as well as extra lengths of ductwork and piping as required to route around these existing installations. Illustrate all such ductwork fittings on the sheet metal duct shop drawing submittal. Existing installations include plumbing, piping, electrical and other building systems components including, but not limited to, roof drain piping, sanitary piping, plumbing piping, fire protection piping, fire protection heads, heating and cooling water piping, condensate drains, steam and condensate return piping, conduit, cable tray, electrical pull boxes, projectors, booms, etc. Coordinate installation of above ceiling components and

devices such that maintenance access is achieved at the completion of the project when all ceiling mounted components are installed. Coordinate with all trades. Ultimate responsibility for any rework required to achieve maintenance access is the responsibility of the Contractor responsible for coordination as noted in Division 1 Sections. The required maintenance access is defined here for this contract:

1. A person with a 24" arm length can stand on a folding ladder which rests on the finished floor and which does not extend through the ceiling grid. All lights and diffusers remain in the grid when defining maintenance access. Ceiling tiles with sprinkler heads, smoke detectors, fire alarm devices and other system devices remain in the grid when defining maintenance access. Light fixtures and diffusers/grilles remain in the ceiling grid when defining maintenance access.
2. While standing on a step of this ladder which is rated for standing upon and while not leaning against the ceiling grid, this person can touch the following items with both hands at the same time:

    a. Terminal unit/terminal box damper actuators.
    b. Terminal unit/terminal box reheat valve actuators.
    c. Terminal unit/terminal box airflow controller.
    d. Terminal unit/terminal box transformers, EP switches, temperature sensor, and all other control components.
    e. Terminal box discharge low pressure volume dampers on diffuser runouts.
    f. Terminal unit/terminal box piped accessories – strainer, PT ports, air vents, drains, shutoff valves, unions and calibrated balance valves.
    g. Piped hydronic system shutoff valves, calibrated balance valves, control valves, vents, and drains.
    h. Steam system traps, control valves, humidifier components and humidifier control components.
    i. Fire damper and fire/smoke damper duct access doors.
    j. Fire damper and fire/smoke damper fusible links.

G. Locate buried utility and distribution services within the project area.

H. Provide temporary connections to maintain existing systems in service during the construction. This may include ductwork, piping, power, controls, water, as well as other connections as required.

I. Provide the Owner a schedule prior to the start of demolition with phased selected demolition identified by system and by floor. Identify required outages on the schedule and any temporary measures required to maintain existing systems in service.

J. Coordinate the HVAC demolition with all aspects of demolition and temporary construction (including dust barriers) by other trades.

1.6 CONTRACT DOCUMENTS

A. The drawings indicate the general arrangement and scope of the systems and shall be followed insofar as possible. If deviations from the layout are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted in writing to the Engineer for approval before proceeding with the Work.

B. The drawings are not intended to show every vertical offset or horizontal offset that may be necessary to complete the system or clear obstructions and/or the Work of other Contractors and other trades. Contractors shall anticipate during bidding that additional offsets may be required and include same in their proposals.

C. The Drawings, Schedules and Specifications shall be considered to be cooperative and anything appearing in the Specifications that may not be indicated on the Drawings or vice-versa, shall be considered as part of the Contract and must be executed by the Contractor the same as though indicated by both. Clarify conflicting statements with the Engineer prior to submitting a bid.

D. Measurements: Contractor shall make all his own measurements in the field and shall be responsible for correct fitting. He shall coordinate this Work with all other branches and trades in such a manner as to cause a minimum of conflict or delay. The Contractor shall coordinate his work in advance with all other trades and report immediately any difficulty which can be anticipated and propose solutions to resolve the potential difficulty.

E. Adjustments to Work in the Field:

1. The Engineer reserves the right to make minor adjustments (maximum of 10'-0") in location of sensors, valving, ductwork, dampers, conduit, drains, piping, hangers and/or equipment at no additional charge if so directed prior to their installation.
2. Where the Drawings show equipment, casework, structure, fire rated construction, or the like, Contractors shall lay out the work to avoid conflicts.
3. Where offsets in piping, additional fittings, necessary drains, minor valves, traps and devices are required to complete the installation, to clear obstructions, or for the proper operation of the system (including air vents and drains), these shall be deemed to be included in the Contract and shall be furnished and installed complete by the Contractor at no additional charge.
4. Where offsets in ductwork, additional fittings, necessary transitions, minor fittings, dampers, accessories and devices are required to complete the installation, to clear obstructions, or for the proper operation of the system, these shall be deemed to be included in the Contract and shall be furnished and installed complete by the Contractor at no additional charge.

F. Clearances: All installations shall be made to maintain maximum headroom and clearance around equipment. When space and/or headroom appear inadequate, the Contractor shall notify the Engineer prior to proceeding with the installation. No claims for additional compensation will be approved for failure on the part of the Contractor or his Subcontractor to comply with this requirement.

1.7 RECORD DRAWINGS

A. Contractor shall provide owner with a complete set of accurate Record Drawings for all work performed under this contract.

1. Record Drawings shall include all approved change orders and pertinent RFI responses.
2. Include actual dimensions of equipment furnished under this contractor were shown on the floor plans.
3. Record Drawings shall include work performed by all sub-contractors retained.
4. Record Drawings shall include the words "RECORD DRAWING" on each sheet.
5. Record Drawings shall be completed using REVIT and, in a version, as directed by the owner.

B. Submission:

1. Submit one set of record Drawings for review by Engineer prior to submission of closeout documents. Record Drawings shall be submitted using the established submittal process.
2. Upon satisfactory review of the Record Drawing submittals by Engineer, provide three (3) printed sets of the Record Drawings and three (3) copies in electronic format with closeout documents
3. Paper Record Drawings shall be printed full size using the same sheet size as the construction documents issued to the contractor with the contractor's title block.
4. Electronic Record Drawings shall include a REVIT compatible model and multi-sheet PDF files combined and named by discipline.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

B. Provide all materials necessary for demolition work to occur, including cutting, capping, removing walls for access, and repairing finishes.

2.2 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

C. Hex bushings, face bushings, and plugs are not acceptable in any Division 23 piping system.

2.3 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. Steam service: ASME B16.20, spiral wound gasket with stainless steel metal winding strip, flat, asbestos-free graphite filler, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated. Suitable for pressure class of service and a minimum operating temperature of 600 deg F. Similar to Flexitallic Style CG.
2. All other services: Thermoseal C-4401, 1/16” thick.
3. Do not apply compounds, adhesives, or anti-stick lubricants to gasket surface.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements for Joining Plastic Piping:

1. CPVC Piping: ASTM F 493.
2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

I. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

2.4 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 225 deg F. Minimum 400 volts dielectric resistance, insulated against galvanic corrosion, threaded ends, O-ring.

1. Manufacturers:

a. Capitol Manufacturing Co.
b. Central Plastics Company.
c. Eclipse, Inc.
d. Epco Sales, Inc.
e. Hart Industries, International, Inc.
f. Watts Industries, Inc.; Water Products Div.
g. Zurn Industries, Inc.; Wilkins Div.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.

1. Manufacturers:

a. Capitol Manufacturing Co.
b. Central Plastics Company.
c. Drake Specialties.
d. Epco Sales, Inc.
e. Watts Industries, Inc.; Water Products Div.

E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

1. Manufacturers:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Central Plastics Company.
d. Drake Specialties.
e. Pipeline Seal and Insulator, Inc.

2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig (1035- or 2070-kPa) minimum working pressure where required to suit system pressures.

F. Dielectric Couplings: Galvanized-steel coupling with inert and non-corrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

1. Manufacturers:

a. Calpico, Inc.
b. Lochinvar Corp.

G. Dielectric Nipples: Electroplated steel nipple with inert and non-corrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

1. Manufacturers:

a. Perfection Corp., Clearflow Dielectric Fittings.
b. Precision Plumbing Products, Inc.
c. Sioux Chief Manufacturing Co., Inc.
d. Victaulic Co. of America.

2.5 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Manufacturers:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Metraflex Co.
d. GPT/Pipeline Seal and Insulator/Link-Seal/Enpro Industries.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Glass reinforced nylon polymer or stainless steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.6 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40 up to 10” NPS, standard weight for 12” NPS and larger, galvanized, plain ends, fabricated with 2” integral seal welded waterstop. Touch up cut ends of galvanized pipe sleeves with zinc-rich coating prior to installation.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

1. Manufacturers:

a. Calpico, Inc.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with set screws.

E. Stainless Steel Sheet: Fabricated 304L stainless steel, 0.078” minimum thickness, round tube closed with welded longitudinal joint, fabricated with 2” integral seal welded waterstop.

2.7 PENETRATION SEALING

A. Penetrations in Horizontal Assemblies:

1. Annular space fill:

a. Resists the free passage of flame and the products of combustion.
b. Approved non-combustible material.

2. Penetration firestopping:

a. Fill, void or cavity material that is tested and classified for use in through penetration firestop systems.

2.8 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Cast-Brass Type: With set screw.

1. Finish: Polished chrome-plated.

C. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.

1. Finish: Polished chrome-plated.

D. One-Piece, Stamped-Steel Type: With set screw or spring clips and chrome-plated finish.

2.9 GROUT

A. Description: ASTM C 1107, Grade B, non-shrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, non-staining, non-corrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

2.10 EQUIPMENT SUPPORTS

A. General: If not specified in individual Division 23 specification sections, provide equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Coordinate dimensions with rough-in information or shop drawings of equipment to be supported.

B. Fabricate exterior supports from galvanized or stainless materials which are compatible with the equipment, piping and ductwork being supported.

C. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

1. Custom Curb, Inc.
2. Pate Co. (The).
3. ThyCurb, Inc.

D. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.0747 inch (1.9 mm) thick, structural quality, hot dip galvanized or aluminum zinc alloy coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.

1. Provide fire retardant treated wood nailers at tops of curbs and formed flanged at perimeter bottom for mounting to roof.
2. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
3. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.
4. Sloping roofs: Where slope of roof deck exceeds 1/4-inch per foot (1:48), fabricate support units with water diverters and height tapered to match slope to level tops of units.
5. Provide supports suitable for equipment dead weight, wind loads, seismic lifting, and anchoring forces as required.
6. Provide anchoring instructions.

PART 3 - EXECUTION

3.1 HVAC DEMOLITION

A. Refer to Division 1 Section "Cutting and Patching" and Division 2 Section "Selective Structure Demolition" for general demolition requirements and procedures.

B. Disconnect, demolish, and remove HVAC systems, equipment, and components indicated to be removed. No equipment or components shall be abandoned in place unless specifically noted on the drawings.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap remaining piping with same or compatible piping material.
2. Piping to Be Abandoned in Place: Drain piping and cap piping with same or compatible piping material.
3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and cap remaining ducts with same or compatible ductwork material. Seal remaining ductwork to seal Class C. Duct tape is not permitted.
4. Ducts to Be Abandoned in Place: Cap ducts with same or compatible ductwork material.
5. Equipment to Be Removed: Disconnect and remove services and remove equipment. Cap piping and ductwork as required.
6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, store equipment and protect in a safe location during construction to prevent damage; when appropriate, reinstall, reconnect, and make equipment operational.
7. Equipment Piping and Ductwork to Be Removed and Salvaged: Disconnect and cap services and remove equipment. Owner shall be given first right of refusal to all items removed from the Owner's facility or property. Deliver salvaged items to Owner at location requested by Owner.
8. When removing piping and ductwork components, all accessories, hangers, insulation and hanger rods shall be removed also.
9. Provide temporary hangers for any pipe or duct to remain which has had hangers removed such that hanger spacing does not exceed 10'-0".
10. Provide temporary hangers for any pipe or duct which was supported by a wall which was removed.
11. Locate and identify mechanical systems passing through the affected demolition area which serves other areas outside the demolition limits. Provide information to the Engineer directly of any questionable items.
12. Systems serving areas outside the work limits shall remain uninterrupted unless specifically authorized in writing by the Owner.

C. If pipe, insulation, or equipment is damaged in appearance or is unserviceable due to demolition work, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. All caps installed shall be installed and located such that the pipe or duct may be reconnected to and extended without relocation of other components while utilizing standard fittings. Coordinate with all trades such that any existing, temporary or new installations by other trades does not block access to caps.

E. Confirm with the Owner, which if any, supply, return or exhaust air openings associated with systems which serve the project area may remain in use during construction. Cover all supply, return and exhaust air openings with synthetic air filter media, 1-inch thick, with non-oily tackified surface, with a dust holding capacity of at least 250 grams per square yard, an average dust spot arrestance of at least 85 percent, and a MERV rating of at least 6. Allow in the bid to replace the air filter media at least once per month and more often as required for proper operation of the fan systems.

F. Removal of portions of systems which are energized or will be energized at any point during the construction project shall be accomplished by skilled trades who will be contractually engaged in connecting new work (piping, ductwork or caps thereof) to these same systems.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections. Utilize tee fittings for branch connections that have all three connection sizes of NPS 1-1/2” and larger. It is acceptable to utilize threadolet fittings with dielectric nipples on carbon steel piping of NPS 2-1/2” and larger when the branch connection size is NPS 1” or less and a bronze body ball valve is installed on the other end of the dielectric nipple.

J. Install piping and ductwork to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, barriers, ceilings, and floors in exposed areas. In Dietary, Kitchen, Cafeteria, Sterile Processing, Sterilizer, Sub-Sterile, Animal Holding, Operating Rooms, Procedure Rooms and other sterile areas do not install escutcheons, but seal pipe penetrations airtight with clear food grade silicone.

M. New concrete floors, walls, and roof penetrations are required to have sleeves cast-in-place (no core drilling is allowed unless specifically noted on the drawings).

1. Core drilling in buildings that are occupied up to two floors above the construction area or two floors below the construction area or are occupied on the same floor within 100 linear feet shall be accomplished with wet core drilling machines with slurry extraction to reduce noise.

N. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs. It is the contractors requirement to coordinate fine sleeve placement and size.

1. Cut sleeves to length for mounting flush with both surfaces.

a. Exception: Extend top of sleeves installed in all floors (including mechanical equipment areas) and penthouses 2 inches (50 mm) above finished floor level. Waterstop shall be entirely contained within concrete with approximately 1-1/2-inch of concrete cover. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
3. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

a. Steel pipe sleeves, cast iron pipe sleeves or stainless steel sheet sleeves for all pipes penetrating other than gypsum board partitions or walls.
b. Galvanized Steel Sheet Sleeves: For pipes and larger, penetrating gypsum-board partitions or walls.

4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 7 Section "Joint Sealants" for materials and installation.

O. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

Q. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, barriers, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section "Firestopping" for materials.

R. Verify final equipment locations for roughing-in.

S. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

T. Install piping, hangers and equipment so that they do not interfere with fully opening the access panels on any part of the structure, any contractor installed access panels, nor access panels on any equipment (either contract provided or Owner provided or Owner installed equipment).

U. Install piping, hangers and equipment so that they do not interfere with personnel movement. Components shall be a minimum of 7’-6” above finished floor unless specifically noted to be installed lower. Provide personnel protection on components located less than 6’-6” above finished floor (elastomeric insulation, caution markings).

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints:

1. Construct carbon steel joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
2. Construct stainless steel joints according to AWS D10.4, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
3. Construct aluminum joints according to AWS D10.7, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
4. Utilize AWS D10.11 Guide for Root Pass Welding of Pipe without Backing for all Welding Operations. Purge as required to obtain a smooth root surface.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
4. PVC Non-pressure Piping: Join according to ASTM D 2855.

J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

K. Plastic Non-pressure Piping Gasketed Joints: Join according to ASTM D 3212.

L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.

1. Plain-End Pipe and Fittings: Use butt fusion.
2. Plain-End Pipe and Socket Fittings: Use socket fusion.

M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.

4. Wet Piping Systems: Install dielectric coupling and dielectric nipple fittings to connect piping materials of dissimilar metals. Do not utilize dielectric unions with O-rings on wet piping systems.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated. Provide a minimum of 7'-2" headroom under all exposed equipment.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

E. Comply with the equipment manufacturer's written installation instructions.

F. Provide access platforms on the side of equipment where the access level is more than 30 inches above the roof or floor. Provide handrail guards that extend 42" above the platform in accordance with the International Building Code. Provide a permanent ladder or stairs to access the platform. All platforms, guards and stair/ladder materials shall be non-corrosive. Handrails shall be readily removable for removal of equipment components.

3.6 PAINTING

A. Painting of HVAC systems, equipment, and components is specified in Division 9 Sections.

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.7 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project. If concrete bases are not detailed on the drawings, then furnish:

1. Construct concrete bases of dimensions indicated, not less than 3.5 inches thick and not less than 4 inches (100 mm) larger in both directions than supported unit.
2. Install bonding agent to connect concrete base to concrete floor. Apply to 100% of the contact area between base and floor.
3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section. If not specified, utilize #4 reinforcing at 12" on center each way with #4 around the perimeter.

3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 5 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.9 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.10 GROUTING

A. Mix and install grout for HVAC equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases. Obtain pump manufacturer's written installation instructions.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

3.11 ROOF CURBS AND EQUIPMENT AND PIPE SUPPORTS

A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to support structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

B. All roof repairs shall be completed by a roofing contractor that is certified by the manufacturer of the existing and new roofing systems. All roof repairs shall be completed with materials and workmanship that is fully compatible with the roofing system and in full accordance with the roofing manufacturer's written installation requirements to maintain the roof warranty.

C. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual" unless otherwise indicated.

D. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces or at locations of contact, with bituminous coating or providing other permanent separation.

E. Flange Seals: Unless otherwise indicated, set flanges of accessory units with a thick bed of roofing cement to form a seal.

F. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counterflashing). Seal overlap with thick bead of mastic sealant.

3.12 CUTTING AND PATCHING

A. Refer to Division 2 for general cutting and patching requirements and procedures.

B. Cut, channel and drill floors, walls, partitions, shafts, ceiling sand other surfaces required to permit electrical installations and demolition. Perform cutting by skilled mechanics of trades involved.

C. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.13 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for all installations to restore original fire-resistance rating of assembly. Apply firestopping to structure where demolition exposes the structure. Firestopping materials and installation requirements are specified in Division 7 Section “Firestopping”.

B. Apply firestopping as indicated to seal penetrations in Paragraph “Penetration Sealing”.

C. Apply firestopping to all penetrations of smoke barriers. Provide an approved through penetration firestop system installed and tested in accordance with the requirements of UL 1479 for air leakage. The L rating for each firestop system shall not exceed 5.0 cfm per square foot at 0.30 inches of water in both ambient and elevated temperature tests.

3.14 PENETRATION SEALING

A. Horizontal assembly penetrations of all floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies shall be sealed as follows:

1. Non-fire resistance rated assemblies with non-combustible penetrating items shall utilize annular space fill or penetration firestopping.
2. Fire resistance rated assemblies shall utilize penetration firestopping.

B. All Penthouse floor penetrations shall be sealed.

C. All attic floor penetrations shall be sealed.

D. All enclosed spaces which house HVAC equipment shall have all penetrations of the horizontal and vertical membranes which separate the space from occupied and unoccupied building spaces sealed.

E. Penetrations to be sealed shall include, at a minimum, all piping, ductwork, flues, vents, chimneys, conduit and cabling penetrations installed.

3.15 CLEANING AND PROTECTION

A. On completion of installation, inspect exposed finish. Remove burrs, dirt, paint spots and construction debris. This requirement applies for components including piping and ductwork which are located above lay-in and hard ceilings, especially their upper surfaces prone to collect dust and debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion. Repair all coatings, finishes and cabinets to “as-new” conditions prior to Substantial Completion.

C. Remove all un-utilized construction materials from the project area.

D. Trim rod hangers to a maximum exposed threaded length of 1” below the bottom nut.

E. Protect all Owner provided spare parts. Obtain written receipt of Owner acceptance of spare parts denoting the quantities and storage location.

END OF SECTION

SECTION 23 05 13

COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes basic requirements for factory-installed motors.

1.2 DEFINITIONS

A. Factory-Installed Motor: A motor installed by motorized-equipment manufacturer as a component of equipment.

1.3 SUBMITTALS

A. Product Data for Installed Motors: For each type and size of motor, provide:

1. Nameplate data and ratings (hp; full load amps; rpm; voltage; power factor; temperature rise class; insulation class; service factor; enclosure type, frame material of construction).
2. Shipping weights.
3. Four pole, nominal 1,800 rpm, full load, nominal efficiency.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices. Provide motors that are:

1. Compatible with the following:

a. Magnetic controllers.
b. Multi-speed controllers.
c. Reduced-voltage controllers.
d. Variable frequency controllers:

1) Cable distance.
2) Operation of the variable frequency controller at up to 90 Hz.

2. Matched to torque, speed and horsepower requirements of the load.

3. Matched to ratings and characteristics of supply circuit and required control sequence.
4. Matched to ambient and environmental conditions at installation location.

B. Motors shall not operate in service factor range.

C. Coordinate motor support with requirements for driven load; access for maintenance and motor replacement; installation of accessories, belts, belt guards; and adjustment of sliding rails for belt tensioning.

D. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section.

PART 2 - PRODUCTS

2.1 MOTOR REQUIREMENTS

A. Motor requirements apply to all motors except when starter requirements, performance or characteristics for a motor are specified in another section or on the drawings.

2.2 MOTOR CHARACTERISTICS

A. Motors 3 HP and Larger: Three phase.

B. Motors Smaller Than 3 HP:
1. Single or three phase as identified on the construction documents.
2. Shall utilize an Electrically Commutated Motor

C. Frequency Rating: 60 Hz.

D. Voltage Rating: Matched to voltage of supply circuit.

E. Service Factor: 1.35 for 1/3 HP and below; 1.25 above 1/3 HP to 3/4 HP; 1.15 above 3/4 HP.

F. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.

G. Capacity and Torque Characteristics: NEMA Standards MG1; Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

H. Enclosure: Open drip-proof unless noted otherwise in specific equipment specification or on the drawings. Motor enclosures in hazardous areas shall be of the proper UL Class and group for the atmosphere in which they are located.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Nominal Efficiency: Four-pole, full load, minimum nominal efficiency and minimum power factor at nominal 1,800 rpm and nominal 460 VAC:

HP	MINIMUM EFFICIENCY PERCENT	MINIMUM POWER FACTOR
1	85.5	75
1.5	86.5	75
2	86.5	75
3	87.5	75
5	89.5	75
7.5	91.0	75
10	91.7	80
15	93.0	80
20	93.0	80
25	93.6	85
30	94.1	85
40	94.1	85
50	94.5	85
60	95.0	85
75	95.0	85
100	95.4	85
125	95.4	85
150	95.8	85
200	95.8	85

C. Service Factor: Minimum 1.15.

D. Stator: Copper windings, unless otherwise indicated.

1. Multi-speed motors shall have separate winding for each speed.

E. Rotor: Squirrel cage, unless otherwise indicated.

F. Bearings: Double-shielded, relubricated ball bearings less than 40 HP, regreasable 40 HP and larger, suitable for radial and thrust loading.

G. Temperature Rise: Class B at 1.0 service factor, unless noted otherwise.

H. Insulation: Class F, unless otherwise indicated.

I. Code Letter Designation: NEMA code letters for AC motors normally started on full voltage. NEMA starting code for Code G for motors 15 Hp and larger.

J. Enclosure Material: Cast iron for motors 10 HP and larger; rolled steel for motors smaller than 10 HP.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Reduced-Inrush Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals and/or leads in motor terminal box, suited to control method.

B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer. Designed and labeled for inverter duty per NEMA MG-1, Part 31 in its entirety and suitable for use throughout 20% to 150% motor base speed range in a variable torque application without overheating.

1. Designed with critical vibration frequencies outside operating range of controller output.
2. Temperature Rise: Class F.
3. Insulation: Class H IEEE Standard 117. Designed to resist transient spikes, high frequencies and short time pulses.
4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
5. Provide a factory installed, maintenance free, circumferential shaft grounding ring to discharge shaft currents to ground. Grounding ring shall be installed at the motor manufacturer’s factory on the drive end of the motor.

C. Severe-Duty Motors: Totally enclosed, with 1.15 minimum service factor, greased bearings, integral condensate drains, and capped relief vents. Windings insulated with non-hygroscopic material. Comply with IEEE 841.

1. Finish: Chemical-resistant paint over corrosion-resistant primer.

2.5 SINGLE-PHASE MOTORS

A. Type: One of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.
2. Split-phase start, capacitor run.
3. Capacitor start, capacitor run.
4. Electronically-commutated.

B. Shaded-Pole or Permanent Split Capacitor Motors: For motors 1/20 hp and smaller only.

C. Motors that are 1/12 HP or greater and less than 1 HP shall be electronically commutated motors with a minimum efficiency of 70 percent when rated in accordance with DOE 10 CFR 431.

D. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

E. Bearings: Ball type for belt-connected motors and other motors with high radial forces on motor shaft; sealed, prelubricated-sleeve type for other single-phase motors.

F. Source Quality Control: Perform the following tests on each motor according to NEMA Standards MG 1:

1. Measure winding resistance.
2. Read no-load current and speed at rated voltage and frequency.
3. Measure locked rotor current at rated frequency.

G. Electronically Commutated Motor Speed Controller: Integral with the motor, sized and matched for motor by the motor manufacturer, capable of at least a 20% speed adjustment increase and 50% speed decrease via a manual potentiometer. Provide all transformers and wiring factory mounted for a completely functional unit. Furnish controller analog input or two speed input as required to meet the control sequence. Coordinate with Building Automation System submittals.

2.6 ELECTRONICALLY COMMMUTATED MOTOR

A. Motor shall be an electronic commutated (EC) motor specifically designed for fan applications.

B. Motor shall be speed controllable down to 20% of full speed. Speed shall be controlled either by a potentiometer dial mounted on the motor or by a 0-10 VDC signal.

C. Motor shall be 80% efficient at all speeds rated in accordance with NEMA Standard MG 1-2006

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive motors for compliance with requirements, installation tolerances, and other conditions affecting performance.

B. Examine roughing-in of conduit systems to verify actual locations of conduit connections before motor installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. For each electronically commutated motor furnished, provide an electronically commutated motor speed controller.

3.2 MOTOR INSTALLATION

A. Anchor each motor assembly to base, adjustable rails, or other support, arranged and sized according to manufacturer's written instructions. Attach by bolting. Level and align with load transfer link.

B. Comply with mounting and anchoring requirements specified in Division 23 Section "HVAC Vibration and Seismic Controls."

3.3 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Run each motor with its controller. Demonstrate correct rotation, alignment, and speed at motor design load.
2. Test interlocks and control features for proper operation.
3. Verify that current in each phase is within nameplate rating.

B. Testing: Perform the following field quality-control testing:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.15.1. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to perform the following:

1. Inspect field-assembled components, equipment installation, and piping and electrical connections for compliance with requirements.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Verify bearing lubrication.
4. Verify proper motor rotation.
5. Test Reports: Prepare a written report to record the following:

a. Test procedures used.
b. Test results that comply with requirements.
c. Test results that do not comply with requirements and corrective action taken to achieve compliance.

3.4 ADJUSTING

A. Align motors, bases, shafts, pulleys and belts. Tension belts according to manufacturer's written instructions.

3.5 CLEANING

A. After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

B. Clean motors and nameplates, on completion of installation, according to manufacturer's written instructions.

END OF SECTION

SECTION 23 05 29

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following hangers and supports for HVAC system piping and equipment:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Pipe stands.
7. Equipment supports.

B. Related Sections include the following:

1. Division 5 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Division 21 Section "Water-Based Fire-Suppression Systems" for pipe hangers for fire-protection piping.
3. Division 23 Section "Expansion Fittings and Loops for HVAC Piping" for pipe guides and anchors.
4. Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment" for vibration isolation devices.
5. Division 23 Section(s) "Metal Ducts" and "Nonmetal Ducts" for duct hangers and supports.

1.2 DEFINITIONS

A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Design seismic-restraint hangers and supports for piping and equipment.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Steel pipe hangers and supports. Include piping system schedule delineating which piping systems receive roller hangers.
2. Thermal-hanger shield inserts.
3. Powder-actuated fastener systems.
4. Spring hangers utilized at pumps and other locations.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:

1. Trapeze pipe hangers. Include Product Data for components.
2. Metal framing systems. Include Product Data for components.
3. Pipe stands. Include Product Data for components.
4. Equipment supports.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following as applicable:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.2, "Structural Welding Code--Aluminum."
3. AWS D1.3, "Structural Welding Code--Sheet Steel."
4. AWS D1.4, "Structural Welding Code--Reinforcing Steel."
5. ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Manufacturers:

1. B-Line Systems, Inc.; a division of Cooper Industries.
2. Carpenter & Paterson, Inc.
3. ERICO/Michigan Hanger Co.
4. Anvil International, Inc.
5. National Pipe Hanger Corporation.
6. PHD Manufacturing, Inc.
7. PHS Industries, Inc.
8. Piping Technology & Products, Inc.
9. Tolco Inc.

C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

B. Manufacturers:

1. B-Line Systems, Inc.; a division of Cooper Industries.
2. ERICO/Michigan Hanger Co.; ERISTRUT Div.
3. Power-Strut Div.; Tyco International, Ltd.
4. Thomas & Betts Corporation.
5. Tolco Inc.
6. Unistrut Corp.; Tyco International, Ltd.

C. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 THERMAL HANGER SHIELDS

A. Description: Carbon steel, galvanized finish, shield. For use with Clevis hangers with ribs to keep shield centered in hanger. MSS-SP-69 Type 40.

2.6 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig- (690-kPa-) minimum, compressive-strength insulation insert encased in sheet metal shield.

B. Manufacturers:

1. Carpenter & Paterson, Inc.
2. ERICO/Michigan Hanger Co.
3. PHS Industries, Inc.
4. Pipe Shields, Inc.
5. Rilco Manufacturing Company, Inc.
6. Value Engineered Products, Inc.

C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 552, Type II cellular glass with vapor barrier.

D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

E. For Trapeze and Clamped Systems: Insert and shield shall cover entire circumference of pipe.

F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

G. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

2.7 FASTENER SYSTEMS

A. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated or stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers:

a. B-Line Systems, Inc.; a division of Cooper Industries.
b. Empire Industries, Inc.
c. Hilti, Inc.
d. ITW Ramset/Red Head.
e. MKT Fastening, LLC.
f. Powers Fasteners.

2.8 PIPE STAND FABRICATION

A. Pipe Stands, General: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support piping.

B. Compact Pipe Stand: One-piece UV-inhibited plastic unit with integral-rod-roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration, complete with seismic restraints. All metal components shall be hot dipped galvanized in accordance with ASTM A123 after fabrication.

1. Manufacturers:

a. ERICO/Michigan Hanger Co.
b. MIRO Industries.
c. Portable Pipe Hangers.

C. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe support made from structural-steel shape, continuous-thread rods, and rollers for mounting on permanent stationary roof curb.

2.9 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.10 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, non-corrosive, and nongaseous.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will come into direct contact with galvanized piping.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use pre-galvanized (hot dipped galvanized not required) or plain finish for indoor steel pipe hangers unless otherwise indicated.

F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750). Install second upper locknut on hanger rod and tighten.
2. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 2 (DN 15 to DN 50).
3. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
4. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.
5. Adjustable, Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 (DN 65 to DN 900), if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.
6. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN 25 to DN 750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.
7. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 (DN 65 to DN 500), from single rod if horizontal movement caused by expansion and contraction might occur.
8. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN 50 to DN 1050), if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
9. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30 (DN 50 to DN 750), if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 12.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 14 to NPS 20, if longer ends are required for riser clamps.

H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
2. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.

I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
3. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
4. C-Clamps (MSS Type 23): For structural shapes.
5. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
6. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
7. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
8. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
9. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
10. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:

a. Light (MSS Type 31): 750 lb (340 kg).
b. Medium (MSS Type 32): 1500 lb (680 kg).
c. Heavy (MSS Type 33): 3000 lb (1360 kg).

11. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

12. For building attachments other than those indicated (such as Z purlins), install appropriate attachments directly to building or install unistrut to structure and hang from the unistrut. Clarify with the Structural Engineer as required

J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from hanger.
6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

a. Horizontal (MSS Type 54): Mounted horizontally.
b. Vertical (MSS Type 55): Mounted vertically.
c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.

L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.

M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections. Utilize powder coated channel for all channel exposed to view in occupied spaces and mechanical spaces.

N. Use mechanical-expansion anchors instead of building attachments where required in concrete construction. Do not utilize powder-actuated fasteners.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
2. Field fabricated from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation:

1. Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
2. Provide vinyl frame caps on the ends of framing members which are located less than 8'-0" above finished floor.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:

1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Pipe Stand Installation:

1. Curb-Mounting-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. Refer to Division 7 Section "Roof Accessories" for curbs.
2. Insulate pipe stands which come in direct contact with piping or piping system components which operate below 50 deg F.

G. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

H. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

I. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

J. Install lateral bracing with pipe hangers and supports to prevent swaying.

K. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 4 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

L. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

N. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.

4. Shield Dimensions for Pipe: Not less than the following:

a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.
c. NPS 5 and NPS 6 (DN 125 and DN 150): 18 inches (457 mm) long and 0.06 inch (1.52 mm) thick.
d. NPS 8 to NPS 14 (DN 200 to DN 350): 24 inches (610 mm) long and 0.075 inch (1.91 mm) thick.
e. NPS 16 to NPS 24 (DN 400 to DN 600): 24 inches (610 mm) long and 0.105 inch (2.67 mm) thick.

5. Pipes NPS 8 (DN 200) and Larger: Include wood inserts.
6. Insert Material: Length at least as long as protective shield.
7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.
8. Pipe Spacing: Arrange piping so that a minimum of 2-1/2” of clear space exists between the outer surface of the pipe insulation on parallel piping.
9. Spaces with no ceiling: Attach protective insulation shield to hanger utilizing tack weld such that shield cannot be dislodged from the hanger.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

D. Paint interior supports with corrosion resistant paint.

E. Insulate supports which come in direct contact with equipment or piping which operates below 50 deg F.

F. Fabricate exterior supports from galvanized or stainless materials which are compatible with the equipment, piping and ductwork being supported.

3.4 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

D. Provide brush-on galvanizing touch-up for all bare metal exposed during installation or assembly. Galvanizing touch-up shall be compatible with original galvanized material.

3.5 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

3.6 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 23 05 53

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following mechanical identification materials and their installation:

1. Equipment labels.
2. Access panel and door labels.
3. Pipe labels.
4. Duct labels.
5. Stencils.
6. Valve tags.
7. Valve schedules.
8. Ceiling and thermostat labels.
9. Access flooring labels.
10. Raceway identification materials.
11. Control cable identification materials.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Valve Tag Schedules: For each piping system. Include a listing of all valves to be labeled with proposed content for each label. Include valve numbering scheme. Furnish extra copies (in addition to mounted copies) to include in maintenance manuals.

C. Equipment Label Schedule: Include a listing of all equipment to be labeled with proposed content for each label.

1.3 QUALITY ASSURANCE

A. ASME Compliance: Comply with ASME A13.1, "Scheme for the Identification of Piping Systems," for letter size, length of color field, colors, and viewing angles of identification devices for piping.

1.4 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with location of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

D. Coordinate identifying devices to be consistent in appearance in all exposed locations.

PART 2 - PRODUCTS

2.1 EQUIPMENT IDENTIFICATION DEVICES

A. Equipment Labels: Engraved, color-coded, multi-layer, multi-color laminated plastic for mechanical engraving. Include contact-type, permanent adhesive suitable for surface temperature of equipment.

1. Terminology: Match Owner's numbering scheme or drawing schedules with unique equipment number.
2. Size: Length and width vary for required label content, but not less than 4-1/2 by 6 inches (115 by 150 mm) for equipment, 1/8 inch thick.
3. Letters: 1/2 inch minimum.

B. Access Panel and Door Labels: 1/16-inch- (1.6-mm-) thick, engraved laminated plastic, with abbreviated terms and numbers corresponding to identification. Provide 1/8-inch (3.2-mm) center hole for attachment.

1. Terminology: Match Owner’s labeling scheme.
2. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

2.2 PIPING IDENTIFICATION DEVICES

A. Manufactured Pipe Labels, General: Preprinted, color-coded, with lettering indicating service, and an arrow showing direction of flow.

1. Colors: ASME A13.1 or Owner's current color scheme.
2. Lettering:

Refrigerant Suction	RS
Refrigerant Liquid	RL
Refrigerant Hot Gas Bypass	RHGB
Condensate Drain	CD

3. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Full-band pipe markers extending 360 degrees around pipe at each location.
4. Pipes with OD, Including Insulation, 6 Inches (150 mm) and Larger: Either full-band or strip-type pipe markers at least three times letter height and of length required for label.
5. Arrows: Integral with piping system service lettering to accommodate both directions; or as separate unit on each pipe marker to indicate direction of material flow in piping.

B. Pretensioned Pipe Labels: Precoiled semi-rigid plastic formed to cover full circumference of pipe and to attach to pipe without adhesive.

C. Self-Adhesive Plastic Tape Pipe Labels: Continuously printed, vinyl tape at least 3 mils (0.08 mm) thick with pressure-sensitive, permanent-type, self-adhesive back.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations used on drawings and an arrow indicating flow direction. Provide lettering size at least 1-1/2 inches high.

2.3 DUCT IDENTIFICATION DEVICES

A. Duct Labels: Preprinted, color-coded with lettering indicating service. Include direction of airflow and duct service (such as supply, return, and exhaust). Include contact-type, permanent adhesive.

2.4 DUCT AND ACCESS DOOR STENCILS

A. Stencils: Prepared with letter sizes according to ASME A13.1; minimum letter height of 1-1/4 inches (32 mm) for ducts; and minimum letter height of 3/4 inch (19 mm) for access panel and door markers and similar operational instructions.

1. Stencil Paint: Exterior, gloss, acrylic enamel black, unless otherwise indicated. Paint may be in pressurized spray-can form.
2. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1, unless otherwise indicated.

2.5 VALVE TAGS

A. Valve Tags: Stamped with 1/4-inch (6.4-mm) letters for piping system abbreviation and 1/2-inch (13-mm) numbers, with numbering scheme approved by Owner. Provide 5/32-inch (4-mm) hole for fastener.

1. Material: 0.032-inch- (0.8-mm-) thick brass.
2. Valve-Tag Fasteners: Brass S-hook.
3. Lettering: Black filled.
4. Size: Minimum 1-1/2”, larger as required for labeling scheme.

2.6 VALVE SCHEDULES

A. Valve Schedules: For each piping system, on standard-size bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-Schedule Frames: Glazed display frame for removable mounting on masonry walls for each page of valve schedule. Include mounting screws.
2. Frame: Extruded aluminum.
3. Glazing: ASTM C 1036, Type I, Class 1, Glazing Quality B, 2.5-mm, single-thickness glass.

2.7 CEILING LABELS

A. Description: 1/2-inch wide clear extra strength tape with 1/4-inch high black letters. Extra strength adhesive suitable for use on rough, textured, or uneven surfaces, as well as painted and powder coated surfaces.

2.8 TEMPERATURE SENSOR LABELS

A. Description: 1/4-inch-wide clear extra strength tape with 1/8-inch-high black letters. Extra strength adhesive for use on rough textured or uneven surfaces, as well as painted or powder coated surfaces.

2.9 ACCESS FLOORING LABELS

A. Description: Minimum 4-inch-tall permanent marker lettering on the upper surface of the access floor tile indicating components located below that tile.

2.10 RACEWAY (EMT AND CONDUIT) IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:

1. Control circuits:

a. Temperature controls: Black letters on a white field.
2. Legend: Indicate system or service. Indicate voltage.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.11 CONTROL CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch (0.35-mm) thick aluminum sheet with stamped, embossed or scribed legend and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

PART 3 - EXECUTION

3.1 APPLICATIONS, GENERAL

A. Products specified are for applications referenced in other Division 23 Sections. If more than single-type material, device, or label is specified for listed applications, selection is Installer's option.

3.2 EQUIPMENT IDENTIFICATION

A. Install equipment labels with permanent adhesive on or near each item of mechanical equipment.

1. Letter Size: Minimum 3/4-inch (19 mm) for name of units and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
2. Data: Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.
3. Locate labels where accessible and visible. Include labels for each piece of mechanical equipment and for the following general categories of equipment:

a. Fuel-burning units, including boilers, furnaces, heaters, stills, and absorption units.
b. Pumps, compressors, chillers, condensers, and similar motor-driven units.
c. Heat exchangers, built-up coil banks, evaporators, cooling towers, heat recovery units, and similar equipment.
d. Fans, blowers, primary balancing dampers, and mixing boxes.
e. Packaged HVAC central-station and zone-type units.
f. Tanks and pressure vessels.
g. Filters, humidifiers and water-treatment systems.
h. Fire dampers and fire/smoke dampers.
i. Humidifiers and pressure reducing valves.
j. Terminal units (supply air terminal boxes, exhaust air valves): For terminal units located above ceiling, locate equipment label on the bottom or side of the terminal unit where it will be visible from the designated ceiling access panel/tile. If utilizing manufacturer’s labels, lettering shall be at least 1” tall. Permanent marker handwritten labels with 2” tall letters are also acceptable. Do not paint over manufacturer provided labels.

B. Install access panel and door labels on equipment and shaft access panels.

3.3 PIPING IDENTIFICATION

A. Install manufactured pipe label indicating service on each piping system. Install with flow indication arrows showing direction of material flow in piping.

1. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Pretensioned pipe labels. Use size to ensure a tight fit.
2. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Self-adhesive pipe labels. Use color-coded, self-adhesive plastic tape, covering full circumference of pipe.
3. Pipes with OD, Including Insulation, 6 Inches (150 mm) and Larger: Self-adhesive pipe labels. Use color-coded, self-adhesive plastic tape, at least 1-1/2 inches (38 mm) wide, lapped at least 3 inches (75 mm) at both ends of pipe label, and covering full circumference of pipe.

B. Locate pipe labels as follows:

1. Near (within 24” of) each valve and control device.
2. Near each branch connection, excluding short takeoffs less than ten feet long for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Each side of penetrations through walls, floors, ceilings, and non-accessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 15 feet (4.5 m) along each run.
7. At a minimum of once over each room for each piping system present over that room. Center the label in the pipe run over the room. If pipe length over the room is less than 15 feet than install labels at each wall penetration.

3.4 DUCT IDENTIFICATION

A. Install duct labels with permanent adhesive on air ducts in the following color codes:

1. Green: For cold-air supply ducts.
2. Yellow: For hot-air supply ducts.
3. Blue: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
4. Red: For bio-hazard and isolation room exhaust ducts.
5. ASME A13.1 Colors and Designs: For hazardous material exhaust.
6. Letter Size: Minimum 1-inch (26 mm) and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

B. Stenciled Duct Option: Stenciled labels, showing service and direction of flow, may be provided instead of laminated-plastic duct labels, if lettering larger than 1 inch (25 mm) high is needed for proper identification because of distance from normal location of required identification.

C. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 15 feet (4.5 m) in each space where ducts are exposed or concealed by removable ceiling system.

