



ADDENDUM NO. 04 (MEPT)

Date of Issuance: April, 23, 2026

Project: **Replacement Elementary on Mustang Rd.**
Alvin Independent School District

Issued by: Arcadis Inc.
P.O. Box 891209
Houston, Texas 77289
281-286-6605

Texas Arcadis Inc.
Project No.: 202502 - 30268973

Prepared for: Prospective Proposers

PART A: NOTICE TO PROPOSERS:

1. Receipt of this Addendum shall be acknowledged on the Proposal Form. Failure to do so may subject Proposers to disqualification. Each proposer shall make necessary adjustments and submit his proposal with full knowledge of all modifications, clarification, and supplemental data included therein.
2. This Addendum forms part of the Contract Documents and shall be incorporated integrally therewith. Where provisions of the following supplemental data differ from those of previously issued documents, this Addendum shall govern.
3. The following Contract Documents have been issued to date delineating the Work (Project).

Contract Documents	April 06, 2026
Addendum 01 (Architectural)	April 13, 2026
Addendum 02 (Pre-Proposal)	April 17, 2026
Addendum 03 (Architectural)	April 21, 2026
4. This Addendum consists of: six (6) 8-1/2x11 written pages, thirty-two (32) 8-1/2x11 pages of specifications, thirty-seven (37) full-size Re-issued Sheets / Drawings as described in PARTS E and F below; as prepared by CMTA Inc.. Total pages: seventy (75).

PART B: GENERAL PROJECT CLARIFICATIONS

5. Page P2.22 room B202, B236 has a sink with no Tag of which sink is needed one sink has no plumbing.
 - a. **CMTA Response:** Tags will be added. Plumbing is provided but will be made more clear on plans and vent routing will be shown.
6. Page 6.01 FD-1 has 3" outlet all of the enlarge drawing show 2" waste to the FD-1 . Should the drains have 2" or the waste increase to 3".
 - a. **CMTA Response:** The FD-1 waste will increase to 3".
7. Thru out there is 4" WCO , 4" pipe is not going to fit in 3-5/8" walls . Will the wall size change or clean out change to floor cleanouts ?
 - a. **CMTA Response:** WCOs in shallow walls will be changed to floor cleanouts or coordinated with arch as required.
8. Page P2.04 near rooms D103, D102 missing underground sanitary plumbing for FS-1's above on 2nd floor . Please submit drawings.
 - a. **CMTA Response:** Under slab drawings will be updated to pick this up.
9. Plumbing RFI 1: What type of gas regulators are required—vented or ventless?
 - a. **CMTA Response:** Vented regulators. The gas riser has been updated
10. Plumbing RFI 2: Could you please provide clarification regarding the brand and model numbers for the valves utilized with domestic water and natural gas system?
 - a. **CMTA Response:** Refer to specification 22 10 05 Plumbing Piping
11. Plumbing RFI 3: What materials are required for the discharge of the elevator sump pump
 - a. **CMTA Response:** Discharge piping shall PVC. Refer to note P5 on P2.01. Provide check valve on discharge.
12. Plumbing RFI 4: Is a sleeve for natural gas underground required in the site drawing for the gas utility provider?
 - a. **CMTA Response:** A 4" sleeve is required anywhere the gas piping is routed under paving. The proposed routing of the site gas piping limits rungs of gas piping under pavement; however, final routing of gas piping shall be coordinated by the gas provider.
13. Plumbing RFI 5: Are (BIM) Drawings required?
 - a. **CMTA Response:** Refer to front specs for additional BIM requirements. The contractor is responsible for coordinating all disciplines for installation. Coordination drawings should be submitted for review.
14. Plumbing RFI 6: Are bentonite or clay plugs necessary?
 - a. **CMTA Response:** Yes, refer to reissued sheet P6.04, view 04, for detail.
15. Plumbing RFI 7: Is video inspection or rodding of the underground plumbing systems required to be conducted by a third party?
 - a. **CMTA Response:** No

16. CCTV RFI: Please confirm for Div 28 Security-This project has NO CCVT[sic] Surveillance, just access control and intrusion.
 - a. **CMTA Response:** Surveillance Cameras are Owner Furnished, Owner Installed per sheet T0.01 System Responsibility Matrix; refer also to clarification added to specification 28 05 10 paragraph 1.2.J.

PART C: CHANGES TO PRIOR ADDENDUM

17. None

PART D: CHANGES TO THE PROJECT MANUAL

18. Section 23 09 93 – SEQUENCE OF OPERATIONS FOR HVAC CONTROLS
 - a. Refer to paragraph 1.06.D.06 concerning Stand-By Pump, CHWP-S: Clarified that control valves [VES1] and [VES2] should be controlled at the BAS front end or web interface and that the stand-pipe cannot operate if both of these are closed.
 - b. Refer to paragraph 1.11.B.03: Adjusted sequences to note that supply fan control for the DOAS unit shall be by CT sensor, not DP sensor.
 - c. Refer to paragraph 1.11.D.01.b: Edited variable flow exhaust trunk to clarify that the variable exhaust trunk modulating damper controls to a static pressure sensor in the duct, not a DP across a damper.
 - d. Refer to paragraph 1.12.03: Changed occupancy wording to reference Fan Coil Units instead of terminal units.
 - e. Refer to paragraph 1.13.05: Removed Space CO2 and Outdoor Air CO2 from trend requirement. Added Space Differential CO2 to trend requirement
19. Section 26 09 23 – LIGHTING CONTROLS
 - a. Replace entire section.
20. Section 26 31 00 – PHOTOVOLTAIC SYSTEM
 - a. Add new section.
21. Section 27 41 16.55 – INTEGRATED AUDIO-VIDEO SYSTEMS - DINING
 - a. Changed wireless microphone basis of design (paragraph 2.3.A.04) to Shure #SLXD24+/58.
 - b. Provided part numbers for batteries and battery chargers compatible with specified wireless microphone systems.
 - c. Clarified wireless microphone antenna distribution (paragraph 2.3.B) with part number specified on drawings.
22. Section 27 41 16.56 – INTEGRATED AUDIO-VIDEO SYSTEMS - GYMNASIUM
 - a. Changed wireless microphone basis of design (paragraph 2.2.A.04) to Shure #SLXD14+/SM35.
 - b. Provided part numbers for batteries and battery chargers compatible with specified wireless microphone systems.
23. Section 28 05 10 – SCOPE OF THE ELECTRONIC SAFETY AND SECURITY WORK
 - a. Changed paragraph 1.2.J to read: "Cabling for video surveillance system as indicated in communications copper horizontal cabling specification. Cameras are Owner Furnished, Owner Installed."