D. Duct marker identification shall indicate the associated fan system (e.g., “EF-3 exhaust”).

3.5 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; faucets; convenience hose connections; at HVAC terminal devices and at similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

3.6 VALVE-SCHEDULE INSTALLATION

A. Mount valve schedules on a wall in an accessible location in each major equipment room.

3.7 CEILING LABEL AND TEMPERATURE SENSOR LABEL INSTALLATION

A. Provide ceiling labels to locate items above T-bar type lay-in panel ceilings. Locate at corner of T-Bar grid closest to equipment. Items which are scheduled on the drawings shall have labels which indicate their scheduled tag (e.g. “TB-201”). Items which are not scheduled on the drawings shall have labels which indicate their name (e.g. “Fire damper”). Provide ceiling labels for the following:

1. HVAC terminal units (terminal boxes, fan powered terminal boxes, fan coil units, reheat coils, etc.).
2. Fire dampers and fire/smoke dampers. Utilize ceiling tags “fire damper”, “fire/smoke damper” etc. if not provided individual tag names by the Owner.
3. Steam traps, humidifiers and steam pressure reducing valves. Utilize ceiling tags “steam trap”, “humidifier”, etc.
4. Controls components: Control panels, duct static pressure sensors, humidifier sensors, control valves, control dampers, control air reducing valves, etc. Utilize ceiling tags “control panel”, “pressure sensor”, etc.
5. Duct smoke detectors. Utilize ceiling tag “duct detector”.
6. Each valve which receives a valve tag. Utilize valve tag nomenclature for ceiling tag (e.g. “CHWP-7”).

B. Provide thermostat labels on the inside cover of all thermostats with removable covers. For other sensors, install label on top exterior surface. Label shall indicate equipment tag of controlled device (e.g., TB-311). Clarify location of label with controls submittal.

3.8 ACCESS FLOOR TILE LABEL INSTALLATION

A. Provide access floor tile labels to locate items below raised access floor. Locate on upper surface of access tile. Provide access floor labels for the following:

1. HVAC terminal units (terminal boxes, reheat coils, etc.).
2. Fire dampers and fire/smoke dampers.
3. Controls components: Control panels, duct static pressure sensors, humidifier sensors, control valves, control dampers and control air reducing valves, etc.
4. Duct smoke detectors.
5. Each valve which receives a valve tag.

3.9 WARNING LABEL INSTALLATION

A. Write required message on and attach warning labels to equipment and other items (e.g., hazardous ductwork systems) where required.

3.10 ADJUSTING

A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

3.11 CLEANING

A. Clean faces of mechanical identification devices and glass frames of valve schedules.

3.12 TEMPERATURE CONTROL LABEL INSTALLATION

A. Control panels shall receive equipment labels where the number of the panel matches that on the controls submittal.

B. All control raceways and junction boxes shall be identified with preprinted self-adhesive vinyl labels.

C. All cables not located within raceways shall be identified at maximum 25-foot intervals.

D. Control raceways shall be identified at maximum 15-foot intervals within rooms with no ceiling and at a minimum once over each room the raceway passes through.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TAB Specialist: An entity engaged to perform TAB Work.

1.2 SUBMITTALS

A. LEED Submittal:

1. Air-Balance Report for LEED Prerequisite EQ 1: Documentation of work performed for ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Qualification Data: Within 30 days of Contractor's Notice To Proceed, submit documentation that the TAB Contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article. This documentation shall include the following:

1. A list of the names of all individual on-site Field Supervisors and TAB Technicians who may be assigned to the project.
2. A statement that each of the individual listed on-site Field Supervisors and TAB Technicians has met the experience and certification requirements of the specification.
3. A statement that each of the individual listed on-site Field Supervisors and TAB Technicians has received the required training from the selected Controls Supplier.
4. A statement noting that apprentice labor may be utilized for lesser skilled tasks if under the direct supervision of one of the listed individual on-site Field Supervisors and TAB Technicians who is on-site at all times the apprentice is working.

C. Contract Documents Examination Report: Within 45 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

D. Strategies and Procedures Plan: Within 90 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

E. Pencil-copy initial TAB reports, sent directly to the Engineer, as system TAB progresses.

F. Certified TAB reports.

G. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration. Calibration dates shall be within a period of six months prior to the first recorded measurements on the project site.

H. Additional testing reports with verified conditions noted, description of adjustments made and outstanding corrective action items required by other trades.

1.3 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Shall meet the following minimum requirements:

1. TAB Contractor shall be either:

a. A current certified member of AABC, registered in the state of the project site.
b. A current certified member of NEBB, registered in the state of the project site.
c. A registered Professional Engineer licensed in the state of the project site that specialized in the testing, adjusting and balancing of systems with a minimum of ten years of documented experience.

2. Testing, adjusting and balancing shall be completed under the direct field supervision of the TAB Field Supervisor. The TAB Field Supervisor shall be either:

a. A direct employee of the TAB Contractor who is currently certified as an AABC Test and Balance Engineer with at least ten years of demonstrated working experience in the testing, adjusting and balancing of building HVAC systems.
b. A direct employee of the TAB Contractor who is currently certified as NEBB Qualified TAB Supervisor with at least ten years of demonstrated working experience in the testing, adjusting and balancing of building HVAC systems.
c. A registered Professional Engineer that specialized in the testing, adjusting and balancing of systems with a minimum of ten years of documented experience.

3. All testing, adjusting and balancing work shall be completed by a TAB technician. The TAB technician shall be either:

a. An employee of the TAB Contractor and who is certified by AABC as a test and balance technician.
b. An employee of the TAB Contractor and who is certified by NEBB as a qualified TAB technician.
c. A registered Professional Engineer that specialized in the testing, adjusting and balancing of systems with a minimum of ten years of documented experience.

4. In addition to the technical capabilities described herein, the TAB Contractor demonstrates a production capability to plan, control, and integrate manpower and other resources necessary for successful contract completion.
5. TAB Contractor shall have received software training from the selected Controls Supplier applicable to the software and hardware which will be provided for this project.
6. TAB Contractor shall have on the project site all required software and hardware necessary from the selected Controls Supplier to perform testing, adjusting and balancing required tasks.
7. TAB Contractor shall be listed on the Bid Form on bid day.
8. TAB Contractor shall not be owned by any of the following contractors nor subcontractors on this project:

a. General Contractor.
b. Mechanical Contractor.
c. Electrical Contractor.
d. Temperature Controls Contractor.

9. TAB Contractor shall have at least five years documented experience in the testing, adjusting and balancing of commercial DDC controls. The Owner may ask to verify the qualifications and experience for all field installation technicians assigned to the project prior to the approval of the TAB Contractor.
10. TAB Contractor shall submit a statement acknowledging agreement with the applicable manufacturer's design guidelines covering the installation of controls and the subsequent requirements of the TAB Contractor.
11. TAB Contractor shall attend a one-hour familiarization session immediately following the project preconstruction meeting.

B. TAB Conference: Meet with Engineer, Owner, Construction Manager, and Commissioning Authority on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.

1. Agenda Items:

a. The Contract Documents examination report.
b. The TAB plan.
c. Coordination and cooperation of trades and subcontractors.
d. Coordination of documentation and communication flow.

C. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

D. TAB Report Forms: Use standard TAB contractor's forms.

E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.4 PROJECT CONDITIONS

A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.5 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

C. The TAB Agent shall telephone the Engineer while on-site TAB work is being undertaken. Provide pencil copy handwritten data directly to the Engineer via fax while on-site TAB work is being undertaken.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TAB SPECIALISTS

A. Subject to compliance with requirements, engage one of the following:

1. Central Texas:

a. TAB Technologies
b. Campos Engineering.
c. Engineered Air Balance (EAB).

3.2 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the final submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Examine automatic temperature system components to verify the following:

1. Dampers, valves and other controlled devices operate by the intended controller.
2. Dampers and valves are in the position indicated by the controller.
3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open position. This includes dampers in multi-zone units, mixing boxes and variable air volume terminals.

4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts and cold walls.
6. Sensors are located to sense only the intended conditions.
7. Sequence of operation for control modes is according to the Contract Documents.
8. Controller setpoints are set at design values. Observe and record system reactions to changes in conditions. Record default setpoints if different from design values.
9. Interlocked systems are operating.
10. Changeover from heating to cooling mode occurs according to design values.

Q. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.3 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance," ASHRAE 111 NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing," and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. After testing and balancing, install test ports and duct access doors that comply with requirements in Division 23 Section "Air Duct Accessories."
3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity. Submit this plan to all contractors to verify phasing and occupancy concerns. Submit plan to the Engineer prior to execution.

D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers. Communicate concerns about potential stratification directly to the Engineer.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling-unit components.

L. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

M. Measure and record for each terminal unit the static air pressure and the damper position (% open) when recording the maximum airflow readings for the space.

3.6 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a minimum set-point airflow with the remainder at maximum-airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set outdoor-air dampers at minimum, and set return- and exhaust-air dampers at a position that simulates full-cooling load.
2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
3. Measure total system airflow. Adjust to within indicated airflow.
4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.

    a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.

6. Remeasure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.

a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.

7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
8. Record final fan-performance data.

3.7 PROCEDURES FOR MOTORS

A. Motors: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.8 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record compressor data.

3.9 PROCEDURES FOR HEAT-TRANSFER COILS

A. Measure, adjust, and record the following data for each water coil:

1. Entering- and leaving-water temperature.
2. Water flow rate.
3. Water pressure drop.
4. Dry-bulb temperature of entering and leaving air.
5. Wet-bulb temperature of entering and leaving air for cooling coils.
6. Airflow.
7. Air pressure drop.

B. Measure, adjust, and record the following data for each electric heating coil:

1. Nameplate data.
2. Airflow.
3. Entering- and leaving-air temperature at full load.
4. Voltage and amperage input of each phase at full load and at each incremental stage.
5. Calculated kilowatt at full load.
6. Fuse or circuit-breaker rating for overload protection.

C. Measure, adjust, and record the following data for each steam coil:

1. Dry-bulb temperature of entering and leaving air.
2. Airflow.
3. Air pressure drop.

4. Inlet steam pressure.

D. Measure, adjust, and record the following data for each refrigerant coil:

1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.
5. Refrigerant suction pressure and temperature.

3.10 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate-drain trap.
7. Check bearings and other lubricated parts for proper lubrication.
8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
4. Balance each air outlet.

3.11 TEMPERATURE CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between setpoints, controller readings and actual measurements.

D. Verify operation of limiting controllers (i.e., high and low temperature controllers).

E. Verify free travel and proper operation of control devices such as damper and valve operators.

F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water flow measurements. Note the speed of response to input changes.

G. Confirm interaction of electrically operated switch transducers.

H. Confirm interaction of interlock and lockout systems.

I. Verify main control supply air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine if the system operates on a ground or non-grounded power supply.

K. Note operation of electric actuators using spring return for proper fail safe operations.

L. For each system with airflow measuring station, record the calibration data, actual airflow and measured sensor process variable at minimum airflow, maximum airflow, and halfway between minimum and maximum airflow settings.

M. With each piece of equipment in operation under the fully automatic control of the Building Automation System, perform the following test:

1. Throw the disconnect to the off position. For equipment driven by a variable frequency drive, switch the breaker feeding the drive to the “off” position. Simultaneously remove power from the Building Automation System controller which controls that piece of equipment.
2. Remain in the un-energized condition for eight seconds.
3. Return disconnect and breaker to their normal “on” position. Return power to controls.
4. Document normal operation of the equipment after power interruption (normal speed, normal position, normal pressure, etc.).

N. Measure and record the discharge air temperature from each terminal unit, fan coil unit and induction unit. Cooling and heating systems shall be operational during this test. Report all cooling discharge air temperatures that are above 55 deg. F to the proper contractors for remediation. Report all heating discharge air temperatures that are less than 90 deg. F to the proper contractor for remediation.

O. Report all results in writing for all verification activities.

3.12 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Zero to plus 10 percent.
2. Air Outlets and Inlets: Plus or minus 5 percent.
3. Heating-Water Flow Rate: Zero to plus 5 percent.
4. Cooling-Water Flow Rate: Zero to plus 5 percent.

3.13 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.14 FINAL REPORT

A. General: Prepare a certified written report, tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:

    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:

    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.
    f. Unit arrangement and class.
    g. Discharge arrangement.
    h. Sheave make, size in inches (mm), and bore.
    i. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).
    j. Number, make, and size of belts.
    k. Number, type, and size of filters.

2. Motor Data:

    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches (mm), and bore.
    f. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

3. Test Data (Indicated and Actual Values):

    a. Total air flow rate in cfm (L/s).
    b. Total system static pressure in inches wg (Pa).
    c. Fan rpm.
    d. Discharge static pressure in inches wg (Pa).
    e. Filter static-pressure differential in inches wg (Pa).
    f. Preheat-coil static-pressure differential in inches wg (Pa).
    g. Cooling-coil static-pressure differential in inches wg (Pa).
    h. Heating-coil static-pressure differential in inches wg (Pa).
    i. Outdoor airflow in cfm (L/s).
    j. Return airflow in cfm (L/s).
    k. Outdoor-air damper position.
    l. Return-air damper position.
    m. Vortex damper position.

F. Apparatus-Coil Test Reports:

1. Coil Data:

    a. System identification.
    b. Location.
    c. Coil type.
    d. Number of rows.
    e. Fin spacing in fins per inch (mm) o.c.
    f. Make and model number.
    g. Face area in sq. ft. (sq. m).
    h. Tube size in NPS (DN).
    i. Tube and fin materials.
    j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):

    a. Air flow rate in cfm (L/s).
    b. Average face velocity in fpm (m/s).
    c. Air pressure drop in inches wg (Pa).
    d. Outdoor-air, wet- and dry-bulb temperatures in deg F (deg C).
    e. Return-air, wet- and dry-bulb temperatures in deg F (deg C).
    f. Entering-air, wet- and dry-bulb temperatures in deg F (deg C).
    g. Leaving-air, wet- and dry-bulb temperatures in deg F (deg C).

h. Water flow rate in gpm (L/s).
i. Water pressure differential in feet of head or psig (kPa).
j. Entering-water temperature in deg F (deg C).
k. Leaving-water temperature in deg F (deg C).
l. Refrigerant expansion valve and refrigerant types.
m. Refrigerant suction pressure in psig (kPa).
n. Refrigerant suction temperature in deg F (deg C).
o. Inlet steam pressure in psig (kPa).

3. Test Data (Indicated and Actual Values):

a. Total air flow rate in cfm (L/s).
b. Entering-air temperature in deg F (deg C).
c. Leaving-air temperature in deg F (deg C).
d. Air temperature differential in deg F (deg C).
e. Entering-air static pressure in inches wg (Pa).
f. Leaving-air static pressure in inches wg (Pa).
g. Air static-pressure differential in inches wg (Pa).
h. Low-fire fuel input in Btu/h (kW).
i. High-fire fuel input in Btu/h (kW).
j. Manifold pressure in psig (kPa).
k. High-temperature-limit setting in deg F (deg C).
l. Operating set point in Btu/h (kW).
m. Motor voltage at each connection.
n. Motor amperage for each phase.
o. Heating value of fuel in Btu/h (kW).

G. Electric-Coil Test Reports: For electric furnaces, duct coils, and electric coils installed in central-station air-handling units, include the following:

1. Unit Data:

a. System identification.
b. Location.
c. Coil identification.
d. Capacity in Btu/h (kW).
e. Number of stages.
f. Connected volts, phase, and hertz.
g. Rated amperage.
h. Air flow rate in cfm (L/s).
i. Face area in sq. ft. (sq. m).
j. Minimum face velocity in fpm (m/s).

2. Test Data (Indicated and Actual Values):

a. Heat output in Btu/h (kW).
b. Air flow rate in cfm (L/s).
c. Air velocity in fpm (m/s).
d. Entering-air temperature in deg F (deg C).
e. Leaving-air temperature in deg F (deg C).
f. Voltage at each connection.
g. Amperage for each phase.

H. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.

g. Sheave make, size in inches (mm), and bore.
h. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

2. Motor Data:

a. Motor make, and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.
e. Sheave make, size in inches (mm), and bore.
f. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).
g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm (L/s).
b. Total system static pressure in inches wg (Pa).
c. Fan rpm.
d. Discharge static pressure in inches wg (Pa).
e. Suction static pressure in inches wg (Pa).
f. System leakage data. Report on system leakage as the difference between the airflows measured at the fan inlet traverse and the summation of airflows measured at the spaces served. Measure fan airflows while the space airflows are all simultaneously at their maximum airflow settings. For leakage rates greater than 3%, perform branch traverse airflow readings to identify locations of leakage.

I. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling-unit number.
b. Location and zone.
c. Traverse air temperature in deg F (deg C).
d. Duct static pressure in inches wg (Pa).
e. Duct size in inches (mm).
f. Duct area in sq. ft. (sq. m).
g. Indicated air flow rate in cfm (L/s).
h. Indicated velocity in fpm (m/s).
i. Actual air flow rate in cfm (L/s).
j. Actual average velocity in fpm (m/s).
k. Barometric pressure in psig (Pa).

J. Air-Terminal-Device Reports:

1. Unit Data:

a. System and air-handling unit identification.
b. Location and zone.
c. Apparatus used for test.
d. Area served.
e. Make.
f. Number from system diagram.
g. Type and model number.
h. Size.
i. Effective area in sq. ft. (sq. m).

2. Test Data (Indicated and Actual Values):

a. Air flow rate in cfm (L/s).
b. Air velocity in fpm (m/s).
c. Preliminary air flow rate as needed in cfm (L/s).
d. Preliminary velocity as needed in fpm (m/s).

e. Final air flow rate in cfm (L/s).
f. Final velocity in fpm (m/s).
g. Space temperature in deg F (deg C).
h. Static pressure at the terminal unit when the terminal is flowing the maximum airflow setting.
i. Damper position (% open) when the terminal is flowing the maximum airflow setting.

K. System-Coil Reports: For terminal heating and cooling hydronic coils at terminal units, include the following:

1. Unit Data:

a. System and air-handling-unit identification.
b. Location and zone.
c. Room or riser served.
d. Coil make and size.
e. Flowmeter type.

2. Test Data (Indicated and Actual Values):

a. Air flow rate in cfm (L/s).
b. Entering-water temperature in deg F (deg C).
c. Leaving-water temperature in deg F (deg C).
d. Water pressure drop in feet of head or psig (kPa).
e. Entering-air temperature in deg F (deg C).
f. Leaving-air temperature in deg F (deg C).

L. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:

1. Unit Data:

a. Unit identification.
b. Location.
c. Service.
d. Make and size.
e. Model number and serial number.
f. Water flow rate in gpm (L/s).
g. Water pressure differential in feet of head or psig (kPa).
h. Required net positive suction head in feet of head or psig (kPa).
i. Pump rpm.
j. Impeller diameter in inches (mm).
k. Motor make and frame size.
l. Motor horsepower and rpm.
m. Voltage at each connection.
n. Amperage for each phase.
o. Full-load amperage and service factor.
p. Seal type.

2. Test Data (Indicated and Actual Values):

a. Static head in feet of head or psig (kPa).
b. Pump shutoff pressure in feet of head or psig (kPa).
c. Actual impeller size in inches (mm).
d. Full-open flow rate in gpm (L/s).
e. Full-open pressure in feet of head or psig (kPa).
f. Final discharge pressure in feet of head or psig (kPa).
g. Final suction pressure in feet of head or psig (kPa).
h. Final total pressure in feet of head or psig (kPa).
i. Final water flow rate in gpm (L/s).
j. Voltage at each connection.
k. Amperage for each phase.

3. Condenser Test Data: Include design and actual values for the following:

   a. Refrigerant pressure in psig (kPa).
   b. Refrigerant temperature in deg F (deg C).
   c. Entering-water temperature in deg F (deg C).
   d. Leaving-water temperature in deg F (deg C).
   e. Entering-water pressure in feet of head or psig (kPa).
   f. Water pressure differential in feet of head or psig (kPa).

4. Evaporator Test Reports: Include design and actual values for the following:

   a. Refrigerant pressure in psig (kPa).
   b. Refrigerant temperature in deg F (deg C).
   c. Entering-water temperature in deg F (deg C).
   d. Leaving-water temperature in deg F (deg C).
   e. Entering-water pressure in feet of head or psig (kPa).
   f. Water pressure differential in feet of head or psig (kPa).

5. Compressor Test Data: Include design and actual values for the following:

   a. Make and model number.
   b. Manufacturer's serial number.
   c. Suction pressure in psig (kPa).
   d. Suction temperature in deg F (deg C).
   e. Discharge pressure in psig (kPa).
   f. Discharge temperature in deg F (deg C).
   g. Oil pressure in psig (kPa).
   h. Oil temperature in deg F (deg C).
   i. Voltage at each connection.
   j. Amperage for each phase.
   k. The kW input.
   l. Crankcase heater kW.
   m. Chilled water control set point in deg F (deg C).
   n. Condenser water control set point in deg F (deg C).
   o. Refrigerant low-pressure-cutoff set point in psig (kPa).
   p. Refrigerant high-pressure-cutoff set point in psig (kPa).

6. Refrigerant Test Data: Include design and actual values for the following:

   a. Oil level.
   b. Refrigerant level.
   c. Relief valve setting in psig (kPa).
   d. Unloader set points in psig (kPa).
   e. Percentage of cylinders unloaded.
   f. Bearing temperatures in deg F (deg C).
   g. Vane position.
   h. Low-temperature-cutoff set point in deg F (deg C).

M. Compressor and Condenser Reports: For refrigerant side of unitary systems, stand-alone refrigerant compressors, air-cooled condensing units, or water-cooled condensing units, include the following:

1. Unit Data: Include the following:

   a. Unit identification.
   b. Location.
   c. Unit make and model number.
   d. Manufacturer's compressor serial numbers.
   e. Compressor make.
   f. Compressor model and serial numbers.
   g. Refrigerant weight in lb (kg).
   h. Low ambient temperature cutoff in deg F (deg C).

2. Test Data: Include design and actual values for the following:

a. Inlet-duct static pressure in inches wg (Pa).
b. Outlet-duct static pressure in inches wg (Pa).
c. Entering-air, dry-bulb temperature in deg F (deg C).
d. Leaving-air, dry-bulb temperature in deg F (deg C).
e. Condenser entering-water temperature in deg F (deg C).
f. Condenser leaving-water temperature in deg F (deg C).
g. Condenser water temperature differential in deg F (deg C).
h. Condenser entering-water pressure in feet of head or psig (kPa).
i. Condenser leaving-water pressure in feet of head or psig (kPa).
j. Condenser water pressure differential in feet of head or psig (kPa).
k. Control settings.
l. Unloader set points.
m. Low-pressure-cutout set point in psig (kPa).
n. High-pressure-cutout set point in psig (kPa).
o. Suction pressure in psig (kPa).
p. Suction temperature in deg F (deg C).
q. Condenser refrigerant pressure in psig (kPa).
r. Condenser refrigerant temperature in deg F (deg C).
s. Oil pressure in psig (kPa).
t. Oil temperature in deg F (deg C).
u. Voltage at each connection.
v. Amperage for each phase.
w. The kW input.
x. Crankcase heater kW.
y. Number of fans.
z. Condenser fan rpm.
aa. Condenser fan airflow rate in cfm (L/s).
bb. Condenser fan motor make, frame size, rpm, and horsepower.
cc. Condenser fan motor voltage at each connection.
dd. Condenser fan motor amperage for each phase.

N. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.
b. Serial number.
c. Application.
d. Dates of use.
e. Dates of calibration.

O. System and Functional Test Reports: For each system test, include the following:

1. Condition of controls (fully automatic or not).
2. Variable frequency drive Hertz.
3. All conditions denoted in the Procedures Section.
4. System static pressures at building automation sensors, both physical readings and controller readouts.

3.15 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.
2. Check the following for each system:

a. Measure airflow of at least 10 percent of air outlets.
b. Measure water flow of at least 5 percent of terminals.
c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.

d. Verify that balancing devices are marked with final balance position.
e. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Engineer.
2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of Engineer of Record.
3. Engineer shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
4. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

3.16 ADDITIONAL TESTS

A. Within 90 days of completing TAB, at the request of the Engineer, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures for equipment were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions. Additional tests shall be performed as follows:

1. Cooling season: With outdoor air temperature at least 80 deg. F, index the unit to 100% outdoor air and reset space setpoints such that all zones are simultaneously at maximum cooling airflow. Test cooling coil performance both airside (including wet bulb readings) and tube side and record data, including cooling systems equipment operation, overall flow rates and system temperatures.
2. Heating season: With outdoor air temperature no greater than 30 deg. F., reset space setpoints such that all zones are simultaneously at maximum heating. Adjust outdoor air control to load the heating coil at its maximum scheduled capacity. Test heating coil performance both air side and tube side and record data, including heating system equipment in operation, overall flow rates and system temperatures.

END OF SECTION

SECTION 23 07 00

HVAC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulation Materials:

a. Calcium silicate.
b. Cellular glass.
c. Flexible elastomeric.
d. Mineral fiber.

2. Fire-rated insulation systems.
3. Insulating cements.
4. Adhesives.
5. Mastics.
6. Sealants.
7. Factory-applied jackets.
8. Field-applied fabric-reinforcing mesh.
9. Field-applied cloths.
10. Field-applied jackets.
11. Tapes.
12. Securements.
13. Corner angles.

B. Related Sections:

1. Division 22 Section "Plumbing Insulation."
2. Division 23 Section "Metal Ducts" for duct liners.
3. Division 33 Section "Underground Hydronic Energy Distribution" for loose-fill pipe insulation in underground piping outside the building.
4. Division 33 Section "Underground Steam and Condensate Distribution Piping" for loose-fill pipe insulation in underground piping outside the building.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, thickness, and jackets (both factory and field applied, if any). Provide a scheduled listing in the submittal of each type of pipe service, duct service or equipment type that insulates with the thickness and jacket noted for each service and type.

B. LEED Submittal (if required):

1. Product Data for Credit EQ 4.1: For adhesives and sealants, including printed statement of VOC content.

C. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at pipe expansion joints for each type of insulation.

3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
4. Detail removable insulation at piping specialties, equipment connections, and access panels.
5. Detail application of field-applied jackets.
6. Detail application at linkages of control devices.
7. Detail field application for each equipment type.

D. Field quality-control reports.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

B. Mockups: Before installing insulation, build mockups for each type of insulation and finish listed below to demonstrate quality of insulation application and finishes. Build mockups in the location indicated or, if not indicated, as directed by Architect. Use materials indicated for the completed Work.

1. Piping Mockups:

   a. One 10-foot (3-m) section of NPS 2 (DN 50) straight pipe.
   b. One each of a 90-degree threaded, welded, and flanged elbow.
   c. One each of a threaded, welded, and flanged tee fitting.
   d. One NPS 2 (DN 50) or smaller valve, and one NPS 2-1/2 (DN 65) or larger valve.
   e. Four support hangers including hanger shield and insert.
   f. One threaded strainer and one flanged strainer with removable portion of insulation.
   g. One pressure temperature tap.
   h. One mechanical coupling.

2. Ductwork Mockups:

   a. One 10-foot (3-m) section, each of rectangular and round straight duct.
   b. One each of a 90-degree mitered round and rectangular elbow, and one each of a 90-degree radius round and rectangular elbow.
   c. One rectangular branch takeoff and one round branch takeoff from a rectangular duct. One round tee fitting.
   d. Four support hangers for round and rectangular ductwork.

3. Equipment Mockups:

   a. One chilled-water pump.
   b. One tank or vessel.

4. For each mockup, fabricate cutaway sections to allow observation of application details for insulation materials, adhesives, mastics, attachments, and jackets.
5. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
6. Obtain Engineer’s approval of mockups before starting insulation application.
7. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Engineer specifically approves such deviations in writing.
8. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
9. Demolish and remove mockups when directed.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

B. Storage: Insulation material shall be stored to prevent dirt and moisture contamination.

1.5 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.6 SCHEDULING

A. Schedule insulation application after satisfactory pressure testing systems and, where required, after installing and testing heat tracing.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Calcium Silicate:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Industrial Insulation Group (The); Thermo-12 Gold.

2. Preformed Pipe Sections: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.
3. Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.
4. Prefabricated Fitting Covers: Comply with ASTM C 450 and ASTM C 585 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

G. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Cell-U-Foam Corporation; Ultra-CUF.
b. Pittsburgh Corning Corporation; Foamglass Super K.

2. Block Insulation: ASTM C 552, Type I.
3. Special-Shaped Insulation: ASTM C 552, Type III.
4. Board Insulation: ASTM C 552, Type IV.
5. Preformed Pipe Insulation with Factory-Applied ASJ or ASJ-SSL: Comply with ASTM C 552, Type II, Class 2.
6. Factory fabricated shapes according to ASTM C 450 and ASTM C 585.

H. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Aeroflex USA Inc.; Aerocel and Aerocel (EPDM).
b. Armacell LLC; AP Armaflex and UT Solaflex (EPDM).
c. K-Flex USA; Insul-Sheet, K-Flex and Kflex HT (EPDM).

2. Where flexible elastomeric (EPDM) is required, it shall be suitable for continuous operation up to at least 250 deg. F and down to at least -40 deg. F and be U.V. resistant in accordance with ASTM G7/G90.

I. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type II with factory-applied vinyl jacket, III with factory-applied FSK jacket, III with factory-applied FSP jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CertainTeed Corp.; Duct Wrap.
b. Johns Manville; Microlite.
c. Knauf Insulation; Duct Wrap.
d. Manson Insulation Inc.; Alley Wrap.
e. Owens Corning; All-Service Duct Wrap.

J. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. For equipment applications, provide insulation with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CertainTeed Corp.; Commercial Board.
b. Fibrex Insulations Inc.; FBX.
c. Johns Manville; 800 Series Spin-Glas.
d. Knauf Insulation; Insulation Board.
e. Manson Insulation Inc.; AK Board.
f. Owens Corning; Fiberglas 700 Series.

K. Mineral-Fiber, Preformed Pipe Insulation:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Fibrex Insulations Inc.; Coreplus 1200.
b. Johns Manville; Micro-Lok.
c. Knauf Insulation; Earthwool 1000.
d. Manson Insulation Inc.; Alley-K.
e. Owens Corning; Fiberglas Pipe Insulation.

2. Type I, 850 deg F (454 deg C) Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ or with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

L. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semi-rigid board material with factory-applied ASJ complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. (40 kg/cu. m) or more. Thermal conductivity (k-value) at 100 deg F (55 deg C) is 0.29 Btu x in./h x sq. ft. x deg F (0.042 W/m x K) or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CertainTeed Corp.; CrimpWrap.
b. Johns Manville; MicroFlex.
c. Knauf Insulation; Pipe and Tank Insulation.
d. Manson Insulation Inc.; AK Flex.
e. Owens Corning; Fiberglas Pipe and Tank Insulation.

2.2 FIRE-RATED INSULATION SYSTEMS

A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with fully encased FSK jacket that is tested and certified to provide a 2-hour fire rating by a NRTL acceptable to authority having jurisdiction.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CertainTeed Corp.; FlameChek.
b. Johns Manville; Firetemp Wrap.
c. Morgan Thermal Ceramics; FireMaster Duct Wrap or Fastwrap XL.
d. 3M; Fire Barrier Wrap Products.
e. Unifrax Corporation; FyreWrap.
f. Vesuvius; PYROSCAT FP FASTR Duct Wrap.

B. Performance:

1. Zero inch clearance required to combustible construction at all points along the ductwork (including insulation joints).
2. Continuous product model and rating markups on foil face for identification.
3. Blanket shall be UL classified non-combustible with a flame spread of 0, smoke development of 0 and fuel construction of 0.
4. Suitable for continuous use to 300 deg F; four hour operation at 500 deg F.
5. Provide UL listed terminations at shaft construction with firestopping details as required by the authority having jurisdiction.
6. Accommodate duct access doors with easily removable sections of insulation.

C. Air Duct Application:

1. Single layer application to achieve required rating.
2. Minimum 1-1/2” thickness.

D. Grease Duct Application:

1. Double layer application to achieve required rating.
2. Minimum 1-1/2” thickness per layer.

3. Installation in compliance with all sections of ASTM E2336. Provide 2” thick layers as required.

2.3 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Insulco, Division of MFS, Inc.; Triple I.
b. P. K. Insulation Mfg. Co., Inc.; Super-Stik.

2.4 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
B. Calcium Silicate Adhesive: Fibrous, sodium-silicate-based adhesive with a service temperature range of 50 to 800 deg F (10 to 427 deg C).

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-97.
b. Foster Products Corporation, H. B. Fuller Company; 81-27/81-93.
c. Marathon Industries, Inc.; 290.
d. Mon-Eco Industries, Inc.; 22-30.
e. Vimasco Corporation; 760.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Cellular-Glass Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F (minus 59 to plus 149 deg C).

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-96.
b. Foster Products Corporation, H. B. Fuller Company; 81-33.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Aeroflex USA Inc.; Aeroseal.
b. Armacell LCC; 520 Adhesive.
c. Foster Products Corporation, H. B. Fuller Company; 85-75.
d. K-Flex USA.
e. RBX Corporation; Rubatex Contact Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Childers Products, Division of ITW; CP-82.
    b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    d. Marathon Industries, Inc.; 225.
    e. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Childers Products, Division of ITW; CP-82.
    b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    d. Marathon Industries, Inc.; 225.
    e. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Dow Chemical Company (The); 739, Dow Silicone.
    b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
    c. P.I.C. Plastics, Inc.; Welding Adhesive.
    d. Speedline Corporation; Speedline Vinyl Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
1. Products: Subject to compliance with requirements, provide one of the following:

    a. Childers Products, Division of ITW; CP-35.
    b. Foster Products Corporation, H. B. Fuller Company; 30-90.
    c. ITW TACC, Division of Illinois Tool Works; CB-50.
    d. Marathon Industries, Inc.; 590.
    e. Mon-Eco Industries, Inc.; 55-40.
    f. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm (0.009 metric perm) at 43-mil (1.09-mm) dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F (Minus 29 to plus 82 deg C).
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Cellular-Glass, Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76.
b. Foster Products Corporation, H. B. Fuller Company; 30-45.
c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Pittsburgh Corning Corporation; Pittseal 444.
f. Vimasco Corporation; 750.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F (Minus 73 to plus 149 deg C).
5. Color: White or gray.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. FSK and Metal Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76-8.
b. Foster Products Corporation, H. B. Fuller Company; 95-44.
c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Vimasco Corporation; 750.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: Aluminum.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
4. FSP Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C 1136, Type II.
5. Vinyl Jacket: White vinyl with a permeance of 1.3 perms (0.86 metric perms) when tested according to ASTM E 96, Procedure A, and complying with NFPA 90A and NFPA 90B.

2.8 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric for Pipe Insulation: Approximately 2 oz./sq. yd. (68 g/sq. m) with a thread count of 10 strands by 10 strands/sq. inch (4 strands by 4 strands/sq. mm) for covering pipe and pipe fittings.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Vimasco Corporation; Elastafab 894.

B. Woven Glass-Fiber Fabric for Duct and Equipment Insulation: Approximately 6 oz./sq. yd. (203 g/sq. m) with a thread count of 5 strands by 5 strands/sq. inch (2 strands by 2 strands/sq. mm) for covering equipment.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; Chil-Glas No. 5.

C. Woven Polyester Fabric: Approximately 1 oz./sq. yd. (34 g/sq. m) with a thread count of 10 strands by 10 strands/sq. inch (4 strands by 4 strands/sq. mm), in a Leno weave, for duct, equipment, and pipe.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Foster Products Corporation, H. B. Fuller Company; Mast-A-Fab.
b. Vimasco Corporation; Elastafab 894.

2.9 FIELD-APPLIED CLOTHS

A. Woven Glass-Fiber Fabric: Comply with MIL-C-20079H, Type I, plain weave, and presized a minimum of 8 oz./sq. yd. (271 g/sq. m).

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Alpha Associates, Inc.; Alpha-Maritex 84215 and 84217/9485RW, Luben 59.

2.10 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules. Flame spread of 25 or less and smoke developed rating of 50 or less per ASTM E84.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Johns Manville; Zeston.
    b. P.I.C. Plastics, Inc.; FG Series.
    c. Proto PVC Corporation; LoSmoke.
    d. Speedline Corporation; SmokeSafe.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

    a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

5. Factory-fabricated tank heads and tank side panels.

C. Metal Jacket:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Childers Products, Division of ITW; Metal Jacketing Systems.
    b. PABCO Metals Corporation; Surefit.
    c. RPR Products, Inc.; Insul-Mate.

2. Aluminum Jacket: Comply with ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105 or 5005, Temper H-14.

    a. Finish and thickness are indicated in field-applied jacket schedules.
    b. Moisture Barrier for Indoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper or 2.5-mil- (0.063-mm-) thick Polysurlyn.
    c. Moisture Barrier for Outdoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper or 2.5-mil- (0.063-mm-) thick Polysurlyn.
    d. Factory-Fabricated Fitting Covers:

        1) Same material, finish, and thickness as jacket.
        2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
        3) Tee covers.
        4) Flange and union covers.
        5) End caps.
        6) Beveled collars.
        7) Valve covers.
        8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

3. Stainless-Steel Jacket: ASTM A 167 or ASTM A 240/A 240M.

    a. Material, finish, and thickness are indicated in field-applied jacket schedules.
    b. Moisture Barrier for Indoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper or 2.5-mil- (0.063-mm-) thick Polysurlyn.
    c. Moisture Barrier for Outdoor Applications: 3-mil- (0.075-mm-) thick, heat-bonded polyethylene and kraft paper or 2.5-mil- (0.063-mm-) thick Polysurlyn.
    d. Factory-Fabricated Fitting Covers:

        1) Same material, finish, and thickness as jacket.
        2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
        3) Tee covers.
        4) Flange and union covers.
        5) End caps.

6) Beveled collars.
7) Valve covers.
8) Field fabricated fitting covers only if factory-fabricated fitting covers are not available.

D. Self-Adhesive Outdoor Jacket: 60-mil- (1.5-mm-) thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross-laminated polyethylene film covered with stucco-embossed aluminum-foil facing.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Polyguard; Alumaguard 60.

2.11 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with pressure sensitive acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
b. Compac Corp.; 104 and 105.
c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Minimum width: 3 inches (75 mm).
3. Thickness: 11.5 mils (0.29 mm).
4. Adhesion: 45 ounces force/inch (1.0 N/mm) in width.
5. Elongation: 2 percent.
6. Tensile strength: 40 lbf/inch (7.2 N/mm) in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
8. WVTR: 0.02 perms per ASTM E96.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic pressure sensitive adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
b. Compac Corp.; 110 and 111.
c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK.
d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.

2. Minimum width: 3 inches.
3. Minimum thickness: 6.5 mils.
4. Minimum adhesion: 40 ounces force/inch in width.
5. Elongation: 2 percent.
6. Minimum tensile strength: 40 lbf/inch (7.2 N/mm) in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
8. WVTR: 0.02 perms per ASTM E96.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0555.
b. Compac Corp.; 130.
c. Ideal Tape Co., Inc., an American Biltrite Company; 370 White PVC tape.
d. Venture Tape; 1506 CW NS.

2. Width: 2 inches (50 mm).
3. Thickness: 6 mils (0.15 mm).
4. Adhesion: 64 ounces force/inch (0.7 N/mm) in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch (3.3 N/mm) in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
b. Compac Corp.; 120.
c. Ideal Tape Co., Inc., an American Biltrite Company; 488 AWF.
d. Venture Tape; 3520 CW.

2. Width: 2 inches (50 mm).
3. Thickness: 3.7 mils (0.093 mm).
4. Adhesion: 100 ounces force/inch (1.1 N/mm) in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch (6.2 N/mm) in width.

E. Bands:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products; Bands.
b. PABCO Metals Corporation; Bands.
c. RPR Products, Inc.; Bands.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch (0.38 mm) thick, 3/4 inch (19 mm) wide with wing seal .
3. Aluminum: ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch (0.51 mm) thick, 3/4 inch (19 mm) wide with wing seal .

F. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin (or other material as required for stainless or aluminum ductwork), fully annealed for capacitor-discharge welding, 0.135-inch-(3.5-mm-) diameter shank, length to suit depth of insulation indicated.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CWP-1.
2) GEMCO; CD.
3) Midwest Fasteners, Inc.; CD.
4) Nelson Stud Welding; TPA, TPC, and TPS.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin (or other material as required for stainless steel or aluminum duct), fully annealed for capacitor-discharge welding, 0.135-inch- (3.5-mm-) diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch (38-mm) galvanized carbon-steel washer.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CWP-1.
2) GEMCO; Cupped Head Weld Pin.
3) Midwest Fasteners, Inc.; Cupped Head.
4) Nelson Stud Welding; CHP.

3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.
2) GEMCO; Perforated Base.
3) Midwest Fasteners, Inc.; Spindle.

b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.76 mm) thick by 2 inches (50 mm) square.
c. Spindle: Fully annealed, 0.106-inch- (2.6-mm-) diameter shank, length to suit depth of insulation indicated.
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

4. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm) thick, sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches (38 mm) in diameter.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; RC-150.
2) GEMCO; R-150.
3) Midwest Fasteners, Inc.; WA-150.
4) Nelson Stud Welding; Speed Clips.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

5. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches (38 mm) in diameter.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) GEMCO.
2) Midwest Fasteners, Inc.

G. Staples: Outward-clinching insulation staples, nominal 3/4-inch- (19-mm-) wide, stainless steel or Monel.

H. Wire: 0.062-inch (1.6-mm) soft-annealed, stainless steel.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. C & F Wire.

b. Childers Products.
c. PABCO Metals Corporation.
d. RPR Products, Inc.

2.12 CORNER ANGLES

A. Aluminum Corner Angles: 0.040 inch (1.0 mm) thick, minimum 1 by 1 inch (25 by 25 mm), aluminum according to ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105 or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

C. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Carbon steel: Coat carbon steel operating at a service temperature below 60 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches (100 mm) o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches (38 mm). Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches (50 mm) o.c.

    a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant. Fabricate a cellular glass "box" around the pump which is removable. Utilize flexible elastomeric at penetrations and seal with silicone. Allow for removal of suction diffuser screen if a suction diffuser is installed.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches (50 mm).
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches (50 mm).

1. Comply with requirements in Division 7 Section "Firestopping" and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches (50 mm).
2. Pipe: Install insulation continuously through floor penetrations.
3. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 7 Section "Firestopping."

3.5 EQUIPMENT, TANK, AND VESSEL INSULATION INSTALLATION

A. Mineral Fiber, Pipe and Tank Insulation Installation for Tanks and Vessels: Secure insulation with adhesive and anchor pins and speed washers.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for minimum 50 percent coverage of tank and vessel surfaces.
2. Groove and score insulation materials to fit as closely as possible to equipment, including contours. Bevel insulation edges for cylindrical surfaces for tight joints. Stagger end joints.
3. Protect exposed corners with secured corner angles.
4. Install adhesively attached or self-sticking insulation hangers and speed washers on sides of tanks and vessels as follows:

a. Do not weld anchor pins to ASME-labeled pressure vessels.

b. Select insulation hangers and adhesive that are compatible with service temperature and with substrate.
c. On tanks and vessels, maximum anchor-pin spacing is 3 inches (75 mm) from insulation end joints, and 16 inches (400 mm) o.c. in both directions.
d. Do not overcompress insulation during installation.
e. Cut and miter insulation segments to fit curved sides and domed heads of tanks and vessels.
f. Impale insulation over anchor pins and attach speed washers.
g. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

5. Secure each layer of insulation with stainless-steel or aluminum bands. Select band material compatible with insulation materials.
6. Where insulation hangers on equipment and vessels are not permitted or practical and where insulation support rings are not provided, install a girdle network for securing insulation. Stretch prestressed aircraft cable around the diameter of vessel and make taut with clamps, turnbuckles, or breather springs. Place one circumferential girdle around equipment approximately 6 inches (150 mm) from each end. Install wire or cable between two circumferential girdles 12 inches (300 mm) o.c. Install a wire ring around each end and around outer periphery of center openings, and stretch prestressed aircraft cable radially from the wire ring to nearest circumferential girdle. Install additional circumferential girdles along the body of equipment or tank at a minimum spacing of 48 inches (1200 mm) o.c. Use this network for securing insulation with tie wire or bands.
7. Stagger joints between insulation layers at least 3 inches (75 mm).
8. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection.
9. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
10. For equipment with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.

B. Flexible Elastomeric Thermal Insulation Installation for Tanks and Vessels: Install insulation over entire surface of tanks and vessels.

1. Apply 100 percent coverage of adhesive to surface with manufacturer's recommended adhesive.
2. Seal longitudinal seams and end joints.

C. Insulation Installation on Pumps:

1. Fabricate custom fitted insulation pieces. Fit pieces around pumps and coincide joints with splits in pump casings. Fabricate joints with outward bolted flanges. Secure box sections together using a latching mechanism for easy removal of sections to maintain pump.
2. For below ambient services, install a vapor barrier at seams, joints, and penetrations. Seal between flanges with replaceable gasket material to form a vapor barrier. Fabricate a cellular glass “box” around the pump which is removable. Utilize flexible elastomeric at penetrations and seal with silicone. Allow for removal of suction diffuser screen if a suction diffuser is installed.

3.6 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the gate valve bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate steam safety relief valves up to the bottom base and provide the minimum clearance to the nuts and bolts to remove the flanged safety relief valve.
6. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
7. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
8. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
9. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
10. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.
11. Install insulation at coil connection piping not required to have a continuous vapor barrier such that the maximum length of uninsulated piping does not exceed 3” in length.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.7 FLEXIBLE ELASTOMERIC INSULATION INSTALLATION

A. Seal longitudinal seams and end joints with manufacturers’ recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturers' recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 MINERAL-FIBER INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch (25 mm), and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

E. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's written recommended coverage rates.
2. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On exposed ductwork where no ceiling is installed, on all duct sizes greater than 12 inch span, place pins along longitudinal centerline of duct on both duct sides and on the duct bottom. Space pins 3 inches (75 mm) maximum from insulation section joints, and maximum 16 inches (400 mm) on center each way from other pins.
    b. On concealed ductwork, on duct with dimensions larger than 24 inches, place pins at a maximum of 16 inches (400 mm) on center each way from other pins and 3 inches (75 mm) maximum from insulation section joints. Install pins on any side or the bottom with dimension greater than 24". Install additional pins to hold insulation tightly against the duct surface at structural steel cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not over compress insulation during installation.
    e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing. Tape shall extend at least 2 inches in all directions from the pin.

3. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches (50 mm) from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch (13-mm) outward-clinching staples installed at a maximum of 3 inches on center between staples. Install vapor barrier tape at each joint. Vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant may be used at joints, seams, and protrusions in lieu of vapor barrier tape.

    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 deg F (10 deg C) at 18-foot (5.5-m) intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches (75 mm).

4. Overlap unfaced blankets a minimum of 2 inches (50 mm) on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches (450 mm) o.c.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-(150-mm-) wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches (150 mm) o.c.
7. Insulate duct mounted coils located within terminal units (terminal boxes, supply air valves, fan coil units) by extending external duct insulation over the terminal unit a minimum of two inches. Insulate over return bends.
8. Insulate the external side of diffusers as noted on the details.

F. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for minimum 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches (450 mm) and smaller, place pins along longitudinal centerline of duct. Space 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c.
    b. On duct sides with dimensions larger than 18 inches (450 mm), space pins 16 inches (400 mm) o.c. each way, and 3 inches (75 mm) maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches (50 mm) from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch (13-mm) outward-clinching staples, 1 inch (25 mm) o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 deg F (10 deg C) at 18-foot (5.5-m) intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches (75 mm).

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- (150-mm-) wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches (150 mm) o.c.

3.9 FIELD-APPLIED JACKET INSTALLATION

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.

1. Draw jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch- (1.6-mm-) thick coats of lagging adhesive.
3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch (38-mm) laps at longitudinal seams and 3-inch- (75-mm-) wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

C. Where PVC jackets are indicated, install with 1-inch (25-mm) overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

D. Where metal jackets are indicated, install with 2-inch (50-mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches (300 mm) o.c. and at end joints.

3.10 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.

B. Insulate duct access panels and doors to achieve same fire rating as duct.

C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Division 7 Section "Firestopping."

3.11 FINISHES

A. Duct, Equipment, and Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 9 painting Sections.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.12 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.13 DUCT INSULATION SCHEDULE, GENERAL

A. Comply with the requirements in “Indoor Duct and Plenum Insulation Schedule” and “Aboveground, Outdoor Duct and Plenum Insulation Schedule” Articles for where insulating materials shall be applied.

B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Factory-insulated flexible ducts.

3. Factory-insulated plenums and casings.
4. Flexible connectors.
5. Vibration-control devices.
6. Factory-insulated access panels and doors.

C. Products shall not contain asbestos, lead, mercury or mercury compounds.

D. Products that come into contact with stainless steel shall be qualified as acceptable according to ASTM C795.

3.14 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed, rectangular, round and flat oval, supply air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 2 inches minimum thick and 1.0-lb/cu. ft. nominal density to achieve a minimum installed (at 25% compression) R value of 6.0 at 75 deg F. mean temperature.

B. Concealed, rectangular, round and flat oval, return air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches minimum thick and 0.75-lb/cu. ft. nominal density to achieve a minimum installed R value of 3.5 at 75 deg F mean temperature.

C. Concealed, rectangular, round and flat-oval, outdoor-air duct and energy recovery device discharge air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 2 inches (50 mm) minimum thick and 1.0-lb/cu. ft. nominal density to achieve a minimum installed R value of 6.0 at 75 deg F mean temperature.
2. Insulate energy recovery device discharge air duct from the outlet of the energy recovery device to the penetration of the building exterior.

D. Concealed and exposed rectangular and round, exhaust-air and relief air duct insulation between isolation damper and penetration of building exterior shall be the following:

1. Mineral-Fiber Blanket: 2 inches (50 mm) thick and 1.0-lb/cu. ft. nominal density.

E. Concealed and Exposed, Type I, Commercial, Kitchen Hood Exhaust Duct and Plenum Insulation: Fire-rated blanket insulating system; thickness as required to achieve 2-hour fire rating.

F. Exposed, supply-air duct, relief air duct, return air duct, outdoor air duct and energy recovery device discharge air duct insulation shall be the following:

1. Flexible Elastomeric: 1 inch (25 mm) thick on edges, corners, and flanges of ductwork which are less than 6’-6” above finished floor with space below them for personal access.
2. Mineral-Fiber Blanket: 2 inches (50 mm) thick and 1.0-lb/cu. ft. nominal density on surfaces which are more than 8’-0” above finished floor.
3. Mineral-Fiber Board: 2 inches (50 mm) thick and 6-lb/cu. ft. nominal density for ductwork which is less than 8’-0” above finished floor.

G. Concealed and exposed ductwork with fire rated blanket insulating system: Fire rated blanket insulating system thickness as required to achieve 2-hour fire rating.

H. Concealed and exposed oven and warewash exhaust duct insulation shall be the following: 2 inches minimum thick and 1.0 lb/cu.ft. nominal density to achieve a minimum installed (at 25% compression) R value of 6.0 at 75 deg F mean temperature.

3.15 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Contractor's option.

B. Concealed, and exposed, rectangular, round and flat-oval, supply-air, return air and exhaust air duct insulation shall be the following:

1. Mineral-Fiber Board: 4 inches minimum thick, 6-lb/cu. ft. (96-kg/cu. m) nominal density to achieve a minimum R value of 17.0 at 75 deg F. mean temperature.
2. Elastomeric (EPDM): 4 inches minimum thick with additional UV resistant coating furnished by the insulation manufacturer.

3.16 EQUIPMENT INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a type of equipment, selection from materials listed is Contractor's option.

B. Insulate indoor and outdoor equipment in paragraphs below that is not factory insulated.

C. Chillers: Insulate cold surfaces on chillers, including, but not limited to, evaporator bundles, heat-recovery bundles, suction piping, compressor inlets, tube sheets, water boxes, and nozzles with the following:

1. Flexible Elastomeric: 1-1/2 inch thick.

D. Heat-exchanger (water-to-water for cooling service) insulation shall be:

1. Flexible Elastomeric: 1-1/2 inch thick.

E. Heat-exchanger (water-to-water for heating service) insulation shall be:

1. Mineral-Fiber Pipe and Tank: 2 inches (50 mm) thick.

F. Steam-to-hot-water heater exchanger (converter) insulation shall be:

1. Mineral-Fiber Pipe and Tank: 3 inches thick.

G. Chilled-water pump insulation shall be one of the following:

1. Flexible elastomeric: 2 inch thick.
2. Cellular Glass: 2-inch thick.

H. Heating-hot-water pump insulation shall be the following:

1. Mineral fiber pipe and tank: 2-inches thick.

I. Heat-recovery pump insulation shall be:

1. Flexible elastomeric: 1-1/2 inch thick.

J. Steam condensate pump and boiler feedwater pump insulation shall be the following:

1. Mineral-Fiber Pipe and Tank: 3 inches thick.

K. Chilled-water expansion/compression tank insulation shall be one of the following:

1. Flexible Elastomeric: 1 inch (25 mm) thick.
2. Mineral-Fiber Pipe and Tank: 1 inch (25 mm) thick.

L. Heating-hot-water expansion/compression tank insulation shall be the following:

1. Mineral fiber pipe and tank: 2-inches thick.

M. Heat-recovery expansion/compression tank insulation shall be the following:

1. Flexible Elastomeric: 1 inch (25 mm) thick.

N. Chilled-water air-separator insulation shall be the following:

1. Flexible Elastomeric: 1-1/2 inches thick.

O. Heating-hot-water air-separator insulation shall be the following:

1. Mineral-Fiber Pipe and Tank: 2 inches (50 mm) thick.

P. Heat-recovery air-separator insulation shall be the following:

1. Flexible Elastomeric: 1-1/2 inches thick.

Q. Fans located on the discharge of heat recovery devices shall be the following:

1. Mineral fiber board: 2-inches thick.

R. Thermal storage tank (brine, water, ice) insulation shall be the following:

1. Cellular Glass: 4 inches (100 mm) thick.

S. Deaerator insulation shall be the following:

1. Mineral-Fiber Pipe and Tank: 3 inches thick.

T. Steam condensate tank and receiver insulation shall be the following:

1. Mineral-Fiber Pipe and Tank: 3 inches thick.

U. Steam flash-tank, flash-separator, and blow-off-tank insulation shall be the following:

1. Mineral-Fiber Pipe and Tank: 2 inches (50 mm) thick.

V. Piping system filter-housing insulation shall match the type and thickness of the air separators in that piping system. Allow for filter removal and other access with removable pieces of insulation.

3.17 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from the materials listed is at the Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

C. Products shall not contain asbestos, lead, mercury or mercury compounds.

D. Products that come into contact with stainless steel shall be qualified as acceptable according to ASTM C795.

3.18 INDOOR PIPING INSULATION SCHEDULE

A. Condensate and Equipment Drain Water below 60 Deg F (16 Deg C):

1. All Pipe Sizes: Insulation shall be the following:

a. Flexible Elastomeric: 3/4 inch (19 mm) thick.

B. Refrigerant Suction, Liquid, and Hot-Gas Piping and Tubing:

1. NPS 1-1/2 and Smaller: Insulation shall be the following:

a. Cellular glass: 1 inch (25 mm) thick.
b. Flexible elastomeric: 1 inch (25 mm) thick.

2. NPS 1-5/8 and Larger:

a. Cellular glass: 1-1/2 inches thick.
b. Flexible elastomeric: 1-1/2 inches thick.

3.19 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping and Tubing:

1. All Pipe Sizes: Insulation shall be the following:

a. Flexible Elastomeric (EPDM): 2 inches (50 mm) thick.

3.20 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Exposed; within finished occupied spaces; below 8’-0” above finished floor:

1. PVC: 20 mils (0.5 mm) thick.

3.21 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket. Confirm that the vapor barrier of the insulation is 100% intact and repair as necessary prior to applying jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Ducts and Plenums, Exposed:

1. Aluminum, Stucco Embossed: 0.024 inch (0.61 mm) thick.
2. Field applied fabric reinforcing mesh with vapor barrier mastic.

D. Piping, Exposed:

1. Aluminum, Stucco Embossed: 0.032 inch (0.81 mm) thick.

END OF SECTION

SECTION 23 23 00

REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

1.2 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-22:

1. Suction Lines for Air-Conditioning Applications: 185 psig (1276 kPa).
2. Suction Lines for Heat-Pump Applications: 325 psig (2241 kPa).
3. Hot-Gas and Liquid Lines: 325 psig (2241 kPa).

B. Line Test Pressure for Refrigerant R-134a:

1. Suction Lines for Air-Conditioning Applications: 115 psig (793 kPa).
2. Suction Lines for Heat-Pump Applications: 225 psig (1551 kPa).
3. Hot-Gas and Liquid Lines: 225 psig (1551 kPa).

C. Line Test Pressure for Refrigerant R-407C:

1. Suction Lines for Air-Conditioning Applications: 230 psig (1586 kPa).
2. Suction Lines for Heat-Pump Applications: 380 psig (2620 kPa).
3. Hot-Gas and Liquid Lines: 380 psig (2620 kPa).

D. Line Test Pressure for Refrigerant R-410A:

1. Suction Lines for Air-Conditioning Applications: 300 psig (2068 kPa).
2. Suction Lines for Heat-Pump Applications: 535 psig (3689 kPa).
3. Hot-Gas and Liquid Lines: 535 psig (3689 kPa).

1.3 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:

1. Thermostatic expansion valves.
2. Solenoid valves.
3. Hot-gas bypass valves.
4. Filter dryers.
5. Strainers.
6. Pressure-regulating valves.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.

1. Shop Drawing Scale: 1/4 inch equals 1 foot (1:50).

2. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
3. Verify piping system design with equipment manufacturers. Obtain manufacturer's written approval of pipe sizing, piping layout and all other system design features prior to system installation.

C. Welding certificates.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.5 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

1.6 COORDINATION

A. Coordinate size and location of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

B. Coordinate layout and installation of refrigerant piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

C. Coordinate pipe sleeve installations for foundation wall penetrations.

D. Coordinate pipe sleeve installations for penetrations in exterior walls and floor assemblies. Coordinate with requirements for firestopping specified in Division 7 Section "Firestopping" for materials and methods for sealing pipe penetrations through fire and smoke barriers.

E. Coordinate pipe fitting pressure classes with products specified in related Sections.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22, streamlined pattern.

C. Wrought-Copper Unions: ASME B16.22, female pattern, brass-to-brass seat, ground joints, socket to socket connections.

D. Brazing Filler Metals: AWS A5.8, Classification BAg-1 (silver) or BAg-2 (silver).

E. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch (20-mm) misalignment in minimum 7-inch-(180-mm-) long assembly.
4. Pressure Rating: Factory test at minimum 500 psig (3450 kPa).
5. Maximum Operating Temperature: 250 deg F (121 deg C).

2.2 VALVES AND SPECIALTIES

A. Packed-Angle Valves:

1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Non-rotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.
6. End Connections: Socket.
7. Working Pressure Rating: 500 psig (3450 kPa).
8. Maximum Operating Temperature: 275 deg F (135 deg C).

B. Check Valves:

1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket.
7. Maximum Opening Pressure: 0.50 psig (3.4 kPa).
8. Working Pressure Rating: 500 psig (3450 kPa).
9. Maximum Operating Temperature: 275 deg F (135 deg C).

C. Service Valves:

1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Socket.
5. Working Pressure Rating: 500 psig (3450 kPa).

D. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.

1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch (16-GRC) conduit adapter, and normally closed ac coil.
6. Working Pressure Rating: 400 psig (2760 kPa).
7. Maximum Operating Temperature: 240 deg F (116 deg C).
8. Manual operator.

E. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.

1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat Disc: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Working Pressure Rating: 400 psig (2760 kPa).
6. Maximum Operating Temperature: 240 deg F (116 deg C).

F. Thermostatic Expansion Valves: Comply with ARI 750.

1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg F (4.4 deg C) or to match system conditions.
6. Superheat: Adjustable. Factory set for system superheat conditions.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket.
9. Working Pressure Rating: 450 psig (3100 kPa).
10. Size and Operating Conditions: As recommended by manufacturer of evaporator.
11. Hot Gas Bypass Provisions: Provide side connection and external equalizer line.

G. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.

1. Body, Bonnet, and Seal Cap: Ductile iron or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
5. Seat: Polytetrafluoroethylene.
6. Equalizer: External.
7. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch (16-GRC) conduit adapter, and ac coil.
8. End Connections: Socket.
9. Set Pressure: Adjustable.
10. Throttling Range: Maximum 5 psig (34 kPa), sized for capacity equal to last step of compressor unloading.
11. Working Pressure Rating: 500 psig (3450 kPa).
12. Maximum Operating Temperature: 240 deg F (116 deg C).

H. Straight-Type Strainers:

1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel in liquid lines less than 1-1/4”, 60 mesh in larger lines. 40 mesh in suction lines.
3. End Connections: Socket.
4. Working Pressure Rating: 500 psig (3450 kPa).
5. Maximum Operating Temperature: 275 deg F (135 deg C).
6. Select mesh size in accordance with manufacturer’s recommendations.

I. Angle-Type Strainers:

1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel in liquid lines less than 1-1/4”, 60 mesh in larger lines. 40 mesh in suction lines..
4. End Connections: Socket.
5. Working Pressure Rating: 500 psig (3450 kPa).
6. Maximum Operating Temperature: 275 deg F (135 deg C).
7. Select mesh size in accordance with manufacturer’s recommendations.

J. Moisture/Liquid Indicators:

1. Body: Forged brass.

2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket.
6. Working Pressure Rating: 500 psig (3450 kPa).
7. Maximum Operating Temperature: 240 deg F (116 deg C).

K. Replaceable-Core Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support. Replaceable.
3. Desiccant Media: Activated alumina.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 (DN 8) connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 1.0 psig at rated flow.
8. Rated Flow: In accordance with evaporator manufacturer's recommendations.
9. Working Pressure Rating: 500 psig (3450 kPa).
10. Maximum Operating Temperature: 240 deg F (116 deg C).

L. Mufflers:

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket.
3. Working Pressure Rating: 500 psig (3450 kPa).
4. Maximum Operating Temperature: 275 deg F (135 deg C).
5. Maximum Pressure Loss: 0.5 psig at rated flow.

M. Receivers: Comply with ARI 495.

1. Comply with ASME Boiler and Pressure Vessel Code for receivers larger than 6 inches; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket.
6. Working Pressure Rating: 500 psig (3450 kPa).
7. Maximum Operating Temperature: 275 deg F (135 deg C).

N. Liquid Accumulators: Comply with ARI 495.

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket.
3. Working Pressure Rating: 500 psig (3450 kPa).
4. Maximum Operating Temperature: 275 deg F (135 deg C).

2.3 REFRIGERANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Atofina Chemicals, Inc.
2. DuPont Company; Fluorochemicals Div.
3. Honeywell, Inc.; Genetron Refrigerants.
4. INEOS Fluor Americas LLC.

B. ASHRAE 34, R-22: Monochlorodifluoromethane.

C. ASHRAE 34, R-134a: Tetrafluoroethane.

D. ASHRAE 34, R-407C: Difluoromethane/Pentafluoroethane/1,1,1,2-Tetrafluoroethane.

E. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-22, R-134a, R407C, R-410A

A. Suction Lines, Hot Gas Lines and Liquid Lines for Conventional Air-Conditioning Applications: Copper, Type ACR and wrought-copper fittings with brazed joints.
1. Above ground outside building and on roof: Drawn temper tubing.
2. Above ground within building: Annealed temper (soft) tubing.
3. Below ground: Type L (B) tubing.

B. Safety-Relief-Valve Discharge Piping: Copper, Type L (B), drawn-temper tubing and wrought-copper fittings with brazed joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install packed-angle valves in suction and discharge lines of compressor for gage taps at hot gas bypass regulators and directly on each side of strainers and dryers.

B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.

C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.

D. Install check valves in condenser liquid lines on multiple condenser systems.

E. Except as otherwise indicated, install packed-angle valves on inlet and outlet side of filter dryers, strainers and evaporators.

F. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top. Install all wiring and conduit necessary for a complete functioning installation.

G. Install thermostatic expansion valves as close as possible to distributors on evaporators.

1. Install valve so diaphragm case is warmer than bulb.
2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
4. Install in accordance with evaporator manufacturer's instructions.

H. Install packed angle valve in liquid line between receiver shutoff valve and thermostatic expansion valve for system charging.

I. Install safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

J. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube, in liquid line leaving receiver, in liquid line leaving condenser and on leaving side of liquid solenoid valves.

K. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:

1. Solenoid valves.
2. Thermostatic expansion valves.
3. Hot-gas bypass valves.
4. Compressor suction valves.

L. Install replaceable core filter dryers in liquid line between compressor and thermostatic expansion valve and in the suction line at the compressor.

M. Install receivers sized to accommodate pump-down charge. Install solenoid valves in liquid lines of systems with pump out or pump down compressor control.

N. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Refer to Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operation" for solenoid valve controllers, control wiring, and sequence of operation.

K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.

M. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation. Pipe passing through exterior building walls shall be caulked weathertight with non-hardening epoxy type waterproof compound.

N. Belowground, install copper tubing in protective conduit. Vent conduit outdoors.

O. Install unions to allow removal of solenoid valves, pressure-regulating valves, and expansion valves and at connections to compressors and evaporators.

P. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

Q. Slope refrigerant piping as follows:

1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
2. Install horizontal suction lines with a uniform slope downward to compressor.
3. Install traps and double risers to entrain oil in vertical runs.
4. Liquid lines may be installed level.

R. When brazing, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

S. Seal penetrations through fire and smoke barriers according to Division 07 Section "Firestopping."

T. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

U. Seal pipe penetrations through exterior walls according to Division 07 Section "Joint Sealants" for materials and methods.

V. Identify refrigerant piping and valves according to Division 23 Section "Identification for HVAC Piping and Equipment."

3.4 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs.
2. Spring hangers to support vertical runs.
3. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:

1. NPS 1/2 (DN 15): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.4 mm).
2. NPS 5/8 (DN 18): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.4 mm).
3. NPS 1 (DN 25): Maximum span, 72 inches (1800 mm); minimum rod size, 1/4 inch (6.4 mm).

4. NPS 1-1/4 (DN 32): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
5. NPS 1-1/2 (DN 40): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
6. NPS 2 (DN 50): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
7. NPS 2-1/2 (DN 65): Maximum span, 108 inches (2700 mm); minimum rod size, 3/8 inch (9.5 mm).
8. NPS 3 (DN 80): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
9. NPS 4 (DN 100): Maximum span, 10 feet; minimum rod size, 1/2 inch (13 mm).

D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 2 (DN 50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
2. NPS 2-1/2 (DN 65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch (9.5 mm).
3. NPS 3 (DN 80): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch (9.5 mm).
4. NPS 4 (DN 100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch (13 mm).

E. Support multi-floor vertical runs at least at each floor.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.

    a. Fill system with nitrogen to the required test pressure.
    b. System shall maintain test pressure at the manifold gage throughout duration of test.
    c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
    d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:

1. Install core in filter dryers after leak test but before evacuation.
2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers (67 Pa). If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig (14 kPa).
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:

1. Open shutoff valves in condenser water circuit.
2. Verify that compressor oil level is correct.
3. Open compressor suction and discharge valves.
4. Open refrigerant valves except bypass valves that are used for other purposes.
5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION

SECTION 23 36 00

AIR TERMINAL UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Single-duct air terminal units.
2. Fan-powered air terminal units.

1.2 SUBMITTALS

A. Product Data: For each type of the following products, including rated capacities, furnished specialties, sound-power ratings, and accessories.

1. Air terminal units.
2. Liners and adhesives.
3. Sealants and gaskets.

B. LEED Submittal:

1. Product Data for Prerequisite EQ 1: Documentation indicating that units comply with ASHRAE 62.1-2004, Section 5 - "Systems and Equipment."

C. Shop Drawings: For air terminal units. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.
3. Liner information including thicknesses, method of joining and materials.
4. Discharge and radiated sound power for each terminal unit. Provide radiated sound power value referenced to 1.0 picowatt at a inlet static pressure of 2.0 inches water gauge and an air side pressure drop of 1.5 inches water gauge. Include ARI environmental adjustment factor and 10 dB of room absorption in the submitted values.
5. Leakage information, in cfm, at 3” w.g. across the fully closed damper.

D. Operation and Maintenance Data: For air terminal units to include in emergency, operation, and maintenance manuals.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

1.4 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fan-Powered-Unit Filters: Furnish one spare filter(s) for each filter installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Trane
2. Metalaire.
3. Nailor.
4. Price.
5. Titus.

2.2 SINGLE-DUCT AIR TERMINAL UNITS

A. Configuration: Volume-damper assembly inside unit casing with control components inside a protective metal shroud.

B. Casing: 0.032-inch (0.8-mm) steel wall.

1. Casing Lining: Adhesive attached, 3/4-inch- (19-mm-) thick, polyurethane closed cell foam, non-porous aluminum foil faced liner over fiberglass with sealed metal end caps, insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84. Secure lining to prevent delamination, sagging or settling with solid sheet metal liner.
2. Air Inlet: Round stub connection or S-slip and drive connections for duct attachment.
3. Air Outlet: S-slip and drive connections.
4. Access: Removable panels for access to parts requiring service, adjustment, or maintenance; with airtight gasket.
5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
6. Hanging Tabs: For supporting terminal units.

C. Volume Damper: Galvanized steel with peripheral gasket and self-lubricating bearings.

1. Maximum Damper Leakage: ARI 880 rated, tested in accordance with ASHRAE 130, 2 percent of nominal airflow at 3-inch wg (750-Pa) inlet static pressure with damper in fully closed position.
2. Damper Position: Normally open.

D. Attenuator Section: 0.034-inch (0.85-mm) steel sheet.

1. Lining: Adhesive attached, 3/4-inch- (19-mm-) thick, closed cell polyurethane foam insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84.
2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

E. Electric-Resistance Heating Coils: Nickel-chromium heating wire, free of expansion noise and hum, mounted in ceramic inserts in a galvanized-steel housing; with primary automatic, and secondary

manual, reset thermal cutouts. Terminate elements in stainless-steel, machine-staked terminals secured with stainless-steel hardware.

1. Control panel access door interlocked disconnect switch that removes power from all exposed parts.
2. Downstream air temperature sensor with local connection to override discharge-air temperature to not exceed a maximum temperature set point (adjustable.)
3. Nickel chrome 80/20 heating elements.
4. Airflow switch for proof of airflow.
5. Fuses in terminal box for overcurrent protection.
6. Pneumatic-electric switches and relays.
7. Silicon controlled rectifier (SCR) providing proportional, continuous, control of heat output by pulsing the coil on and off in response to an analog input signal.
8. Silent contactors.
9. Secondary manual reset thermal cutout.
10. Automatic reset thermal cutout.
11. Factory mounted heating coil and control panel.

F. Velocity Sensors: Multi-point array with velocity pressure sensing.

1. Flow sensing: Integral center averaging flow ring to afford velocity pressure measurement of air volume within 2% accuracy.

G. Controls: Refer to Division 23 Section “Environmental Control System” for control devices installed on all terminals.

1. Mount all controls components within a control panel enclosure with a removable cover. Panel shall be NEMA 250, Type 1.
2. Factory mount controls with a single point electrical connection.
3. Provide and wire a non-fused disconnect switch.
4. Utilize terminal strips and wiring terminations sized according to NFPA 70.

2.3 FAN-POWERED AIR TERMINAL UNITS

A. Configuration: Volume-damper assembly and fan in parallel arrangement inside unit casing with control components inside a protective metal shroud.

B. Casing: 0.034-inch (0.85-mm) steel wall.
1. Casing Lining: Adhesive attached, 3/4-inch- (19-mm-) thick, polyurethane foam insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84. Secure lining to prevent delamination sagging or settling with solid sheet metal liner.
2. Air Inlets: Round stub connections or S-slip and drive connections for duct attachment.
3. Air Outlet: S-slip and drive connections.
4. Access Doors: Removable panels for access to parts requiring service, adjustment, or maintenance; with airtight gasket and quarter-turn latches.
5. Fan: Forward-curved centrifugal.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

7. Hanging Tabs: For supporting terminal unit.

C. Volume Damper: Galvanized steel with flow-sensing ring and peripheral gasket and self-lubricating bearings.
1. Maximum Damper Leakage: ARI 880 rated, 2 percent of nominal airflow at 3-inch wg (750-Pa) inlet static pressure.
2. Damper Position: Normally closed.

D. Velocity Sensors: Multipoint array with velocity sensors in cold- and hot-deck air inlets and air outlets.

E. Motor:

1. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
2. Type: Electronically commutated motor.
3. Fan-Motor Assembly Isolation: Rubber isolators.
4. Enclosure: Open drip-proof.

5. Enclosure Materials: Rolled steel.
6. Efficiency: Premium efficient.
7. Motor Speed: Multispeed.

a. Speed Control: Infinitely adjustable with pneumatic-electric and electronic controls.

F. Filters: Minimum arrestance according to ASHRAE 52.1 and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.

1. Material: Glass fiber treated with adhesive; having 80 percent arrestance and 5 MERV.
2. Thickness: 1 inch (25 mm).

G. Attenuator Section: 0.034-inch (0.85-mm) steel sheet.
1. Lining: Adhesive attached, 3/4-inch- (19-mm-) thick, polyurethane foam insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84. Secure to prevent delamination sagging or settling with solid sheet metal liner.
2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
3. Location: Plenum air inlet.

H. Electric-Resistance Heating Coils: Nickel-chromium heating wire, free of expansion noise and hum, mounted in ceramic inserts in a galvanized steel housing with primary automatic and secondary manual, reset thermal cutouts. Terminate elements in stainless steel, machine staked terminals secured with stainless steel hardware.

1. Location: Plenum air inlet.
2. Silicon controlled rectifier (SCR).
3. Access door interlocked disconnect switch.
4. Downstream air temperature sensor with local connection to override discharge-air temperature to not exceed a maximum temperature set point (adjustable.)
5. Nickel chrome 80/20 heating elements.
6. Airflow switch for proof of airflow.
7. Fan interlock contacts.
8. Fuses in terminal box for overcurrent protection of the entire power circuit to the terminal unit.
9. Pneumatic-electric switches and relays.

I. Factory-Mounted and -Wired Controls: Electrical components mounted in control box with removable cover. Incorporate single-point electrical connection to power source.

1. Control Transformer: Factory mounted for control voltage on electric and electronic control units with terminal strip in control box for field wiring of thermostat and power source. Minimum 50VA transformer.
2. Wiring Terminations: Fan and controls to terminal strip. Terminal lugs to match quantities, sizes, and materials of branch-circuit conductors. Enclose terminal lugs in terminal box that is sized according to NFPA 70.
3. Disconnect Switch: Factory-mounted, non-fuse type.

J. Control Panel Enclosure: NEMA 250, Type 1, with access panel sealed from airflow and mounted on side of unit.

K. Controls: Refer to Division 23 Section “Environmental Control System” for control devices installed on all terminals.

1. Flow sensing: Integral center averaging flow ring to afford velocity pressure measurement of air volume within 2% accuracy.
2. Pneumatic controller: Accommodate direct and reverse acting thermostats, normally open or normally closed damper position and have the ability to adjust span and rest start point.
3. Damper actuator: Actuator to be sized to provide full damper shutoff at design (before air terminal units) system static pressure.

2.4 HANGERS AND SUPPORTS

A. Hanger Rods for Non-corrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electro-galvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Steel Cables: Galvanized steel complying with ASTM A 603 or stainless-steel complying with ASTM A 492.

D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

E. Air Terminal Unit Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials. Utilize hanging tabs rather than penetrating casing. Allow for removal of control enclosure when hanging.

F. Trapeze and Riser Supports: Steel shapes and plates for units with steel casings; aluminum for units with aluminum casings.

2.5 SOURCE QUALITY CONTROL

A. Factory Tests: Test assembled air terminal units according to ARI 880.

1. Label each air terminal unit with plan number, nominal airflow, maximum and minimum factory-set airflows, coil type, and ARI certification seal.

B. Factory Calibration: Provide factory calibration of minimum and maximum airflow settings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install air terminal units according to NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."

B. Install air terminal units level and plumb. Maintain sufficient clearance for normal service and maintenance.

C. Install exhaust valves/airflow control valves level. Rotate units for accessibility as allowed by manufacturer’s written installation instructions.

D. Install all air terminals such that the top of each air terminal is no more than 36” above the finished ceiling.

3.2 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes and for slabs more than 4 inches (100 mm) thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes and for slabs less than 4 inches (100 mm) thick.
5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hangers Exposed to View: Threaded rod and angle or channel supports.

D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.3 CONNECTIONS

A. Install piping adjacent to air terminal unit to allow service and maintenance.

B. Connect ducts to air terminal units according to Division 23 Section "Metal Ducts" or Division 23 Section "Nonmetal Ducts." Provide duct transitions where unit inlet size and duct runout size are different, see terminal unit detail.

C. Make connections to air terminal units with flexible connectors complying with requirements in Division 23 Section "Air Duct Accessories." See terminal unit detail for restrictions.

3.4 IDENTIFICATION

A. Manufacturer shall label each air terminal unit with plan number, nominal airflow, and maximum and minimum factory-set airflows and inlet size. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for equipment labels and warning signs and labels.

B. Installing Contractor shall add a hand-written label indicating the air terminal’s scheduled equipment tag on the bottom and all four sides of the air terminal prior to beginning any installation of the air terminal. Lettering shall be 2” tall and may be hand written with permanent marker directly on the bottom and sides of the air terminal on an area of the air terminal that will not receive insulation such that it is visible from the floor during construction. Under-floor terminal units shall be labeled on the top of the unit, as well as the top of the access floor tile.

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

4. Visually inspect all air terminal unit liners when making final duct connection to the terminal unit. If liner is not continuous, impervious and without damage, then remove and replace the terminal unit with a new unit.

B. Air terminal unit will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain air terminal units.

END OF SECTION

SECTION 23 81 26

DUCTLESS SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.2 ACTION SUBMITTALS

A. Submit in writing and so delineated at the beginning of each submittal, known substitutions and deviations from requirements of Contract Documents. Deviation from Contract Documents must be approved by engineer prior to submittal.

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

D. Units shall fit into the space available with adequate clearances meeting manufacturer's requirements for service and as determined by the Engineer. Submitted units, which do not meet these criteria, shall be rejected. The Contractor shall not assume that all of the manufacturers listed as acceptable manufacturers will provide a unit that will fit in the space allocated for the unit(s). If any system modifications are required to accommodate submitted equipment the contractor shall be responsible for all material, labor, and engineering cost.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance:

1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases.

B. Coordinate sizes and locations of wall penetrations with actual equipment provided.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. For Compressor: Six year(s) from date of Substantial Completion.
b. For Parts: One year(s) from date of Substantial Completion.
c. For Labor: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Mitsubishi Electric & Electronics USA, Inc.; HVAC Advanced Products Division.

2. Daikin.

3. LG

4. Approved equal.

2.2 INDOOR UNITS (5 TONS OR LESS)

A. The indoor unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. Both liquid and suction lines must be individually insulated between the outdoor and indoor units.

B. Unit Cabinet:

1. The indoor unit shall have a white, “flat screen” finish.
2. The drain and refrigerant piping shall be accessible from six (6) positions for flexible installation (right side, right back, and right bottom; and left side, left back, and left bottom.
3. The cabinet shall be supplied with a mounting plate to be installed onto a wall for securely mounting the cabinet.
4. The cabinet includes an “intelligent-eye” motion sensor capable of setting back the set point temperature for energy savings. This feature may be disengaged on the wireless remote controller.

C. Fan:

1. The evaporator fan shall be an assembly consisting of a direct-driven fan by a single motor.
2. The fan shall be statically and dynamically balanced and operate on a motor with permanent lubricated bearings.
3. An auto-swing louver for adjustable air flow (both vertically and horizontally) is standard via the wireless remote control furnished with each system.
4. The indoor fan shall offer a choice of five speeds, plus quiet and auto settings.

D. Filter:

1. The return air filter provided will be a mildew proof, removable and washable filter. Optional photo catalytic, air purifying filters are available.

E. Coil:

1. The evaporator coil shall be a nonferrous, aluminum fin on copper tube heat exchanger.
2. All tube joints shall be brazed with silver alloy or phoscopper.
3. All coils will be factory pressure tested.
4. A condensate pan shall be provided under the coil with a drain connection.

F. Electrical:

1. The unit shall be powered with 208-230 volts, 1 phase, and 60 hertz power with an allowable voltage range shall be 187 volts to 253 volts.
2. The indoor unit shall receive 208-230 volt, 1 phase, 60 hertz power from the outdoor unit utilizing manufacturers provided wiring harness consisting of at a minimum three (3) fourteen (14) gauge AWG conductors, plus ground, and control wiring wire connecting the units.

G. Control:

1. The unit shall have a backlit, wireless remote infra-red controller capable to operate the system. It shall have Cooling Operation, Heating Operation, Automatic Operation, Dry Operation and Fan Only Operation.
2. The infrared remote controller shall consist of an On/Off Power switch, Mode Selector, Silent Button (for outdoor unit), Fan Setting, Swing Louver, On/Off Timer Setting, Temperature Adjustment, ℃ or ℉ Temperature Display, “Intelligent Eye” sensor, Home Leave Operation and Powerful Operation.
3. On/Off switch powers the system on or off.
4. Mode selector shall operate the system in auto, cool, heat, fan or dry operation
5. Silent operation shall lower the sound level of the outdoor unit by slowing the inverter driven fan speed.
6. Fan setting shall provide five fan speeds, plus quiet and auto settings.
7. Swing louver shall adjust the airflow (horizontal and vertical) blades.
8. On/Off timer is used for automatically switching the unit on or off.
9. Temperature adjustment allows for the increase or decrease of the desired temperature.

10. Intelligent eye provides an infrared sensor which detects movement and adjusts the temperature by 3.6°F up or down depending on operating mode.
11. Home leave operation allows you to record your favorite temperature and airflow setting and allows the system to set back to a user defined setting.
12. Powerful operation allows quick cool down or heating up in the desired space to achieve maximum desired temperature in the shortest allowable time period.
13. The infrared remote control shall perform Fault Diagnostic functions which may be system related, indoor unit or outdoor unit related depending on the fault code.
14. Temperature range on the remote control shall be 64°F to 90°F in cooling mode and 50°F to 86°F in heating mode.
15. The indoor unit microprocessor has the capability to receive and process commands via return air temperature and indoor coil temperature sensors enabled by commands from the remote control.

H. Sound:

1. Indoor unit sound levels shall not exceed: 40 dB(A)

2.3 OUTDOOR UNITS (5 TONS OR LESS)

A. Air-Cooled, Compressor-Condenser Components:

1. The outdoor unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant regulator.
2. High/low pressure gas line, liquid and suction lines must be individually insulated between the outdoor and indoor units.
3. The sound pressure level shall be 63 dBA or less at 3 feet from the front of the unit.
4. The system shall automatically restart operation after a power failure and shall retain all settings, eliminating the need for reprogramming.
5. The unit shall incorporate an auto-charging feature and a refrigerant charge check function.
6. The following safety devices shall be included on the condensing unit; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, high pressure switch, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.
7. Oil recovery cycle shall be automatic occurring 2 hours after start of operation and then every 8 hours of operation.
8. The outdoor unit shall be capable of heating operation at 0°F dry bulb ambient temperature.
9. The system shall continue to provide heat to the indoor units while in the defrost mode.

B. Unit Cabinet:

1. The outdoor unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

C. Fan:

1. The condensing unit shall consist of one or more propeller type, direct-drive fans that have variable speed operation via a DC (digitally commutating) inverter.
2. The condensing unit fan shall have 0.32” of external static pressure available.
3. Nominal sound pressure levels shall be 63 dBA or less.
4. The fan motor shall have inherent thermal overload protection and permanently lubricated bearings.

D. Condenser Coil:

1. The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.
2. The heat exchanger coil shall be of a waffle louver fin and rifled bore tube design to ensure high efficiency performance.
3. The heat exchanger on the condensing units shall be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design.
4. The fins shall be covered with an anti-corrosion acrylic resin and type E1, hydrophilic film.
5. The pipe plates shall be treated with powdered polyester resin for corrosion prevention. The thickness of the coating must be between 2.0 to 3.0 microns.

E. Compressor:

1. The scroll compressors shall be variable speed PAM inverter to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit. In addition, samplings of evaporator and condenser temperatures shall be made so that the high/low pressures detected are read every 20 seconds and calculated. With each reading, the compressor capacity (INV frequency or STD ON/OFF) shall be controlled to eliminate deviation from target value.
2. The inverter driven compressor in each condensing unit shall be of highly efficient reluctance DC (digitally commutating), hermetically sealed scroll type.
3. The capacity control range shall be from 100% to as low as 6%.
4. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.
5. Oil separators shall be standard with the equipment together with an intelligent oil management system.
6. The compressor shall be spring mounted to avoid the transmission of vibration.

F. Electrical:

1. The control voltage between the indoor and outdoor unit shall be 16VDC non-shielded, stranded 2 conductor cable.

2.4 ACCESSORIES

A. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:

1. Compressor time delay.
2. 24-hour time control of system stop and start.
3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
4. Fan-speed selection including auto setting.

B. Automatic-reset timer to prevent rapid cycling of compressor.

C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

D. Drain Hose: For condensate.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install ground-mounted, compressor-condenser components on 5-inch- thick, reinforced concrete base that is 4 inches larger, on each side, than unit. Coordinate anchor installation with concrete base.

D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

SECTION 26 00 01

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Electrical Contractor shall provide:
   a. Furnish labor and materials, tools, supervision and services required to provide a complete, operable, and acceptable installation as shown or implied on the Contract Documents.
   b. Items described by the Contract Documents shall be furnished and installed complete by the Contractor unless noted otherwise.

B. Alternates:

1. Provide Alternate Proposals as defined on the Drawings and in Section 01 00 23 of these specifications.

C. The work includes, but is not limited to:
1. Labeling and identification.
2. Testing.
3. Operating and maintenance manuals.
4. Equipment connections.
5. Raceways.
6. Supporting devices.
7. Wires, cables.
8. Feeders and branch circuits.
9. Wiring devices and finish plates.
10. Disconnect switches.
11. Lighting and lamps.
12. Telephone and data provisions.

D. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

E. Definitions – See section 01 4200.

1.2 PROJECT CONDITIONS AND QUALITY ASSURANCE

A. Include in the work as a part of the Bid Proposal labor, materials, equipment, services, apparatus, drawings (in addition to the Contract Documents) as required to complete the intended work.