PART E: CHANGES TO THE DRAWINGS

24. Sheet P2.01 – UNDERSLAB PLUMBING - AREA A0
 - a. Revised sanitary routing.
25. Sheet P2.02 – UNDERSLAB PLUMBING - AREA B0
 - b. Revised sanitary routing.
26. Sheet P2.04 – UNDERSLAB PLUMBING - AREA D0
 - c. Revised sanitary routing.
27. Sheet P2.11 – LEVEL 1 PLUMBING - AREA A1
 - d. Revised cold and hot water routing.
28. Sheet P2.12 – LEVEL 1 PLUMBING - AREA B1
 - a. Revised cold and hot water routing.
29. Sheet P2.13 – LEVEL 1 PLUMBING - AREA B1
 - b. Revised cold and hot water routing.
30. Sheet P2.14 – LEVEL 1 PLUMBING - AREA D1
 - c. Revised cold and hot water routing.
31. Sheet P2.22 – LEVEL 2 PLUMBING - AREA B2
 - d. Added routing notes.
32. Sheet P2.23 – LEVEL 2 PLUMBING - AREA C2
 - e. Added routing notes.
33. Sheet P2.24 – LEVEL 2 PLUMBING - AREA D2
 - f. Added routing notes.
34. Sheet P4.01 – ENLARGED PLUMBING PLANS
 - g. Revised tags and plumbing line routing.
35. Sheet P4.02 – ENLARGED PLUMBING PLANS
 - h. Revised tags and plumbing line routing.
36. Sheet P5.02 – LEVEL 1 - KITCHEN ENLARGED PLAN
 - i. Revised cold and hot water routing.
37. Sheet P6.01 – PLUMBING SCHEDULES
 - j. Revised schedule.
38. Sheet P6.04 – PLUMBING DETAILS
 - k. Detail revised.
39. Sheet P7.01 – PLUMBING RISER - NATURAL GAS
 - l. Revised riser.
40. Sheet M2.05 – AIR DISTRIBUTION – LEVEL 2 AREA A
 - m. Adjust CAV Box size and associated ductwork.
41. Sheet M2.08 – AIR DISTRIBUTION – LEVEL 2 AREA D
 - a. Added supply air duct tap and diffuser S-3B
 - b. S-1B supply air diffuser updated to S-3B diffuser and ductwork sizes adjusted.
42. Sheet M4.01 – ENLARGED MECHANICAL ROOM – CENTRAL PLANT
 - a. Adjusted spacing between Chilled Water Pumps.
 - b. Added Keynote addressing FCU-1 Condensate routing.
43. Sheet M4.02 – ENLARGED MECHANICAL ROOM – KITCHEN
 - a. Provided location for Duct Pressure sensor.
44. Sheet M4.05 – ENLARGED MECHANICAL ROOM – SECOND FLOOR
 - a. Provided locations for Duct Pressure sensor.
 - b. Adjusted exhaust ductwork sizing and fittings. Added motorized dampers and associated annotations.
45. Sheet M5.06 – MECHANICAL CONTROL SCHEMATICS
 - a. Added [VES1C] and [VES2C] for open/closed command position of stand-by pump isolation valves.
 - b. Added [PF 1M] start/stop status for sidestream filter pump.
46. Sheet M5.07 – MECHANICAL CONTROL SCHEMATICS
 - a. Added [ZCO2D], zone CO2 differential to VAV terminal unit control points.

- b. Added SCR control to Series Fan Powered Terminal Unit controls.
- 47. Sheet M6.01 – MECHANICAL SCHEDULES
 - a. Added schedule remarks.
- 48. Sheet M6.02 – MECHANICAL SCHEDULES
 - a. Updated remarks for Fan schedule and GRD schedule.
 - b. Added additional information for Air Separator schedule.
- 49. Sheet M6.03 – MECHANICAL SCHEDULES
 - a. Updated electrical information for FVAV Terminal Boxes w/ Electric Heat Schedule.
 - b. Updated column information for Fan Powered Terminal Unit Runout schedule.
 - c. Added additional information for Single Duct CAV Runout schedule.
- 50. Sheet E3.01 – ELECTRICAL LIGHTING PLAN – LEVEL 1 AREA – A1
 - a. Lighting in single restrooms A104 and A156 moved to life-safety circuit. Life-safety hatching shown.
 - b. Exit signs in clinic moved to life-safety circuit.
- 51. Sheet E3.02 – ELECTRICAL LIGHTING PLAN – LEVEL 1 AREA – B1
 - a. Lighting in gang restrooms and single restrooms B104, B141, and B119 moved to life-safety circuit.
- 52. Sheet E3.03 – ELECTRICAL LIGHTING PLAN – LEVEL 1 AREA – C1
 - a. Lighting in kitchen vestibule and single restroom C115 moved to life-safety circuit.
 - b. Exit signs in kitchen and serving moved to life-safety circuit.
 - c. Home-run shown for exterior lighting on life-safety circuit for reference.
 - d. Exit sign added at platform ramp and added to nearby life-safety circuit.
- 53. Sheet E3.05 – ELECTRICAL LIGHTING PLAN – LEVEL 2 AREA – A2
 - a. Light fixtures in vestibule shown with life-safety hatching for reference. Lighting already connected to life-safety.
 - b. Lighting in gang restrooms and single restrooms A218 and A216 moved to life-safety circuit.
- 54. Sheet E3.06 – ELECTRICAL LIGHTING PLAN – LEVEL 2 AREA – B2
 - a. Lighting in gang restrooms and single restrooms B234 and B206 moved to life-safety circuit.
- 55. Sheet E4.01 – ENLARGED ELECTRICAL PLANS
 - a. Located remote EPO button for generator.
- 56. Sheet E5.01 – ELECTRICAL ONE-LINE DIAGRAM
 - a. Added remote EPO button to generator.
 - b. Provide 20A/3-pole breaker at HD1C to power Meter SP0 serving MSB. Refer to sheet.
 - c. Clarification: Panels LP1A2 & LP1B shall be two section.
- 57. Sheet E7.01 – LIGHTING SCHEDULES
 - a. Lumen package for Columbia model for type F450 and FW450 modified as shown.
 - b. Note added to type HB18 for safety loop.
 - c. Color temperature for exterior lights revised to be 4000K.
 - d. Wattstopper model for POC2 and POH2 power packs modified as shown.
 - e. Additional lighting manufacturer added to platform lighting schedule.
- 58. Sheet E7.03 – PANEL SCHEDULES
 - a. All FVAV-8 OCP sized down to 20A from 25A. Wire sized down to 2#12, 1#12G, 3/4"C. Refer to sheet.
 - b. All FVAV-10 OCP sized down to 30A from 35A. Wire sized down to 2#10, 1#10G, 3/4"C. Refer to sheet.
 - c. All FVAV-12 OCP sized down to 20A from 25A. Wire sized down to 3#12, 1#12G, 3/4"C. Refer to sheet.
- 59. Sheet E7.04 – PANEL SCHEDULES