B. Work for the Project must be performed in accordance with federal, state, and local laws, ordinances, codes, rules, and regulations, pertaining to the work which are hereby made a part of the Contract Documents, by reference, the same as if repeated herein in their entirety. Where the Contract Documents exceed these requirements, the Contract Documents shall govern. In no case shall work be installed contrary to, or not in conformance with the minimum legal standards.

C. Comply with the applicable requirements of NFPA; the National Electrical Code - NFPA 70; the Texas Accessibility Code, The Americans with Disabilities Act, Life Safety Code NFPA

.

D. Only new, clean and perfect equipment, apparatus, materials and supplies of latest design and manufacture, for which replacement parts shall be available, shall be incorporated in the work in order to assure an

electrical system of high quality.

E. When more than one unit of the same class of equipment is required, such units shall be the product of a single manufacturer.

F. Equipment Assemblies and Components:
   1. Components of an assembled unit need not be products of the same manufacturer.
   2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
   3. Components shall be compatible with each other and with the total assembly forthe intended service.
   4. Constituent parts which are similar shall be the product of a single manufacturer.

G. The Electrical Contractor shall be completely responsible for all work installed byhim and shall employ only competent and experienced workmen of proper trades to perform the work.

H. Electrical Components, Devices, and Accessories: All materials shall be installed according to the manufacturer's specifications or as directed by the Engineer/Architect. All materials shall be listed and/or labeled as defined in NFPA 70, Article 100, or otherwise certified by a nationally recognized testing agency acceptable to the authorities having jurisdiction, and marked for the intended use and environment. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings. Comply also to applicable provisions of NFPA, NEMA, IEEE, ASTM and ANSI (latest adopted editions with current amendments). The Electrical Contractor shall assume responsibility for proper installation of materials in the space available.

I. Where specific testing agency standards are referenced in subsequent sections of these specifications, the specific standards referenced shall be the minimum acceptable criteriafor the equipment specified.

J. Before submitting a proposal, the Electrical Contractor shall visit the site of the work and shall carefully examine the plans and specifications. It is expressly understood that the Electrical Contractor's proposal is based on the above requirements and that the proposal covers everything necessary to do and complete the work.

K. When Contract Documents specify wiring between various pieces of equipment, furnished by other than the Electrical Contractor, is to be provided by the Electrical Contractor, the Contractor furnishing the equipment shall provide complete wiring diagrams to the Electrical Contractor in accord with the installation schedule. Factory wiring and field installed wiring and components shall be clearly defined and identified on the wiring diagrams.

1.3 EQUIPMENT PROTECTION

A. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, moisture, cold and rain:
   1. During installation, enclosures, equipment, controls, controllers, circuit protective devices, and other like items, shall be protected against entry of foreign matter; and be vacuum cleaned both inside and outside before testing and operating and repainting if required.
   2. Damaged equipment shall be, as determined by the Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
   3. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
   4. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are notobvious.

B. Electrical Contractors shall coordinate with the General Contractor and Painting Contractor (or sub-Contractor) to prevent the entry of paint materials into or onto Electrical Equipment, Boxes, Panels, devices etc. during plastering, painting and other construction activities
   1. Provide temporary closures of all open boxes, cabinets, raceways, etc.
   2. Provide conduit caps and closures where exposed to paint and paint operations.
   3. Provide suitable masking of wiring devices and boxes during painting and prior to installation of cover plates.

4. Completely mask flush panel covers to protect from paint, splatter and overspray on to panel cover surface.
5. Electrical Contractor shall be responsible for all costs associated with cleaning and/or replacement of inadequately protected electrical equipment, boxes, panels, devicesetc.

1.4 WORK PERFORMANCE

A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by contract.

B. Job site safety and worker safety is the responsibility of the contractor.

C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
2. Electricians must wear personal protective equipment while working onenergized systems in accordance with NFPA 70E.
3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented by the Architect and General Contractor. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.

1.5 REGULATORY REQUIREMENTS

A. The specified portions of the latest editions of following standards form a part of this project manual to the same force and effect as if repeated herein.

1. ASTM American Society for Testing Materials
2. IEEE institute of Electrical and Electronic Engineers
3. NEC National Electrical Code
4. NEMA National Electric Manufacturers Association
5. NFPA National Fire Protection Association
6. UL Underwriters Laboratories, Inc.

1.6 DRAWINGS AND SPECIFICATIONS

A. The architectural, structural, mechanical, and electrical drawings and specifications shall be considered as mutually explanatory and complementary. Any electrical work called for by one and not by the other shall be performed as though required by all. All sections and subsections of the Electrical work shall be governed by and subject to the general and supplementary conditions. All electrical sections of the electrical specification (Division 26) shall be governed by and subject to the requirements of this section (26 0001).

B. Any discrepancies in or between the drawings and specifications, or between the drawings and actual field conditions shall be reported to the Engineer/Architect in sufficient time to issue an addendum for clarification. In the event that there is no time for an addendum to be issued, the Electrical Contractor shall qualify his bid as to whether or not it includes questionable items and the additions or deductions made in his base bid for suchitems.

C. Where manufacturer’s name or catalog numbers are called for, substitutions will be unacceptable. Where manufacturer’s name or catalog number is followed by “or equal”, substitutions must be of equal quality in every way to those listed. The Contractor shall submit documentation to support the “or equal” claim. The Engineer/Architect will makethe judgment as to acceptability of other manufacturers. Acceptance of another manufacturer does not relieve the Contractor of meeting the requirements and features inherent in the specified products.

D. The electrical drawings are diagrammatic, and some circuit runs have been distorted to avoid confusion of lines. However, the drawings indicate the general layout of the complete electrical system. Field verification of scale dimensions on plans is directed since actual locations, distance, and levels will be governed by actual field conditions.

E. When the drawings indicate items or show details which are not specifically called for in any specifications, the drawings shall be interpreted as the overall instruction, and the Electrical Contractor is to include them as part of the electrical work, to be installed complete and ready for operation.

1.7 PERMITS, LICENSES, AND INSPECTIONS

A. The Electrical Contractor shall obtain and pay for all required and necessary electrical license, permit, and inspection fees in order to perform the work.

B. The Electrical Contractor shall make application and arrange for inspection of all electrical work installed under this Contract. The inspection shall be made by the code enforcing authority. Any defect or defects found shall be corrected by the Electrical Contractor at no cost to the Owner. The Electrical Contractor shall include the cost of the inspections in his base bid and shall pay the inspection fees. Certificate of Inspection shall be sent to the Owner.

1.8 SUBMITTALS

A. Product
   1. Provide shop drawings for the following:
      a. Conduit and fittings; surface metal raceway and fittings.
      b. Wire and cable and connectors.
      c. Wiring devices and plates.
      d. Disconnects - circuit breakers and switches.
      e. Fuses.
      f. Lighting: fixtures and lamps.

B. Shop drawings: Shop drawings are original drawings prepared by Contractor, subcontractor, supplier or distributor, which illustrates some portion of the work, showing fabrication, layout, setting or erection details.
   1. Prepared by qualified detailer.
   2. Identify details by reference to sheet and detail numbers shown on contract drawings:
   3. Minimum sheet size: 8-1/2" x 11".

C. Product data:
   1. Manufacturer's standard schematic drawings:
      a. Modify to delete information which is not applicable to project.
      b. Supplement standard information to provide additional information applicable to project.
   2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
      a. Clearly mark each copy to identify pertinent materials, products or models.
      b. Show dimensions and clearances.
      c. Show performance characteristics and capacities.
      d. Show wiring diagrams and controls.

D. In addition to the printed copies of the submittal, a portable document format (pdf) of the submittal shall be transmitted via email to the Engineer.

E. Samples: Provide samples where requested.

F. Submit number of copies of shop drawings, product data and samples which Contractor requires for distribution plus two copies which will be retained by Engineer/Architect.

G. Accompany submittals with transmittal letter, in duplicate, containing:
   1. Date.

2. Project title and number.
3. Contractor's name and address.
4. The number of shop drawings, product data and samples submitted.
5. Notification of deviations from Contract.
6. Other pertinent data.

H. Submittals shall include:

1. Date and revision dates.
2. Project title and number.
3. Names of:
   a. Engineer/Architect.
   b. Subcontractor.
   c. Supplier.
   d. Manufacturer.
4. Identification of product or material.
5. Relation to adjacent structure or material.
6. Field dimensions clearly identified as such.
7. Specification section and page number.
8. Specified standards, such as ASTM number or ANSI.
9. A blank space, 4" x 4", for Engineer/Architect's stamp.
10. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract.

I. Submit all components of an entire system as one package. Package all components from same specification section together and identify as indicated above. If complete system is not submitted together, those submitted will not be reviewed until the remaining items have been submitted.Revise initial drawings as directed and resubmit in accordance with submittal procedures.

J. Contractor will distribute copies of shop drawings and product data which carry Architect/ Engineer's stamp to:
1. Contractor's file.
2. Job site file.
3. Subcontractors.
4. Suppliers.
5. Fabricators.
6. Owner.

K. Contractor shall review shop drawings, product data and samples and:
1. Verify:
   a. Field dimensions.
   b. Field construction criteria.
   c. Catalog numbers and similar data.
2. Coordinate each submittal with requirements of:
   a. The work.
   b. The contract documents.
   c. The work of other contractors

L. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer/Architect's review of submittals.

M. Do not begin any work which requires submittals without having Engineer/Architect's stamp and initials or signature indicating review. Any work started without reviewed shop drawings is done so at Contractor's risk.

1. Operating and Maintenance Manuals.
2. Submit Operation and Maintenance Manuals in binder witheach system identified and indexed.

N. Record Documents:
   1. Record documents shall be prepared in accordance with Section 017800.
   2. Record Documents shall be electronically forwarded to the Architect/Engineer in Autodesk CAD format.

1.9 TEMPORARY POWER AND LIGHTING

A. Provide temporary power and lighting for building activities in accord with OSHA and as required.

B. Provide and maintain all required equipment safety barriers and safety equipment and exit pathways, coordinate with the General Contractor. Provide temporary battery powered emergency lighting along interior exit pathways.

1.10 ACCESS TO EQUIPMENT

A. The Electrical Contractor shall furnish access doors or panels where required for testing or servicing electrical equipment or where shown on the electrical drawings. The panels shall be located immediately below or in front of equipment, equipment disconnects, junction boxes and other items requiring access, which are concealed above the ceiling or behind the finish. Installation shall be by the General Contractor.

B. Access doors shall be a minimum of 12" x 12" steel construction with screw-drive operated cam lock. Style "DW" for drywall; style "M" for masonry and glazed tile finishes; style "K" for plaster finish and style "AT" for acoustical tile (other than lay-in panels), unless otherwise indicated.

C. Installations shall be in accordance with the letter and intent of the Contract Documents as determined by the Engineer/Architect.

D. Equipment locations shall be as close as practical to locations shown on the drawings.

E. Working spaces shall not be less than specified in the NEC for all voltages specified.

F. Inaccessible Equipment:
   1. Where the Engineer determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Owner.
   2. "Conveniently accessible" is defined as being capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

1.11 ACCURACY OF DATA

A. The information given herein and on the drawings is as exact as could be secured, but its extreme accuracy is not guaranteed. The Electrical Contractor must examine the locations carefully and verify all measurements, distances, levels, conduit, wire sizes, obstructions, remodeling work, work of other trades, etc., before submitting bids and before starting work.

B. The Electrical Contractor shall inspect the architectural, mechanical, and structural drawings and shop drawings to verify that the location of electrical facilities will clear the actual dimensions of features of the building and shall plan his work and obtain approval of the Engineer/Architect for any relocation of electrical devices found necessary or desirable.

C. The Electrical Contractor shall provide all necessary offsets, raises, or drops in conduit, ducts, raceways, and fixtures as required by building conditions at no additional cost.

1.12 CUTTING, PATCHING, AND REPAIRING

A. The Electrical Contractor shall be responsible for all cutting required for and resulting from the installation of his work, except where noted otherwise. The Electrical Contractor shall patch and repair the holes and restore surface finish for his work. Cutting shall be kept to the minimum required for the installation of the

work.

B. The Electrical Contractor shall place sleeves for conduits that must pass through grade beams, foundations, walls and slabs ahead of concrete pouring. Failing in this, the Electrical Contractor shall do the necessary cutting and sealing thereafter in anapproved manner.

C. The Electrical Contractor shall obtain approval from the Engineer/Architect for the placement of any sleeves or holes through beams and foundations.

D. The Electrical Contractor shall lay out his floor, wall, roof, etc. penetrations and coordinate openings with all other contractors prior to cutting openings.

1.13 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. When portions of existing circuiting which is routed in the slab are indicated to remain with other portions of the circuiting to be demolished or abandoned, the Electrical Contractor shall provide new circuiting in the overhead from existing available spare circuits and reestablish those portions of the circuit to remain. Record replacement circuiting used on the construction record documents and update panel schedules. Provide minimal cutting and channeling as required for this work. Coordinate with the General Contractor.

E. Remove demolished material from Project site and legally dispose of off-site. Coordinate the disposal of hazardous materials with the Owner.

F. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

1.14 PAINTING: See Division 9.

A. Electrical receptacles, switches, and cover plates shall not be painted.

B. Electrical apparatus including panels and switch boards shall be panted to matchfactory finish only.

C. Painting of electrical devices and apparatus shall not interfere with the operation or labeling of the device or apparatus.

1.15 ROOF FLASHING:

A. The General Contractor will flash around all roof penetrations. All penetrations are to be installed in manufacturer-fabricated penetration flashings.

1.16 GUARANTEE

A. In entering into a contract covering this work, the Contractor accepts the specifications and drawings and guarantees that the work will be carried out in accordance with the requirements of the specifications and drawings.

B. Guarantee all work (materials and labor) for a period of one year from the date of acceptance except where these specifications or the manufacturer's product warranty exceed this duration.

END OF SECTION

SECTION 26 00 10

ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid
   1. Contractor shall:
      a. Furnish all materials and labor required for electrical demolition.
      b. Furnish all materials and labor required for cutting and patching.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS**:**

A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The drawings are intended to indicate the scope of work required and do not indicate every box, conduit, or wire that must be removed. The contractor shall visit the site prior to submitting a bid and verify existing conditions.

B. Where walls, ceilings, structures, etc., are indicated as being removed on general drawings, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, raceways, wiring, systems, etc., from the removed area.

C. Where ceilings, walls, structures, etc., are temporarily removed and replaced by others, this Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.

D. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities and equipment that will remain in operation following demolition. Extension of conduit and wire to equipment shall be compatible with the surrounding area.

E. Coordinate scope of work with all other Contractors and the using agency at the project site. Schedule removal of equipment and electrical service to avoid conflicts.

F. Bid submittal shall mean the Contractor has visited the project site and has verified existing conditions and scope of work.

3.2 PREPARATION

A. Disconnect electrical systems in walls, floors, structures, and ceilings scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment, or circuits, use personnel experienced in such operations. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.

C. Existing Fire Alarm System: Maintain existing system in service. Disable system only to make connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of Division 1 of Specifications and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring and raceway to source of supply.

D. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated clamps, hangers, supports, etc. associated with raceway removal.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is removed. Provide blank cover for abandoned outlets that are not removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

I. Ballasts in light fixtures installed prior to 1980 shall be incinerated in EPA approved incinerator or disposed of in EPA certified containers and deposited in an EPA landfill certified for PCB disposal or recycled by permitted ballast recycler. Punctured or leaking ballasts must be disposed of according to Federal Regulations under the Toxic Substance Control Act.

J. Repair adjacent construction and finishes damaged during demolition and extension work. Patch openings to match existing surrounding finishes.

K. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

L. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

M. HID and fluorescent lamps, determined by the Toxicity Characteristic Leachate procedure (TCLP), to be hazardous waste shall be disposed of in a permitted hazardous waste disposal facility or by a permitted lamp recycler.

N. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

O. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes x- ray or similar non-destructive means.

P. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.4 CUTTING AND PATCHING

A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. See Section 26 0001 for additional requirements.

B. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for

clean opening.

D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.

E. Gypsum wall surfaces shall be restored to a smooth gypsum wall finish ready for prime and finish coat painting. All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be free smooth and free of tool marks and ridges.

F. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes x- ray or similar non-destructive means.

G. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.5 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 1 of Specifications.

3.6 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION

SECTION 26 05 00

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:
1. Electrical Contractor shall provide:
   a. Labor and materials, tools, supervision and services required to provide a complete, operable, and acceptable installation as shown or implied on the Contract Documents.
   b. Items described by the Contract Documents shall be furnished and installed complete by the Contractor unless noted otherwise.

B. This Section includes the following:
1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical demolition.
5. Cutting and patching for electrical construction.
6. Touchup painting.

1.2 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Specified Elsewhere
1. Section 26 0001 - General Electrical Requirements
2. Section 26 0553 – Identification for Electrical Systems

1.3 REFERENCES

Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the designation only:

1.4 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. LFMC: Liquid tight flexible metal conduit.

D. RMC: Rigid Metallic (Steel) Conduit.

E. RNC: Rigid Nonmetallic Conduit (PVC)

F. Provide – Indicates the Electrical Contractor shall furnish and install the item.

G. Install – Indicates the Electrical Contractor shall install item furnished by others.

H. Furnish – Indicates the Electrical Contractor shall furnish item for installation by others.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: All materials shall be new and shall be installed according to manufacturer's specifications or as directed by the Engineer/Architect. All materials

shall be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for the intended use and environment. Comply also to applicable provisions of NFPA, NEMA, IEEE, ASTM and ANSI. The Electrical Contractor shall assume responsibility for proper installation of materials in the space available.

B. Conform to requirements of NFPA 70 (National Electrical Code) Comply with the applicable requirements of NFPA 72,, Life Safety Code NFPA -101 and any other codes or ordinances required by state, county, city or other local authorities

C. Products: Listed by a Nationally Recognized Testing Laboratory and classified as suitable for the purpose specified and indicated.

1.6 SUBMITTALS

A. Product Data: Provide product data sheets for raceways, supporting devices cables and conductors.

PART 2 - PRODUCTS

2.1 RACEWAYS

A. EMT: ANSI C80.3- 2005, zinc-coated steel, with steel compression fittings.

B. FMC: Zinc-coated steel.

C. LFMC: Zinc-coated steel with sunlight-resistant and mineral-oil-resistant plastic jacket.

D. RMC: ANSI C 80.1.1-1994, All fittings shall be threaded

E. IMC: ANSI C 80.1.1-1994 All fittings shall be threaded

F. RNC: Schedule 40 PVC for ductbank installation.

G. Raceway Fittings: Specifically designed for the raceway type with which used.

2.2 CONDUCTORS

A. Conductors, No. 10 AWG and Smaller: Solid or Stranded copper.

B. Conductors, Larger than No. 10 AWG: Stranded copper.

C. Insulation: Thermoplastic, rated at 90 deg C minimum.

D. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

2.3 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal Items for Use in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches o.c., in webs.

D. Channel Thickness: Selected to suit structural loading.

E. Fittings and Accessories: Products of the same manufacturer as channel supports.

F. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-

clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

G. Expansion Anchors: Carbon-steel wedge or sleeve type.

H. Toggle Bolts: All-steel springhead type.

2.4 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Working Clearances shall be as prescribed by NEC article 110.

B. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.

C. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 RACEWAY APPLICATION

A. Use the following raceways for indoor installations:
1. Exposed: EMT. For 1-1/2” or smaller.
2. Concealed: EMT.
3. Connection to Vibrating Equipment: FMC; except in wet or damp locations, use LFMC.
4. Motor Connections: LFMC
5. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.
6. Mechanical or Electrical Rooms: RMC for 2” or larger.

3.3 RACEWAY INSTALLATION

A. Conceal raceways, unless otherwise indicated, within finished walls, ceilings, and floors.

B. Install raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Locate horizontal raceway runs above water and steam piping.

C. Use temporary raceway caps to prevent foreign matter from entering.

D. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

E. Use raceway fittings compatible with raceways and suitable for use and location.

F. EMT raceway fittings shall be insulated throat compression type only.

G. Connect motors and equipment subject to vibration, noise transmission, or movement with a

maximum of 72-inch flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

3.4 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

A. Feeders: Type THHN/THWN insulated conductors in raceway.

B. Branch Circuits: Type THHN/THWN insulated conductors in raceway.

C. Remote-Control Signaling and Power-Limited Circuits: Type THHN/THWN insulated conductors in raceway for Classes 1, 2, and 3, unless otherwise indicated.

3.5 WIRING INSTALLATION

A. Install splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

B. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to the manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

C. When stranded conductors #10 AWG or smaller are used for power or lighting circuits, provide solid pigtail connections.

3.6. ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials, U-channel system components.

B. Dry Locations: Steel materials.

C. Selection of Supports: Comply with manufacturer's written instructions.

D. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

3.7 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U- bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch- diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

H. Install metal channel racks for mounting disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to

structural elements of adequate strength.

I. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
   1. Wood: Fasten with wood screws or screw-type nails.
   2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
   3. Existing Concrete: Expansion bolts.
   4. Light Steel: Sheet-metal screws.
   5. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof- test load.

3.8 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. When portions of existing circuiting which is routed in the slab are indicated to remain with other portions of the circuiting to be demolished or abandoned, the Electrical Contractor shall provide new circuiting in the overhead from existing available spare circuits and reestablish those portions of the circuit to remain. Record replacement circuiting used on the construction record documents and update panel schedules. Provide minimal cutting and channeling as required for this work. Coordinate with the General Contractor.

E. Remove demolished material from Project site and legally dispose of off-site.

F. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.9 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.10 FIELD QUALITY CONTROL

A. Inspect installed components for damage and faulty work.

3.11 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Building wires and cables rated 600 V and less.
   2. Connectors, splices, and terminations rated 600 V and less.

B. Related Sections include the following:
   1. Division 26 Section "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 2001 to 35,000 V.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Contractor with qualifications and minimum ten (10) years' experience in installation, splicing and testing of low voltage power conductors may be considered at discretion of Architect/Engineer, as acceptable agency.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Encore Wire.
   2. Nexans.
   3. Southwire Company.
   4. United Copper Industries.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THW and THHN-THWN.

D. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad (mc) cable with ground wire.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper**.**

B. Branch Circuits: Copper, stranded**.**

C. The minimum conductor size shall be #12 AWG.

D. Voltage Drop: Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent to comply with the requirements of ASHRAE Standard 90.1-2007. The following are minimum allowable conductor sizes based on circuit length. The circuit length shall be measured from the branch panelboard to the furthest device in that circuit. The phase and neutral conductors

shall be sized as indicated on the entire length of that circuit unless a larger size conductor is indicated on the drawings.

1. Conductor sizes for 20A/1-Phase/120-volt circuits shall be as follows unless noted otherwise:

a. Circuit length of 0 to 95 feet: #12 awg.
b. Circuit length of 96 to 150 feet: #10 awg.
c. Circuit length of 151 to 235 feet: #8 awg.
d. Circuit length of 236 to 380 feet: #6 awg.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Feeders: Type THHN-THWN, single conductors in raceway.

B. Branch Circuits (minimum #12 AWG): Type THHN-THWN, single conductors in raceway

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. MC cable not to be used for branch circuiting or homeruns to a panel. It shall only be used for final connection whips not to exceed 6’-0”.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

G. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

H. Each branch circuit shall be provided with a dedicated neutral conductor. Sharing of the neutral conductor between multiple circuits will not be allowed.

I. A single raceway shall be limited to a maximum of six current carrying conductors.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque- tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
1. After installing conductors and cables and before electrical circuitry has been energized, test feeder conductors for compliance with requirements.
   a. Megger Test for insulation integrity.
   b. Test all branch circuit wiring for leakage current requirements for NFPA 99 for isolation panelboard.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
   a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
   b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
   c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

C. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Hangers and supports for electrical equipment and systems.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 SUBMITTALS

A. Product Data: For the following:
   1. Steel slotted support systems.
   2. Nonmetallic slotted support systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
   1. Trapeze hangers. Include Product Data for components.
   2. Steel slotted channel systems. Include Product Data for components.
   3. Nonmetallic slotted channel systems. Include Product Data for components.
   4. Equipment supports.

C. Welding certificates.

1.6 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

C. Comply with IBC and UBC.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
1. Available Manufacturers: Subject to compliance with requirements, provide product by one of the following:
a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. ERICO International Corporation.
d. GS Metals Corp.
e. Thomas & Betts Corporation.
f. Unistrut; Tyco International, Ltd.
g. Wesanco, Inc.
2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA- 4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) Hilti Inc.
2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1) Cooper B-Line, Inc.; a division of Cooper Industries.
   2) Empire Tool and Manufacturing Co., Inc.
   3) Hilti Inc.
   4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
   5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

6. Toggle Bolts: All-steel springhead type.

7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter. Support conduit within 10” from box and bend, maximum 10’ apart and minimum of one support for conduit length Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

C. Single Conduits 1-1/2-Inch and Smaller: Conduit clamps for supporting single conduits shall be spring steel type without bolts. This shall apply for raceways serving branch circuits and low voltage systems above suspended ceilings and for fastening raceways to trapeze supports.

D. Single Conduits 1-1/2-Inch and Smaller: Conduit clamps for supporting single conduits shall be bolt type clamps. The use of spring type clamps will not be permitted. They shall apply for raceways serving branch circuits and low voltage systems above suspended ceilings and for fastening raceways for trapeze supports.

E. Use of powder-actuated fasteners may only be permitted at scheduled portions of the day or week. Obtain written approval from Owner on acceptable times for use.

F. The use of powder-actuated fasteners will not be permitted.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise

indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.

E. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 5 Section "Metal Fabrications" for site- fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Division 9 painting sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
2. Surface raceway.
3. Conduit sleeve and firestop.
4. Core drill for electrical work.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. ENT: Electrical nonmetallic tubing.

C. EPDM: Ethylene-propylene-diene terpolymer rubber.

D. FMC: Flexible metal conduit.

E. IMC: Intermediate metal conduit.

F. LFMC: Liquidtight flexible metal conduit.

G. LFNC: Liquidtight flexible nonmetallic conduit.

H. NBR: Acrylonitrile-butadiene rubber.

I. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data:For surface raceways, wireways and fittings, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.

C. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
1. Structural members in the paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in the paths of conduit groups with common supports.