- a. All FVAV-8 OCP sized down to 20A from 25A. Wire sized down to 2#12,1#12G,3/4"C. Refer to sheet.
 - b. All FVAV-10 OCP sized down to 30A from 35A. Wire sized down to 2#10,1#10G,3/4"C. Refer to sheet.
 - c. All FVAV-12 OCP sized down to 20A from 25A. Wire sized down to 3#12,1#12G,3/4"C. Refer to sheet.
 - d. All FVAV-14 OCP sized down to 25A from 30A. Refer to sheet.
 - d. 3#12,1#12G,3/4"C. Refer to sheet.
60. Sheet T5.02 – TECHNOLOGY ONE-LINE DIAGRAMS (Narrative Only)
- e. In Cafetorium sound system, changed part numbers on WMRX-1, WMRX-2, WMRX-3 to "SHURE SLXD4+".
 - f. In Gymnasium sound system, changed part number on WMRX-1 to "SHURE #SLXD4+".

PART G: NEW ISSUED SHEETS

- 1. None

END OF ADDENDUM NO. 04

SECTION 26 09 23
LIGHTING CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Occupancy sensors
- B. Manual control components
- C. Network lighting control processors
- D. Daylighting controls
- E. Lighting contactors
- F. Digital Load Controllers

1.2 RELATED REQUIREMENTS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- B. Section 26 05 29 - Hangers and Supports for Electrical Systems
- C. Section 26 05 33.16 - Boxes for Electrical Systems.
- D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 05 73 - Power System Studies.
- F. Section 26 27 26 - Wiring Devices:
 - 01 Includes finish requirements for wall controls specified in this section.
 - 02 Includes accessory receptacles, single-pole single-throw switches, and wall plates, to match lighting controls specified in this section.
- G. Section 26 28 13 - Fuses.
- H. Section 26 29 13 - Enclosed Controllers : General purpose contactors.
- I. Section 26 51 00 - Interior Lighting.
- J. Section 26 56 00 - Exterior Lighting.

1.3 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- D. NEMA IA 10030 - Industrial Control and Systems: Enclosures; 2024.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.
- G. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 01 Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 02 Coordinate the placement of wall switch/dimmer occupancy sensors with actual installed door swings.
 - 03 Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
 - 04 Coordinate the placement of photo sensors for daylighting controls with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.
 - 05 Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
- B. Sequencing:
 - 01 Do not install lighting control devices until final surface finishes and painting are complete.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 - 01 Occupancy Sensors: Include detailed motion detection coverage range diagrams.
- C. Shop Drawings:
 - 01 Occupancy Sensors: Provide lighting plan indicating location, model number, and orientation of each occupancy sensor and associated system component.
 - 02 Daylighting Controls: Provide lighting plan indicating location, model number, and orientation of each photo sensor and associated system component.
- D. Field Quality Control Reports.
- E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 SUBMITTALS FOR CLOSEOUT

- A. Submit according to the requirements of Division 01 and Section 26 0100.
- B. As-Built Drawings: include as-built drawings showing final locations, settings, and circuit arrangements of all devices included in this section.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 01 See Section 01 60 00 - Product Requirements, for additional provisions.
- D. Operation and Maintenance Manuals:
 - 01 Approved and edited copy of Submittals for Review shall be included in the Operation and Maintenance Manuals.
 - 02 Include copies of all documentation required by part 3 of this specification with the Operation and Maintenance Manual.
 - 03 Provide System User's Guide and Programmer's Guide in electronic pdf format for the following equipment:
 - a. Lighting control panel.
 - b. Distributed digital lighting control system.
 - 04 Provide a digital copy of the final lighting control system programming on a CD or USB flash drive.
 - 05 Provide current licenses, and backup copies of the software for the Owner's records.
 - 06 Training Video: The contractor shall provide a complete training video for installation of software, basic operation of software, and common components of system.

1.7 SPARE MATERIALS

- A. Provide two (2) additional of each lighting control device for spares to be used over the course of construction.
- B. Turn all unused spare materials over to owner as Maintenance Materials at closeout.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.9 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide ten year manufacturer warranty for all occupancy sensors.
- C. Provide five year manufacturer warranty for all daylighting controls.

PART 2 PRODUCTS

2.1 SYSTEM CAPABILITIES

- A. Provide a full lighting control system. General system types to be used on this project are:
 - 01 Standalone automatic lighting controls: low-voltage automatic lighting controls designed for economical control of individual spaces.
 - 02 Network lighting control system: low-voltage individually-addressable lighting controls connected using a full-building network controller. All devices connected to the network system must be individually addressable and controllable via the network; standalone control components may not be connected to or integrated with the network.
 - 03 Wireless lighting controls are not allowed.

2.2 MANUFACTURERS

- A. See Lighting Controls Schedule on Drawings.
- B. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.3 MANUAL CONTROL COMPONENTS

- A. Single Pole Single Throw (SPST) Switches: refer to Section 26 27 26.
- B. Wall Dimmers and Scene Controllers
 - 01 General Requirements:
 - a. Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.
 - b. Finish: Match finishes specified for wiring devices in Section 26 27 26, unless otherwise indicated.
 - 02 Control Type:
 - a. Standalone: Digital fade type with tap on/off, dimming, and preset scene control where indicated. Laser-engraved legends. Unmarked buttons are not acceptable.
 - b. Networked: Digital fade type with tap on/off, dimming, and preset scene control where indicated. Laser-engraved legends. Unmarked buttons are not acceptable. Powered via network communication bus.
- C. Digital Switches
 - 01 Finish: Match finishes specified for wiring devices in Section 26 27 26, unless otherwise indicated.
 - 02 Control: Digital fade type with separated tap on/off. Laser-engraved legends. Unmarked buttons are not acceptable.