D. Source quality-control test reports.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70, 79.

C. Product shall be UL approved.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Available Manufacturers: Subject to compliance with requirements, provide product by one of the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc., a unit of Southwire.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Republic Conduit, a unit of Tenaris.
7. Western Tube and Conduit Corporation.
8. Wheatland Tube Company.

```Rigid Steel Conduit: ANSI C80.1.

B. Aluminum Rigid Conduit: ANSI C80.5.

C. IMC: ANSI C80.6.

D. PVC-Coated Steel Conduit: PVC-coated IMC.
1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch (1 mm), minimum.

E. EMT: ANSI C80.3.

F. FMC: Zinc-coated steel.

G. LFMC: Flexible steel conduit with PVC jacket and UL label.

H. Fittings for Conduit (Including all Types and Flexible and Liquidtight): NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
2. Fittings for EMT: Steel or die-cast, set-screw type.
3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
4. Fittings for Rigid and Intermediate Steel Conduit: Threaded rigid steel conduit.
5. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

I. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.
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2.2 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide product by one of the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. CANTEX Inc.
4. Dura-Line.
5. Electri-Flex Co.
6. Lamson & Sessions; Carlon Electrical Products.
7. Thomas & Betts Corporation.

B. ENT: NEMA TC 13.

C. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

D. LFNC: UL 1660.

E. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

F. Fittings for LFNC: UL 514B.

2.3 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Manufacturer's standard enamel finish in color selected by Architect.

1. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
   a. Thomas & Betts Corporation.
   b. Walker Systems, Inc.; Wiremold Company (The).
   c. Wiremold Company (The); Electrical Sales Division.

B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Enduro Systems, Inc.; Composite Products Division.
   b. Hubbell Incorporated; Wiring Device-Kellems Division.
   c. Lamson & Sessions; Carlon Electrical Products.
   d. Panduit Corp.
   e. Walker Systems, Inc.; Wiremold Company (The).
   f. Wiremold Company (The); Electrical Sales Division.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers: Subject to compliance with requirements, provide product by one of the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.

2. EGS/Appleton Electric.

3. Erickson Electrical Equipment Company.

4. Hoffman.

5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.

6. O-Z/Gedney; a unit of General Signal.

7. RACO; a Hubbell Company.

8. Robroy Industries, Inc.; Enclosure Division.

9. Spring City Electrical Manufacturing Company.

10. Thomas & Betts Corporation.

11. Walker Systems, Inc.; Wiremold Company (The).

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1, minimum 4” X 4” X 2-1/8” deep. Provide with single gang plaster ring unless two gang plaster ring is specifically noted elsewhere to be provided.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover. Minimum 4” X 4” X 2-1/8” deep. Provide with single gang plaster ring unless two gang plaster ring is specifically noted elsewhere to be provided.

D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1 gasketed cover.

G. The box support bracket shall be with support leg to eliminate movement of box in wall. The box support shall be attached to metal stud by using screw gun. The box support shall have an offset for drywall.

H. Device rough-in boxes shall be securely and rigidly attached and supported plumb, level and true to the building lines using one of the following:
1. Screw Gun Box Brackets: Preset for metal stud 16” or 24” on center, depth set for 2-1/2” deep electrical box. Install using screw gun.
2. Box Mounting Bracket: Allow 4” or 4-11/16” boxes. Bendable leg serves as a bracket stabilizer.
3. Extension Plate Bracket: Allow outlet boxes 12” or 18” offset from either metal stud track or a stud. Allow 4” or 4-11/16” outlet boxes, 2-1/8” deep, bracket with bendable stabilizer leg for use on 2-1/2” and 3-1/2” metal studs for bracket sterilizer.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:

1. Exposed Conduit: Rigid steel conduit.
2. Concealed Conduit, Aboveground: Rigid steel conduit.
3. Underground Conduit: RNC, Type EPC-PVC, direct buried for utility power system, RNC Type EPC-40 in concrete encased for standby power system.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway product as specified herein, unless otherwise indicated:
1. Exposed in Mechanical Room: GRC.
2. Below Grade: PVC Coated PVC80.
3. Branch Circuit: EMT.
4. Equipment Feeder, 2” and larger: EMT.
5. Damp or Wet Locations: Rigid steel conduit.

C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

D. Install nonferrous conduit or tubing for circuits operating above 60 Hz.Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

E. Do not install aluminum conduits in contact with concrete.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot- water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical System" and "Vibration and Seismic Controls for Electrical Work."

E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

G. Conceal conduit within finished walls and ceilings, unless otherwise indicated.

H. Raceways embedded in slabs or below slab inside the building envelope are not permitted unless shown on Contract Documents.

I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including bushing for size No. 6 AWG and larger conductors.

K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where otherwise required by NFPA 70.

M. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, use LFMC for equipment subject to vibration, noise transmission, or movement; transformers, motors and damp/wet location.

N. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

3.3 DEVICE ROUGH-IN BOX

A. Finish plates shall not span different types of walls finishes either vertically or horizontally. Plates shall cover mortar joints and cut openings completely.

B. Outlet, junction and pull boxes, and their covers shall have corrosion protection suitable for the atmosphere in which they are installed. Provide gaskets for all boxes installed outside and other wet or damp locations (tunnels, crawl spaces, pits, etc.).

C. Outlet boxes shall be protected to prevent entrance of plaster, and debris shall be thoroughly cleaned from

the box prior to installation of conductors.

D. Single gang opening outlet boxes shall be mounted with the long axis vertical unless otherwise noted for horizontal mounting. Three or more gang boxes shall be mounted with the long axis horizontal.

E. Finish plates shall be a type designed, intended, and appropriate for the use and location.

F. Existing outlet boxes are being reused, provide extension rings compatible with new wall surfaces or finishes.

G. Provide outlet box with barrier for grouped or ganged light switched where voltage between adjacent switches exceeds 300-volt AC per NEC Article 380.

H. Provide outlet box with barrier and separate conduit feed for switches grouped or ganged where connected to utility power and standby power.

3.4 METAL RACEWAY

A. Metal raceway duct shall be installed level and true to building construction lines such that removable or hinged covers can be operated to be fully accessible.

B. Routing shall be pre-planned by the Contractor to assure right-of-way and accessibility; routing indicated by Contract Documents shall be considered schematic in nature and may require job site alteration to avoid interference.

C. Metal raceway duct shall be adequately supported at not more than 5'-0" intervals. The support accessories shall be of the same manufacturer as metal raceway.

D. Metal raceway duct penetrations of walls shall be unbroken lengths, scaled to the wall opening; dead ends shall be closed with manufactured closures.

E. Metal raceway duct to be installed surface mounted; flush in wall or in floor as indicated by the Contract Documents.

F. Provide approved wall flanges and fully seal all penetrations of fire and smoke rated walls and partitions, cutting and patching as needed.

G. Provide divider to compartment the metal raceway duct as indicated by Contract Documents.

3.5 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping."

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Identification for raceway.
2.
3. Identification for conductors and communication and control cable.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:
   1. Power Circuits:
      a. Utility power - Black letters on a white field.
   2. Legend: Indicate system or service and voltage, if applicable.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch- (0.35-mm-) thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

2.3 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Metal-Backed, Butyrate Warning Signs: Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 10 by 14 inches (250 by 360 mm).

C. Warning label and sign shall include, but are not limited to, the following legends:

   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
   2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 42."

2.4 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. Punched or drilled for mechanical fasteners.
   3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.5 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. Black letters on a white background for utility power. Minimum letter height shall be 3/8 inch (10 mm).

2.6 DEVICE, RECEPTACLE AND SWITCH LABELS

A. Label shall be self-adhesive vinyl and shall be computer or machine printed. Minimum size shall be ¼" label with 1/8" letter.

1. Label background shall be clear or match to device plate.
2. Black letter for normal power.
3. Legend: Indicates panel and circuit number.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength: 50 lb (22.6 kg), minimum.
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

B. Paint: Paint materials and application requirements are specified in Division 9 painting Sections.

C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 APPLICATION

A. Accessible Raceways, 600 V or Less, for Feeder and Branch Circuits: Identify with preprinted self-adhesive vinyl label.

B. Power-Circuit Conductor Identification: For primary and secondary conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use marker tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

C. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use marker tape. Identify each ungrounded conductor according to source and circuit number.

D. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with white letters on a red background. Apply to exterior of door, cover, or other access.
1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
a. Power transfer switches.
b. Controls with external control power connections.

2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

E. Instruction Signs:

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer.

F. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels on each power and system equipment/panel power equipment. Label shall include device identification and source.
   1. Labeling Instructions:
      a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38- mm-) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.
      b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
      c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   2. Equipment to Be Labeled:
      a. Panelboards, electrical cabinets, and enclosures.
      b. Access doors and panels for concealed electrical items.
      c. Electrical switchgear and switchboards.
      d. Disconnect switches.
      e. Enclosed circuit breakers.
      f. Contactors.
   3. Equipment Schedule:
      a. Panelboards shall include correct, typewritten circuit directory cards identifying load served by branch circuit protective devices.
      b. Panelboards located in a renovated area shall have their schedules updated for all spares, spaces and circuits connected to the panelboard.

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for feeder and branch- circuit conductors.
   1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
   2. Colors for 240/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
      d. Neutral: White.
      e. Ground: Green.
   3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply

last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

I. Painted Identification: Prepare surface and apply paint according to Division 9 painting Sections.

END OF SECTION

SECTION 26 56 00

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Exterior luminaires with lamps and ballasts.
2. Luminaire-mounted photoelectric relays.
3. Poles and accessories.
4. Luminaire lowering devices.

B. Related Sections include the following:
1. Division 26 Section "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

A. CRI: Color-rendering index.

B. HID: High-intensity discharge.

C. Luminaire: Complete lighting fixture, including ballast housing if provided.

D. Pole: Luminaire support structure, including tower used for large area illumination.

E. Standard: Same definition as "Pole" above.

1.4 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4.

1.5 SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.

a. Photometric data shall be certified by manufacturer's laboratory with a current accreditation

under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

6. Photoelectric relays.
7. Ballasts, including energy-efficiency data.
8. Lamps, including life, output, and energy-efficiency data.
9. Materials, dimensions, and finishes of poles.
10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
11. Anchor bolts for poles.

B. Shop Drawings

1. Anchor-bolt templates keyed to specific poles and certified by manufacturer.
2. Wiring Diagrams: Power and control wiring.

C. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4 and that load imposed by luminaire has been included in design.

D. Qualification Data: For agencies providing photometric data for lighting fixtures.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For luminaires and poles luminaire lowering devices to include in emergency, operation, and maintenance manuals.

G. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with IEEE C2, "National Electrical Safety Code."

D. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package aluminum poles for shipping according to ASTM B 660.

B. Store poles on decay-resistant-treated skids at least 12 inches (300 mm) above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Handle wood poles so they will not be damaged. Do not use pointed tools that can indent pole surface more than 1/4 inch (6 mm) deep. Do not apply tools to section of pole to be installed below groundline.

D. Retain factory-applied pole wrappings on fiberglass and laminated wood poles until right before pole installation. Handle poles with web fabric straps.

E. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. Warranty Period for Lamps: Replace lamps and fuses that fail within 12 months from date of Substantial Completion.
5. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In Exterior Lighting Device Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 LUMINAIRES, GENERAL REQUIREMENTS

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.

3. Diffusing Specular Surfaces: 75 percent.

K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
   a. Color: Match Architect's sample of manufacturer's standard color.

M. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

   a. Color: Refer to architectural plans for color.

2.3 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc (16 to 32 lx) and off at 4.5 to 10 fc (48 to 108 lx) with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.

1. Relay with locking-type receptacle shall comply with NEMA C136.10.
2. Adjustable window slide for adjusting on-off set points.

2.4 POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS

A. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in Part 1 "Structural Analysis Criteria for Pole Selection" Article, with a gust factor of 1.3.

B. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.

C. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.

D. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Shall not cause galvanic action at contact points.

2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication, unless stainless-steel items are indicated.
3. Anchor-Bolt Template: Plywood or steel.

E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Division 3 Section "Cast-in-Place Concrete."

F. Breakaway Supports: Frangible breakaway supports, tested by an independent testing agency acceptable to authorities having jurisdiction, according to AASHTO LTS-4.

2.5 ALUMINUM POLES

A. Poles: Seamless, extruded structural tube complying with ASTM B 429, Alloy 6063-T6 with access handhole in pole wall.

B. Poles: ASTM B 209 (ASTM B 209M), 5052-H34 marine sheet alloy with access handhole in pole wall.

1. Shape: [Round, tapered] [Round, straight].
2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

C. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

D. Grounding and Bonding Lugs: Welded 1/2-inch (13-mm) threaded lug, complying with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

E. Brackets for Luminaires: Detachable, with pole and adapter fittings of cast aluminum. Adapter fitting welded to pole and bracket, then bolted together with stainless-steel bolts.

1. Tapered oval cross section, with straight tubular end section to accommodate luminaire.
2. Finish: Same as [pole] [luminaire].

F. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.

G. Aluminum Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

a. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Install lamps in each luminaire.

B. Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources.

3.2 POLE INSTALLATION

A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features, unless otherwise indicated on Drawings:

1. Fire Hydrants and Storm Drainage Piping: [60 inches (1520 mm)] .
2. Water, Gas, Electric, Communication, and Sewer Lines: [10 feet (3 m)]
3. Trees: [15 feet (5 m)]

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Division 3 Section "Cast-in-Place Concrete."

D. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use non-shrink or expanding concrete grout firmly packed to fill space.
3. Install base covers, unless otherwise indicated.
4. Use a short piece of 1/2-inch- (13-mm-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

E. Raise and set poles using web fabric slings (not chain or cable).

F. Install vibration damper per manufacturer's recommendation.

3.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 GROUNDING

A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole, unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

3.5 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
   a. Verify operation of photoelectric controls.

C. Illumination Tests:
   1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IESNA testing guide(s):

      a. IESNA LM-5, "Photometric Measurements of Area and Sports Lighting."
      b. IESNA LM-50, "Photometric Measurements of Roadway Lighting Installations."
      c. IESNA LM-52, "Photometric Measurements of Roadway Sign Installations."
      d. IESNA LM-64, "Photometric Measurements of Parking Areas."
      e. IESNA LM-72, "Directional Positioning of Photometric Data."

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices. Refer to Division 1 Section "Demonstration and Training."

END OF SECTION

SECTION 28 05 00

COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Electronic safety and security equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Sleeve seals.
4. Grout.
5. Common electronic safety and security installation requirements.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of electronic safety and security equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electronic safety and security items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section "Access Doors and Frames."

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Firestopping."

1.6 RECORD DRAWINGS

A. Contractor shall provide owner with a complete set of accurate Record Drawings for all work performed under this contract.

1. Record Drawings shall include all approved change orders and pertinent RFI responses.
2. Include actual dimensions of equipment furnished under this contractor where shown on the floor plans.
3. Record Drawings shall include work performed by all sub-contractors retained.
4. Record Drawings shall include the words “RECORD DRAWING” on each sheet.
5. Record Drawings shall be completed using **REVIT** and in a version as directed by the owner.

B. Submission:

1. Submit one set of record Drawings for review by Engineer prior to submission of closeout documents. Record Drawings shall be submitted using the established submittal process.
2. Upon satisfactory review of the Record Drawing submittals by Engineer, provide three (3) printed sets of the Record Drawings and three (3) copies in electronic format with closeout documents
3. Paper Record Drawings shall be printed full size using the same sheet size as the construction documents issued to the contractor with the contractor’s title block.
4. Electronic Record Drawings shall include **REVIT** compatible **model** and **individual PDF files named by sheet and organized in folders by disciplines.**

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Metraflex Co.
d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
3. Pressure Plates: Carbon steel. Include two for each sealing element.

4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electronic safety and security equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRONIC SAFETY AND SECURITY PENETRATIONS

A. Electronic safety and security penetrations occur when raceways, pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants."

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 7 Section "Firestopping."

K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using **steel** pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electronic safety and security installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping."

END OF SECTION

SECTION 28 31 11

DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Non-system smoke detectors.
5. Heat detectors.
6. Notification appliances.
7. Firefighters' two-way telephone communication service.
8. Magnetic door holders.
9. Remote annunciator.
10. Addressable interface device.
11. Digital alarm communicator transmitter.
12. Radio alarm transmitter.
13. System printer.

1.3 DEFINITIONS

A. LED: Light-emitting diode.

B. NICET: National Institute for Certification in Engineering Technologies.

C. FACP: Fire Alarm Control Panel.

D. FANP: Fire Alarm Power Extender Panel.

E. FAAP: Fire Alarm Annunciator (LCD).

1.4 SYSTEM DESCRIPTION

A. Non-coded, UL-certified addressable system, with multiplexed signal transmission, dedicated to fire-alarm service only.

1.5 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 72.

1.6 SUBMITTALS

A. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire-alarm system design.
b. NICET-certified fire-alarm technician, Level III minimum.
c. Licensed or certified by authorities having jurisdiction.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
2. Include voltage drop calculations for notification appliance circuits.
3. Include battery-size calculations.
4. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
5. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
6. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
7. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

D. Qualification Data: For qualified Installer.

E. Seismic Qualification Certificates: For fire-alarm control unit, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

F. Field quality-control reports.

G. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
3. Record copy of site-specific software.
4. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:

a. Frequency of testing of installed components.

b. Frequency of inspection of installed components.
c. Requirements and recommendations related to results of maintenance.
d. Manufacturer's user training manuals.

5. Manufacturer's required maintenance related to system warranty requirements.
6. Abbreviated operating instructions for mounting at fire-alarm control unit.

H. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: CD disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.

C. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:

1. Notify Owner no fewer than five days in advance of proposed interruption of fire-alarm service.
2. Do not proceed with interruption of fire-alarm service without Owner's written permission.

1.9 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.

B. Equipment Removal: Dallas ISD shall have first right of refusal of removed system components. After acceptance of new fire-alarm system, salvage existing disconnected fire-alarm equipment and devices and remove wiring. Salvaged equipment and devices shall be delivered to Dallas ISD, at location to be determined, unless otherwise directed by Dallas ISD designated representative.

C. All unclaimed fire alarm system components and removed wiring shall become property of the contractor and shall be legally disposed off-site.

1.10 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning with Substantial Completion, provide software support for two years.

C. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.11 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
3. Smoke Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than 1 unit of each type.
4. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but no fewer than 1 unit of each type.
5. Keys and Tools: One extra set for access to locked and tamper-proofed components.
6. Audible and Visual Notification Appliances: One of each type installed.
7. Fuses: Two of each type installed in the system.

B. Furnish extra materials and labor. Describe below that matches products installed.

1. Submit unit price to install and wire additional devices. This price will be applied to additional devices to be installed. Include as part of the scope of work the installation of the following additional devices, above and beyond the number of devices shown on the plans. The Architect/Engineer will direct the Contractor where to install such devices during construction. Architect/Engineer shall have the latitude to have devices installed anywhere within the project area.

1.12 WARRANTY

A. Written warranty, executed by manufacturer agency to repair or replace equipment, devices, and auxiliary components that fail in material or workmanship within specified warranty period.

1. Warranty Period: Two year**s** from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. NOTIFIER NFS2-3030 or current replacement series is Owner preferred.
2. Proposed alternate systems to be pre-approved by Dallas ISD designated representative and Dallas ISD-M&O.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire alarm system shall be monitored by an AES-Multinet receiver at Dallas ISD's central monitoring system. Fire alarm system shall report to central monitoring system via an AES 7788F/7744F series fire subscriber and AES 7794 AES-IntelliPro Fire or Dallas ISD approved equal. If central monitoring system is not available, signal shall report to Southwest Dispatch or as directed by Dallas ISD designated representative. Provide twelve (12) months of monitoring service required as part of this installation.

B. Fire-alarm signal initiation shall be by one or more of the following devices and systems:

1. Manual stations.
2. Verified automatic alarm operation of smoke detectors.
3. Automatic sprinkler system water flow.

C. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm at fire-alarm control unit FACP and remote annunciators (FAAP).
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.
6. Activate voice/alarm communication system.
7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
8. Activate smoke-control system (smoke management) at firefighter smoke-control system panel.
9. Activate stairwell and elevator-shaft pressurization systems.
10. Close smoke dampers in air ducts of designated air-conditioning duct systems.
11. Recall elevators to primary or alternate recall floors.
12. Activate emergency lighting control.
13. Activate emergency shutoffs for gas and fuel supplies.
14. Record events in the system memory.
15. Record events by the system printer.

D. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Low-air-pressure switch of a dry-pipe sprinkler system.
3. Elevator shunt-trip supervision.

E. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at fire-alarm control unit FACP.
4. Ground or a single break in fire-alarm control unit internal circuits.
5. Abnormal ac voltage at fire-alarm control unit FACP and FAAP.
6. Break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at fire-alarm control unit FACP, and FAAP.
9. Fire-pump power failure, including a dead-phase or phase-reversal condition.
10. Low-air-pressure switch operation on a dry-pipe or pre-action sprinkler system.
11. Removal of an alarm initiating device.

F. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit FACP and FAAP. Record the event on system printer.

2.3 EXISTING FIRE ALARM SYSTEM

A. Compatibility with Existing Equipment: New Fire alarm system and components shall operate independent of the existing system unless otherwise directed by Dallas ISD designated representative.

2.4 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Enclosure: Steel, baked enamel, painted cabinet with indicator viewing window, removable hinged outer door with cylinder lock and dead front construction with the outer door open. The inner dead front doors shall be hinged for ease of system operation by firefighters and access by technicians for testing and maintenance modes.
2. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by an NRTL.

    a. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
    b. Include a real-time clock for time annotation of events on the event recorder and printer.

3. Addressable initiation devices that communicate device identity and status.

    a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
    b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

4. Addressable control circuits for operation of mechanical equipment.

    a. Capability shall exist within the system to extend the network at any node. The system shall support a maximum of two network extension circuits in series on any system branch, extending the inherent distance limitations for network communications.
    b. Communication protocol shall be of the CS/MACD (carrier sense, multiple access, collision detect) type, RJ-485 token ring configuration or "ARNET" communication protocol.

5. The system shall have built-in equipment allowing reporting of system events to pagers.
6. The system shall employ a RS-232 RS485, TCP/IP and other interface protocol to interface with building automation system.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 3 line(s) of 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

C. Circuits:

1. Initiating Device, Notification Appliance, and Signaling Line Circuits:

D. Stairwell Pressurization: Provide an output signal using an addressable relay to start the stairwell pressurization system. Signal shall remain on until alarm conditions are cleared and fire-alarm system is reset. Signal shall not stop in response to alarm acknowledge or signal silence commands.

1. Pressurization starts when any alarm is received at fire-alarm control unit.
2. Alarm signals from smoke detectors at pressurization air supplies have a higher priority than other alarm signals that start the system.

E. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.

5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

F. Elevator Recall:

1. Smoke detectors at the following locations shall initiate automatic elevator recall.

   a. Elevator lobby detectors except the lobby detector on the designated floor.
   b. Smoke detector in elevator machine room.
   c. Smoke detectors in elevator hoistway.

2. Elevator lobby detectors located on the designated recall floors shall be programmed to move the cars to the alternate recall floor.

3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.

   a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

G. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in walls shall be connected to fire-alarm system.

H. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.

I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

J. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of fire-alarm control unit.

1. Indicated number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711 and be listed by an NRTL.

   a. Allow the application of and evacuation signal to indicated number of zones and, at same time, allow voice paging to the other zones selectively or in any combination.
   b. Programmable tone and message sequence selection.
   c. Standard digitally recorded messages for "Evacuation" and "All Clear."
   d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification appliance circuits of fire-alarm control unit.

2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.

3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.

K. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

L. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

M. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: Sealed lead calcium.

N. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.5 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Single-action mechanism, plastic-rod pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit FACP.
2. Double-action mechanism requiring two actions to initiate an alarm, plastic-rod pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit FACP.
3. Station Reset: Key- or wrench-operated switch.
4. Indoor Protective Shield: Factory-fabricated clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.
5. Weatherproof Protective Shield: Factory-fabricated clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.6 SYSTEM SMOKE DETECTORS

A. Multi-Sensor Type System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal, multi-sensor type containing photoelectrical sensor, tested according to UL 268A and thermal sensor, combination of rate of rise and fixed temperature.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit FACP.
3. Base Mounting: Detector shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
5. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.
6. Remote Control: Unless otherwise indicated, detectors shall be individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit and shall be adjustable for the following:

a. Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 or 20 deg F (8 or 11 deg C) per minute.
b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F (57 or 68 deg C).

c. Multiple levels adjustable detection sensitivity.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

a. Primary status.
b. Device type.
c. Present average value.
d. Present sensitivity selected.
e. Sensor range (normal, dirty, etc.).

C. Ionization Smoke Detector:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

a. Primary status.
b. Device type.
c. Present average value.
d. Present sensitivity selected.
e. Sensor range (normal, dirty, etc.).

D. Duct Smoke Detectors: Multi-sensor type complying with UL 268A and specified above.

1. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.
2. Each sensor shall have multiple levels of detection sensitivity.
3. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
4. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

E. Beam-Type Smoke Detector: Each detector shall consist of a separate transmitter and receiver, and shall have the following features:

1. UL 268 listed, operating at 24-V dc, nominal.
2. Adjustable Sensitivity: At least six sensitivity levels, settable at the receiver, measured as percent of obscuration.

3. Two selectable alarm delay settings, allowing each to be associated with a corresponding sensitivity.

4. Trouble signal delay, fixed at 20 seconds.

5. Separate Color-Coded LEDs: Indicate normal, alarm, and trouble status.

F. Heat Detectors:
1. General Requirements for Heat Detectors: Comply with UL 521.

2. Heat Detector, Combination Type: Comply with UL 521. Actuated by either a fixed temperature of **135 deg.** or a rate of rise that exceeds 15 deg F (8 deg C) per minute unless otherwise indicated.

3. Mounting: Twist-lock base interchangeable with smoke-detector bases.

4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

5. Heat Detector, Fixed-Temperature Type: Comply with UL 521. Actuated by temperature that exceeds a fixed temperature of **190 deg. F.**

6. Mounting: Twist-lock base interchangeable with smoke-detector bases.

7. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 NONSYSTEM SMOKE DETECTORS

A. Single-Station Smoke Detectors:

1. Comply with UL 217; suitable for NFPA 101, residential occupancies; operating at 120-V ac with 9-V dc battery as the secondary power source. Provide with "low" or "missing" battery chirping-sound device.

2. Auxiliary Relays: One Form A and one Form C, both rated at 0.5 A.

3. Audible Notification Appliance: Piezoelectric sounder rated at 90 dBA at 10 feet (3 m) according to UL 464.

4. Visible Notification Appliance: 177-cd strobe.

5. Heat sensor, 135 deg F (57 deg C) combination rate-of-rise and fixed temperature.

6. Test Switch: Push to test; simulates smoke at rated obscuration.

7. Tandem Connection: Allow tandem connection of number of indicated detectors; alarm on one detector shall actuate notification on all connected detectors.
8. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.

9. Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.

10. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.

B. Duct Smoke Detectors:

1. Comply with UL 268A; operating at 120-V ac.
2. Sensor: LED or infrared light source with matching silicon-cell receiver.
3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. The fixed base shall be designed for mounting directly to air duct. Provide terminals in the fixed base for connection to building wiring.

    a. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
4. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.8 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling line circuit (zoned as indicated), equipped for mounting as indicated and with screw terminals for system connections.

2.9 FIREFIGHTERS' TWO-WAY TELEPHONE COMMUNICATION SERVICE

A. Dedicated, two-way, supervised, telephone voice communication links between fire-alarm control unit[and remote firefighters' telephone stations. Supervised telephone lines shall be connected to talk circuits by controls in a control module. Provide the following:

1. Common-talk type for firefighter use only.
2. Selective-talk type for use by firefighters and fire wardens.
3. Controls to disconnect phones from talk circuits if too many phones are in use simultaneously.
4. Audible Pulse and Tone Generator, and High-Intensity Lamp: When a remote telephone is activated, it causes audible signal to sound and high-intensity lamp to flash.
5. Selector panel controls shall provide for simultaneous operation of up to six telephones in selected zones. Indicate ground faults and open or shorted telephone lines on the panel front by individual LEDs.
6. Display: Graphic to indicate location of caller.
7. Remote Telephone Cabinet: Flush- or surface-mounted cabinet as indicated, factory-standard red finish, with handset.

    a. Install one-piece handset to cabinet with vandal-resistant armored cord. Silk-screened or engraved label on cabinet door, designating "Fire Emergency Phone."
    b. With "break-glass" type door access lock.

8. Remote Telephone Jack Stations: Single-gang, stainless-steel-plate mounted plug, engraved "Fire Emergency Phone."
9. Handsets: Push-to-talk-type sets with noise-canceling microphone stored in a fire-alarm control unit.

2.10 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.

1. Electromagnet: Requires no more than 3 W to develop 25-lbf (111-N) holding force.
2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
3. Rating: 24-V ac or dc.

B. Material and Finish: Match door hardware.

2.11 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.

1. Mounting: cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.12 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

2.13 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.
3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply or loss of power.
5. Low battery.
6. Abnormal test signal.
7. Communication bus failure.

E. Secondary Power: Integral rechargeable battery and automatic charger.

F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.14 RADIO ALARM TRANSMITTER

A. Transmitter shall comply with NFPA 1221 and shall be listed and labeled by an NRTL.

B. Comply with 47 CFR 90.

C. Description: Manufacturer's standard commercial product; factory assembled, wired, tested, and ready for installation and operation.

1. Packaging: A single, modular, NEMA 250, Type 1 metal enclosure with a tamper-resistant flush tumbler lock.
2. Signal Transmission Mode and Frequency: VHF or UHF 2-W power output, coordinated with operating characteristics of the established remote alarm receiving station designated by Owner.
3. Normal Power Input: 120-V ac.
4. Secondary Power: Integral-sealed, rechargeable, 12-V battery and charger. Comply with NFPA 72 requirements for battery capacity; submit calculations.

5. Antenna: Omni-directional, coaxial half-wave, dipole type with driving point impedance matched to transmitter and antenna cable output impedance. Wind-load strength of antenna and mounting hardware and supports shall withstand 100 mph (160 km/h) with a gust factor of 1.3 without failure.
6. Antenna Cable: Coaxial cable with impedance matched to the transmitter output impedance.
7. Antenna-Cable Connectors: Weatherproof.
8. Alarm Interface Devices: Circuit boards, modules, and other auxiliary devices, integral to the transmitter, matching fire-alarm and other system outputs to message-generating inputs of the transmitter that produce required message transmissions.

D. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit or from its own internal sensors or controls and shall automatically transmit signal along with a unique code that identifies the transmitting station to the remote alarm receiving station. Transmitted messages shall correspond to standard designations for fire-reporting system to which the signal is being transmitted and shall include separately designated messages in response to the following events or conditions:

1. Transmitter Low-Battery Condition: Sent when battery voltage is below 85 percent of rated value.
2. System Test Message: Initiated manually by a test switch within the transmitter cabinet, or automatically at an optionally preselected time, once every 24 hours, with transmission time controlled by a programmed timing device integral to transmitter controls.
3. Transmitter Trouble Message: Actuated by failure, in excess of one-minute duration, of the transmitter normal power source, derangement of the wiring of the transmitter, or any alarm input interface circuit or device connected to it.
4. Local Fire-Alarm-System Trouble Message: Initiated by events or conditions that cause a trouble signal to be indicated on the building system.
5. Local Fire-Alarm-System Alarm Message: Actuated when the building system goes into an alarm state. Identifies device that initiated the alarm.
6. Local Fire-Alarm-System Supervisory-Alarm Message: Actuated when the building alarm system indicates a supervisory alarm.

2.15 SYSTEM PRINTER

A. Printer shall be listed and labeled by an NRTL as an integral part of fire-alarm system.

2.16 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by manufacturer of device.
2. Finish: Paint of color to match the protected device.

2.17 WIRE AND CABLE

A. Wire and cable for fire alarm systems shall be UL listed and labeled as complying with NFPA 70, Article 760.

B. Signaling Line Circuits: Twisted, shielded pair, not less than No. 18 AWG or size as recommended by system manufacturer.

C. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation.

1. Low-Voltage Circuits: No. 18 AWG, minimum and recommended by system supplier.
2. Line-Voltage Circuits: No. 12 AWG, minimum and recommended by system supplier.

D. Multi-conductor Armored Cable: NFPA 70 Type MC, copper conductors, TFN/THHN conductor insulation, copper drain wire, armor with outer jacket with red identifier stripe, UL listed for fire alarm and cable tray installation, plenum rated and size/pair, recommended by system supplier.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Equipment Mounting: Install fire-alarm control unit on finished floor with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.

1. Comply with requirements for seismic-restraint devices specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

C. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.

1. Connect new equipment to existing control panel in existing part of the building.
2. Connect new equipment to existing monitoring equipment at the supervising station.
3. Expand, modify, and supplement existing control and monitoring equipment as necessary to extend existing control and monitoring functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.

D. Detector Spacing:

1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing and shown on Contract Documents.
2. Smooth ceiling spacing shall not exceed 30 feet (9 m).
3. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A]in NFPA 72.
4. HVAC: Locate detectors not closer than 5 feet (1.5 m) from air-supply diffuser or return-air opening.
5. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture.

E. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

F. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.

G. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.

H. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

I. Indicating Devices: Install at 80” A.F.F. to center.

J. Manual Pull Station: Install at 48” A.F.F. to center.

K. Device Location-Indicating Lights: Locate in public space (in ceiling) near the device they monitor.

L. Fire-Alarm Control Unit: Surface mounted, with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.

M. Annunciator: Install with top of panel not more than 72 inches (1830 mm) above the finished floor.

3.2 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Division 08 Section "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet (1 m) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Alarm-initiating connection to smoke-control system (smoke management) at firefighter smoke-control system panel.
2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
3. Smoke dampers in air ducts of designated air-conditioning duct systems.
4. Alarm-initiating connection to elevator recall system and components.
5. Alarm-initiating connection to activate emergency lighting control.
6. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
7. Supervisory connections at valve supervisory switches.
8. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
9. Supervisory connections at elevator shunt trip breaker.
10. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
11. Supervisory connections at fire-pump engine control panel.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

C. Install device address at each device.

3.4 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.5 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

D. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

E. Fire-alarm system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Temporary erosion- and sedimentation-control measures.

1.2 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Notify 811 for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

1. Use coating with a VOC content of 3.5 lb/gal. or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Wrap a 1-inch blue vinyl tie tape around each tree trunk at 54 inches above the ground.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site as indicated on the drawings.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of **6** inches in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
2. Excavating and backfilling for buildings and structures.
3. Subbase course and base course for paving.
4. Subsurface drainage backfill for walls and trenches.
5. Excavating and backfilling trenches for utilities and pits for buried utility structures.
6. Excavating well hole to accommodate elevator-cylinder assembly.

1.2 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.

2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 ACTION SUBMITTALS

A. TX-CHPS Submittals
1. Product Data for Credit MW3.1: For products having recycled content, provide cut sheets for materials claimed to have the required recycled content. Provide schedule of values for the project with each recycled content product clearly marked or highlighted and sorted by CSI number

B. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Warning tapes.

1.4 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to the geotechnical engineering recommendations.

B. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

B. Preexcavation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify 811 for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, are in place.

E. Do not commence earth moving operations until plant-protection measures are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils:
1. Refer to the geotechnical engineers report.
2. Base course materials for paving shall have a minimum of 50% recycled aggregate

C. Unsatisfactory Soils: Refer to the geotechnical engineers report

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials,

and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches **each side of pipe or conduit**.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.8 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Refer to drawings

D. Trenches under Roadways: Refer to drawings.

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Place and compact initial backfill free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

G. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

H. Place and compact final backfill of satisfactory soil to final subgrade elevation.

I. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

J. Install warning tape directly above utilities, 12 inches below finished grade, except 6 feet below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to the drawings.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks: Plus or minus 1/2 inch
3. Pavements: Plus or minus 1/2 inch

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating and backfilling for structures, utilities, and pavement.
   2. Pipe bedding.
   3. Compacting fill materials.
   4. Borings and casings under roads.

B. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:
   1. Section 312000 - Earth Moving: Cutting, filling, and grading for proposed site improvements.
   2. Section 313200 - Soil Stabilization: Lime, cement, fly ash, and geotextile subgrade stabilizers.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.
   2. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

B. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO T 180 - Moisture-Density relations of Soils Using a 10 Pound Rammer and an 18 Inch Drop.

C. American Water Works Association (AWWA):
   1. AWWA C 200 - Steel Water Pipe, 6 Inch and Larger.
   2. AWWA C 206 - Field Welding of Steel Water Pipe.

D. National Fire Protection Association (NFPA):
   1. NFPA 70 - National Electric code.

1.3 DEFINITIONS

A. Building Area Subgrade Pad: Portion of site directly beneath and within a line 10 feet beyond building and appurtenances including limits of any future building expansion areas indicated on Drawings.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Procedures for submittals.
   1. Shop Drawings:
      a. Submit drawings or details indicating proposed alternate earthwork procedures or proposed procedures not indicated in Contract Documents.
      b. Shop Drawings or details pertaining to Site Utilities are not required unless required by regulatory authorities or unless use of materials, methods, equipment, or procedures are contrary to Drawings or these specifications are proposed. Do not perform work until required shop drawings have been approved by Contracting Officer.
   2. Assurance/Control Submittals:
      a. Material Source: Submit name of imported materials suppliers. Provide materials from same source throughout the work. Change of source requires Contracting Officer approval.
      b. Test Reports: Submit the following reports directly to Contracting Officer from Testing Laboratory, with copy to Contractor:
         1) Test reports on borrow material.
         2) Verification of each footing subgrade.
         3) Field density test reports.
         4) Optimum moisture-maximum density curve for each type of soil encountered.
         5) Report of actual unconfined compressive strength and bearing tests/results for each strata tested. Give "three-dimensional" description of each test location.
      c. Certificates: Gradation and certification of aggregate material for Testing Laboratory review.

d. Qualification Documentation: Submit earthwork company documentation of experience indicating compliance with specified qualification requirements.

B. Section 017704 - Closeout Procedures and Training: Procedures for closeout submittals.
1. Project Record Documents: Accurately record the following.
a. Spot elevations for building area subgrade pad.
b. Location of existing utilities remaining, re-routed utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.5 QUALITY ASSURANCE

A. Qualifications: Earthwork company specializing in performing the Work of this Section with minimum 5 years documented experience.

B. Regulatory Requirements: Perform earthwork in accordance with applicable requirements of governing authorities having jurisdiction.

1.6 PROJECT CONDITIONS OR SITE CONDITIONS

A. Existing Conditions: Requirements specified in Section 312000.

B. Existing Utilities: Requirements specified in Section 312000.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stockpiled on-site fill and backfill material specified in Section 312000, tested by Testing Laboratory and approved by Contracting Officer.

B. Imported off-site fill and backfill material specified in Section 312000, tested by Testing Laboratory and approved by Contracting Officer.

C. Pipe Bedding Material: Processed sand and gravel free from clay lumps, organic, or other deleterious material complying with the following gradation requirements:

SIEVE SIZE	PERCENT PASSING
1 Inch	100
3/4 Inch	90 to 100
1/2 Inch	25 to 60
3/8 Inch	20 to 55
No. 4	0 to 10
No. 8	0 to 5

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Verification of existing conditions before starting work.

B. Verification of Conditions: Verify that field measurements, surfaces, and conditions are as required, and ready to receive Work.

C. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

D. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to United States Postal Service.

3.2 PREPARATION

A. Identify required lines, elevations, levels, contours, grades, and datum necessary to perform earthwork operations as indicated on Drawings.

B. Verify that survey benchmark and intended elevations for the Work are as indicated on Drawings.

C. Locate, identify, and protect existing utilities to remain and previously installed utilities that may be damaged by construction operations.
1. Notify Contracting Officer, municipality, and utility company immediately of utilities, not indicated on Drawings, encountered.

2. Maintain existing utilities, active utilities, and drainage systems in operating condition.
3. Comply with utility company requirements and directions of Construction Manager to keep utilities in operation.
4. Repair damage to utilities as directed by Contracting Officer.

D. Protect plant life, lawns, fences, existing structures, sidewalks, paving and curbs from earthwork operations, excavating equipment, and vehicular traffic.

E. Protect benchmarks, property corners, and other survey monuments from damage or displacement. Where markers are required to be removed, provide removal and reinstallation by licensed land surveyor licensed in State where project is located.

F. Overexcavate areas of building subgrade found consisting of unsuitable materials as determined by Testing Laboratory and Contracting Officer. Prepare, fill with suitable material, and compact as specified. Stabilize areas as specified in Section 313200.

3.3 EXCAVATION

A. Excavation for filling and grading specified in Section 312000.

B. Excavation for Structures:
1. Excavate subbase for building foundations, slabs-on-grade and site structures to width and depth indicated on Drawings.
   a. Cut excavation banks vertically.
   b. Remove rocks, loose soil, and debris from bottom of excavation.
   c. Overexcavate wet or unsuitable soil from bottom of excavation.
   d. Provide stable base for concrete reinforcing installation and concrete placement.
   e. Hand trim to indicated lines and grades just prior to concrete reinforcing installation.
2. Provide protection for workers within trench areas in accordance with local, state, and national Occupational Safety and Health requirements and regulations.
   a. Trenches minimum 4 feet in depth.
3. During excavation, stockpile materials suitable for backfilling away from excavation to prevent overloading, slides, or cave-ins.
4. Remove material encountered in excavating operations that is unsuitable for backfilling, subgrade or foundation purposes as determined by Testing Laboratory and Contracting Officer. Dispose of materials off-site in an approved manner in accordance with requirements of authorities having jurisdiction.
5. Prevent surface water from flowing into excavations by temporary grading or other approved methods.
   a. Do not allow water to accumulate in excavations.
   b. Remove accumulated water in excavations.
   c. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components required to remove water from excavations.

C. Excavation for Utilities:
1. Excavate trench width and depth required for laying pipe, conduit, or cable. Cut trench banks vertical. Remove stones from bottom of trench as required to avoid point-bearing. Over excavate wet or unstable soil, if encountered, from trench bottom as required to provide suitable base for continuous and uniform bedding.
2. During excavation, stockpile materials suitable for backfilling away from trench bank to prevent overloading, slides, or cave-ins.