2.4 OCCUPANCY SENSORS

- A. General Requirements

- 01 Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
 - 02 Sensor Technologies:
 - a. Passive Infrared (PIR) Occupancy Sensors: Designed to detect occupancy by sensing movement of thermal energy between zones.
 - b. Ultrasonic Occupancy Sensors: Designed to detect occupancy by sensing frequency shifts in emitted and reflected inaudible sound waves.
 - c. Microphonic Occupancy Sensors: Designed to detect occupancy by passively sensing frequencies associated with human activity.
 - 03 Connection/Communication Technologies:
 - a. Standalone low-voltage sensors: low voltage units, for use with separate compatible accessory power packs or fixtures with integrated control modules.
 - b. Network-connected sensors: low-voltage, individually-addressable units for use with separate network-controlled accessory power packs or networked luminaires with integrated control modules.
 - 04 Passive Infrared Lens Field of View: Field customizable by addition of factory masking material, adjustment of integral blinders, or similar means to block motion detection in selected areas.
 - 05 Operation: Field selectable to operate either as occupancy sensor (automatic on/off) or as vacancy sensor (manual-on/automatic off).
 - 06 Turn-Off Delay: Field adjustable, with time delay settings up to 20 minutes.
 - 07 Sensitivity: Field adjustable.
 - 08 Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.
 - 09 Integral Photocell: For field selectable and adjustable inhibition of automatic turn-on of load when ambient lighting is above the selected level.
 - 10 Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
 - 11 Load Rating for Line Voltage Occupancy Sensors: As required to control the load indicated on drawings.
 - 12 Load Rating for Line Voltage Occupancy Sensors:
 - a. Motor Load: Not less than 1/6 HP.
- B. Wall Switch/Dimmer Occupancy Sensors
- 01 Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integral manual control capability, and no leakage current to load in off mode.
 - 02 Provide vandal resistant lenses for wall switch occupancy sensors where indicated.
 - 03 Switch Type:
 - a. Provide units with a second set of contacts to control minor motor loads along with lighting.
 - 04 Dimmer Type:
 - a. Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, and listed as complying with UL 1472; type and rating suitable for load controlled.
 - b. Provide field adjustable dimming preset for occupied state.
 - c. Provide fade-to-off operation to notify occupant of impending load turn-off.
- C. Ceiling Mounted Occupancy Sensors
- 01 Description: Low profile occupancy sensors designed for ceiling installation.

- 02 Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
 - 03 Finish: White, unless otherwise indicated.
 - 04 Standard Range Sensors: Capable of detecting motion within an area of 450 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.
 - 05 Extended Range Sensors: Capable of detecting motion within an area of 1,200 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.
- D. Directional Occupancy Sensors:
- 01 Designed for wall or ceiling mounting, with integral swivel for field adjustment of motion detection coverage.
 - a. Standard Range Sensors: Capable of detecting motion within a distance of 40 feet at a mounting height of 10 feet.
 - b. Extended Range Sensors: Capable of detecting motion within a distance of 80 feet at a mounting height of 10 feet.
 - c. High Bay Sensors: Capable of detecting motion within a distance of 50 feet at a mounting height of 30 feet.
 - 02 Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
 - 03 Finish: White, unless otherwise indicated.

2.5 DAYLIGHTING CONTROLS

- A. Description: Control system consisting of low-voltage photo sensors and compatible control modules, power packs, contactors, or relays as required for automatic control of load indicated according to available natural light; capable of integrating with occupancy sensors and manual override controls.
- B. Operation: Unless otherwise indicated, specified daylight zones shall be continuously dimmed or brightened in response to available daylight to meet target illuminance values as determined during system commissioning. Load to be turned off when available daylight is sufficient to fully dim the load, after the selected time delay.
- C. Daylighting Control Photo Sensors: Low voltage class 2 photo sensor units with output signal proportional to the measured light level and provision for zero or offset based signal.
 - 01 May be combined with occupancy sensors in a single housing.
 - 02 Sensor Type: Filtered silicon photo diode.
 - 03 Sensor Range:
 - a. Indoor Photo Sensors: 5 to 100 footcandles.
 - 04 Finish: White unless otherwise indicated.
- D. Daylighting Control Dimming Modules for Low Voltage Sensors: Low voltage class 2 control unit compatible with specified photo sensors and with specified dimming drivers, for both continuous dimming of compatible dimming drivers and switching of compatible power packs, contactors, or relays in response to changes in measured light levels according to selected settings.
 - 01 Dimming and Fade Rates: Adjustable from 5 to 60 seconds.
 - 02 Cut-Off Delay: Selectable and adjustable from 0 to 20 minutes.
 - 03 Output Voltage: Compatible with specified drivers.

2.6 NETWORK LIGHTING CONTROL PROCESSOR

- A. General Requirements

- B. Web-accessible, network connected, programmable control processor using manufacturer's software, manufacturer's software applications, and industry drivers to work with manufacturer's entire line of lighting controls. SNMP support, with built-in firewall, NAT, and router. Provide a communication / control bus providing power as required or manufacturer's network devices.
 - 01 Software shall be resident within the lighting control system.
 - 02 System shall provide local access to all programming functions at the control processor and remote access to all programming functions through any standard computer workstation connected to the building network. Lighting control system shall have the capability to be remotely controlled via the internet and/or building wide Ethernet LAN.
 - 03 At any time, should the remote PC go offline all system programming uploaded to the lighting control system shall continue to operate as intended. Systems dependent on an always-online PC or server for normal operation are not acceptable.
 - 04 All programs, schedules, time of day, etc, shall be held in non-volatile memory for an indefinite time exceeding 10 years in the event of power failure. At restoration of power, lighting control system shall implement programs required by current time and date. Time of day shall be battery backed for at least 10 years.
- C. Network connection: provide connection to building owner's Local Area Network via CAT6 cable; coordinate connection location and security requirements with owner's IT staff.
- D. Mount in surface enclosure provided by manufacturer.

2.7 LIGHTING CONTACTORS

- A. Manufacturers:
 - 01 ABB/GE: www.geindustrial.com
 - 02 Eaton Corporation: www.eaton.com
 - 03 Schneider Electric; Square D Products: www.schneider-electric.us
 - 04 Siemens Industry, Inc: www.usa.siemens.com
 - 05 Substitutions: See Section 01 60 00 - Product Requirements.
- B. Description: Magnetic lighting contactors complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; noncombination type unless otherwise indicated; ratings, configurations and features as indicated on the drawings.
- C. Combination Contactors: NEMA ICS 2, Class A combination controllers with magnetic contactor(s) and externally operable disconnect.
 - 01 Disconnects: Circuit breaker type.
 - a. Disconnect Switches: Fusible type unless otherwise indicated.
 - b. Provide externally operable handle with means for locking in the OFF position. Provide safety interlock to prevent opening the cover with the disconnect in the ON position with capability of overriding interlock for testing purposes.
 - c. Provide auxiliary interlock for disconnection of external control power sources where applicable.
- D. Short Circuit Current Rating:
 - 01 Provide contactors with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 26 05 73.
- E. Enclosures:
 - 01 Comply with NEMA IA 10030.