3. Remove material encountered in trenching operations that is unsuitable for backfilling, subgrade or foundation purposes as determined by Testing Laboratory and Contracting Officer. Dispose of materials off-site in an approved manner in accordance with requirements of authorities having jurisdiction.
4. Prevent surface water from flowing into trenches or other excavations by temporary grading or other approved methods.
   a. Do not allow water to accumulate in excavations.
   b. Remove accumulated water in excavations.
   c. Provide and maintain pumps, well points, sumps, suction and discharge lines and other dewatering system components required to remove water from excavations.
5. Open cut excavation using trenching machine or backhoe. Do not use dirt clods for backfill created by use of machines other than ladder or wheel-type trenching machines.
6. Grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material along entire trench length, except where necessary to excavate for bell holes, proper sealing

of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Do not excavate trench deeper, longer, or wider than required to make proper joint connection.

7. Excavate trench width below the top of pipe minimum 300 mm wide and maximum 460 mm wider than outside surface of pipe or conduit installed to elevations and grades indicated on Drawings. Excavate trench width for other pipe, conduit, or cable to least practical width allowing for proper compaction of trench backfill.
8. Excavate trench depth measured from finished grade or paved surface to the following requirements or applicable codes and ordinances:
   a. Water Mains: 30 inches to top of pipe barrel or 6 inches below frost line established by local building official, whichever is deeper.
   b. Sanitary Sewer: Elevations, and grades indicated on Drawings.
   c. Storm Sewer: Depths, elevations, and grades indicated on Drawings.
   d. Electrical Conduits: 24 inches minimum to top of conduit or as required by NFPA 70, or local utility company requirements, whichever is deeper.
   e. TV Conduits: 18 inches minimum to top of conduit or as required by local utility company, whichever is deeper.
   f. Telephone Conduits: 18 inches minimum to top of conduit, or as required by local utility company, whichever is deeper.
   g. Gas Mains and Service: 30 inches minimum to top of pipe, or as required by local utility company, whichever is deeper.
9. Provide shoring, sheeting, and bracing, as required, in trenches and other excavations where protection of construction personnel is required. Sheeting may be removed after sufficient backfilling to protect against damaging or injurious caving.

D. Excavation for Pavement:
   1. Excavate roadway and pavement areas to line and grade indicated on Drawings.
   2. Stockpile excavated material suitable for backfilling on-site.
   3. Remove excavated materials not required or not suitable for backfill from site.
   4. Overexcavate areas of pavement subgrade found to contain unsuitable material. Prepare, fill with suitable material, and compact as specified. Stabilize areas as specified in Section 313200.

3.4 PIPE BEDDING

A. Excavate trenches, for pipe or conduit installed to elevations indicated on Drawings, 4 inches below bottom of pipe and to width as specified. Place 4 inches of bedding material, compact in bottom of trench, and shape to conform to lower portion of pipe barrel. After pipe installation, backfill and compact to top of trench.

B. Place geotextile fabric as indicated on Drawings.

3.5 BACKFILLING AND SUBGRADE PREPARATION

A. Backfilling:
   1. Verify that imported off-site fill and stockpiled on-site fill is tested and approved.
   2. Verify that foundation perimeter drainage installation is inspected and approved.
   3. Verify that foundation or below grade structure walls are braced to support surcharge forces imposed by backfilling operations.
   4. Verify that backfill areas are free of debris, snow, ice, or water, and that ground surfaces are not frozen.

B. Prepare building area subgrade pad in accordance with foundation subsurface preparation information indicated on Drawings and specified herein. Do not use rock larger than 6 inches for building subgrade fill.

C. Areas Exposed by Excavation or Stripping:
   1. Scarify areas exposed by excavation or stripping on which building subgrade preparations are to be performed to minimum 9 inch depth.
   2. Compact to minimum 95 percent optimum density in accordance with ASTM D698 at minimum moisture content as indicated in the geotechnical engineering report.
   3. Proofroll to detect any areas of insufficient compaction by making minimum of 2 complete passes with fully-loaded tandem-axle dump truck, or Contracting Officer approved equivalent, in each of two perpendicular directions under supervision and direction of Contracting Officer.
   4. Excavate and recompact areas failing to meet specified requirements.

D. Fill Material Placement:
   1. Place in 9 inch maximum lifts compacted minimum 95 percent optimum density in accordance with ASTM 698 at minimum moisture content as indicated in the geotechnical engineering report.

2. Maximum allowable values for plasticity index (PI) and liquid limit (LL) of suitable fill materials to be used as fill in the specified areas, unless indicated otherwise on Drawings:

	LOCATION	PI	LL
a.	Building area	10 - 25	45
b.	Paving area,	10 - 25	45

E. Provide material imported from off-site with CBR (California Bearing Ratio) or LBR (Limerock Bearing Ratio) value equal to or above pavement design subgrade CBR or LBR value indicated on Drawings.

3.6 MAINTENANCE OF SUBGRADE

A. Verify finished subgrades for elevations indicated on Drawings and specified conditions for construction above subgrade.

B. Protect subgrade from excessive wheel loading during construction, including concrete trucks and dump trucks.

C. Remove areas of finished subgrade found to have insufficient compaction density. Replace in a manner that will comply with compaction requirements as directed by Contracting Officer. Provide hard, uniform, smooth, stable surface, true to grade and cross-section after completion of compaction.

3.7 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Field testing and inspection.

B. Excavation: Notify Testing Laboratory and Contracting Officer for visual inspection of bearing surfaces, 48 hours prior to backfilling and other subsequent Work.

C. Site Tests:
1. Specified in Section 312000.
2. Tests for Building Area Subgrade Pad:
   a. Cut Areas: Minimum one compaction test for every 2,500 square feet.
   b. Fill Areas: Minimum one compaction test for every 2,500 square feet for each 9 inch lift measured loose.
3. Tests for areas outside building area subgrade pad specified in Section 312000.

D. If tests indicate the Work does not meet specified requirements, remove Work, replace, compact and retest at no additional cost to United States Postal Service.

3.8 PROTECTION

A. Protect building subgrade pad and building related earthwork from damage by construction operations and erosion.

B. Prohibit vehicles from entering building subgrade pad area. Vehicles not permitted.

C. Scarify surface, reshape, and compact areas damaged by construction operations or weather erosion.

END OF SECTION

SECTION 31 25 00

SWPPP

PART 1 - GENERAL

1.1 SUMMARY

A. This Section provides for the delivery and implementation of the Storm Water Pollution Prevention Plan.

1.2 DEFINITIONS

A. SWPPP: Storm Water Pollution Prevention Plan

PART 2- PRODUCTS

2.1. The contractor will be provided with a package outlining including the SWPPP and contractor requirements regarding the SWPPP. In addition, reference is made to the Erosion Control construction plan prepared for this project.

PART 3- EXECUTION

3.1. The contractor will be responsible for execution and implementation of the SWPPP, including construction of all required erosion control features, reporting to TCEQ and completion of inspection forms.

END OF SECTION

SECTION 31 25 53

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Temporary and permanent erosion control systems.
   2. Slope protection systems.

B. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:
   1. Section 313200 - Soil Stabilization: Lime, cement, fly ash, and geotextile subgrade stabilizers.

1.2 SUBMITTALS

A. Section 013300 - Submittal Procedures: Procedures for Quality Assurance/Control submittals.
   1. Material Source: Submit name of material suppliers.
   2. Provide materials from same source throughout Work. Change of source requires Contracting Officer approval.

1.3 PROJECT CONDITIONS OR SITE CONDITIONS

A. Environmental Requirements: Protect adjacent properties and water resources from erosion and sediment damage throughout Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Quick Growing Grasses: Wheat, rye, or oats.

B. Straw Bales: Free of weed seed.

C. Fencing for Siltation Control: Indicated on Drawings.

D. Erosion Control Blankets and/or Erosion Control Geotextiles.

E. Bale Stakes:
   1. Minimum 4 feet length.
   2. 2 No. 4 steel reinforcing bars or,
   3. 2 steel pickets or,
   4. 2 - 2x2 inch hardwood stakes driven 18 inches to 24 inches into ground.

F. Temporary Mulches: Loose straw, netting, wood cellulose, or agricultural silage free of seed.

G. Metal Fence Stakes: Minimum 8 foot length.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Verification of existing conditions before starting Work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.

C. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

D. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to U.S. Postal Service.

3.2 PREPARATION

A. Prepare and implement Stormwater Pollution Prevention Plan SWP^3, if required.

3.3 EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

A. Contracting Officer may direct Contractor to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and may direct Contractor to provide immediate permanent or temporary pollution control measures.

B. Provide permanent erosion control measures at earliest practical time to minimize requirement for temporary erosion controls. Permanently seed and mulch cut slopes as excavation proceeds.

C. Maintain temporary erosion control systems installed by Contractor as directed by Contracting Officer to control siltation at all times throughout Work. Provide maintenance or additional Work directed by Contracting Officer within 48 hours of notification by Contracting Officer.

D. Apply soil stabilization as specified in Section 313200 or seed slopes that may be easily eroded with wheat, rye or oat grasses.

END OF SECTION

SECTION 31 32 00

SOIL STABILIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Lime stabilized subgrade.

B. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:
   1. Section 31 20 00 - Earth Moving: Cutting, filling, and grading for site improvements.
   2. Section 31 32 00 - Excavation and Fill: Earthwork for structures., utilities, and pavement.

1.2 REFERENCES

A. American Society for Testing Materials (ASTM):
   1. ASTM C 150 - Specification for Portland Cement
   2. ASTM C 618 - Specification for Fly Ash and Raw of Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
   3. ASTM C 977 - Specification for Quicklime and Hydrated Lime for Soil Stabilization
   4. ASTM D 698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 Pound Rammer and 12 Inch Drop.
   5. ASTM D 1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10 Pound Rammer and 18 Inch Drop.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.
   1. *Material Source:*
      a. Submit name of imported materials suppliers.
      b. Provide materials from same source throughout the work. Change of source requires Contracting Officer approval.
   2. *Samples:* Submit two samples of each type of imported off-site fill material in air-tight, 10 pound container for Contracting Officer testing or submit gradation and certification of aggregate material for Contracting Officer review.
   3. *Mix Design*: Submit mix design and materials mix ratio that will achieve specified requirements for soil stabilization by state and local agencies.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Perform soil stabilization work in accordance with applicable requirements of governing authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Transport, handle, store, and protect products.

B. Examine soil stabilization materials upon delivery to site. Verify that materials are as specified and match approved samples. Remove non-complying materials from site.

1.6 PROJECT CONDITIONS OR SITE CONDITIONS

A. Environmental Requirements:
   1. Do not begin mixing operation when subgrade is frozen or when air temperature is less than 40° F.
   2. Do not install mixed materials in wind above 10 miles per hour.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Quicklime or Hydrated Lime: ASTM C 977.

B. Fine and Coarse Aggregate: In accordance with applicable State Highway Standard Specification regarding source, quality, gradation, liquid limit, plasticity index, and mix proportioning.

C. Degradable natural fiber erosion control blankets
   1. Provide and install materials in accordance with applicable state highway standard specification.

2.2 EQUIPMENT

A. Perform operations using suitable, well maintained equipment capable of excavating subsoil, mixing and placing materials, wetting, consolidation and compaction of material.

2.3 SOIL MIX

A. Mix materials in accordance with referenced State Highway Standard Specification.
   1. Soil mix shall be as recommended in the geotechnical engineering report.

B. Add water to mix to achieve a consistent mixture without lumping yet not create a wet plastic consistency.

C. Obtain Contracting Officer approval of mix before proceeding with placement.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Verification of conditions before starting work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
   1. Verify that existing site soils and soil conditions encountered are as indicated in Geotechnical Data.
   2. Verify quantity and type of soil stabilization materials before beginning material installation.

C. Report in writing to Contracting Officer prevailing the conditions that will adversely affect satisfactory execution of this Work. Do not proceed with Work until unsatisfactory conditions have been corrected.

D. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to United States Postal Service.

3.2 PREPARATION

A. Obtain Contracting Officer approval of mix design before proceeding with placement.

B. Do not start stabilization without weather and soil conditions being favorable for successful application of proposed material.

C. Proof roll subgrade to identify areas in need of stabilization.

D. Prior to stabilization of soils, prepare surface areas in accordance with applicable State Highway Standard Specifications.

3.3 EXCAVATION

A. Excavate subsoil to a depth sufficient to accommodate soil stabilization.

B. Remove lumped subsoil, boulders and rock that interfere with achieving uniform subsoil conditions.

3.4 SOIL TREATMENT AND BACKFILLING

A. Do not backfill over frozen or spongy subgrade surfaces.

B. Lime Stabilized Subgrade: Where indicated on Drawings, treat prepared subgrade with hydrated lime in accordance with the recommendations. Compact to minimum 95 percent optimum density in accordance with ASTM D 698.

C. Maintain optimum moisture of mix materials to attain required stabilization and compaction.

D. Finish subgrade surface as specified in Section 312000.

3.5 GEOTEXTILE FABRIC

A. Place fabric in areas indicated on Drawings or in areas requiring additional stabilization prior to placement of base course.

END OF SECTION

SECTION 31 63 29

DRILLED CONCRETE PIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Drilling and cleaning pier holes
2. Underreaming pier holes
3. De-watering of shafts and removal of spoil
4. Casing pier holes

B. Products Installed, Not Furnished Under This Section
1. Concrete and reinforcing steel
2. Anchor bolts, templates and dowels

1.2 REFERENCES (Latest Edition)

A. Codes and Specifications
1. Standards and specifications provided by the Association of Drilled Shaft Contractors
2. American Concrete Institute (ACI):
a. ACI 336.1, Specification for the Construction of Drilled Piers
b. ACI 336.3, Report on Design and Construction of Drilled Piers

1.3 BASIS FOR BIDS

A. Definitions
1. Ground surface: Final grade based on finish floor elevations.
2. Pier depth: Total depth of pier calculated as the sum of:
a. Depth from ground surface to top of bearing stratum
b. Depth that casing extends into bearing stratum
c. Required penetration into bearing stratum
3. Bid depth: Pier depth based on top of bearing stratum elevation.
4. Pay depth: Actual depth of pier as installed.

B. Contract Sum
1. Calculate Contract Sum based on bid depth.
2. Do Not Include temporary casing in Contract Sum.

C. Unit Prices
1. Piers: provide add and deduct unit price per linear foot shorter or longer than bid depth
a. No additional depth of penetration into bearing stratum will be included in the pay depth unless required in writing by the inspecting agency.
2. Casings: provide add and deduct unit price per linear foot for steel casing installation and removal. Base unit price on actual length of temporary steel casing measured from ground surface to bottom of casing.
3. Provide unit prices for complete Work including labor, materials, overhead, taxes and profit.

1.4 QUALITY ASSURANCE

A. Qualifications
1. Contractor: at least 3 years of experience in similar applications
a. Relevant experience to anticipated subsurface materials, water conditions, shaft sizes and special techniques required
2. Demonstrate to Architect dependability of equipment and techniques to be used, when requested.

B. Conform to requirements of ACI 336.1, except as modified by requirements of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store reinforcing cages off ground and protect from contamination by dirt, grease and corrosion.

B. Deliver concrete to site in timely manner and in sufficient quantities to allow concreting of each pier as monolithic unit.

C. Coordinate delivery of concrete to allow placement to begin within 8 hours of completion of drilling.

PART 2 - PRODUCTS

2.1 MATERIALS - Refer to related sections for materials installed, not furnished under this section.

2.2 FABRICATION

A. Prior to drilling pier holes, fabricate reinforcing cages in stock lengths suitable for cutting to required lengths. Bend reinforcing as detailed.
1. Do not splice vertical reinforcing.
2. Do not use cross wire ties that would interfere with tremie pipe or concrete free falling down the center of the cage.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to beginning installation, review subsoil investigation report for site provided by Owner and become thoroughly familiar with anticipated subsoil conditions.

B. Examine site for obstructions to drilling, such as power lines, utilities, material stockpiles, boulders and uneven surfaces. Report anticipated problems to Architect in timely manner so as not to delay schedule of Work.

C. Locate existing underground utilities and notify Architect of conflicts with Work.

3.2 PREPARATION

A. Have ready at site equipment anticipated to be necessary for successful installation of piers, including power augers, core barrels, belling tools, tremies, hoppers, chutes, and casing, as applicable.

B. Maintain in ready condition dowels, templates, and anchor bolts required for pier installation.

3.3 INSTALLATION

A. Drilling Underreamed Pier Holes
1. Drill pier holes with power augers or core barrels suitable for subsoil conditions at site.
2. Drill pier holes of required diameters to bearing stratum and underream piers to required shape and diameter.
3. Where casing is required, increase pier hole diameter as necessary to accommodate casing having inside diameter not less than required shaft diameter to depth necessary to seal shaft.

B. De-watering Pier Holes
1. Remove standing water from pier holes to within 3 inches of hole base by bailing or pumping.
2. Where flowing water is encountered, or required water level cannot be maintained, use casing.

C. Casing Pier Holes
1. Where flowing water or caving soil is encountered use temporary steel casings to seal sides of shaft.
2. Provide watertight, steel casings of adequate strength to withstand handling stresses and concrete and earth pressures.
3. Extend casings only to depth required to seal off water or caving soil.
4. Extract casings in vertical lifts, maintaining adequate head of concrete to prevent caving of soils. Do not rotate casing during removal.

D. Placing Reinforcing Cages, Dowels and Anchor Bolts
1. Place reinforcing steel cages accurately in shafts and hold in position during placement of concrete.
2. Place dowels and anchor bolts in position and maintain proper location and elevation with templates.
3. Use spacer rollers to maintain position of cage within shaft and to maintain minimum 3 inches of concrete cover without casing, and 4 inches of concrete cover with casing.
4. Use end blocks to support cage at required elevation maintaining proper clearance at base of pier.

E. Placing and Consolidating Concrete
1. Clean pier shafts of accumulated loose material before placing concrete and remove water to within 3 inches of base of shaft.
2. Place concrete within 8 hours of drilling.
3. Place concrete using collection hopper with steel outlet pipe to direct concrete down the center of the shaft. Placing concrete directly into the shaft from concrete truck chute is not allowed.
4. Extend tremie pipe as required to limit concrete free fall height as follows:
   a. Shaft diameter 18 inches or less: 10 feet max free fall
   b. Shaft diameter 20 to 30 inches: 30 feet max free fall
   c. Shaft diameter 32 inches or larger: 60 feet max free fall
5. Place concrete in one continuous operation for each pier.
6. Consolidate top 6 feet of each pier with concrete vibrator.
7. Where water rises to top of pier during placement, remove over-wetted concrete and replace with sound, dense material.
8. Remove and replace portions of concrete that become contaminated with mud or spoil material during placement.
9. Where tops of pier holes become mushroomed during drilling or installation procedures, use round forms to maintain constant diameter.

F. Tolerances
1. Maximum lateral variation off centerlines: 3 inches
2. Plumbness of vertical piers within 1 ½ percent of shaft depth to bearing stratum.
3. Shaft diameter: plus 2 inches, minus 0
4. Top of pier elevation: plus one inch, minus 3 inches
5. Diameter of underream: plus 2 inches, minus 0
6. Levelness of pier bottom bearing surface: within 1 vertical to 12 horizontal of level
7. Placement of dowels at tops of piers: plus or minus 1 inch horizontal and vertical. Set dowels in open shaft prior to concrete placement, unless wet setting of dowels is approved by Architect.
8. Placement of anchor bolts: plus or minus ¼ inch horizontal, plus or minus ½ inch vertical.

3.4 FIELD QUALITY CONTROL

A. Testing Laboratory and Inspection Services
1. Inspect drilling of each pier hole
   a. Determine location of required bearing stratum
   b. Measure depth to bearing stratum from ground surface
   c. Measure overlap of casing into the bearing stratum where casing required.
   d. Measure depth of penetration into stratum
   e. Measure shaft and underream diameters.
   f. Measure casing diameter where casing required
   g. Inspect condition of base prior to placing concrete
2. Inspect reinforcing cages
   a. Check bar sizes and quantity
   b. Check tieing and splicing of cages
   c. Monitor placement and securement techniques
3. Monitor concrete placement
   a. Monitor time interval between drilling and placement.
   b. Inspect placement techniques and conditions.
   c. Inspect concrete quality at tops of shafts.
4. Material Tests: refer to sections for products installed, not furnished under this section.
5. Field Conditions: where un-anticipated subsurface conditions prevent proper installation of piers, do not proceed with Work until directed by Architect.
6. Pier Log: for each pier record the following and submit to Architect for review:
   a. Identification mark
   b. Plan view identifying pier location
   c. Shaft diameter
   d. Bell diameter
   e. Bottom of pier elevation
   f. Pier reinforcing (vertical bars and ties)
   g. Steel cage length
   h. Depth and diameter of casing, where casing required

i. Top of Pier Elevation
j. Concrete quantity
k. Date and time drilling completed
l. Date and time concrete placement begun and completed
m. Plumbness variation
n. Condition of drilled hole before placement of concrete
o. Notes regarding piers not in compliance

B. Adjusting
1. Re-drill piers for which time lapse between drilling and concreting exceeds maximum as determined by Architect at no additional cost to Owner.
2. Replace piers installed without required inspection as directed by Architect at no additional cost to Owner.
3. Test and/or correct pier installations suspect of deficient quality as directed by Architect at no additional cost to Owner.
4. Pier shafts larger than required diameter, except where casing is required, may require additional vertical reinforcing, as instructed by Architect at no additional cost to Owner.
5. Remove mushrooms - before concrete cures, remove excess concrete from tops of piers to maintain pier shafts of constant diameter.

C. Clean-up
1. Remove spoil and debris from the site and legally dispose.

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. TX-CHPS Submittals

1. Product Data for Credit MW3.1: For products having recycled content, provide cut sheets for materials claimed to have the required recycled content. Provide schedule of values for the project with each recycled content product clearly marked or highlighted and sorted by CSI number.
2. Design Mixtures for Credit MW3.1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements. For each design mixture submitted, include an equivalent concrete mixture that does not contain portland cement replacements, to determine amount of portland cement replaced.

D. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer of detectable warnings, ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.

3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301 unless otherwise indicated.

F. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete paving subcontractor.
e. Manufacturer's representative of stamped concrete paving system used for detectable warnings.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F, for oil-based materials 55 deg F for water-based materials, and not exceeding 95 deg F

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 ; deformed.

C. Plain-Steel Wire: ASTM A 82/A 82M.

D. Deformed-Steel Wire: ASTM A 496/A 496M.

E. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars, Cut bars true to length with ends square and free of burrs.

F. Tie Bars: ASTM A 615/A 615M, Grade 60 deformed.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

H. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, portland cement

a. Fly Ash: ASTM C 618,
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

2. Blended Hydraulic Cement: ASTM C 595, cement.

Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

3. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.
4. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

B. Water: Potable and complying with ASTM C 94/C 94M.

C. Air-Entraining Admixture: ASTM C 260.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable nonfading, and resistant to lime and other alkalis.

1. Color: As selected by Architect from manufacturer's full range

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Chemical Surface Retarder: Water-soluble, liquid, set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch.

E. Pigmented Mineral Dry-Shake Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Color: As selected by Architect from manufacturer's full range.

2.6 DETECTABLE WARNING MATERIALS

A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome.

1. Manufacturers: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:

a. Advanced Surfaces Inc.
b. Matcrete Precision Stamped Concrete Tools.
c. Southern Color N.A., Inc.
d. Stampcrete International Ltd.
e. Superior Decorative by Dayton Superior.

2. Size of Stamp: One piece matching detectable warning area shown on Drawings

B. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation designed to facilitate release of stamp mats.

1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:

a. Advanced Surfaces Inc.; Liquid Release.
b. Matcrete Precision Stamped Concrete Tools; Liquid Release Agent.
c. Southern Color N.A., Inc.; SCC Clear Liquid Release.
d. Stampcrete International Ltd.; Stampcrete Liquid Release.
e. Superior Decorative by Dayton Superior; Pro Liquid Release.

2.7 PAVEMENT MARKINGS

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248**;** colors complying with FS TT-P-1952.

1. Color as indicated.

B. Pavement-Marking Paint: MPI #32 Alkyd Traffic Marking Paint.

1. Color: as indicated.

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

1. Color: As indicated.

D. Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint.

1. Color As indicated.

E. Glass Beads: AASHTO M 247, Type 1

2.8 WHEEL STOPS

A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4 inch in diameter, 10-inch minimum length.

2.9 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): As shown on drawings.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
3. Slump Limit: 4 inches.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: Refer to geotechnical engineering report.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture, high-range, water-reducing admixture, high-range, water-reducing and retarding admixture, or plasticizing and retarding admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent (Min.)
2. Ground Granulated Blast-Furnace Slag: 50 percent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes.

    a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

    a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies**,** reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

L. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. *Elevation:* 3/4 inch
2. *Thickness*: Plus 3/8 inch, minus 1/4 inch
3. *Surface:* Gap below 10-foot-long, unleveled straightedge not to exceed 1/2 inch
4. *Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge*: 1/2 inch per 12 inches of tie bar.
5. *Lateral Alignment and Spacing of Dowels:* 1 inch
6. *Vertical Alignment of Dowels:* 1/4 inch.
7. *Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge:*

1/4 inch per 12 inches of dowel.

8. *Joint Spacing:* 3 inches.
9. *Contraction Joint Depth:* Plus 1/4 inch, no minus.
10. *Joint Width:* Plus 1/8 inch, no minus.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete paving to cure for a minimum of 30 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.11 WHEEL STOPS

A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.

B. Securely attach wheel stops to paving with not less than two steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

3.12 FIELD QUALITY CONTROL

A. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

B. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

C. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

F. Concrete paving will be considered defective if it does not pass tests and inspections.

G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

H. Prepare test and inspection reports.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 32 13 73

CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.
2. Hot-applied joint sealants.

B. Related Sections:
1. Section 321313 "Concrete Paving" for constructing joints in concrete pavement.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, Samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint-preparation data that are based on previous testing, not older than 24 months, of sealant products for compatibility with and adhesion to joint substrates and other materials matching those submitted.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Pavement-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of joint sealant and accessory, from manufacturer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.

C. Preconstruction Compatibility and Adhesion Test Reports: From joint-sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility with and adhesion to joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

D. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone.
b. Dow Corning Corporation; 888.
c. Pecora Corporation; 301 NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
    b. Dow Corning Corporation; 890-SL.
    c. Pecora Corporation; 300 SL.

C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pecora Corporation; Urexpan NR-200.

2.3 HOT-APPLIED JOINT SEALANTS

A. Hot-Applied, Single-Component Joint Sealant for Concrete: ASTM D 3406.

1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Crafco Inc., an ERGON company; Superseal 444/777.

B. Hot-Applied, Single-Component Joint Sealant for Concrete and Asphalt: ASTM D 6690, Types I, II, and III.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Meadows, W. R., Inc.;
    b. Right Pointe; D-3405 Hot Applied Sealant.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are noN-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backings.
2. Do not stretch, twist, puncture, or tear joint-sealant backings.
3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place joint sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING

A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within cement concrete pavement.

1. Joint Location:

    a. Expansion and isolation joints in cast-in-place concrete pavement.
    b. Contraction joints in cast-in-place concrete slabs.
    c. Other joints as indicated.

2. Silicone Joint Sealant for Concrete: Single component, self-leveling.
3. Urethane Joint Sealant for Concrete: Multicomponent, pourable, traffic-grade.
4. Hot-Applied Joint Sealant for Concrete: Single component
5. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement

1. Joint Location:

    a. Joints between concrete and asphalt pavement.
    b. Joints between concrete curbs and asphalt pavement.
    c. Other joints as indicated.

2. Hot-Applied Joint Sealant for Concrete and Asphalt: Single component.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION

SECTION 32 14 00

UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete pavers set on concrete bed and aggregate setting bed
2. Cast-in-place concrete edge restraints.

B. Related Sections:
1. Section 321313 "Concrete Paving" for concrete base under unit pavers and for cast-in-place concrete curbs and gutters serving as edge restraints for unit pavers.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Pavers.
2. Bituminous setting materials.
3. Mortar and grout materials.
4. Edge restraints.
5. Precast concrete curbs.
6. Stone curbs.

B. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C 136.

C. Samples for Initial Selection: For the following:

1. Each type of unit paver indicated.
2. Joint materials involving color selection.
3. .

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Preinstallation Conference: Conduct conference at Project site

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquids in tightly closed containers protected from freezing.

1.5 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

PART 2 - PRODUCTS

2.1 CONCRETE PAVERS

A. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936 and resistant to freezing and thawing when tested according to ASTM C 1645, made from normal-weight aggregates.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pavestone

2. Thickness: 3-1/8 inches (80 mm)
3. Face Size and Shape: As indicated on drawings.
4. Color: As selected by Architect from manufacturer's full range

2.2 CURBS AND EDGE RESTRAINTS

A. Job-Built Concrete Edge Restraints: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of 3000 psi (20 MPa).

2.3 AGGREGATE SETTING-BED MATERIALS

A. Sand for Leveling Course: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33 for fine aggregate.

B. Sand for Joints: Comply with gradation requirements in ASTM C 144

1. Provide sand of color needed to produce required joint color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

3.3 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

1. For concrete pavers, a block splitter may be used.

D. Handle protective-coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

E. Joint Pattern: As indicated on drawings

F. Tolerances: Do not exceed 1/16-inch (1.6-mm) unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches (3 mm in 600 mm) and 1/4 inch in 10 feet (6 mm in 3 m) from level, or indicated slope, for finished surface of paving.

3.4 AGGREGATE SETTING-BED APPLICATIONS

A. Place leveling course and screed to a thickness of 1 to 1-1/2 inches, taking care that moisture content remains constant and density is loose and uniform until pavers are set and compacted.

B. Treat leveling course with herbicide to inhibit growth of grass and weeds.

C. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.

1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

D. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.

1. Compact pavers when there is sufficient surface to accommodate operation of vibrator, leaving at least 36 inches of uncompacted pavers adjacent to temporary edges.

E. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

F. Do not allow traffic on installed pavers until sand has been vibrated into joints.

G. Repeat joint-filling process 30 days later.

3.5 REPAIRING, POINTING, AND CLEANING

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, and with no evidence of replacement.

B. Cleaning: Remove excess sand from exposed paver surfaces; wash and scrub clean.

END OF SECTION

SECTION 32 17 13

PRECAST CONCRETE SITE ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes: Precast concrete splash blocks.

1.2 ACTION SUBMITTALS
- A. Product Data: For each product.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SPLASH BLOCKS
- A. Precast concrete, reinforced with manufacturer's standard mesh or deformed bars.
- B. Concrete: Normal weight, minimum 4000 psi 28-day compressive strength.
- C. Size: As indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION - SPLASH BLOCKS
- A. Place blocks on smooth, even topsoil. Place level and solidly supported.
- B. Splash blocks to be used at bottom of downpouts where indicated.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 - **GENERAL**

1.1 SUMMARY

A. Section includes painted markings applied to asphalt and concrete pavement.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site

1. Review methods and procedures related to marking pavement including, but not limited to, the following:

a. Pavement aging period before application of pavement markings.
b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the TXDOT construction specifications for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Benjamin Moore & Co.
2. PPG Industries.

3. Sherwin-Williams Company (The).

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248; colors complying with FS TT-P-1952.

1. Color: As indicated

B. Pavement-Marking Paint: MPI #32, alkyd traffic-marking paint.

1. Color: As indicated

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

1. Color: As indicated

D. Pavement-Marking Paint: MPI #97, latex traffic-marking paint.

1. Color: As indicated

E. Glass Beads: AASHTO M 247, Type 1.

1. Roundness: Minimum 80 percent true spheres by weight.

F. VOC Content: Pavement markings used on building interior shall have a VOC content of 150 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond the stencil. Apply paint so that it cannot run beneath the stencil.

2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 32 84 00

LANDSCAPE IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with the installation of underground sprinkler irrigation system complete, as shown on drawings and/or specified herein. When the term "Contractor" is used in this section, it shall refer to the irrigation Subcontractor.

1.2 REFERENCES

A. Texas Commission on Environmental Quality (TCEQ) – current requirements and guidelines for landscape irrigation design and specifications.

B. Dallas Independent School District (DISD) - Technical Design Guidelines (TDG) – current edition.

C. City of Dallas Article X Landscape Ordinance or any applicable Planned Development (PD).

1. Exception for relocation of existing DISD parking lot required to comply with landscape ordinance: variance to ten (10) foot buffer strip. Notify DISD designated representative immediately. Policy is to request a variance to allow existing irrigation to remain without modification.

1.3 CODES/PERMITS

A. All work under this section shall comply with the provisions of these Specifications, as illustrated on the accompanying drawings, or as directed by the Owner and shall satisfy all applicable local codes, ordinances, or regulations of the governing bodies and all authorities having jurisdiction over this Project.

B. Installation of equipment and materials shall be done in accordance with requirements of the National Electrical Code, City Plumbing Code, and standard plumbing procedures. The drawings and these Specifications are intended to comply with all the necessary rules and regulations; however, some discrepancies may occur, the Contractor shall immediately notify the Owner's Authorized Representative in writing of the discrepancies and apply for an interpretation. Should the discovery and notification occur after the execution of a contract, any additional work required for compliance with the regulations shall be paid for as covered by these Contract documents.

C. The Contractor shall give all necessary notices, obtain all permits, and pay all costs in connection with his work; file with all governmental departments having jurisdiction; obtain all required certificates of inspection for his work and deliver to the Owner.

D. The Contractor shall include in the work any labor, materials, services, apparatus, or drawings in order to comply with all applicable laws, ordinances, rules, and regulations whether or not shown on the drawings and/or specified.

E. The installation of the irrigation system shall be made by an individual or firm duly licensed under Article No. 8751 VTCS, Titled "Licensed Irrigators Act", S.B. No. 259 as passed by the 66th Texas Legislature.

1.4 GENERAL REQUIREMENTS

A. New Schools: Irrigation to be considered for the "front" yard(s), or street frontages, and athletic fields for the campus. Unless local code requires entire site to be irrigated.

B. Renovation Projects: To be discussed directly with the Dallas ISD-M&O during Schematic Design / STB phase. Preliminary approach to include front yards, street frontages and athletic fields.

C. Coordination and final review of irrigation plans and specifications to occur with the Dallas ISD-M&O at the Design Development and 95% CD stage.

D. Architect to provide the Dallas ISD-M&O with estimated water usage for landscaped areas with recreational fields calculated separately.

1.5 DESIGN REQUIREMENTS

A. Irrigation System:
1. Connectivity: Controller to have Ethernet connection for inclusion in the building management and control system (BMCS).
2. Components: System to include the following components at a minimum:
a. Master valve and two (2) inch flow sensor.
b. Lightening protection for system.
c. Sufficient flow for two (2) zones to operate simultaneously.
d. Controller zone chart.
e. Bubblers at trees and large shrubs.
3. Construction Documents: Comply with and reference all applicable codes including but not limited to ball valve and backflow preventers, meter monitoring requirements, and water conservation codes.

B. Hose Bibs Connectors:
1. Location: Building perimeter, no more than one hundred (100) feet apart.
2. Type: Keyed type, freeze resistant, flush mounted in a lockable box.
3. Provide underground water line with quick-couplers in boxes with lockable covers at grade.

C. Quick-Couplers:
1. To include a ball shut off valve three (3) feet to four (4) feet from each quick-coupler location and within eighteen (18) inches of mainline supply.
2. Must accept one (1) inch hose.
3. Located constant flow quick-couplers:
a. Ball Fields: Behind home plate and behind pitcher’s mound.
b. Along football field sidelines near the fifty (50) yard line.
c. All sidewalk and pavement areas to have at least one (1), four (4) inch sleeve with two (2) pull strings at each irrigation crossing.

1.6 QUALITY ASSURANCE

A. The Contractor shall warranty material and workmanship for one (1) year after final acceptance including repair and replacement of defective materials, workmanship, and repair of backfill settlement.

1.7 SUBMITTALS

A. The Contractor shall submit shop drawings or manufacturer's "cut sheet" for each type of sprinkler head, pipe, controller, valves, check valve assemblies, valve boxes, wire, conduit, fittings, and all other types of fixtures and equipment proposed to install on the job. The submittal shall include the manufacturer's name, model number, equipment capacity, and manufacturer's installation recommendation, if applicable, for each proposed item.

B. No partial submittal will be accepted, and submittals shall be neatly bound into a brochure and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Owner’s Authorized Representative.

C. Shop drawings shall be provided, upon request, for any special custom fabrication or coordination with other trades.

1.8 “APPROVED EQUAL” SUBSTITUTIONS

A. Where items on the plans are specified by a manufacturer's brand name and catalog number, followed by the phrase "or approved equal". This is not intended to unduly restrict competitive procurements or bidding but is done to assure a minimum standard of quality which is believed to be best for the item specified and to match existing equipment.

1.9 EXISTING UTILITIES

A. Locations and elevations of various utilities included with the scope of this work have been obtained from the most reliable sources available and should serve as a general guide without guarantee to accuracy. The Contractor shall examine the Site and verify to his own satisfaction the locations and elevation of all utilities and availability of utilities and services required. The Contractor shall inform himself as to their relation to the work and the submission of bids shall be deemed as evidence thereof. The Contractor shall repair at his own expense, and to the satisfaction of the Owner, for damage to any utility shown or not shown on the plans.

B. Should utilities not shown on the plans be found during excavations, Contractor shall promptly notify the Owner for instructions as to further action.

C. Contractor shall make necessary adjustments in the layout as may be required to connect to existing stub-outs, should such stub- outs not be located exactly as shown and as may be required to work around existing work, at no increase in cost to the Owner. All such work will be recorded on record drawings and turned over to the Owner prior to final acceptance.

1.10 ELECTRICAL POWER

A. Electric power shall be provided within five (5) feet of each controller location by the G.C. The irrigation contractor shall provide final hardwire connection.

1.11 WATER FOR TESTING

A. Unless noted otherwise on the plans or elsewhere, furnish all water necessary for testing, flushing, and jetting.

1.12 BORINGS, SLEEVES AND ELECTRICAL CONDUITS

A. Sleeves and electrical conduits are the responsibility of the Irrigation Contractor to install prior to paving or related construction and should be installed as noted on the drawings and specifications. Contractors shall be responsible for locating all sleeves and conduits at no additional cost to the Authority.

B. Borings under existing paving will be required where noted on the drawings and shall be provided at no additional cost to the Owner. Borings shall be a minimum of eighteen (18) inch depth and new pipes shall be incased in PVC sleeves as noted on the plans.

1.13 RECORD DRAWINGS

A. Record dimensioned locations and depths for each of the following:
   1. Point of connection.
   2. Sprinkler pressure line routing (provide dimensions for each 100 lineal feet (maximum) along each routing, and for each change in directions).
   3. Gate valves.
   4. Sprinkler control valves (buried only).
   5. Control wire routing.
   6. Other related items as may be directed by the Owner’s Authorized Representative.

B. Locate all dimensions from two (2) permanent points (buildings, monuments, sidewalks, curbs, or pavements).

C. Record all changes which are made from the Contract drawings, including changes in the pressure and non-pressure lines.

D. Record all required information on a set of reproducible drawing files.

E. Maintain information daily. Keep Contract drawings at the Worksite at all times and available for review by the Owner’s representative.

1.14 CONTROLLER CHARTS

A. Do not prepare charts until record drawings have been approved by the Owner’s representative.

B. Provide one (1) controller chart for each automatic controller installed.
   1. Chart may be a reproduction of the record drawing, if the scale permits fitting within the controller door. If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.
   2. Chart shall be blackline print of the actual system, showing the area covered by that controller.

C. Identify the area of coverage of each remote-control valve, using a distinctly different pastel color, drawn over the entire area of coverage.

D. Following approval of charts by the Owner's representative, they shall be hermetically sealed between two (2) layers of 20 mil. thick plastic sheet (laminated).

E. Charts must be completed and approved prior to final acceptance of the irrigation system.

1.15 OPERATION AND MAINTENANCE MANUALS

A. Prepare and deliver to the Owner within ten (10) calendar days prior to completion of construction, three (3) hard cover binders with three (3) rings containing the following information:
   1. Index sheet, stating Irrigation Contractor's name, address, telephone number, and name of person to contact.
   2. Equipment list providing the following for each item of equipment installed under this contract:
      a. Manufacturer's name.
      b. Make and model number.
      c. Name and address of local manufacturer's representative.
      d. Spare parts list in detail.
   3. Guarantee statement - Duration of guarantee period.
   4. Copy of the Irrigation Installation Certification Letter.
   5. Water Schedule: Recommended programs for watering by season shall state watering times and frequencies of each irrigation zone. Water schedule shall be based on the local ET (evapotranspiration) rate.

B. Provide descriptions of all installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate, and maintain the equipment.

C. It is the responsibility of the Licensed Irrigation Contractor to demonstrate that final installed sprinkler system will operate according to intent of originally designed and specified system. If Licensed Irrigation Contractor notes any problems in head spacing or potential coverage, it is his responsibility to notify the Owner in writing, before proceeding with work. Licensed Irrigation Contractor guarantees 100% coverage of all areas to be irrigated.

1.16 EQUIPMENT TO BE FURNISHED – SPARE PARTS

A. Supply as part of this contract the following tools:
   1. Two (2) sets of sprinkler wrenches for adjusting, cleaning or disassembling each type of sprinkler and two (2) each of any special tools required for any other equipment.
   2. Four (4) pop-up spray heads of each type and four (4) nozzles of each type installed.
   3. Four (4) rotary heads of each type installed.
   4. Two (2) quick coupling keys with hose swivels, hose bibs/garden valves to match size installed.
   5. Two (2) valve keys each for operating cast iron and brass gate valves.
   6. Two (2) keys for automatic controller lock.

B. The above-mentioned equipment shall be turned over to the Owner via a signed transmittal at the conclusion of the project. Before final inspection, verification that materials have been provided will occur.

1.17 GUARANTEE

A. The guarantee for the sprinkler irrigation system shall be included in the operations and maintenance manual.

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the sprinkler irrigation system we have furnished and installed is free from defects in materials and workmanship, and that work has been completed in accordance with the contract documents, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one (1) year from date of acceptance (substantial completion) and also to repair or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by the Owner, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

Project:

Location:

Signed:

Address:

Phone:

Date of Acceptance:

1.18 CHECKLIST

A. Provide a signed and dated checklist and deliver to the Owner’s representative prior to final acceptance of the work.

B. Use the following format:

1. Plumbing permits: if none required, so note.
2. Material approvals: approved by and date.
3. Pressure line tests: by whom and date.
4. Record Drawings: received by and date.
5. Controller charts: received by and date.
6. Materials furnished: received by and date.
7. Operation and maintenance manuals: received by and date.
8. System and equipment operation instructions: received by and date.
9. Manufacturer's warranties if required: received by and date.
10. Written guarantee: See 1.15 above; received by and date.
11. Lowering of heads in lawn areas: if incomplete, so state.

1.19 WARRANTY AND MAINTENANCE

A. Maintenance during warranty shall include, but not necessarily be limited to, the following:

1. Adjustment of sprinkler height and plumb to compensate for settlement and/or plant growth.
2. Backfilling of all trenches.
3. Adjustment of head coverage (arc of spray) as necessary.
4. Unstopping heads plugged by foreign material.
5. Adjustment of controller as necessary to ensure proper sequence and watering time.
6. All maintenance necessary to keep the system in good operating order. Repair of damage caused by vandals, other contractors or weather conditions shall be considered extra to these specifications.

B. Warranty and maintenance after final acceptance does not include alterations as necessitated by re-landscaping, re-grading, addition of trees or the addition and/or changes in sidewalks, walls, driveways, etc.

C. Maintenance shall continue for one (1) month after final acceptance to allow for adjustments, repair and scheduling.

PART 2 - PRODUCTS

2.1 GENERAL

A. Unless otherwise noted on the plans, all materials shall be new and unused. The irrigation equipment catalog numbers used for reference in these Specifications are to establish minimum quality standards. Substitution will require Dallas ISD approval.

2.2 POLYVINYL CHLORIDE PIPE (PVC PIPE)

PVC pipe manufactured in accordance with ASTM Standards noted herein.

A. Marking and Identification: PVC pipe shall be continuously and permanently marked with following information: Manufacturer's name, size, type of pipe, and material, SDR number, Product Standard number, and the NSF (National Sanitation Foundation) Seal.

B. Pressure mainline piping for sizes one (1) inch and larger, shall be PVC Schedule 40.

C. PVC pipe shall be made from an NSF approved Type I, Grade II, PVC compound conforming to ASTM resin specification D1785-68. All pipe must meet requirements as set forth in Federal Specification PS-21-70, with an appropriate standard dimension (S.D.R.) (Solvent-weld pipe).

D. PVC solvent-weld fittings shall be of the same material as the PVC pipe specified and compatible with PVC pipe furnished. Solvent weld type fittings shall be Schedule 40, 1-2, II-I NSF approved conforming to ASTM test procedure D2466.

E. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of type and installation methods prescribed by the manufacturer.

F. Pipe sleeves: Shall be as noted on the plans.

2.3 FLEXIBLE PVC TUBING

A. All flexible PVC tugging shall be I.P.S. heavy wall hose made from rigid PVC material.

B. Hose shall meet or exceed schedule 80 wall thickness and shall comply with ASTM D2287 and tested in accordance with ASTM D1598.

C. Hose shall be tested at 200 PSI static pressure for two (2) hours and a quick burst rating of a minimum of 400 PSI.

2.4 SWING JOINTS AND NIPPLES

A. Install threaded and gasketed schedule 80 PVC 3-way swing joints and nipples.

B. The unit shall contain o-ring seals at all elbow connections.

2.5 MANUAL VALVES

A. Gate valves three (3) inches and smaller shall be USA made, 200 pound W.O.G., highest grade cast bronze gate valve with screw-in bonnet, nonrising stem and solid wedge disc, threaded ends and a cast iron handwheel, manufactured by Nibco or Dallas ISD approved equal.

B. Isolation valves shall be Nibco schedule 80 PVC ball valves with union connection at both ends of valve sized same main line or Dallas ISD approved equal.

C. All valves shall have wheel handles unless cross handles are called for on the plan.

2.6 QUICK COUPLING VALVES

A. Quick coupling valves shall have a brass one-piece (cast) body designed for working pressure of 150 PSI operable with quick coupler key, and with a purple, (NP) cover.

B. The valve shall accept a single lug three-quarter (3/4) inch bronze valve key for operation unless noted otherwise.

2.7 CONTROL WIRING

A. Connections between the automatic controllers and the electric control valves shall be made with UF-B UL PVC double insulated, two (2) conductor solid core wire, (Maxi-Wire) #14, under 30 VAC RMS using a National Electric Code Class II circuit. Install in accordance with valve manufacturer's specifications and system design.

B. Conductor shall be soft drawn, annealed solid copper conforming to ASTM 33.

C. Conductor insulation shall be 4/64-inch thick polyvinyl chloride (PVC), conforming to UL Standard #493 for thermoplastic-insulated style UF, rated at 60 degrees C.

D. The two (2) insulated conductors are laid in a parallel and encased in a single oter jacket of 3/64-inch thick, high density, sunlight resistant polyethylene conforming to ICEA S-61-402 and NEMA WC5, having a minimum wall thickness of 0.045-inch.

E. Conductor shall be one (1) red, one (1) black.

F. All wire insulation shall be intact and free of nicks and cuts.

G. For runs greater than 4,000 feet, larger wire may be used provided it conforms to controller manufacturer's specifications for both material specification and installation.

H. Underground splice kit shall be 3M DBR-6 or approved equal, water-tight, dry splice connector or approved equal. All wire splices shall be protected by a valve box. No splices shall be installed on runs less than 500 feet.

I. Where control wire leaves mainline, install in Schedule 40 PVC conduit.

2.8 AUTOMATIC CONTROLLER(S)

A. BaseLine BaseStation 3200R or Dallas ISD approved equal controller with ethernet connection to be completed with BaseLine BaseManager system. Ethernet connection to initiate at the MDF cabinet and terminate inside the irrigation controller cabinet with a RJ 45 connector. Cable to be CAT5 or newer. Provide lockable, weatherproof metal cabinet. Verify intent with Dallas ISD prior to final install of this portion of the system.

B. Automatic controllers shall be of size and type to accommodate system design. Final location of automatic controllers shall be approved by Dallas ISD-M&O.

C. Unless otherwise indicated, the 120 volt electrical power for the controller is available at the site. The final electrical hook-up shall be the responsibility of the Irrigation Contractor. Controller to be hard wired. Plug-in connection is not allowed.

D. Flow sensor(s), bicoder(s), surge protector(s) and biosensor(s) to be compatible with BaseLine system.

2.9 VALVE BOXES

A. Manual Valves: ten (10) inch box, Carson Industries or Ametek, with green bolt down cover. Use extensions where required.

B. Electrical Control Valves: Standard rectangular box, Carson Industries or Ametek, with green bolt down cover or Dallas ISD approved equal. Install extension sleeves as required.

C. Backflow Preventer: Pump Guard Box. Box shall be sized to fit required backflow preventer by minimum of six (6) inches on each end.

2.10 SPRINKLER HEADS

A. Sprinkler heads are specified on the drawings.

B. Sprinkler heads in lawn area as specified on plan.

1. Pop-up heads twelve (12) and six (6) inches
2. Spray adjustable nozzles.
3. Adjustable rotor heads 3/4-inch female inlet NPT.
4. Spray heads 1/2-inch female inlet NPT.
5. Approved Manufacturer: Hunter or Dallas ISD approved equal.

C. All sprinkler heads shall be of the same size, type, and deliver the same rate of precipitation with the diameter (or radius) of throw and discharge as to accommodate designed system and/or specified in these special provisions.

D. All sprinkler heads of the same type shall be of the same manufacturer.

E. The sprinkler body and all related parts shall be plastic cycolac or polycarbonate. They shall have a spring retraction for positive return action of the pop-up nozzle.

F. The spring for retraction and the adjustable nozzle screw shall be made of corrosion resistant materials.

G. Ensure that Sprinkler head at the building perimeter are pointed away from the building so not to stain materials.

2.11 ROTARY HEADS

A. Rotary pop-up sprinklers shall be in-line combination type with positive drive by means of a water-driven gear motor.

B. Nozzles shall be readily accessible without removing the upper head assembly.

2.12 SLEEVES

A. Definition: a pipe within another pipe for carrying water will be installed.

B. Wire sleeve: a pipe used to carry low voltage irrigation wires for operation of electric control valves.

C. All sleeves shall be Schedule 40. Size shall be equal to twice (2 times) the diameter of the pipe or combination of pipes enclosed within the sleeve.

2.13 ACCESSORIES

A. Connections for PVC and Metal Pipe: for all threaded connections between PVC and metal pipe use Heavy Duty Rectorseal thread sealing paste with virgin Teflon No. 100 as manufactured by Rectorseal Corporation or Dallas ISD approved equal. Apply in accordance with manufacturer's instructions.

B. Drainage Fill: 1/2-inch washed pea gravel.

C. Sand Layer: Washed sand.

2.14 DRIP TUBE WITH PRESSURE COMPENSATING EMITTERS (Only if required by TCEQ and with approval from Dallas ISD-M&O)

Drip tube shall be of the manufacturer and model as noted on the plans. Pressure compensating emitters with internal check valves are required unless noted otherwise.

A. Barbed Insert Fittings:

1. All barbed insert fittings shall be constructed of molded, ultra-violet-resistant plastic having nominal inside dimension (I.D.) of 0.24 inch.
2. Each fitting shall have a minimum of two (2) ridges or barbs per outlet with a raised barb nearest the fitting outlet. All fittings shall be of one (1) manufacturer and shall be available in one (1) of the following end configurations:
   a. Barbed insert fittings, or
   b. Male pipe threads (MPT) with barbed insert fittings, or
   c. Female pipe threads (FPT) with barbed insert fittings.

2.15 ELECTRIC REMOTE-CONTROL VALVES

A. Electric remote-control valves shall have plastic bodies and covers and shall be globe-type diaphragm valves of normally closed design. The valves are specified on the drawings.

B. Operation shall be accomplished by means of integrally mounted heavy-duty 24-V solenoid complying with National Electrical Code, Class II Circuit. Solenoid coil shall be potted in epoxy resin within a plastic coated stainless steel housing. Solenoids shall be completely waterproof, suitable for direct underground burial.

C. A flow stem adjustment shall be included in each valve.

2.16 BACKFLOW PREVENTER

A. An approved backflow prevention device is required, as noted on the plans. The device shall include all materials as required by the local municipality and shall be inspected accordingly.

2.17 TEMPERATURE SENSORS/ RAIN SENSORS (as part of BaseLine BaseStation) – ref. plans.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

A. Sleeves and Conduits: Installed by Contractor as indicated on Drawings. Do not use as main or lateral lines.

B. Contractor shall verify on-site pressure is adequate for a proper installation. Contractor shall submit letter certifying that on-site pressure exceeds design pressure by 10%.

1. If on-site pressure does not exceed design pressure by 10%, contact Owner's Representative for resolution. If construction work is started prior to receiving certification letter, Contractor assumes all costs for changes required to meet on-site pressure requirements.

2. If on-site pressure exceeds design pressure by greater than 10%, Contractor shall install a pressure regulator.

C. Site Utilities: Determine locations of underground utilities, including but not limited to, site lighting, cable, telephone, and irrigation lines prior to commencement of work. Perform all work in a manner which will avoid possible damage. Do not permit heavy equipment or trucks to damage utilities. Hand excavate or use air-spade technology, as required to minimize possibility of damage to underground utilities.

D. Contractor Responsibility: The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage, area dimensions or water pressure exist that might not have been considered in the engineering. Such obstructions or differences shall be brought to the attention of the Owner's Representative in writing. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.

E. Staking: Before installation is started, place a stake or flag where each sprinkler and valve box is to be located, in accordance with drawing. Staking shall be approved by the Owner's Authorized Representative before proceeding.

F. Piping Layout: Piping layout is diagrammatic. Route piping around existing trees and root zones in such a manner as to avoid damage to plantings. Do not dig within the ball of newly planted trees or shrubs.

G. In areas where trees are present, trenches will be adjusted on site to provide a minimum clearance of four (4) times the trunk diameter of the tree (at its base) between any tree and any trench.

H. Contractor is responsible for protecting all existing trees, plants, lawns, and other features designated to remain.

I. Provide and install a dedicated irrigation meter and backflow preventer for the irrigation system water supply.

J. Design Pressure: (Unless System Designer proposes differently)

1. Design Static Pressure: 52.6 PSI.

2. Spray Zone: 30 PSI.

3. Rotary Zone: 40 PSI.

4. Tree Bubbler Zone: 30 PSI.

K. All material and equipment shall be delivered to the Worksite in unbroken reels, cartons or other packaging to demonstrate that such material is new and of a quality and grade in keeping with the intent of these Specifications.

L. Acceptance of Substrate: Contractor shall automatically assume the responsibility for any unacceptable finished work caused by substrate conditions.

M. Damages: Contractor shall be responsible for any and/or all damages that might occur during the project to utilities and related items. In addition, Contractor agrees to promptly make any repairs or pay damages whichever Dallas ISD prefers, should damages occur. Contractor shall locate all utilities.

3.2 EXCAVATION AND TRENCHING

A. The Contractor shall perform all excavation to the depth indicated in these Specifications and Contract drawings. The banks of trenches shall be kept as nearly vertical as practicable. Trenches shall be wide enough to allow a minimum of four (4) inches between parallel pipelines or electrical wiring.

B. Where rock excavation is required, or where stones are encountered in the bottom of the trench that would create a concentrated pressure on the pipe, the rock or stones shall be removed to a depth of six (6) inches minimum below the trench depth indicated. The over depth rock excavation and all excess trench excavation shall be backfilled with loose, moist earth or sand, thoroughly tamped.

C. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe is encountered in the trench bottom, such shall be removed to a depth and length required, and the trench backfilled to trench bottom grade as hereinafter specified, with coarse sand, fine gravel or other suitable material.

D. Bottom of trench grade shall be continued past ground surface deviations to avoid air pockets and low collection points in the line. The minimum cover specifications shall govern regardless of variations in ground surface profile and the occasional deeper excavation required at banks and other field conditions. Excavation shall be such that a uniform trench grade variation will occur in all cases where variations are necessary.

E. Trench excavation shall comprise the satisfactory removal and disposition of all materials and shall include all shoring and sheeting required to protect the excavation and to safeguard employees.

F. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling shall be wasted as directed by the Owner’s Authorized Representative. When excavated material is of a rocky nature and the topsoil or any other layer of excavated material is suitable for pipe bedding and backfill in the vicinity of the pipe, such material shall be separately stockpiled for use in such bedding and pipe backfill operations, unless satisfactory imported material is used.

G. All excavations and backfill shall be unclassified and covered in the basic bid. No additional compensation will be allowed for rock encountered.

H. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original conditions in a manner acceptable to the Owner’s Authorized Representative.

3.3 PIPE INSTALLATION

A. Sprinkler Mains: Sprinkler mains are that portion of piping from water source to electric valves. This portion of piping is subject to surges since it is a closed portion of the sprinkler system. Sprinkler mains shall be installed in a trench with a minimum of eighteen (18) inches of cover.

B. Lateral Piping: Lateral piping is that portion of piping from electrical valve to sprinkler heads. This portion of piping is not subject to surges since it is an "open end" portion of the sprinkler system. Lateral piping shall be installed in a trench with a minimum of twelve (12) inches of cover.

3.4 PVC PIPE AND FITTING ASSEMBLY

A. Solvent: Use only solvent recommended by manufacturer to make solvent-welded joints following standards noted herein. Thoroughly clean pipe and fittings of dirt, dust, and moisture with an approved PVC primer before applying solvent.

B. PVC to Metal Connection: Work metal connections first. Use a non-hardening pipe dope such as Permatex No. 2 or "Teflon" tape on threaded PVC to metal joints. Use only light wrench pressure.

C. Threaded PVC Connections: Where required, use threaded PVC adapters into which pipe may be welded.

D. Remove lumber, rubbish, and rocks from trenches. Provide firm, uniform bearing for entire length of each pipeline to prevent uneven settlement. Wedging or blocking of pipe will not be permitted. Remove foreign matter or dirt from inside of pipe before welding and keep piping clean during and after laying pipe.

E. PVC pipe shall not be installed where there is water in the trench, nor shall PVC pipe be laid when temperature is 40 deg. F or below or when rain is imminent. PVC pipe will expand and contract as the temperature changes. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.

3.5 HYDROSTATIC TESTS

A. Pressure Test: After the pipe is laid, the joints completed, and the trench partially backfilled, leaving the joints exposed for examination, the newly laid mainline pipe or any valved section of main pressure line piping shall, unless otherwise specified, be subjected for four (4) hours to a hydrostatic pressure test of normal city water pressure. Each valve shall be opened and closed during the test. Enclosed pipe, joints, fittings, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade, as necessary. Cracked or defective pipe, joints, fittings, or valves discovered in consequence of this pressure test shall be repeated until the test results are satisfactory.

B. All replacement and repair shall be at contractor's cost. Notify the Owner's Authorized Representative at least three (3) days before tests are scheduled to be conducted.

3.6 CONTROL WIRE INSTALLATION

A. Refer to 2.7 for related information.

B. All control wires shall be installed at least eighteen (18) inches deep. Contractor shall obtain Dallas ISD-M&O approval for wire routing when installed in a separate ditch. Control wires may be installed in a common ditch with piping, however wires must be installed a minimum of four (4) inches below or to one (1) side of piping.

C. All wire passing under existing or future paving, sidewalk, construction, etc., shall be encased in PVC conduit extending at least two (2) feet beyond edges of paving, sidewalks, or construction.

3.7 POP-UP SPRAY BUBBLER HEADS

A. Provide heads and nozzles as specified and install in locations as shown on the Contract Drawings.

B. Pop-up spray heads shall be installed with connections to rigid PVC pipe as detailed on the Contract drawings. Rotary heads shall be installed on a double swing joint connected to the lateral pipe as detailed on the drawings.

C. Heads shall be installed with underside of flange flush with the finished grade.

D. Contractor will be required to adjust heads as necessary after establishment of grass or other plant material.

3.8 DRIP EQUIPMENT (Only if required and with approval from DISD Representative)

A. Drip tube can be installed in one (1) of the following methods:

1. Over-excavation: Over-excavate the entire area to a depth of two (2) inches to four (4) inches below finish grade. Plant all specimen trees and shrubs fifteen (15) gallon size and larger, then place drip tube at the row spacing interval indicated on the plans.
2. Pipe Pulling: Where ground disruption is to be minimized, pneumatic tire, pipe-pulling machinery shall be used. Potholes shall be used at the ends of each run for making connection to supply and exhaust headers of rigid PVC pipe or polyethylene pipe.
3. Trenching: Hand or mechanically trench to the pipe depth indicated on the plans or in these specifications and backfill flush with finish grade. Avoid mechanically trenching within the dripline of existing trees. Hand-trench around existing tree roots when roots of two (2) inches and larger are encountered. Remove all rock one and one-half (1½) inch and larger when excavating and remove from site. Do not backfill trenches with rock that will come in direct contact with tubing or rigid PVC piping.

B. Placement of Rigid PVC Piping: Install pipe in a serpentine (snaked) manner to allow for expansion and contraction in trench before backfilling. Install pipes at temperatures over 40°F. Pipe markings shall face upward out of the trench whenever possible.

C. Drip tube: Drip tube can be installed with the water outlets facing up, down, or sideways. In irregular areas, some water outlets could end up too close to fixed improvements and may have to be capped off with a dripper plug ring.

D. Cover: Install underground piping horizontally and as evenly as possible to a maximum depth of 4 inches, unless otherwise specified. (Typical pipe depth is two (2) inches in shrub beds, four (4) inches in turf unless periodic aeration is anticipated, and then pipe depth should be lowered to six (6) inches.)

E. Barbed Insert Fittings: Connect drip tube to barbed insert fittings by pushing the tubing on and over both barbs of the fitting until the tubing has seated against another piece of tubing or has butted against another portion of the barbed fitting. For water pressures in excess of the 30 psi, or the maximum stated system pressure for the drip tube, whichever is less, use stainless steel clamps.

F. Clamping: When design-operating pressure exceeds 30 psi, or maximum stated system pressure for the drip tube, whichever is less, stainless steel pipe clamps shall be used. Slip clamps over tubing before slipping tubing over barbed insert fitting. Place clamp between the first and second ridge of the barbed fittings and crimp the "ear" of the clamp tightly. Crimp the "ear" twice to ensure proper seating.

3.9 QUICK COUPLING VALVES

A. Quick coupling valves shall be installed with the underside of flange flush with the finished grade.

B. Quick coupling valves shall be installed on a swing joint assembly as detailed on the drawings.

C. Under the warranty, the Contractor shall return after grass is established and adjust valves and valve boxes to proper grade.

3.10 MANUAL VALVES

A. Manual valves shall be sized and located where shown on the Contract drawings.

B. Valve boxes shall be adjusted to be flush with finished grade. The Contractor will be required to adjust after establishment of grass.

C. Valve boxes shall be properly supported and of sufficient construction that tractors and mowers crossing over the boxes will not push boxes down and crush the pipe, valve, or box.

3.11 VALVE AND VALVE BOX PLACEMENT

A. All manual, electric, and quick coupling valves shall be in boxes as specified in Paragraph 2.7 of this section and shall be set with a minimum of six (6) inches of space between their top surface and the bottom of the valve box. The base of the box shall be filled with pea gravel as shown on plan.

B. Valves shall be fully opened and fully closed to ensure that all parts are in operating condition.

C. Valve boxes shall be set plumb, vertical, and concentric with the valve stem.

D. Any valve box which has moved from this required position so as to prevent the use of the operating wheel of the valve shall be reset by the Contractor at his own expense.

3.12 AUTOMATIC CONTROLLER: Final location of automatic controllers shall be approved by Dallas ISD-M&O.

3.13 ELECTRIC REMOTE-CONTROL VALVES

A. Remote control valves shall be located and sized as shown on the plans. All electrical connections shall be made when the weather is dry with connection kits as specified in Paragraph 2.15 of this section in strict accordance with manufacturer's recommended procedures.

B. All remote-control valves shall be installed in a horizontal position, in accordance to the manufacturer's published installation instructions.

C. It shall be the responsibility of the Contractor to furnish and install the proper size wire on each of the low voltage circuits from the master control center to the various electric remote-control valves.

D. Consideration shall be given to each circuit for allowance of voltage drop and economy consistent with accepted practices of electrical installation. Under no circumstances shall the voltage of any branch circuit be reduced more than proper due to length of run exceeding the maximum allowable for the wire size used.

3.14 BACKFILL AND COMPACTION

A. After system is operating and required tests and inspections have been made, the trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, gravel, soft shale, or other approved materials, free from large clods of earth or stone. Rock, broken concrete, or pavement, and large boulders shall not be used as backfill material. The backfill shall be thoroughly compacted and evened with the adjacent soil level.

B. Compact trenches in areas to be planted by thoroughly flooding the backfill. Compact all other areas by flooding or hand tamping. The jetting process may be used in areas when flooding.

C. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to a minimum of 90% density.

D. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for compaction, then refilled and compacted with the surface restored to the required grade and left in a completed surface condition as described above.

E. Specifically tamp backfill under heads and around the flange of heads for one (1) foot by a suitable means after trench backfill has dried from flooding to prevent heads loosening in the ground.

3.15 FINAL ADJUSTMENT

A. After installation has been completed, make final adjustment of sprinkler system prior to Owner's Authorized Representative's final inspection.

B. Completely flush system to remove debris from lines by removing nozzle from heads on ends of lines and turning on system.

C. Check sprinklers for proper operation and proper alignment for direction of throw.

D. Check each section for operating pressure and balance to other sections by use of flow adjustment on top of each valve.

E. Check nozzles for proper coverage. Prevailing wind conditions may indicate that arc or angle of spray should be other than as shown on drawings. In this case, change nozzles to provide correct coverage and furnish record data to Owner's Authorized Representative with each change.

F. After system is thoroughly flushed and ready for operation, each section of sprinklers shall be adjusted to control pressure at heads. Use the following method, one (1) section at a time:

1. Remove last head on section and install a temporary riser above grade. Install tee with pressure gauge attached on top of riser and re-install head with nipple onto tee.
2. Correct operating pressure at last head of each section as follows: Spray and rotor heads - 30-35 psi.
3. After replacing head, at grade, tamp thoroughly around head.
4. Drip zone valve pressure regulating devices shall be set at not to exceed 40 psi.

3.16 CLEAN-UP

A. The Worksite shall be thoroughly cleaned of all waste materials and all unused or salvaged materials, equipment, tools, etc.

B. After completion of the work, areas disturbed shall be leveled and the Worksite shall be raked clean and left in an orderly condition.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with the installation of the sod.

1.2 SUMMARY

A. Work Includes:
1. Soils Test/Analysis Report of existing site soils.
2. Providing and installing manufactured topsoil.
3. Providing and installing organic compost.
4. Initial removal of weeds on site.
5. Tilling/spike harrowing/ripping/breaking-up/shattering of compacted site soils.
6. Soil preparation and tilling topsoil and compost into existing rough graded subbase soils.
7. Hand or deep-tine aerifier mixing organic compost into existing soil at root zone of existing trees to remain.
8. Fine grading and removal of debris.
9. Germinating weeds for second eradication prior to sodding.
10. Hand removal or raking away of dead weeds.
11. Sodding of grass as designated on landscape plans.
12. Providing temporary irrigation (if necessary to establish).
13. Establishment of grass.

1.3 REFERENCES

A. Codes and regulations of the jurisdictional authorities.
B. Reference Codes and Standards (current standards):
1. AASHTO: M140.
2. ASTM: C33/C33M, C51.
3. ASTM: D6459, D6566, D6567, D7322, D7367.
4. U.S. Department of Agriculture and Texas Department of Agriculture
5. Federal Seed Act.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer: Company specializing in manufacturing Products specified with minimum seven (7) years documented experience.
2. Installer: Company specializing in performing the Work of this Section with minimum seven (7) years documented experience.
B. Inspections:
1. Make written request for inspection after sodding operations have been completed. Such inspection is for the purpose of establishing the Maintenance Period.
2. Submit written requests for inspections to the Owner’s Authorized Representative at least seven (7) days prior to anticipated inspection date.

1.5 SUBMITTALS

A. Submit the following for approval in accordance with contract related submittals in a single package to the Owner's Authorized Representative no less than sixty (60) days prior to installation.

B. All delivery receipts and copies of invoices for materials used for this work shall be subject to checking by the Owner's Authorized Representative. The Contractor shall offer proof of materials' compliance to the specifications to the Owner's Authorized Representative prior to installation. Various samples, certificates, and specifications of seed, and other materials shall be submitted for approval as required by subsequent sections of this specification and Section 32 9300. The Contractor should submit the following certification to the Owner's Authorized Representative prior to installation.

1. Sod: Certified, each delivery bearing a certification tag and label as required by law.
2. Sources: No less than sixty (60) days prior to installation, notify Owner and Owner's Authorized Representative in writing of source of seed required for the project.
3. Soil as used for Manufactured Topsoil: Submit a one (1) gallon sample along with documentation for Soil Test/ Analysis Report.
4. Manufactured Topsoil: Submit a one (1) gallon sample for spreading along with manufacturer's product data and laboratory analysis report with Solvita® Compost Maturity Test results for compost components of this manufacturer's mix.
5. Mature Organic Compost: Submit a one (1) gallon sample for spreading as specified in Section 2.6 along with Solvita® Compost Maturity Test results.
6. Organic Fertilizer: Copy of product information labeled with manufacturer's name and address and chemical analysis.
7. Organic Herbicide: Copy of product information labeled with manufacturer's name and address and chemical analysis. Submit manufacturer's information or cut sheets on products.
8. Organic Fungicide: Copy of product information labeled with manufacturer's name and address and chemical analysis. Submit manufacturer's information or cut sheets on products.
9. Organic Insecticide(s): Copy of product information labeled with manufacturer's name and address and chemical analysis. Submit manufacturer's information or cut sheets on products.

C. Work Schedule: The sodding of grass must occur at stipulated times. Also, time periods are specified to achieve an acceptable stand. Therefore, the Contractor must submit a schedule for the work of this section so that the grass can achieve full coverage as specified by the contract completion date. The schedule must be submitted no less than sixty (60) days prior to installation for review and approval of the Owner's Authorized Representative, Architect and Owner's Authorized Representative. Refer to Subsection 1.12.

D. Submit Maintenance Instructions upon final acceptance. Refer to Subsection 3.6, Paragraph K.

E. Special Warranty: Submit written special warranty registered with manufacturer as specified in this Section.

F. Provide documentation and testing of existing site soils and screened soil as used in the manufactured topsoil by means of a Chemical Soil Test/Analysis Report with recommendations for organic amendments (not chemical based) to soils for landscape turf grasses, aesthetic planting with ornamentals and native plants (not agricultural crops) for determination or adjustment of required amendments.

G. Provide existing site soils testing, as noted above, at two (2) predetermined/approved locations on site per approval by Owner's Authorized Representative and Landscape Architect. Provide testing at least sixty (60) days prior to soil preparation.

1. Approved Chemical Testing Laboratories:
   a. Perry Agricultural Laboratory, mailing address: P.O. Box 418, or shipping address: 15241 Pike 138, Bowling Green, MO 63334, phone: (573-324-2931), www.perryaglab.com. (Equivalent tests as noted above – minimum – Standard Albrecht Test.)
   b. Approved equivalent laboratory to match parameters and report recommendations as approved by Owner's Authorized Representative.

H. Provide documentation and testing of compost materials as specified in Parts 2 and 3 of this section.

1.6 SELECTION AND ORDERING OF PLANTING MATERIALS

A. Documentation: Submit documentation no less than sixty (60) days prior to installation that all materials have been ordered.

B. Unavailable Materials: If proof is submitted that any of the materials specified is not obtainable, a proposal will be considered for use of the nearest equivalent variety with corresponding adjustment of Contract price. Substantiate such proof in writing no less than sixty (60) days prior to installation.

C. Special Conditions: The above provisions shall not relieve Contractor of the responsibility for obtaining specified materials in advance if special growing conditions or other arrangements must be made in order to supply specified materials.

1.7 JOB CONDITIONS AND PROVISIONS

A. Carefully maintain all site benchmarks, layout points and other points established by other contractors. If destroyed, replacement will be by this Contractor.

B. Coordinate all work of this Section with other on-site contractors and the Owner. Give advance notice on sequencing of this work so not to affect the operations of other contractors.

C. All turf grass work shall be performed under the direct supervision of a superintendent and laborers thoroughly experienced with the work of this Section and who shall be at the project site for the duration of the work.

D. No turf grass work shall take place during inclement weather or when the ground conditions are, in the opinion of the Owner's Authorized Representative, not in a condition to be properly worked.

E. No turf grass operations shall occur earlier than April 15th nor later than August 30th. If sod is to be installed from October 15th to March 15th, then provide temporary installation of cereal rye grass for winter establishment. Remove cereal rye grass prior to April 15th and install sod.

F. Erect barricades, snow fencing, hire temporary watchmen or whatever is deemed necessary by the Contractor to totally protect all turf grasses until one hundred (100%) percent established.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Materials and supplies are subject to inspection and sampling for testing. Allow no seed, fertilizer, straw, or other agronomic materials or supplies on Work site other than those for the Project.

1. Sod:

a. Deliver sod to job within twelve (12) hours after being cut; place sod within twenty (20) hours after being cut. Allow sod only eight (8) hours maximum on site.

b. Prior to and after delivery during wet weather, allow sod to dry to the extent that will prevent tearing during handling and laying. During dry weather, water sod to ensure its vitality and prevent dropping of the soil in handling.

c. Analysis of purity and germination tag.

d. Certification tag.

B. Organic Biological Fertilizer: Labeled with manufacturer's name and address, guaranteed analysis, including nutrient and its derived source, listing of potential acidity, and any toxic materials.

C. Organic Biological Fungicide: Labeled with manufacturer's name and address and analysis, warnings, safety instructions, and application requirements.

D. Organic Herbicide: Labeled with manufacturer's name and address and analysis, warnings, safety instructions, and application requirements.

E. Organic Insecticide: Labeled with manufacturer's name and address and analysis, warnings, safety instructions, and application requirements.

1.9 PROJECT CONDITIONS OR SITE CONDITIONS

A. Verify and examine site conditions with the Owner's Authorized Representative. Proceed when official notice is given to the Contractor that the work site is ready.

B. Proceed with tree protection prior to any mobilization, staging, site work, demolition, or grading.

1.10 SEQUENCING

A. Coordinate grading, soil preparation and other related units of Work specified in other Sections to ensure that grass sod can be supported and installed as indicated.

B. Coordinate with General Contractor for construction sequencing.

1.11 SCHEDULING

A. Submit a proposed work schedule to the Owner for approval no less than sixty (60) days prior to start of installation. After approval, no modification shall be made to this schedule without written authorization by the Owner or Owner's Authorized Representative. List anticipated start and stop dates for each segment of work up to and including final acceptance.

B. In general, the work shall proceed as rapidly as the site becomes available, consistent with normal seasonal limitations for turf grass work.

C. Establishment Period: The grass must be fully, one hundred (100%) percent established by the contract completion date. The Contractor shall allow for a minimum of one hundred (100) days to establish the grasses.

PART 2 – PRODUCTS

2.1 SOD FOR TURF

A. Well-rooted certified sod, at least eighteen (18) months old.

1. Front Yard Areas and areas disturbed by proposed construction.
   'Tiffway 419' Bermudagrass (Cynodon dactylon var.)
   Cultivar to be approved by Landscape Architect based on availability per submittal by Contractor.
2. Grassed football, soccer, baseball and softball fields (existing or proposed)
   Latitude 36® Bermudagrass (Cynodon dactylon var.)
   Cultivar to be approved by Landscape Architect based on availability per submittal by Contractor.

B. Sod and attached soil free from any noxious weeds such as quack grass, garlic, Johnson grass, dallisgrass, nutsedge, Canada thistle, and other turf weeds.

C. Mowed in production field to height of not more than two and one-half (2-1/2) inches within five (5) days prior to lifting.

D. DO NOT use any sod grown with mesh netting due to tripper issues with children. Sod with netting will be rejected.

E. Machine cut in sections not less than two and one-half (2-1/2) feet in length nor less than twelve (12) inches in width and to a depth equal to growth of fibrous roots, uniform soil thickness of three-quarter (3/4) inch, plus or minus one-quarter (1/4) inch. Measurement for thickness to exclude top growth and thatch.

F. Cut in sections or strips for pallets strong enough to support its' own weight and retain size and shape when suspended vertically from firm grasp on upper ten (10) percent of section. Small, irregular or broken pieces of sod are prohibited.

2.2 MANUFACTURED TOPSOIL

A. Containing approximately twenty-five (25) percent organic matter as determined by the topsoil composition tests.

B. Compost will meet requirements of 2.3 D. for Solvita® Compost Maturity value of 7 or higher.

C. Soil shall be very fine native silt screened to be free of sticks, stones, roots, and other debris and objectionable materials. Soil may be as from screened lake dredging. Screened soil shall be subject to the approval of the Owner's Authorized Representative based on visual and tactile inspection.

D. Sand shall be a deep sand excavated from below fifteen (15) feet to ensure it is free of nutsedge, and screened or screened cushion (sharp) sand from sands available in this region.

E. Manufactured topsoil as blended from soil, deep sand (screened cushion sand) and organic compost. Manufactured topsoil handled too wet or soggy is not acceptable. Soils supporting growth of noxious weeds, as defined by the Kansas Seed Law, or undesirable weeds, are not acceptable. Manufactured topsoil containing dallisgrass and nutgrass (nutsedge) will be rejected.

F. Physical properties as follows:
   1. Clay: between 0 and 10 percent
   2. Screened Soil: between 13 to 17 percent
   3. Sand: between 55 to 65 percent
   4. Mature Compost (Organic matter): approximately 25 percent of total dry weight
   5. pH: 7.2 to 8.7

G. Acceptable Manufactured Topsoil Mix: Enriched Top Soil™ – a precisely measured mixture of Professional Compost, screened native soil and screened sharp sand, pH from 7.5 to 8.7, as supplied by Soil Building Systems, 2101 Walnut Hill Lane, Dallas, Texas 75229, (972-831-8181), attention: Baron Ablon, or equivalent meeting all composition and compost maturity as determined by the Owner's Authorized Representative.

2.3 COMPOST - Professional Compost or Mature Organic Compost – 100% plant based

A. Compost: shall be compost for mix above that is fully finished compost that has been produced by aerobic (biological) decomposition of organic matter and meets or exceeds the requirements set forth by the United States Department of Agriculture, the United States Composting Council (USCC), and State composting requirements.

B. Compost feedstock shall include fully composted cotton burrs, local grass trimmings, leaves, brush and processed wood fiber and shall add an average of 1.1 lbs. N^1, 0.13 lbs. P^1, and 0.8 lbs. K^1 of pure consumable organic nutrients per one (100) square feet for each inch depth added plus minerals and trace elements. Compost shall not include food waste, stable waste, treated lumber, pallets, pine bark, raw manure or mushroom compost waste. Compost shall not include any man-made materials or chemicals. Do not use mixed municipal solid waste compost since it varies from season to season. Ensure compost does not contain any visible inorganic refuse, other physical contaminants, or any substance considered to be harmful to plant growth.

C. The compost must be turned a minimum of five (5) times and not achieve a temperature greater than 160 degrees Fahrenheit. Each turning cycle should not be shorter than fourteen (14) days minimum. Compost shall be completely composted for a minimum of six to twelve (6 - 12) months. Particle Sizes 97% will pass through a one-half (1/2) inch screen, 99%+ will pass through a three-quarter (3/4) inch screen.

D. Compost material shall have no pungent smell, but rather an earthy smell. Supporting documentation should be made available upon request. The contractor is obligated to provide testing of the compost at the supplier's yard and at the job site for quality assurance.

   Acceptable Professional compost is as supplied by: Soil Building Systems, 2101 Walnut Hill Lane, Dallas, Texas 75229, (972-831-8181), attention: Baron Ablon, or equivalent as determined by the Owner's Authorized Representative.

Table 1

Physical Requirements for Compost

pH: 7.9 – 8.9
Maturity: germination and vigor greater than 90% in accordance with TMECC 05.05-A, "Germination and Vigor"
Solvita® Compost Maturity Index: value of 7 or higher in accordance with TMECC 05.08-E

E. The contractor is obligated to provide testing of the compost at the supplier's yard and at the job site for quality assurance.

F. TESTING OF THE COMPOST AT THE JOB SITE

   NOTE: Contractor is advised to test the designated compost stockpile at the supplier's yard prior to loading to ensure the designated pile passes the compost maturity test. If the compost does not pass the test at the jobsite, it will be rejected.

1. Use Solvita® Compost Maturity Test Kit or approved equal. Solvita® test kit shall be recently purchased and shall be stored in a refrigerator protected from heat until use at the site. (The two parameters which Solvita® measures (CO2 / NH3) are the mostly frequently cited factors that correlate closely with maturity and potential phytotoxicity. Ammonia is also an odorous aerosol toxicant and is a potential worker hazard at agrocultural and compost facilities.) Provide Compost maturity test results to measure both carbon-dioxide (CO2) and ammonia (NH3) evolution and provide a Maturity Index value, useful or compost quality evaluation. Compost maturity test is TMECC Test #05-08A.
2. Provide results to Owner's Authorized Representative at the job site.
3. Physical inspection of the material shall be performed at the same time by the Owner's Authorized Representative.
4. Owner's Authorized Representative has the right to reject the material if it does not meet the above parameters.

2.4 PRE-EMERGENCE - ORGANIC HERBICIDE – for initial weed eradication on site prior to sod installation.

A. Chemical Herbicides will not be used due to detrimental effects on the soils and due to runoff effects to the site detention basin and into the storm system.

B. Organic herbicide will be used to remove weeds prior to turf grass installation.

C. Use of any herbicide is to be of limited nature because of the potential to damage the viability of the soil and therefore the retardation of future plant growth.

D. Non-selective post emergence herbicide: Ammonium Nonanoate – 40%, AXXE® Broad Spectrum Herbicide, OMRI listed, as manufactured by BioSafe Systems, LLC, 22 Meadow Street, East Hartford, CT 06108, (888-273-3088).

E. Supplier: San Jacinto Environmental Supplies, Houston, TX (713-957-0909), local representative: Lanse Fullinwider, cell: (214-534-2317), or other suppliers.

F. Nonselective organic herbicide, such as Agricultural grade (20%) vinegar or 20% vinegar based product mixed with citrus oil.

2.5 ORGANIC BIOLOGICAL FERTILIZER: to build soil structure within urban environment. Synthetic fertilizers will not be used due to runoff issues and per iSWM (Integrated Storm Water Management) best practices.

A. Homogenous, granulated all organic biological fertilizer containing soil microbes, endo & ecto mycorrhizal fungi, vitamins, minerals, plant hormones, stimulators, essential carbon and protein: MicroLife Multi-Purpose 6-2-4 All Organic Biological Fertilizer.

B. Manufacturer/Supplier: San Jacinto Environmental Supplies, (713) 957-0909, local representative: Lanse Fullinwider, cell: (214-534-2317), or equivalent product as approved by the Owner's Authorized Representative or Landscape Architect.

C. See 3.4 for application rates of product to amended soils.

2.6 ORGANIC FUNGICIDES

A. As needed for specific conditions.

B. No chemical fungicides shall be used.

C. MicroGro Granular Root Protector - Biological Fungicide as supplied by San Jacinto Environmental Supplies, Houston, TX (713) 957-0909, local representative: Lanse Fullinwider, cell: (214-534-2317), or available locally at Southwest Wholesale Nursery, Lewisville, TX, or equivalent product as approved by the Owner's Authorized Representative or Landscape Architect.

D. Contractor shall recommend products for submittal and approval by the Owner's Authorized Representative or Landscape Architect depending on final plant selections and their susceptibility to certain fungi.

2.7 ORGANIC INSECTICIDE - FIRE ANTS

A. Fire Ant Bait:

1. PayBack® Fire Ant Bait with Conserve® Insecticide (spinosad 0.015%) granular form as manufactured by Southern Agricultural Insecticides, Inc., Palmetto, FL 34220, (941-722-3285).
2. Ferti-lome Come and Get It! Fire Ant Killer with Conserve® Insecticide (spinosad 0.015%) granular form as manufactured by Ferti-lome – Voluntary Purchasing Groups, Inc., 230 FM 87, Bonham, TX 75418.

B. Dusting Powder: Perma-Guard® Commercial Insecticide D-20 (pyrethrins 0.02%, technical piperonyl butoxide 1.0%, silicon dioxide from diatomaceous earth 88.0%) as manufactured by Perma-Guard, Inc., Albuquerque, NM 87102, (505-243-1460), or equivalent product as approved by the Owner's Authorized Representative or Landscape Architect.

2.8 WATER

A. Potable. Available on site. Applied and monitored by Contractor to establish seed and sod areas.

B. Keep seed and sod moist with watering schedules to promote deep roots and to prevent runoff. Part of the site will be watered by permanent underground irrigation systems. Overwatering of planting areas should not occur. Refer to irrigation plans.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.

1. Verify that all areas to receive turf grasses are clear of stones larger than one (1) inch diameter, weeds, debris and other extraneous materials.
2. Verify that rough grades are left below finish grades in order to accommodate the following work, the addition of stockpiled/manufactured topsoil, soil amendments and sod (if sod is shown on the plans). The top of sod with amended soil after settlement shall meet the finished grade as shown in the grading plans. Report all variations in writing.

B. Soil Moisture:

Inadequate Moisture: Do not commence work of this section when soil moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily. Apply water, as necessary, to bring soil to an optimum moisture content for planting.

C. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the owner.

3.2 PREPARATION

A. Examine rough grade, verify elevations noted on the Drawings, observe the conditions under which work is to be performed, and notify Owner's Authorized Representative of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Authorized Representative. Beginning of installation means acceptance of existing site conditions.

B. Thoroughly rip/disrupt/break-up/shatter the soil to a minimum depth of eight (8) inches, preferably deeper due to typical construction site compaction areas of site and areas outside of existing tree drip line/critical root zone (CRZ). Only lightly scarify the soils (about two (2) inches) where tree roots are present. Re-compact to industry standards using a standard gill or comparable piece of equipment.

C. Remove non-soil materials and construction debris such as wood, rock, brick, cement, pipe, sheetrock, metal, paint, plastic, glass, etc. and unacceptable clays, then re-grade subsoil to established grades for proper drainage.

D. Tilling/spike-harrowing/ripping/disrupting/breaking-up/shattering of the soils should occur prior to irrigation line installation. If the turf grass sprinkler system has already been installed, then it will be necessary to stake heads and to take necessary measures to prevent damage to the system.

E. Remove foreign materials and undesirable plants and their roots. Do not bury foreign material beneath areas to be sodded. Remove contaminated subsoil.

F. Ensure positive drainage away from building and all planting areas adjacent to the building. Ensure positive drainage at all turf grass areas. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

G. Unless it has rained at least one (1) inch within twenty-four (24) hours prior to planting, water turf grass areas thoroughly to provide a moist, not wet, bed before planting.

3.3 AREAS OF APPROVAL

A. Delineate the area scheduled for sodding on the site using the drawing to scale the shape and size of the planting area.

B. The Owner's Authorized Representative shall approve the area delineated to receive sod prior to planting.

3.4 PREPARING SOIL & FINE GRADING

A. Note: During hauling operations, keep walkway and roadway surfaces clean. Promptly remove compost or other material.

B. Per the soil analysis report, determine if additional organic amendments are to be integrated into the soil preparation for plant health and horticultural suitability. Coordinate addition of amendments with the soil preparation as noted below. If no further soil amendments are required, then soil preparation shall be as noted below.

C. Weed removal:

1. If site has been freshly graded, compacted or disturbed due to construction efforts and placement of manufactured topsoil, water site for minimum two (2) weeks to encourage weed germination and growth. (If site was graded more than two (2) weeks prior, watering is not needed to encourage weed growth.)

2. Area scheduled for grass: Totally remove all grasses and weeds, unless directed otherwise by Owner's Authorized Representative. Apply organic herbicide to thoroughly exterminate existing grasses, weeds, or other vegetation (unless noted on the drawing or in the field by the Owner's Authorized Representative for protection) in area scheduled to receive turf grass for grasses.

3. Clear and remove these existing weeds upon organic herbicide's completed action by grubbing off all plant parts and roots to at least one and one-half (1.5) inch below the surface of the soil.

4. In area adjacent to existing trees to remain lightly scarify the soil to remove seedlings and other ground vegetation to a depth not to exceed one and one-half (1.5) inches. Keep all scarification a minimum of eight (8) feet from the base of all existing trees. If exposed roots are on the surface of the soil DO NOT SCARIFY.

D. Remove branches, roots, weeds, rocks, trash and other material foreign in nature from the existing stockpiled topsoil prior to placing stockpiled topsoil or use manufactured topsoil if no suitable stockpiled topsoil material is available. If pulling from a stockpile, push weed growth off top and pull from the lower inside portion of the pile where weed seeds have been heated and are less likely to germinate. Amend stockpiled topsoil to provide organic matter as per 2.3.

E. Once subsoil is lightly but firmly re-compacted, spread topsoil over areas to be sodded to a depth which will produce a two (2) inch depth minimum after natural settlement and will conform to finish lines, grades and elevations. Add this soil from the outside of the site in, so the subsoil and topsoil create an interface (mingled) layer instead of two (2) distinct layers with the possibility of a pan layer being generated.

F. Do not drive over re-graded/scarified subsoil clays - dump topsoil on the outside of the site and with a tractor/dozer push topsoil onto scarified clays. Make equipment ride on top of topsoil as this will allow topsoil to partially mix with subsoil clays creating an interface layer instead of a compacted pan layer.

G. Fine grade, level and scarify with a weighted spike harrow, spike float drag, or by hand raking. Leave no depressions, ruts, soft spots or humps. Finish to lines or elevations shown and parallel to proposed finished grade, as approved. Maintain positive drainage on site. Remove rocks, clods, weeds, trash or debris from area to be sodded. Remove rocks and other foreign materials one (1) inch or greater in any dimension. Legally dispose debris off site.

H. Place and spread compost over topsoil to depth which will produce a one-half (1/2) inch depth after natural settlement and will conform to finish lines, grades and elevations.

I. Spread organic biological fertilizer at rate of twenty (20) pounds per one thousand (1,000) square feet over top of spread compost.

J. Till or disk topsoil and compost with organic biological fertilizer to five (5) inch minimum depth into existing subsoil to eliminate slip-plane between the three (3) materials and to prepare an acceptable bed for sod. Make a minimum of one (1) pass to break up clods and integrate compost evenly into the existing soil. Penetration of soil to a depth of five (5) inches is desired to encourage dormant seed grass and weed growth. Do not till if soil is wet.

K. Under adjacent existing trees, place and spread compost over area to depth which will produce a one (1) inch depth after natural settlement and will conform to finish lines, grades and elevations. Hand rake mix compost into native soil to two (2) inch depth to eliminate slip-plane between the materials and to prepare an acceptable bed for sod. Make a minimum of one (1) pass to break up clods and integrate compost evenly into the existing soil.

L. If soil or weather conditions are unsuitable, cease compost operations. Resume compost operations when proper conditions prevail.

M. Compact amended soil with lawn roller to final compacted thickness as approved.

N. Second (2nd) weed and grass removal in areas scheduled for - sodded grass: Water the tilled and fine graded areas to receive grass three (3) weeks prior to sodding to encourage additional disturbed weed and native grass germination and growth. Apply an organic herbicide to thoroughly exterminate existing grasses, weeds, or other vegetation (unless noted on the drawing or in the field by the Owner's Authorized Representative for protection) in areas scheduled to receive sodded grasses. Totally remove all grasses and weeds, unless directed otherwise by Owner's Authorized Representative.

O. If weeds should germinate prior to sodding, hand pull or re-apply organic herbicide by wick method to eradicate weeds, but do not injure grass.

3.5 SODDING

A. After soil preparation (Section 3.4) is approved by the Owner's Authorized Representative, commence with sodding.

B. Scope of work:

1. Refer to the plans for the location of areas to receive sod.
2. Prepare soils per 3.4 and install sod in areas disturbed by renovation construction.
3. Prepare soils per 3.4 and install sod on entire grounds of project with new construction.
4. Install a minimum of two (2) feet of new sod along each side of new or renovated walkways in sodded areas. Refer to plans for extents of sod if greater than two (2) feet.
5. Sod will also be required in areas designated for turf grass that exceed 4:1 slope, unless noted otherwise on the drawings.
6. Delineate areas to receive sod and receive approval for area by Owner's Authorized Representative prior to planting.

C. Laying Sod:

1. Time frame for laying sod is from April 15 to October 15.
2. Extend or reduce specified period for laying sod as approved and as necessitated by weather and soil conditions.
3. Final selection of sod: As approved.
4. Do not lay sod when sodding area is muddy or frozen nor when sod is frozen. When soil surface is hot or dry, wet soil to a depth of two (2) inches, six (6) to eight (8) hours prior to sodding.
5. Lift sod from trucks or storage piles and place by hand with close joints and no overlapping. When Beck Roll of sod is used, lay as specified and in accordance with the supplier's instructions.
6. Lay first row of sod in straight line. Place subsequent rows parallel to and tightly against each other. Stagger lateral joints to promote more uniform growth and strength. Do not stretch sod. On slopes, lay sod parallel to contours of slope.
7. Peg sod placed on slopes 2:1 or greater. Peg each strip or section of sod with at least two stakes not more than two (2) feet apart. Use stakes one-half (½) inch by one (1) inch by twelve (12) inches driven flush with top of sod so that roots are in contact with topsoil.

8. Water sod immediately to prevent excessive drying during progress of work. Sod which dries out will be rejected.
9. Roll entire area as sodding is completed in one section so that sod is without surface irregularities, such as depressions and high spots.
10. Irrigate immediately after rolling to wet underside of sod and one (1) inch of soil immediately below.
11. For athletic fields (if applicable), the sod must be laid to be without bumps, dips or unlevel areas. Continue to level and proof roll field to meet Owner's or Owner's Authorized Representative's approval.

3.6 ESTABLISHMENT PERIOD AND REPLACEMENT

A. The establishment period for sodding of grasses shall commence at installation and continue throughout the construction period until final acceptance by the Owner's Authorized Representative.

B. Maintain sodding and incidental work by performing the following and other operations of care necessary for promotion of growth so that work is in an approved condition throughout establishment period; uniform in color, quality, and coverage; and free of weeds, insects, diseases, surface damage, and other imperfections.

1. Watering: Provide labor and materials for establishment watering.
   a. First two (2) weeks: Perform watering daily to keep sod beds continuously moist and to maintain moist topsoil to a depth of at least four (4) inches. Water during heat of day to help prevent wilting. Water with frequent, light watering and avoid runoff or puddling. Water may be needed more than once a day depending on weather conditions. Water to ensure germination and root growth for resodding work.
   b. Remaining weeks: Perform watering weekly, decreasing frequency and increasing amount per application to encourage deep root growth.

      Recommended schedule:

      1) Next four (4) weeks: Perform watering to provide two (2) soil-wetting events to a depth of four (4) inches per each week.
      2) Remainder of growing season: March to November, water to provide two (2) soil-wetting events to a depth of six (6) inches per each month.
      3) In prolonged drought, over six (6) weeks in summer with no rain, irrigate once every five (5) to six (6) weeks to keep the dormant turf alive, but not trigger "green-up", unless more regular watering is desired to keep the turf green.

C. Eliminate weeds that emerge as soon as they appear, in a timely fashion mechanically and/or with an herbicide to prevent establishment and resodding. Use an herbicide that will not injure the newly sodded grass and apply according to manufacturer's recommendations. The Contractor should allow for a minimum of two (2) herbicide applications of areas scheduled for grasses during the establishment period.

D. Mowing: Turf solid sod grass areas.

1. Mow grass when it reaches a height of four (4) inches. Do not mow until sod is firmly rooted and securely in place. Mow to height of two (2) inches at first cutting. Thereafter, do not remove more than one third (1/3) of grass leaf at any cutting and mow only to enhance root growth.

E. Rolling and reshaping: Roll to maintain uniform surface. Roll to eliminate uneven places in sod. Reshape soil surface to maintain positive drainage. Resod to provide one hundred (100%) percent coverage.

F. Applying organic biological fertilizer:

1. MicroLife Multi-Purpose 6-2-4 All Organic Biological Fertilizer, as supplied by San Jacinto Environmental Supplies, (713) 957-0909.
2. Rate: Twenty (20) pounds per one thousand (1,000) square feet of turf area.
3. Application:
   a. March
   b. June
   c. October

G. For high-use turf grass areas with heavy foot traffic, additionally top dress with one-half (1/2) inch organic compost in the fall plus aeration to open the compacted soils.

H. Applying organic herbicides, organic fungicides and/or organic insecticides:
   1. Apply as needed to ensure one hundred (100%) percent coverage of turf grass that is weed, disease and pest free.
   2. Apply in spray form by certified applicator.
      a. Do not apply when temperature exceeds 80 deg. F. or during periods of drought.
   3. Treat fire ant mounds as they appear with approved organic materials.

I. Replacing sodding:
   1. Replace sodded areas that are dead or are in an unhealthy, unsightly, or badly impaired condition as soon as possible during specified planting seasons.
   2. Replace sod with same variety as noted for application per 2.1.
   3. Make such replacements in the same manner as specified for original sodding.

J. Coordinate watering schedules with other plantings during installation and until final acceptance. DO NOT overwater as this will promote weeds.

K. Maintenance Instructions: Submit one (1) electronic copy and two (2) copies of typewritten instructions recommending procedures to be established by the Owner for the maintenance of grasses for one (1) full year. Submit one (1) set of instructions to Owner's Authorized Representative for approval. Submit two (2) copies of revised instructions prior to expiration of Contractor's maintenance period(s) required under the contract.