- 02 Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1 or Type 12.
 - b. Outdoor Locations: Type 3R or Type 4.
- 03 Finish: Manufacturer's standard unless otherwise indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
- F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
- G. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

- A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of lighting control devices provided under this section.
 - 01 Mounting Heights: As indicated on the drawings.
 - 02 Orient outlet boxes for vertical installation of lighting control devices unless otherwise indicated.
 - 03 Locate wall controls on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.
- C. Install lighting control devices in accordance with manufacturer's instructions.
- D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

- E. Install lighting control devices plumb and level, and held securely in place.
- F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 27 26.
- G. Provide required supports in accordance with Section 26 05 29.
- H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- I. Program controls in each room and verify that they function correctly. Failure of the programming will require a call back to correct the program.
- J. Program the lighting controls once each area is ready for occupancy or after each phase has been completed.
- K. Identify lighting control devices in accordance with Section 26 05 53.
- L. Occupancy Sensor Locations:
 - 01 Location Adjustments: Locations indicated are diagrammatic and only intended to indicate which rooms or areas require devices. Provide quantity and locations as required for complete coverage of respective room or area based on manufacturer's recommendations for installed devices.
 - 02 Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.
- M. Daylighting Control Photo Sensor Locations:
 - 01 Location Adjustments: Locations indicated are diagrammatic and only intended to indicate which rooms or areas require devices. Provide quantity and locations as required for proper control of respective room or area based on manufacturer's recommendations for installed devices.
 - 02 Unless otherwise indicated, locate photo sensors for closed loop systems to accurately measure the light level controlled at the designated task location, while minimizing the measured amount of direct light from natural or artificial sources such as windows or pendant luminaires.
 - 03 Unless otherwise indicated, locate photo sensors for open loop systems to accurately measure the level of daylight coming into the space, while minimizing the measured amount of lighting from artificial sources.
- N. Combination Enclosed Lighting Contactors:
 - 01 Except where indicated to be mounted adjacent to the equipment they supply, mount lighting contactors such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
 - 02 Provide fuses complying with Section 26 28 13 for fusible switches as indicated.
- O. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.
- P. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.

- Q. Unless otherwise indicated, install switches on load side of power packs so that switch does not turn off power pack.
- R. Where indicated or required, provide cabinet or enclosure in accordance with Section 26 05 33.16 for mounting of lighting control device system components.

3.4 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.
- C. Adjust position of directional occupancy sensors and outdoor motion sensors to achieve optimal coverage as required.
- D. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.
- E. Adjust daylighting controls under optimum lighting conditions after all room finishes, furniture, and window treatments have been installed to achieve desired operation as indicated or as directed by Architect. Readjust controls calibrated prior to installation of final room finishes, furniture, and window treatments that do not function properly as determined by Architect.

3.5 COMMISSIONING

- A. See Section 01 91 13 - General Commissioning Requirements for commissioning requirements.

3.6 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.7 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstration: Once each area is ready for occupancy or after each phase has been completed, demonstrate proper operation of lighting control devices to Owner and Engineer, and correct deficiencies or make adjustments as directed.
- D. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
 - 01 Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 02 Provide minimum of two hours of training.
 - 03 Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed lighting control devices.
 - 04 Location: At project site.

- 05 Provide any reprogramming, readjusting and training of the lighting control system within one year after occupancy.

END OF SECTION

SECTION 26 31 00
PHOTOVOLTAIC SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Photovoltaic system requirements.
- B. Photovoltaic modules.
- C. Photovoltaic module mounting system.
- D. Photovoltaic combiner boxes.
- E. Photovoltaic inverters.
- F. Monitoring system.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 21 00 - Low-Voltage Electrical Service Entrance.
- F. Section 26 22 00 - Low-Voltage Transformers: Isolation transformers not integral to inverters.
- G. Section 26 28 13 - Fuses.
- H. Section 26 28 16.16 - Enclosed Switches.
- I. Section 26 32 13 - Engine Generators: Generators for interconnection with photovoltaic system.
- J. Section 26 43 00 - Surge Protective Devices.

1.3 REFERENCE STANDARDS

- A. IEC 61215-1 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 1: Test Requirements; 2021 (Corrigendum).
- B. IEC 61215-1-1 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 1-1: Special Requirements for Testing of Crystalline Silicon Photovoltaic (PV) Modules; 2021.

- C. IEC 61215-1-2 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 1-2: Special Requirements for Testing of Thin-Film Cadmium Telluride (CdTe) Based Photovoltaic (PV) Modules; 2021, with Amendment (2022).
- D. IEC 61215-1-3 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 1-3: Special Requirements for Testing of Thin-Film Amorphous Silicon Based Photovoltaic (PV) Modules; 2021, with Amendment (2022).
- E. IEC 61215-1-4 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 1-4: Special Requirements for Testing of Thin-Film Cu(In,GA)(S,Se)₂ Based Photovoltaic (PV) Modules; 2021, with Amendment (2022).
- F. IEC 61215-2 - Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval - Part 2: Test Procedures; 2021.
- G. IEEE 1547 - IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces; 2018, with Amendment (2020).
- H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- I. NECA 412 - Standard for Installing and Maintaining Photovoltaic (PV) Power Systems; 2012.
- J. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. UL 489B - Outline of Investigation for Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures for Use with Photovoltaic (PV) Systems; Current Edition, Including All Revisions.
- M. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.
- N. UL 1699B - Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection; Current Edition; Current Edition, Including All Revisions.
- O. UL 1703 - Flat Plate Photovoltaic Modules and Panels; Current Edition, Including All Revisions.
- P. UL 1741 - Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources; Current Edition, Including All Revisions.
- Q. UL 2579 - Low-Voltage Fuses - Fuses for Photovoltaic Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 01 Coordinate the work with other trades to avoid placement of ductwork, piping, equipment or other potential obstructions within the spaces dedicated for photovoltaic system components.
 - 02 Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