3.7 FIELD QUALITY CONTROL

A. Owner will engage an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports.
   1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from requirements.

B. Correct deficiencies in or remove and replace that inspections and test reports indicate do not comply with specified requirements.

C. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

3.8 CLEANING

A. Daily removal of rubbish and debris caused by this work from the site.

B. Keep site clean during maintenance period.

3.9 PROTECTION

A. Turf grass areas shall be protected against damage from the time work is started until the date of acceptance by the Owner's Authorized Representative. The moving of heavy equipment or materials over turf grass areas shall be done on planks if necessary.

3.10 INSPECTIONS

A. Make written request for inspection after areas have been sodded.

B. Submit request for inspection to Owner's Authorized Representative at least two (2) days prior to anticipated inspection date.

3.11 FINAL ACCEPTANCE

A. Due to seasonal requirements, final acceptance of this section may not coincide with that of the remaining contract work.

B. Request inspection for final acceptance at least ten (10) calendar days before the end of the establishment period.

C. Final acceptance shall be considered the time at which warm season turf grass areas are 100% established, and weed, pest and disease free with complete lush cover and no exposed soil areas showing. Weeds shall not occupy more than 2% of any 40'x40' test area.

D. Replace rejected sodded areas as specified so that repair or replacement is rooted and established prior to approval.

3.12 WARRANTY

A. In accordance with the General Provisions warranty for grasses shall be valid for one (1) year after final acceptance. Replace dead materials and materials not in vigorous, thriving condition as soon as weather permits. Re-sod areas where grasses have not established. The opinion of the Owner's Authorized Representative as to what constitutes a dead stand of grass shall be final.

B. Replace grasses with same kind as originally planted at no cost to the Owner. Provide one (1) year warranty on replacement plants. Plants should be replaced at start of next season. Protect irrigation system, other piping conduit, or other work during replacement. Repair any damage immediately.

C. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects, or diseases. Warranty excludes replacement of plants due to negligence, over watering, or improper maintenance by the Owner or Owner's maintenance contractor.

D. Plants will be guaranteed to be true to species, variety or cultivar as specified.

TABLE 32 92 00-1

This chart indicates minimum length of time by which material samples must be submitted for approval before intended use and minimum quantity of each. Usable samples will be returned.

ITEM	TIME	QUANTITY	COMMENT
SOD	7 days	3 square feet	Each variety specified
ORGANIC COMPOST	7 days	1 gallon bag	Organic finished compost
ORGANIC HERBICIDE	7 days	1/2 pint	Unopened container
ORGANIC FERTILIZER	14 days	1 quart	Provide sample
ORGANIC FUNGICIDE	14 days	1 quart	Provide sample
SCREENED SOIL	14 days	1 gallon bag	
MANUFACTURED TOPSOIL	14 days	1 gallon bag	
OTHER MATERIAL	7 days	As directed or as approved.	

END OF SECTION

SECTION 32 93 00

LANDSCAPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all work and materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with the installation of the landscape.

1.2 SUMMARY

A. Work includes:

1. Providing complete landscaping as shown.
2. Excavation of plant pits.
3. Percolation test and drainage of tree pits in lawn and planter beds.
4. Eliminating weeds – minimal two treatments.
5. Provide spike harrowing/ripping of compacted soils for beds.
6. Providing plant materials and related items.
7. Providing manufactured or stockpiled topsoil.
8. Providing expanded shale.
9. Providing organic professional compost.
10. Providing organic biological fertilizer.
11. Providing planting mix for specific site planters (if applicable).
12. Bed preparation and planting.
13. Providing weed barrier for planting beds.
14. Providing mulches for planting beds areas.
15. Providing tree anchoring frame.
16. Providing steel edging with stakes.
17. Providing organic herbicide and organic fungicide.
18. Providing organic insecticides.
19. Finished grading of planting areas.
20. Watering with water-wise practices to establish and not over-water plants.
21. Warranty and replacements.

B. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

1.3 REFERENCES

A. The following Codes, Regulations, Reference Standards, and Specifications apply to work included in this Section and Section 329300.

1. Codes and regulations of the jurisdictional authorities.

2. "REFERENCE CODES AND STANDARDS":
   a. AASHTO: M288.
   b. ASTM: A6, C33/C33M-18.
   c. American Standard for Nursery Stock, Edition approved April 14, 2014 by American Nursery and Landscape Association (ANSI Z60.1-2014) - plant materials.

d. Hortus Third, 1976 - Cornell University - plant nomenclature.

B. Observation at growing site does not preclude right of rejection at the Worksite. Plants damaged in transit or at the Worksite shall be rejected.

C. Personnel: Perform work only with qualified personnel familiar with required landscaping methods and materials.

1.4 DEFINITIONS

A. Weeds: Any plant not specified on the drawings or accepted as a substitute.

1.5 QUALITY ASSURANCE

A. Source quality control: Furnish certificates of inspection of landscape materials, to accompany shipments, as required by governmental authorities or as requested for inspection by Owner. Comply with applicable federal, state, county and local regulations governing landscape materials.

B. Growing location: Furnish certificates showing where materials have been grown or balled and burlapped.

C. Qualifications:

1. Manufacturer: Company specializing in manufacturing Products specified with minimum seven (7) years documented experience.

2. Installer: Company specializing in performing the Work of this Section with minimum seven (7) years documented experience installing projects of similar size and scope. The Landscape Contractor shall furnish a list of references or previous work experience as requested by the Owner. The Landscape Contractor shall employ only skilled personnel and provide adequate supervision.

D. Mockups: Contractor shall provide three (3) foot x three (3) foot representative mockups of each type of bed preparation for approval by the Owner's Authorized Representative and the Landscape Architect to show compliance with Section 3 – Execution. Mock-ups that do not conform to the drawings, specs, and manufacturer's recommendations will be rejected. An in-place mock-up sample may be acceptable. By installing an in-place mock-up, the Contractor accepts the risk and bears the cost of removing and replacing rejected samples. Contractor shall receive final approval from the Owner's Authorized Representative prior to commencing balance of work.

1.6 SUBMITTALS

A. Provide representative quantities (1 gallon plastic bag or container) of manufactured topsoil, expanded shale, organic compost, planter mix, and rustic cut mulch. Samples shall be approved by Owner's Authorized Representative prior to installation. Attach product name, address of manufacturer and/or supplier and appropriate literature and composition of material or gradation for each sample. Literature or Product Data shall consist of manufacturer's current specifications, with catalog cuts, data sheets and installation instructions. Samples shall be submitted no less than sixty (60) days prior to installation.

1. Organic Biological Fertilizers: Copy of each products information labeled with manufacturer's name and address and analysis. Submit manufacturer's information or cut sheets on products.

2. Organic Herbicide: Copy of product information labeled with manufacturer's name and address and analysis. Submit manufacturer's information or cut sheets on products.

3. Organic Fungicide: Copy of product information labeled with manufacturer's name and address and analysis. Submit manufacturer's information or cut sheets on products.

4. Organic Insecticide(s): Copy of each products information labeled with manufacturer's name and address and analysis. Submit manufacturer's information or cut sheets on products.

5. Edging: Manufacturer's literature and 12" long sample.

6. Tree Anchoring Frame: Copy of product information labeled with manufacturer's name and address. Submit manufacturer's information or cut sheets on products.

7. Weed Barrier - Recycled Newsprint Roll Stock Paper: Manufacturer's literature and 12" square sample.

B. Plant Material Samples: Submit documentation no less than sixty (60) days prior to installation that all plant materials have been located and are ready to be secured. Arrange specific review procedure of plant materials at time of submission. Submittals and review shall be organized as follows:

1. Preliminary Review: Submit representative photographs for review of all plant materials in the required sizes and in available quantity at no less than sixty (60) working days prior to shipment to the site.
2. Submittal shall include each of these items per plant: 1) a minimum of one (1) high quality color bond image or 2) one (1) color digital image. Include one (1) set for each plant type and size required for the project. The 8-1/2" x 11" sheet/image is to include the name and address of the supplier, size of the plant in the picture and Botanical and English name of the plant and variety/cultivar name. Digital submittals are preferred due to expediting time and for reduction in the carbon footprint.
3. Tree photographs shall include a person or device to determine scale, and shall include two (2) photographs of each tree type or group. The two (2) photographs shall be taken at approximately 90 degrees from each other. One (1) additional photograph shall be taken at the base of each tree to show root flare and root conditions at the soil surrounding the roof flare.
4. Provide any additional tree groups and specimen photographs as required to illustrate the quality and/or quantity of material.
5. Poor quality photographs, photographs that are not in color, not labeled, or photographs which do not adequately represent the plant material will be rejected.
6. Photograph Acceptance and Nursery Review: Acceptance of material through photographs/digital images does not preclude rejection of unsatisfactory material upon delivery. The Owner's Authorized Representative reserves the right to refuse review from photographs or at the grower if, in his judgment suitable material or sufficient quantities are not available. Contractor shall ensure a sufficient quantity of plants will be available whenever trips are arranged to a nursery for the purposes of tagging material for the project.
7. Specific sources of materials may be listed in the plant schedule for availability, size, quality control of plant character and for matching of specific plant growing conditions.
8. Unavailable Material: If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price. Substantiate such proof in writing no less than sixty (60) days prior to installation.

C. Sources: Within at least sixty (60) days prior to delivery to site, notify Owner and Owner's Authorized Representative in writing of source of plant material and bed preparation materials required for the project. This data is to be furnished in addition to representative samples.

D. Special Warranty: Submit written special warranty registered with manufacturer as specified in this Section.

E. Provide documentation and testing of compost materials as specified in Parts 2 and 3 of this Section.

F. Maintenance Instructions: Submit two (2) copies of typewritten and one (1) electronic copy of instructions for one (1) full year. Submit to Owner's Authorized Representative for approval. Submit two (2) copies and one (1) electronic copy of revised instructions prior to expiration of Contractor's maintenance period(s) required under the contract.

1.7 PROJECT CONDITIONS OR SITE CONDITIONS

A. Verify and examine site conditions with the Owner's Authorized Representative. Proceed when official notice is given to the Contractor that the Work site is ready. Proceed with and complete the landscape work as rapidly as portions of the site become available.

B. Planting Restrictions: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice. Do not install plant life when ambient temperatures may drop below 35 degrees F or above 100 degrees F. Commence landscaping work when the Site is free of rocks and debris. All planting areas to be left at depth per drawing details/sections from finished grade by others for landscape contractor to add soil amendments.

C. Protection:
1. Do not move equipment over existing or newly placed paving without approval of Owner's Authorized Representative.
2. Provide road-boarding to protect paving.
3. Protect paving, structures and any other site improvement from damage, with protection boards, ramps, and protective sheeting.

D. Utilities:

1. Determine locations of underground utilities and perform work in a manner which is intended to avoid possible damage. Hand excavate, where required, to minimize possibility of damage to underground utilities.
2. Coordinate work with Owner's Authorized Representative to prevent damage to existing underground sprinkler (irrigation) system at trees.
3. Water is available on site. Refer to irrigation system drawings for proposed underground irrigation system.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials in sealed containers showing weight, analysis and name of manufacturer, supplier or grower. Protect materials from deterioration during delivery and while stored at the site.

B. Storage: Store products with protection from weather or other conditions which would damage or impair the effectiveness of the product. Protect metal containers from sun during summer months with temperatures above 80 degrees F.

C. Preparation of Plant Materials:

1. Balled and Burlapped (B&B) Plants: Dig and prepare shipment in a manner intended to protect roots. foliage and branches from damage and protect the shape, and future development.
2. Container Grown Plants: Prepare shipment in a manner intended to protect roots, foliage and branches from damage, and protect the shape for future development.
3. Plants should bear label from the grower certifying genus and species. Labels should be securely attached and waterproof bearing legible designation of botanical and common name. Plants not labeled may be rejected.

D. Deliver trees, shrubs and other plants after preparation for planting have been completed and plant immediately.

E. Damage: Protect plant material in transit and at the site. Material not properly protected and which is damaged will be rejected.

F. Unloading, Handling and Staging of Trees:

1. Staging systems shall be prepared in advance to adequately hold trees above ground for optimum tree health prior to planting. Many times, even with the best planning and coordination, trees cannot be planted when they are delivered.
2. Use extreme caution when handling trees. Use a strap cradle, adequate for weight and size of tree and root ball, attached to the root ball to unload and move trees. Strapping and wire baskets can break or loosen. Never move, lift, or handle by attaching to or by putting pressure on the trunk. Be very careful not to damage or scar trunks and branches.
3. Prior to unloading, proper moisture shall be maintained in root balls. Trucks shall be staged in the shade prior to unloading. Unloading time shall be no more than two (2) hours per trunk.
4. Immediately after unloading, no more than one hour after unloading, stand the trees up to reduce risk of sun scald. Properly staged trees shall be standing, untied and spaced.
5. Remove cardboard trunk protector within forty-eight (48) hours of trees being stood upright to reduce the risk of damage.
6. Monitor moisture in the root ball by probing the soil with a soil probe and manage supplemental irrigation accordingly. Be careful not to over or under irrigate.
7. During cold weather periods, root balls must be protected from freezing temperatures.
8. Storage is at Contractor's own risk.

G. Handling of Plant Materials:

1. Do not deliver plants until the site conditions are ready for planting. If planting is delayed, heel-in bare rooted or freshly dug plants in a bed containing adequate mulch to keep roots moist. Separate bundles and trim roots, if long or damaged, using sharp pruning shears. Place plants in flats, pots, or other containers in a sheltered spot protected from sun, wind and mechanical damage and keep roots moist. Storage is at Contractor's own risk.
2. Do not lift or handle any plants by tops, stems or trunks at any time. Do not bind or handle plants with wire or rope at any time.

1.9 MOCK-UPS

A. Mockups of bed preparation shall be provided on site in two (2) locations with Owner and Owner's Authorized Representatives to show compliance with Section 3 – Execution.

B. Coordinate with General Contractor for sequencing of mock-ups to demonstrate soil preparation for planting beds. Mockup may be part of installed area if it shows compliance with Section 3 – Execution.

C. Contractor shall demonstrate installation of the weed barrier with mulch topdressing prior to planting.

D. Refer to Section 3.2 Site Preparation.

1.10 SEQUENCING

A. Coordinate rough and landscape grading, soil preparation, irrigation, and other related units of Work specified in other Sections to ensure that plant material can be supported and installed as indicated.

1.11 SCHEDULING

A. Submit a proposed work schedule to the Owner's Authorized Representative for approval at least sixty (60) days prior to start of work under this Section. After approval, no modification shall be made to this schedule without written authorization by the Owner.

B. In general, the work shall proceed as rapidly as the site becomes available, consistent with normal seasonal limitations for planting work.

1.12 WARRANTY

A. General: Warranties specified in this Section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. In accordance with the General Provisions, warranty for plants and trees shall be valid for one (1) year after final acceptance. Replace dead materials and materials not in vigorous, thriving condition as soon as weather permits. The opinion of the Owner's Authorized Representative as to what constitutes a dead plant shall be final.

C. Replace dead trees or trees not in vigorous, thriving condition as soon as weather permits. Replace trees, which have partially died thereby damaging shape, size, or symmetry. The opinion of the Owner's Authorized Representative as to what constitutes a dead plant shall be final.

D. Replace plants and trees with same kind and size as originally planted at no cost to the Owner. Provide one (1) year warranty on replacement plants. Trees should be replaced at start of next planting or digging season. In such cases, remove dead trees immediately. Protect irrigation system, other piping conduit, or other work during replacement. Repair any damage immediately.

E. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects, or diseases.

F. Plants will be guaranteed to be true to species, variety or cultivar as specified.

G. Warranty: Warrant that all shrubs and groundcover planted under this Contract will be healthy and in flourishing condition of active growth one (1) year from date of Substantial Completion.

H. Replacements: As soon as weather conditions permit, replace, without cost to Owner all dead plants and all plants not in a vigorous, thriving condition, as determined by Owner's Authorized Representative during and at the end of Warranty Period.

1.13 REPLACEMENTS

A. General:

1. Plant materials exhibiting conditions which are determined as being unacceptable due to workmanship by the Contractor shall be repaired and/or replaced at no additional cost to the Owner.
2. Closely match replacements to adjacent specimens of the same species. Apply all requirements of this Specification to all replacements.

B. Replacement Quantities: Contractor shall be held responsible for a maximum of two (2) replacements for each failed tree and shrub, and same area of groundcover and perennial planting after final acceptance during the Warranty Period.

PART 2 - PRODUCTS

2.1 PLANTS

A. General: Provide healthy, field-grown ball and burlapped plants or nursery-grown container and boxed plants, well-formed No. 1 grade from a recognized, local nursery, and of the species and variety shown on the drawings, well-developed branches conforming to and complying with the last edition of American Standard for Nursery Stock, Edition approved May 12, 2004 by American Nursery and Landscape Association (ANSI Z60.1-2004). Listed plant heights are from tops of root balls to nominal tops of plants.

B. Provide only healthy, vigorous stock, grown under climatic conditions similar to conditions in the locality of the project and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement. Plants will have been grown within a two hundred and fifty (250) mile radius of the site.

C. Vigor: Plants shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae. They shall have healthy, well-developed, vigorous and fibrous root systems. Plants shall be free from physical damage or adverse conditions which would prevent thriving growth.

D. Container and Boxed Stock material:

1. Verify that all container stock has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years.
2. Plants shall have a root ball size of minimum of ten (10) inches in diameter for each one (1) inch caliper, measured six (6) inches above root ball.
3. Root system development:
    a. Samples must prove to be free of kinked, circling or girdling roots and with no evidence of a pot-bound condition.
    b. Trees shall have been grown in heavy or heavy clay soil and irrigated with drip irrigation. Loose potting soils are not acceptable since root mass will flex with trunk sway and allow potential overturn of tree.
    c. Field grown plants recently planted into containers will be accepted if roots have developed into new soils.
4. Root flare of plant material shall be visible at nursery prior to delivery, and after transplanting into the landscape.
5. Root balls shall not be cracked or broken prior to shipment.
6. Do not remove self-locking tags prior to delivery to site.
7. Remove all weeds and other invasive plants from the base of the nursery plant’s root container prior to delivery to site.

E. Nursery grown B&B material:

1. Plants shall have a root ball size of minimum of ten (10) inches in diameter for each one (1) inch caliper, measured six (6) inches above root ball.
2. Root system development:
    a. All named cultivars shall be own root clones; no grafted or bud-grafted trees will be accepted.
    b. 100% mechanically root-pruned at least once and transplanted a minimum of three (3) times during the first three (3) years of the tree’s life.
    c. Trees shall have been grown in heavy clay soil and irrigated with drip irrigation.
    d. Plants shall be well healed in for a minimum of thirty (30) days with a flush of new roots at the edge of the burlap prior to shipping. Recently dug plants will not be accepted.
    e. Trees shall have no girdling roots, have no “J” shaped roots, and the trunk flare shall be visible.
3. Ensure balls are firm, neat, slightly tapered, and well burlapped.
4. Root balls shall not be cracked or broken prior to shipment.
5. Root flare of plant material must be above ground and visible at nursery before harvest, prior to delivery, before planting, and after transplanting into the landscape.
6. Root liner grown trees shall have been planted such that their root flare is visible above the finished grade of the liner. No buried tree flares will be submitted or accepted.
7. Do not remove self-locking tags prior to delivery to site.

8. Remove all weeds and other invasive plants from the base of the nursery plant's root ball prior to delivery to site.

F. Shade and Ornamental Trees - Canopy development:

1. No. 1 grade nursery stock healthy, vigorous, full-branched, well-shaped, trunk diameter, and height requirements as specified
2. There shall be a strong central leader to the top of the canopy. The tip of the leader on the main trunk must be intact and it's terminal bud must be the highest part of the tree.
3. No branch can have a diameter greater than 2/3 the trunk diameter measured directly above the branch crotch. The tree will have no inclusions or co-dominant branches.
4. The tree crown shall be structurally uniform. Branches shall be evenly distributed around the trunk. The crown shall be full of foliage which is evenly distributed around the tree.
5. Trees that have had branches tipped or cropped will not be accepted.
6. Provide trees with full rounded crowns, meeting height and spread standards after pruning. No flat sided trees or trees with open areas on any side will be acceptable. Trees shall be consistently superior in form and branching, and typical of the growth habit of their species unless otherwise specified.

G. Tree Caliper Measurement Requirements: for a single stem tree, the diameter (caliper) of the trunk shall be measured twelve (12) inches above the top of the root ball for a tree having a diameter up to and including eight (8) inches, and measured at four and one-half (4.5) feet (Datum Breast Height - DBH) above the top of the root ball for a tree having a diameter of more than eight (8) inches. For multi-stem trees, the diameter of the trunk measured at the narrowest point below branching when branching occurs higher than twelve (12) inches above the top of the root ball. When branching occurs at or lower than twelve (12) inches above the top of the root ball, caliper means the diameter of the largest stem plus the average diameter of the remaining stems, measured at four and one-half (4.5) feet (DBH) above the top of the root ball.

H. Shrubs, ornamental grasses, yuccas, hesperaloe, opuntia, groundcovers and perennials: Nursery grown, healthy, vigorous, of normal habit of growth for species, free from disease, insect eggs, and larvae. Specified sizes are before pruning and measured with branches in normal position. Plants to be well rooted and established in the container.

I. Plants shall conform to the sizes and quality notes in the plant list and/or as indicated, with the exception of that larger plants than those specified may be used if approved by the Owner's Authorized Representative. Use of larger plants shall not increase the contract price. Specified sizes shall be after pruning, and plants shall be measured with their branches in normal position.

J. Pruning: Do not prune plants before delivery. If pruning is necessary, prune with direction from Owner's Authorized Representative (Landscape Architect).

K. Plant protection during shipping: Wrap canopy of plants prior to loading to ensure that branch structures are protected, and that wind damage is minimized. Shrubs and smaller plant material will be handled and loaded to protect character and form of each plant. Removal of protection strapping and wrapping shall be handled with care to prevent damage to the plant material once it is delivered to the site. Damaged materials will be subject to rejection.

L. Upon delivery to site:

1. Reject trees with cracked, lose or broken balls when frame or burlap is removed at time of planting.
2. Trees will be individually approved or rejected by the Owner's Authorized Representative on site.
3. Trees: Free of physical damage such as scrapes, bark abrasions, or split branches.
4. Trees for planting adjacent to sidewalk shall be pruned and branched up to seven (7) foot height above the finished grade of the sidewalk or accessible surface for pedestrian clearances as directed by the Owner's Authorized Representative.

2.2 MANUFACTURED TOPSOIL – Refer to Section 32 92 00 – 2.2.

2.3 EXPANDED SHALE

A. Expanded Shale: shall be rotary kiln expanded shale and clay lightweight aggregate as manufactured and supplied by Arcosa Lightweight Arlington, TX (817-635-8541), local representative: Eric Nelson, cell (817-635-8541) or equivalent as determined by the Owner's Authorized Representative.

2.4 COMPOST - Professional Compost - 100% plant based - Refer to Section 32 92 00 – 2.3.

2.5 PLANTER MIX – for raised planters (if applicable)

A. Moderately Pervious Container Soil Mix (modified):

1. pH in the neutral range, moderately draining, perpetually loose in texture, holds sufficient moisture to adequately supply the vegetation without excessive leeching of transient nutrients.
2. Composition: mix of pH Balanced Compost, expanded shale, soil and sand blend. Mix will be modified slightly as follows*: reduce pH Balanced Compost by 10%, increase fine aggregates by 10%.*

B. As processed and supplied by Soil Building Systems, Dallas, Texas, (972-831-8181), attention: Baron Ablon, or equivalent as approved by the Owner's Authorized Representative.

2.6 PRE-EMERGENCE AND POST-EMERGENCE FOR WEED REMOVAL - ORGANIC HERBICIDE AND HAND PULLING - Refer to Section 32 92 00 – 2.4.

2.7 ORGANIC BIOLOGICAL FERTILIZER – Refer to Section 32 92 00 – 2.5.

2.8 MISCELLANEOUS PLANTING MATERIALS

A. Wrapping Material: Do not use!

B. Tree Paint: Do not use!

2.9 WEED BARRIER AND TOPDRESSING

A. Weed Barrier for Planting Areas: Recycled roll stock newsprint paper as manufactured in the U.S. Available: Global Industrial at (1-888-978-7759), www.globalindustrial.com; or Uline (1-800-958-5463) / (1-800-295-5510), www.uline.com; or Pack Secure at (1-888-511-7225), www.packsecure.com, or equivalent product as determined by the Owner's Authorized Representative.

B. Mulch for Planting Beds and Tree Watering Wells at Turf – material screened to not exceed eight (8) inches:

1. Rustic Cut Hardwood – native hardwoods; free of: man-made foreign material, lumber, treated materials, woodmill sawdust or pine bark; hammer mill processed, decomposed - heat sterilized two (2) times to remove latent weed seeds, aged for minimum two (2) to four (4) months, screened to remove fines. No soft green or unprocessed materials allowed. 96% of material will pass through a one (1) inch screen with additional screening down to three-eighths (3/8) inch, 98% of material will not exceed eight (8) inches in length. Material shall have no pungent odors, but will have an earthy smell. As processed and supplied by Soil Building Systems, 2101 Walnut Hill Lane, Dallas, TX 75229 (972-831-8181), attention: Baron Ablon.
2. Tree Mulch (once ground native hardwood mulch) custom screened material to match properties of mulch noted above and to not exceed eight (8) inches in length.
    a. Product must have been heat sterilized (2) times to remove latent weed seeds.
    b. Aged for minimum two (2) months.
    c. No soft green or unprocessed materials allowed.
    d. As custom processed and supplied by Living Earth (LETCO), Dallas, TX, if determined to be an equivalent by the Owner's Authorized Representative.

2.10 ANCHORING FRAME FOR ORNAMENTAL AND SHADE TREES

A. For anchoring of tree root balls in planting bed areas and native grass areas.

B. Re-bar anchoring ring with three (3) six (6) inch U brackets, color: natural metal or painted, and three (3) separate anchors with S-hook and tightening strap.

C. Anchoring rings to have two (2) cuts per ring, four (4) total, for fail-points.

D. Below Grade Safety Stakes (ground anchors) as manufactured by Tree Stake Solutions, local representative: Jeff Tuley, (903-676-6143), www.treestakesolutions.com, or equivalent as approved by the Owner's Authorized Representative.

Item #	Description
15-BG	10-15 gal. or 17” root ball with 3 – V68 Anchors
30-BG	20-30 gal. or 22” root ball with 3 – V68 Anchors
45/65BG	45-65 gal. or 27-30” root ball with 3 – V68 Anchors
100-BG	95-100 gal. or 36” root ball with 3 – V68 Anchors
150-BG	150 gal. or 42” root ball with 3 – V68 Anchors
200-BG	200 gal. or 48” root ball with 3 – V88 Anchors

2.11 EDGING

A. Steel Edging: 1/8” x 4”, color: black, interlocking sections, installed with 12” steel stakes.

B. Option for Safety (if requested by DISD:

Aluminum Edging: Permaloc CleanLine, 3/16” x 4”, mill finish, with rolled top edge for safety, with twelve (12) inch stakes, as manufactured by Permaloc Corporation, 13505 Barry Street, Holland Michigan 49424, (800-356-9660), www.permaloc.com.

2.12 ORGANIC FUNGICIDES – Refer to Section 32 92 00 – 2.6.

2.13 ORGANIC INSECTICIDES

A. Soft Bodied Insects (aphids, mites, thrips, white flies, lace bugs, etc.):

1. EcoSMART® Organic Insecticides as manufactured by a division of the Kittrich® Corporation, Atlanta, GA 30336, (714-736-1011).
2. Neem Oil.

B. Scale: Use 2 ounces of Orange Oil mixed with 1 ounce of Neem Oil to a gallon of water. Spray weekly for 3 weeks.

C. Caterpillars, Army Worms, Sod Webworms: Use Bacillus Thuringiensis (BT) biological agent.

D. Chinch Bugs:

1. EcoSMART® Granular, as manufactured by a division of the Kittrich® Corporation, Atlanta, GA 30336, (714-736-1011).

2.14 ORGANIC INSECTICIDE - FIRE ANTS – Refer to Section 32 92 00 – 2.7.

2.15 WATER

A. Potable. Available on site. Refer to the irrigation specifications and plans. Truck or other means of watering shall be required to establish native grass areas behind the sidewalks where no existing or temporary irrigation system exists.

2.16 MACHINERY AND EQUIPMENT

A. Machinery requirements listed under this Section are NOT intended to be restrictive of specific manufacturers or models, unless so stated. Specific mention of the manufacturers is intended as a guide to illustrate the final product of the maintenance operations desired. All equipment used shall be and maintained in top working condition at all times.

B. Pruning and grinding tools shall be maintained in safe, working condition, cutting edges shall be sharp at all times.

C. Fertilizer and insecticide spreaders (for organic products) shall be of the hand-held or cyclone type. Vehicle-mounted or push cyclone spreaders shall be allowed. Spreaders shall be in a safe working condition at all times.

D. Insecticide and fungicide sprayers (for organic products) shall be of the hand-held, backpack, or vehicle-mounted type. Sprayers shall be in a safe working condition at all times.

E. The Contractor shall be responsible for any grade, plant material (native grass, trees, shrubs, etc.), or hardscape amenity (fence, pavement, arbor, steel edging, stone wall, etc.) damage caused by the spreader or sprayer and the application process.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.

1. Verify that all planting areas are clear of stones larger than one (1) inch diameter, weeds, debris and other extraneous materials.
2. Verify that grades are within one (1) inch plus or minus of the required finished grades. Report all variations in writing.

B. Soil Moisture:

Inadequate Moisture: Do not commence work of this section when soil moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily. Apply water, as necessary, to bring soil to an optimum moisture content for planting.

C. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the owner.

3.2 SITE PREPARATION

A. Coordinate with General Contractor for scheduling and sequencing of installation of planting bed areas to ensure that the areas are protected from construction sediment runoff.

B. Examine rough excavated grade/subgrade for planting areas and verify conditions under which work is to be performed. Do not proceed with work until all grading and related work is completed in a satisfactory manner so that the landscape installation can proceed. All lumps, clods, and debris over two (2) inches in diameter shall be removed from the Worksite. Delineate bed areas and receive approval from Owner's Authorized Representative prior to starting work. Beginning of installation means acceptance of existing site conditions.

3.3 BED PREPARATION AT PLANTING BED AREAS

A. Ensure rough grading of planting beds is provided to grade elevation to allow for amendment installation and drainage for positive surface flow for runoff.

B. Coordinate for irrigation installation to allow for plant placement and for height of heads relative to finished topdressed beds.

C. Weed and invasive vegetation removal:

1. Organic Herbicide: Treat weeds and invasive vegetation with organic herbicide to eradicate any material growing after rough grading for beds.

D. Thoroughly clear and remove the existing weeds and grass roots upon organic herbicide's completed action by grubbing off all plant parts and root systems to depth to allow for proposed planting bed soil amendments and topdressing, and to prevent re-growth of removed plant.

E. Thoroughly till/rip/disrupt/break-up/shatter the soil to a minimum depth of ten (10) inches due to typical construction site compaction. Re-compact to industry standards using a standard gill or comparable piece of equipment. Remove non-soil materials and construction debris such as wood, rock, brick, cement, pipe, sheetrock, metal, paint, plastic, glass, etc. and unacceptable clays, then re-grade subsoil to established grades for proper drainage of planting beds.

F. Tilling/spike harrowing/ripping/disrupting/breaking-up/shattering of the soils should occur prior to irrigation line installation. If the turf grass sprinkler system has already been installed, then it will be necessary to stake heads and to take necessary measures to prevent damage to the system.

G. Upon delivery of topsoil and planting amendments, ensure that the material is protected and is not contaminated with any materials or soils on the site prior to installation.

H. Delineate bed areas and receive approval from Owner's Authorized Representative prior to starting work.

I. Open bed areas to receive shrubs, groundcover, ornamental grass and perennials to be prepared as follows to provide a stratified bed mix:

1. Install two (2) inches (settled depth) of manufactured topsoil.
2. Till to depth of eight (8) inches to mix topsoil thoroughly with native disrupted soil.
3. Install three (3) inches (settled depth) of expanded shale.
4. Till to a depth of eight (8) inches to mix additives thoroughly with topsoil/native soil.

5. Install three (3) inches (settled depth) of organic compost.
6. Apply organic biological fertilizer at rate per manufacturer's recommendations for bed preparation at forty (40) lbs. per one thousand (1,000) square feet.
7. Till compost and organic biological fertilizer to a depth of eight (8) inches to stratify into shale/soil mix.

J. Set beds to finished grade of media to allow for topdressing installation depth.

K. Coordinate installation and placement of irrigation mainline at edge of bed to ensure that they are clear of tree root ball installation and do not impede planting. Lateral irrigation lines for bubblers, drip irrigation (if allowed/required) and spray heads shall be provided per irrigation plans.

L. Water beds to promote germination of dormant weeds and grasses, if media has been contaminated or mixed with soils containing native weed seeds prior to installation in planter beds.

M. Treat weeds in bed with application of organic herbicide.

N. Remove weeds after organic herbicide treatment period by hand digging.

3.4 BED PREPARATION AT RAISED PLANTERS (if applicable)

A. Protect finish and integrity of inside of waterproofed architectural planter walls. Do not use any sharp tools when working in this planter area.

B. Protect subdrainage system (piping and other drainage media) as designed per Civil or Architectural.

C. Install Planter Mix (modified) per 2.5 in six (6) inch water compacted and hand tamped layers to remove air pockets and to ensure that there is no settlement.

D. Apply organic biological fertilizer (MicroLife 6-2-4) at rate per manufacturer's recommendations for bed preparation at forty (40) lbs. per one thousand (1,000) square feet. Rake into surface of soil mix.

E. Coordinate and install irrigation system in bed at depth allowing for mulch topdressing or other materials and plants to be installed.

3.5 PLANT PREPARATION AT HOLDING AREA PRIOR TO INSTALLATION AT BED AREAS

A. Contractor shall remove excess soils from the top of tree root balls or containerized trees to ensure that the natural tapered root flare is fully visible and exposed. Trim and remove all circling, girdling and spider roots away from the root flare and dispose. Taper top of root ball from flare.

B. Contractor shall completely remove all weeds, vines or plant seedlings, including their root system, growing at top of container or on top of the root ball to ensure that these invasive non-specified plants do not gain foothold to establish in the planting beds and cause additional maintenance to remove.

C. Removal and disposal of all weeds, vines or plant seedlings shall occur prior to any plant moving for installation or placement in the planting beds.

3.6 TOP DRESSING PLANTING BEDS

A. After finished grade has been approved, top dress parking lot shrub screening bed areas first with eight (8) rolled layers of recycled roll-stock newsprint paper, as specified in 2.9 A., to provide a weed barrier.

B. Then top dress bed areas with rustic cut hardwood mulch to a depth of three (3) inches compacted depth.

C. In planting beds, this top dressing occurs prior to plant installation. Delay this operation until near final acceptance.

D. Top dressing must achieve specified depth to attain final acceptance.

E. Hold mulches back to expose the flare of the plant, once the plant is installed, or tree trunk at the root ball if in planting bed.

3.7 PLANTING OF PLANTING BEDS

A. After topdressing has been installed Contractor shall mark proposed locations for plants with contractor spray paint or lay out plants over top of topdressing at required spacing. Obtain approval from Owner's Authorized Representative.

B. The Owner's Authorized Representative reserves right to interchange or shift locations of plants prior to planting.

C. Once sprayed locations have been approved by Owner's Authorized Representative, pull back topdressing layer of mulch to expose the area of newsprint where the plant will be located.

D. Carefully cut cross-shaped slits to provide an opening for the plant. Roll/pull back the cut paper for plant installation.

E. Plant in pits two (2) times greater in diameter than root balls or container diameter. Remove all burlap, ropes, wires and strings from the rootball prior to planting.

F. Remove the container from the prepared plant.

G. Score the root ball vertically at four (4) equal points around the edge prior to planting.

H. Plant shrub/large ornamental grass/groundcover such that top of the root ball at the flare of the plant is one and one half (1 1/2) inch above finished grade of the recycled roll stock newsprint paper (weed barrier) for plants in 2 gallon and up sized containers, and one (1) inch above the top of the weed barrier for plants in containers 1 gallon and smaller.

I. Backfill to depths of root balls with planting media. Carefully settle by watering to prevent air pockets. Water in thoroughly.

J. Fold the cut back sections up to the root flare of the plant and pull compost/mulch topdressing back to cover the newsprint.

K. Hold mulch back to keep the root flare exposed and to keep moisture away from foliage base and prevent yellowing.

L. Carefully prune plants to remove dead or broken branches and hand-rake bed areas to smooth even surfaces.

3.8 TREE PLACEMENT AND PROXIMITY TO BUILDING WALLS & PERMANENT STRUCTURES

A. Criteria for tree distance based on trees full height and canopy spread at full maturity:

1. Large trees: Minimum of twenty-five (25) feet.
2. Small trees: Minimum of fifteen (15) feet.

3.9 TREE PIT PERCOLATION TESTING

A. For all Canopy Shade and Ornamental Trees locations:

1. Stake locations for approval by Owner's Authorized Representative prior to excavation.
2. Percolation test for trees in planting beds and turf beds: After approval of tree locations, excavate pit and perform percolation test. The pit shall be the same depth as the height of the root ball or slightly less so that the root ball sits approximately two (2) inches above surrounding grade. The pit shall be dug square so that the pits are twelve (12) inches or more greater in diameter than root balls for trees in planter beds and two (2) times the diameter of the root ball for trees in turf areas.
3. Fill excavated pits with water and wait until next day. If the water level has not dropped at least six (6) inches within twelve (12) to twenty-four (24) hours, then notify the Owner's Authorized Representative. An Owner's Authorized Representative must be present to monitor and record the results of the percolation test.
4. If tree pit does not drain in the required time, then provide one of these below two (2) options for final direction based on approval by the Owner's Authorize Representative:
    a. Provide an augured drain pit at one of the tree pits to determine if a permeable layer can be achieved to allow the required drain down time.
    b. If the above cannot be achieved, then raise the tree planter pits such that the top of tree's root flare and root ball is six (6) inches above finished grade.

3.10 CANOPY AND ORNAMENTAL TREE PLANTING

A. General Planting Requirements for all Canopy Shade and Ornamental Trees:

1. Handling trees: Use extreme caution. Use a strap cradle (adequate for weight and size of root ball) attached to root ball to unload and move trees. Strapping and wire basket can break or loosen. Never move, lift or handle by attaching to or by putting pressure on the trunk. Be certain that equipment, including straps, chains, and cradles, are rated for the weights of the trees being lifted.

2. Face tree to give best appearance and to allow for required branching height clearance above walks and streets. Provide branching orientation turned to provide for best growth pattern to prevent conflict with vehicles or adjacent structures. Receive approval from the Owner's Authorized Representative or Landscape Architect prior to final installation to prevent further handling or damage to the root system.
3. Remove any plastic wrap and any circling roots from the root ball. Handle tree only by root ball.
4. Maintain tree in a straight and plumb position.
5. Position tree anchoring frame over top of root ball and install ground anchors to align to frame above. Connect anchoring hooks and adjust tree to ensure it is plumb and anchored securely to the subgrade per manufacturer's directions prior to starting backfill. Refer to tree anchoring details for further information.
6. Backfill the lower portion against the root ball as noted per specific requirements of B. and C. below.
7. Saturate the planting hole with water after backfilling is one half (½) complete to aid removal of air from the backfill.
8. After initial backfill, watering, and the tree is plumb, then add backfill to just below the top horizontal wire ring, saturate planting hole and adjust root ball, if necessary, to make tree straight and plum.
9. After above items have been completed, remove synthetic wrap, cardboard packaging, and cut/remove the top portion of the wire basket down to and including the first horizontal ring. Remove the burlap from the top portions of the root ball.
10. Backfill remaining balance of fill at top of root ball as noted per B. and C. below.
11. Remove all remaining shipping straps, tags, tapes, ties, stakes and other items from the trunk and canopy of the tree.
12. Provide watering dam at the edge of the tree's drip line/canopy edge to keep the tree's root flare fully exposed.
13. If rock is encountered:
    a. Owner's Representative may select alternative location. Location shall not impede visibility triangles.
    b. Rock shall be removed to a minimum of six (6) inches below the plant if an alternative location cannot be selected and tree drainage pits shall be installed.

B. Canopy Shade and Ornamental Trees in Planting Beds:
1. Excavate square tree pits twelve (12) inches greater in diameter than root balls or container diameter.
2. Rip bottom and sides of pit to break up construction compaction, and then recompact bottom only by hand.
3. Place tree directly into excavated pit such that the trunk flare will be two (2) inches above surrounding finished grade in planter bed. Refer to planting details for cross-section of tree planters.
4. Backfill the lower portion of tree pit to not more than one half (½) the depth of the root ball with excavated native soils.
5. Backfill the top nine (9) inches with adjacent amended planting media blended with two (2) ounces of organic biological fertilizer per each five (5) gallon increment in tree root ball size and thoroughly saturate top backfill layer with water to aid removal of air pockets.
6. Provide top dressing per 3.6 for planting beds.

C. Canopy Shade and Ornamental Trees in Turf Areas:
1. Till soil to ten (10) inch depth within ten (10) foot radius of tree for trees in existing turf areas.
2. Excavate and plant tree in square pits two (2) times greater in diameter than root balls or container diameter.
3. Rip bottom and sides of pit to break up construction compaction, and then recompact bottom only by hand.
4. Place tree directly into excavated pit such that the trunk root flare will be two (2) inches above surrounding finished grade in turf area. Refer to planting details for cross-section of tree planters.
5. Backfill the lower portion of tree pit to not more than one half (½) the depth of the root ball with excavated native soils.

6. Backfill the top nine (9) inches with mix of one (1) part compost to one (1) part native stockpiled/imported topsoil blended with two (2) ounces of organic biological fertilizer per each five (5) gallon increment in tree root ball size and thoroughly saturate top backfill layer with water to aid removal of air pockets.
7. Topdressing – See 3.13 below.

3.11 TREE SAUCERS

A. Form a watering saucer around each new tree per construction drawings. Keep root flare exposed and keep watering saucer at edges of tree root ball. Saucer shall be no higher than three (3) inches.
B. Contractor is responsible for deep watering trees a minimum of once (1) per week until final acceptance and as needed to promote growth.

3.12 TREE ROOT BALL ANCHORING

A. Anchor trees prior to backfilling to ensure ground anchors are firmly into existing subbase.
B. Anchor all trees as detailed and per manufacturer's requirements.
C. Take precautions during staking operation to prevent damage or injury to roots and irrigation or other underground utility lines.

3.13 TOPDRESSING TREES IN TURF AREAS

A. After watering dam has been approved, top dress root zone area first with eight (8) rolled layers of recycled roll-stock newsprint paper, as specified in 2.9 A., to provide a weed barrier.
B. Then top dress tree root balls with rustic cut mulch to a compacted depth of three (3) inches.
C. Top dressing must achieve specified depth to attain final acceptance.
D. Hold mulches back minimum of six (6) inches to expose the flare of the tree trunk at the root ball.

3.14 PRUNING OF NEW TREES

A. Prune trees to preserve natural character of plant. Remove sucker growth, broken or badly bruised branches, and crossed branches.
B. Thin native trees heavier than nursery grown plants.
C. When directed by the Owner’s Authorized Representative, remove approximately one-third of wood by thinning. Do not cut back terminal branches.

3.15 EDGING

A. Provide edging where noted on Drawings on-grade at interface of turf bed to planting bed.
B. On-grade: Set edging as indicated in true lines as designed with top of edging two (2) to three (3) inches above finish grade prior to installation of sod or mulch. Receive approval from Owner’s Authorized Representative for layout of edging prior to installation. Refer to details for additional requirements.

3.16 NEW TREES

A. Trees shall be continuously and routinely inspected for distress caused by construction activities. Notify Owner’s Authorized Representative at first sign of distress.
B. Any Fire Ant mounds around or on top of a new or protected tree root zone shall be treated immediately and the mound removed physically. Do not allow the mound to build on the tree trunk as this will cover the tree root flare and possibly cause injury or death. Ensure that any chemical application to the Fire Ant mound is safe for application atop tree root zones.
C. Trees: Pruning will be carried out by experienced pruning personnel.
1. Receive approval in the field for extent of pruning from Owner’s Authorized Representative.
2. Sterilize pruning tools between individual plants, especially in the genus Quercus.
3. Raise limbs to an acceptable height as approved by the Owner’s Authorized Representative. Raise limbs to seven (7) foot height for trees within ten (10) feet of sidewalk.

4. No weed-eaters or edgers are to be used within fifteen (15) inches of any tree. Should the need for trimming be necessary within fifteen (15) inches of any tree, it shall be done so by hand trimming only.

D. Remove dead wood, broken branches, mistletoe and suckers from trees as needed. Thin prune by removing no more than twenty (20) percent of growth. Sterilize pruning tools between individual plants to keep down spread of disease.

E. Spray paint all wounds of plants of the genus Quercus as soon as possible. Spray paint deliberate wounds on genus Quercus within one (1) hour and accidental wounds due to storms, etc. as soon as possible. Wounds on other species shall be allowed to compartmentalize naturally, unless determined otherwise by Owner's Authorized Representative or Arborist. Refer to Section 01 56 39 – 2.1 for acceptable wound paint.

F. Remove all remaining tags, straps, flags, ties, etc. from trees.

G. Dispose of all waste and removed material off site per requirements of local codes.

3.17 WEED REMOVAL

A. Contractor shall hand-remove foreign grass, weeds and immature weeds prior to formation of seed heads.

B. Contractor shall monitor and remove weeds, with root systems, from top of nursery grown plants to prevent competition for plant growth.

C. Remove all poison ivy or other native vines, with root systems, from bases of tree's root balls.

D. Contractor shall obtain prior approval from the Owner's Authorized Representative before applying the approved organic herbicides. Read and follow all label directions.

E. The Contractor shall be held solely responsible for plant loss due to the application of organic herbicides. Any loss of plant material shall be replaced at Contractor's sole expense and all plant replacements shall be of the same species and size of the existing plant materials.

F. Hand weeding or plant specific application of organic herbicide shall be used during plant establishment.

3.18 DEEP ROOT WATERING

A. Deep root water all existing trees to remain within the construction limits of the project once every two (2) weeks during the summer and once (1) a month during the winter, during the duration of the project and until final acceptance. This should be adjusted to the amount of rain. However, unless it has rained at least one-half (1/2) inch since the last watering, continue to deep root water. Complete deep root watering by filling each tree saucer three (3) times and letting it percolate dry.

B. Water new plantings to provide optimum soil moisture level for plant germination and root development and not to exceed watering requirements.

3.19 PLANT CARE UNTIL FINAL ACCEPTANCE

A. Water: When irrigation system is not operational, provide necessary hoses and other watering equipment required to complete landscaping.

B. Maintain plantings and trees by watering, cultivating, weeding, raking, fertilizing, controlling diseases and pests, cleaning, and replacing plants as necessary to keep landscape in a vigorous, healthy condition as needed until final acceptance. Maintenance until final acceptance includes but is not limited to the following:

1. Watering Trees: Tree balls to be kept moistened to the depth of the tree ball.
2. Weeding: Remove weeds and foreign grass over plant areas at least once (1) a week.
3. Cultivating: Gently cultivate bed areas to a depth of approximately three (3) inches once (1) a month. Care should be taken not to damage plant roots.
4. Mowing and Edging; Refer to Section 32 92 00.
5. Application of approved organic insecticides, organic herbicides and organic fungicides shall be in accordance with manufacturer's instructions per Owner and Owner's Authorized Representative approval. Remedy damage from use of insecticides.
6. Trimming and pruning includes only removal of dead or broken branches, and treatment of pruned areas and other wounds. Do not shear any plants.
7. Disease control.
8. Maintenance of temporary BMP's to prevent washout, siltation, or damage to planting beds (if applicable).

9. Tree straightening: Best for the health of the trees to wait until dormancy to straighten or reset the trees that have started to root into the backfill. Straighten by carefully digging out around the root ball, attaching seat belt strap to the part of the wire basket that is still intact around the root ball, and lifting with appropriate equipment, or adjusting the anchoring straps for the tree anchoring frame. Never pull, push or put pressure on the trunk. Then repeat applicable planting instructions 3.10.

C. Coordinate watering schedules during installation and until final acceptance. Provide deep root watering to keep root balls moist on newly installed trees at a minimum of once (1) every two (2) weeks during summer months or as weather conditions indicate.

D. Maintenance Instructions: Submit two (2) hard copies and one (1) electronic copy of typewritten instructions recommending procedures to be established by the Owner for the maintenance of landscape prior to expiration of Contractor's maintenance period(s) required under the contract. Submit to Owner's Authorized Representative for approval.

3.20 CLEAN-UP

A. Keep premises neat and orderly including organization of storage areas.

B. Remove trash and debris from excavated planting areas, preparing beds, or planting plants from Work site daily as work progresses.

C. Clean faces of building, walls, and other architectural features to remove sediments.

D. Keep paved areas clean by sweeping or hosing.

3.21 SITE ENVIRONMENTAL PROCEDURES

A. Waste Management: Comply with requirements of local codes for recycling and reusing waste.

B. Waste Disposal: Disposal of waste, including accessories and used items, by recycling or reusing waste to the extent practical. When washing containers for recycling, do not permit runoff to enter storm drains or sewer systems or penetrate soils.

3.22 FINAL ACCEPTANCE

A. Due to seasonal requirements, final acceptance of this section may not coincide with that of the remaining contract work.

B. Request inspection for final acceptance at least ten (10) calendar days before the end of the plant care and maintenance as described in 3.19.

C. Final acceptance shall be considered the time at which planting, related work and clean-up are one hundred (100%) percent completed.

END OF SECTION