- 03 Roof-Mounted Arrays: Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
- 04 Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Preinstallation Meeting: Convene one week prior to commencing work of this section; require attendance of all affected installers. Include adequate instruction on the electrical hazards associated with photovoltaic systems and appropriate safety procedures to be followed. Agenda topics
 - 01 Methods and procedures related to roofing system and PV system installation
 - 02 System installation schedule and material availability
 - 03 Planned conductor routing
 - 04 Planned building enclosure penetrations
 - 05 Planned attachment points
 - 06 Building material compatibility
 - 07 Cutting and patching requirements
 - 08 Temporary attachment requirements
- C. Rebates and Incentives: Prepare and submit documentation as required for Owner to secure funds from available federal, state, and utility company rebate and incentive programs. Notify Owner of any time constraints affecting program qualification.
 - 01 Include copies of documentation with submittals.
- D. Utility Interconnection:
 - 01 See Section 26 21 00 for Utility Company contact information and additional requirements.
 - 02 Coordinate with Utility Company to provide utility metering suitable for system requirements.
 - 03 Arrange for inspections and secure permits necessary to obtain Utility Company approval of system.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product. Include ratings, configurations, standard wiring diagrams, outline and support point dimensions, finishes, weights, service condition requirements, and installed features.
- C. Shop Drawings: Include dimensioned plan views and sections indicating locations of system components, required clearances, attachment locations and details, and proposed size, type, and routing of conduits and cables. Include system interconnection schematic diagrams showing all factory and field connections.
- D. Design Data:
 - 01 Include structural calculations, certified by structural engineer, for equipment and mounting system.
 - 02 Include electrical calculations for array and associated equipment.
- E. Certify that work of this section does not void roof warranty.
- F. Manufacturer's detailed field testing procedures.
- G. Rebate and incentive documentation.

- H. Utility interconnection documentation.
- I. Source quality control test reports.
- J. Field quality control test reports.
 - 01 Include manufacturer's field reports.
- K. Installer's Qualification Statement.
- L. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
 - 01 Include contact information for entity that will be providing contract maintenance and trouble call-back service.
 - 02 Routine maintenance requirements for all installed components.
 - 03 Safety instructions for the operations and maintenance of PV systems.
- M. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- N. Maintenance contracts.
- O. Project Record Documents: Record actual locations of system components, installed circuiting arrangements and routing, and final equipment settings. Provide a copy of photovoltaic system manufacturer's inspection report of completed photovoltaic installation.
- P. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 01 See Section 01 60 00 - Product Requirements, for additional provisions.
 - 02 Fuses: One for every 10 of each type and rating, but no fewer than one of each.
 - 03 Power Optimizers: 1% of installed quantity.

1.6 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with Utility Company requirements for interconnection.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
 - 01 Manufacturing facilities certified to ISO 9001 International Quality Standard with third-party certification verifying quality assurance in design/development, production, installation, and service.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience with photovoltaic systems of similar size, type, and complexity.
 - 01 Manufacturer's authorized installer.
 - 02 Supervisor: North American Board of Certified Energy Practitioners (NABCEP) certified PV Installer or 5 years experience supervising the installation of photovoltaic systems.
 - 03 Installer Personnel: At least 3 years of experience installing photovoltaic systems. Certified PV Installation Professional (PVIP) by the North American Board of Certified Energy Practitioners (NABCEP)

- E. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging, keep dry and protect from damage until ready for installation.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Specified warranties indicate minimum requirements. Provide additional warranties or extended warranty periods where required to qualify for rebate and incentive programs.
- C. Photovoltaic Modules:
 - 01 Provide minimum 10 year manufacturer warranty covering repair or replacement due to defective materials or workmanship.
 - 02 Provide manufacturer warranty guaranteeing minimum 90 percent of rated power output for 10 years and minimum 80 percent of rated power output for 25 years.
- D. Photovoltaic Module Mounting System: Provide minimum 25 year manufacturer warranty covering repair or replacement due to defective materials or workmanship.
- E. Photovoltaic Combiner Boxes: Provide minimum 10 year manufacturer warranty covering repair or replacement due to defective materials or workmanship.
- F. Photovoltaic Inverters: Provide minimum 10 year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Photovoltaic Modules, Crystalline Silicon:
 - 01 Canadian Solar: www.canadiansolar.com.
 - 02 JA Solar: www.jasolar.com.
 - 03 Jinko Solar: www.jinkosolar.us.
 - 04 Mission Solar: www.missionsolar.com.
 - 05 REC Solar: www.recsolar.com.
 - 06 SunPower: www.us.sunpower.com.
 - 07 Talesun Solar: www.talesun.com.
 - 08 Trina Solar: www.trinasolar.com.
 - 09 Substitutions: See Section 01 60 00 - Product Requirements.
- B. Photovoltaic Inverters:
 - 01 Chint Power Systems: www.chintpowersystems.com.
 - 02 Delta: www.deltaww.com.
 - 03 SMA America, LLC: www.sma-america.com.
 - 04 SolarEdge: www.solaredge.com.
 - 05 Solectria Renewables, LLC: www.solectria.com.
 - 06 SunGrow: www.sungrowpower.com.
- C. Monitoring System:
 - 01 SMA America, LLC: www.sma-america.com.

- 02 Solectria Renewables, LLC: www.solren.com.
- 03 Substitutions: See Section 01 60 00 - Product Requirements.

- D. Source Limitations: For each type of component, furnish products produced by a single manufacturer and obtained from a single supplier.

2.2 PHOTOVOLTAIC SYSTEM REQUIREMENTS

- A. Provide complete photovoltaic system consisting of photovoltaic modules and associated balance of system components necessary for connection to facility electrical system. Include labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, configuration, and installation for a fully functioning photovoltaic system as required for the complete performance of the Work.
- B. System Description:
 - 01 Photovoltaic array is roof-mounted in location indicated on the drawings.
 - 02 Orientation of array is as indicated on the drawings.
 - 03 System includes interconnection with utility grid (grid-tied system).
 - a. Utility metering configuration: Net metering.
 - 04 System does not include battery storage system.
 - 05 System includes engine generator.
 - 06 System includes DC system surge protection.
 - 07 System includes monitoring system.
 - 08 Owner intends to secure funds from available federal, state, and utility company rebate and incentive programs.
- C. Capacity:
 - 01 Minimum Expected Annual Energy Production: Refer to capacity indicated on drawings, as calculated by National Renewable Energy Laboratory's PVWatts calculator or approved equivalent.
- D. Size:
 - 01 Array: Designed to fit within the area designated on the drawings.
- E. Appearance:
 - 01 Arrange array such that modules are aligned with uniform spacing.
 - 02 Make no alterations affecting appearance of building exterior or interior without approval of Architect.
 - 03 Final determination of acceptable appearance is by Architect.
 - 04 Create a uniform appearance of the array by keeping space between individual modules and panels to a minimum. Conceal mechanical hardware, conduit, junction boxes, and other equipment beneath and/or behind the array.
- F. Fire Resistance Rating: Provide photovoltaic module and mounting system combination that together with the roof covering form a system listed in accordance with UL 1703 to provide a fire rating equal to or better than the required fire rating of the roof.
- G. Provide photovoltaic system and associated components suitable for wind loads, snow loads, seismic loads, and other structural design considerations of the installed location.
- H. Provide photovoltaic system and associated components suitable for continuous operation under the service conditions at the installed location.
- I. Provide products listed, classified, and labeled as suitable for the purpose intended.

- J. Provide photovoltaic system and associated components that qualify for available federal, state, and utility company rebate and incentive programs.
- K. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system.
- L. DC Arc Fault Circuit Protection: Provide DC photovoltaic arc-fault protection devices listed as complying with UL 1699B as required for compliance with NFPA 70.
- M. Rapid Shutdown of Photovoltaic Systems on Buildings: Provide listed equipment arranged to provide rapid shutdown in accordance with NFPA 70.
- N. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- O. Arrange array to provide adequate access to rear of string(s) for maintenance.
- P. Arrange array to minimize shading during peak production periods.
- Q. Roof-Mounted Arrays:
 - 01 Arrange array such that normal roof drainage is not affected.
 - 02 Arrange array to maintain required safety clearances from edges of roof as indicated.
 - 03 Arrange array to maintain access and clearance requirements for other roof-mounted equipment.
 - 04 Arrange array to avoid spanning of expansion joints.
 - 05 Minimize the number of roof penetrations. Coordinate roof attachments and penetration details to ensure compatibility with roof installation warranty. Do not invalidate the roof warranty.

2.3 PHOTOVOLTAIC MODULES

- A. Acceptable Module Types: Either crystalline silicon or thin film modules complying with specified requirements will be considered for this project.
- B. General Requirements:
 - 01 Photovoltaic Modules: Factory assembled; consisting of photovoltaic cells, frame, junction box, cables for series connection, and bypass diodes for shade tolerance; rated for 600 V DC; complying with IEC 61215-1 and IEC 61215-2 and listed as complying with UL 1703.
 - 02 Crystalline Silicon Photovoltaic Modules: Comply with IEC 61215-1-1.
 - 03 Thin Film Photovoltaic Modules: Comply with IEC 61215-1-2, IEC 61215-1-3, or IEC 61215-1-4 as applicable.
 - 04 Frame: Anodized aluminum.
 - 05 Glass: Heat strengthened with anti-reflection coating.
 - 06 Operating Temperature: -40 deg C to 85 deg C.
 - 07 Minimum Module Efficiency: 20 percent.
 - 08 Factory-Installed Junction Box: Weatherproof IP-67 rating, with factory-installed terminals and bypass diodes.
 - 09 Factory-Installed Cables: Type USE-2 or listed photovoltaic (PV) wire with polarized locking connectors.
 - 10 Unless otherwise indicated, specified module performance characteristics are rated under Standard Test Conditions (STC).

2.4 BALANCE OF SYSTEM COMPONENTS

- A. Photovoltaic Module Mounting System:
 - 01 Delegated Design: Engage a qualified professional engineer to design supports, attachments, and foundations.
 - a. Structural Characteristics: Comply with ASCE Standard 7, Chapter 13.
 - b. Mounting and Support System including modules, hardware, and attachments must withstand wind loads as required by ASCE standard.
 - 02 Provide complete mounting system compatible with modules to be installed and suitable to properly install them in the location indicated, including all necessary hardware and accessories. Mounting system shall be suitable for mounting an array in landscape or portrait orientations.
 - 03 Support Structure and Associated Hardware Materials: Use aluminum or stainless steel.
 - a. Rails: Corrosion resistant extruded aluminum alloy of varying lengths and profiles, anodized finish unless noted otherwise.
 - b. Splices: Bonding type, suitable for mechanically connecting multiple rail sections.
 - c. Module Clamps: End and mid clamp assemblies, bonding type, suitable for attaching panels to rails.
 - d. Wire/Cable Management: Stainless steel or UV-stabilized composite wire clips, trays, or conduit suitable for use with rail system.
 - 04 Roof-Mounted Arrays:
 - a. Acceptable System Types: Either non-penetrating or penetrating systems complying with specified requirements will be considered for this project.
 - b. Provide system compatible with the roof at the installed location.
 - c. Module Tilt Angle: As required to provide maximum energy production for installed location.
 - d. Provide minimum clearance of 3 inches between roof and module for air circulation and drainage.
- B. Photovoltaic Combiner Boxes:
 - 01 Provide combiner box(es) for termination of strings as indicated or as required for the array configuration installed.
 - 02 Combiner Boxes: Rated for 600 V DC; current ratings suitable for connected strings; equipped with fuseholders; listed as complying with UL 1741.
 - 03 Fuseholders: Touch-safe; suitable to accept fuses indicated.
 - 04 Number of Input Circuits: As indicated or as required for termination of strings, with minimum of 25 percent spare capacity for future expansion.
 - 05 Enclosure: NEMA EN 10250, Type 3R, unless otherwise indicated.
- C. Photovoltaic Inverters:
 - 01 Provide inverter(s) as indicated or as required for connection of the photovoltaic array DC system to the AC system indicated.
 - 02 Inverters: Suitable for the requirements of the connected array; output configuration compatible with connected system; listed as complying with UL 1741; furnished with the following features:
 - a. Maximum power point tracking (MPPT).
 - b. LCD display.
 - c. Integral DC disconnect.
 - d. Communications Interface: RS485/Modbus.
 - 03 Grid-Tied Inverters: Comply with IEEE 1547, including over/under grid voltage and frequency protection, and anti-islanding protection to automatically disconnect upon loss of utility power and to remain disconnected until utility power restoration has been maintained for five minutes.

- 04 Grounded Photovoltaic DC Systems: Furnish with integral isolation transformer. Transformerless inverters may be used if a separate isolation transformer is provided.
 - 05 Total Harmonic Distortion: Less than five percent.
 - 06 General Characteristics:
 - a. Minimum AC Output: As indicated on Drawings.
 - b. Topology: Transformer-less
 - c. Output Type: Utility-Interactive
 - d. Operating Temperature: -40 deg C to 60 deg C, 0-100% relative humidity
 - e. Minimum CEC Efficiency: 98 percent
 - 07 Enclosure Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
- D. Isolation Transformers: Comply with Section 26 22 00 .
 - E. Enclosed Switches, in Addition to Requirements of Section 26 28 16.16:
 - 01 Switches for DC System: Rated for 600 V DC.
 - F. Engine Generator: Comply with Section 26 32 13.
 - G. Surge Protective Devices, in Addition to Requirements of Section 26 43 00:
 - 01 Surge Protective Devices for DC System:
 - a. Rated for 600 V DC.
 - b. Listed and labeled as complying with UL 1449, Type 1.
 - c. Surge Current Rating: Not less than 50 kA per mode.
 - d. UL 1449 Nominal Discharge Current (I-n): 20 kA.
 - H. Molded-Case Circuit Breakers and Switches for DC System: Rated for 600 V DC; listed as complying with UL 489B.
 - I. Fuses, in Addition to Requirements of Section 26 28 13:
 - 01 Fuses for DC System: Rated for 600 V DC.
 - 02 Fuses for Protection of Photovoltaic Strings and Arrays: Photovoltaic fuses listed as complying with UL 2579.
 - J. Monitoring System:
 - 01 Provide a system to monitor photovoltaic system performance including all sensors, dataloggers, connections, software, equipment and accessories necessary for a complete operating system.
 - 02 System communications interfaces to be wired or wireless, with compatible interconnected components.
 - a. Provide suitable raceway, minimum 3/4 inch trade size, for all required wired connections.
 - 03 System to monitor and record, in 15 minute intervals, with logs going back a minimum of 365 days:
 - a. System power and energy production.
 - b. Inverter status.
 - c. Instantaneous power (kW).
 - d. Cumulative energy production (kWh).
 - e. Irradiation.
 - f. Ambient temperature.
 - g. Module cell temperature.
 - 04 Energy Production Meter: Revenue grade, with accuracy of plus or minus two percent.
 - 05 System real-time and historical data to be accessible from the following locations:
 - a. Personal computer(s), via internet connection.

06 System to provide alarm notification via e-mail or instant message.

2.5 SOURCE QUALITY CONTROL

- A. Factory test the following products to verify operation and performance characteristics. Include test reports with submittals.
 - 01 Photovoltaic modules.
 - 02 Photovoltaic inverters.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that ratings and configurations of system components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive system components. Examine roofs, supports, and supporting structures for suitable conditions where PV system will be installed. Verify attachments are sufficient to withstand loads applied by the PV system and associated components.
- D. Verify that conditions are satisfactory for installation prior to starting work. Do not begin installation until mounting surfaces have been properly prepared and any unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Use open circuiting, short circuiting, or opaque covering to disable modules, array or portions of array prior to installation and service.
- B. Roof-Mounted Arrays: Protect roof and adjacent roof-mounted items from damage.

3.3 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install photovoltaic system in accordance with NECA 412.
- D. Provide required support and attachment in accordance with Section 26 05 29.
- E. Mount equipment such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor, ground, or working platform.
- F. Circuiting Requirements. in Addition to Requirements of Section 26 05 19:
 - 01 Wiring Methods:
 - a. Unless otherwise indicated, use exposed module factory-installed cables (not routed inside building) for module interconnections.
 - b. Unless otherwise indicated, use exposed type USE-2/RHH/RHW-2 single-conductor cable or listed photovoltaic wire (not routed inside building) for wiring between string(s) and combiner box(es).

- c. Unless otherwise indicated, use type THHN/THWN-2 single-conductor building wire in suitable raceway for wiring between combiner box(es) and point of interconnection.
 - d. Secure exposed cables in accordance with NFPA 70. Where possible, conceal behind array.
 - e. Install cables in suitable raceway where readily accessible or where required by authority having jurisdiction.
 - 02 Photovoltaic DC System Conductor Color Code:
 - a. Negative Grounded System:
 - 1) Positive: Red.
 - 2) Negative/Grounded: White.
 - b. Positive Grounded System:
 - 1) Positive/Grounded: White.
 - 2) Negative: Black.
 - c. Ungrounded System:
 - 1) Positive: Red.
 - 2) Negative: Black.
 - 03 Maintain separation of photovoltaic and non-photovoltaic circuits in accordance with NFPA 70.
- G. Grounding and Bonding Requirements, in Addition to Requirements of Section 26 05 26:
- 01 Ensure that there is only one AC System bonding connection between grounding system and grounded/neutral conductor, including external connections and connections internal to equipment.
- H. Identification Requirements, in Addition to Those Specified in Section 26 05 53:
- 01 Color for Photovoltaic System Identification Nameplates and Labels: White text on red background, unless otherwise required by NFPA 70 or authorities having jurisdiction.
 - 02 Use identification nameplate or means of identification acceptable to authority having jurisdiction to identify the presence of multiple power sources and the location of main service disconnecting means and each photovoltaic system disconnecting means. Locate at main service disconnecting means and at each photovoltaic system disconnecting means. Verify format and descriptions with authorities having jurisdiction.
 - 03 Use identification nameplate to identify each photovoltaic system disconnecting means with text "PV SYSTEM DISCONNECT".
 - 04 Use identification nameplate or identification label to identify systems equipped with rapid shutdown and associated rapid shutdown switch(es). Format, descriptions, and locations to comply with NFPA 70 and requirements of authorities having jurisdiction.
 - 05 Use identification nameplate or identification label to identify the information required by NFPA 70 for marking of direct-current photovoltaic power sources. Locate at each DC disconnect means requiring marking.
 - 06 Use identification nameplate or identification label to identify the interactive system point of interconnection at the disconnecting means as a power source and with the rated AC output current and the nominal operating AC voltage.
 - 07 Use warning labels to identify electrical hazards for photovoltaic system disconnecting means. Include the word message "Warning - Electric Shock Hazard; Terminals on the line and load sides may be energized in the open position" or approved equivalent.
 - 08 Use wire and cable markers to identify photovoltaic system source, output, and inverter circuit conductors at all points of termination, connection, and splices.

- 09 Use voltage markers, identification labels, stenciled text, or suitable permanent marking approved by authority having jurisdiction to identify exposed raceways, cable trays, pull boxes, junction boxes, and conduit bodies with the text "Warning: Photovoltaic Power Source" at maximum intervals of 10 feet in accordance with NFPA 70.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. See article "SYSTEM STARTUP" below for additional requirements related to testing and inspection.
- C. Provide services of a manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.
- D. Inspection and testing to include, at a minimum:
 - 01 Inspect each system component for damage and defects.
 - 02 Verify that equipment enclosures, boxes, and associated connections installed outdoors are weatherproof.
 - 03 Verify proper wiring connections have been made and check for conductor continuity. Verify proper polarity.
 - 04 Verify tightness of mechanical and electrical connections are according to manufacturer's recommended torque settings.
 - 05 Measure and record voltages at the inverter AC and DC inputs.
 - 06 Measure and record AC output power.
 - 07 Perform inverter functional test.
 - a. Grid-Tied Inverters: Include simulation of loss of utility power and subsequent power restoration.
 - 08 Verify proper operation of monitoring system.
- E. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.
- F. Repair roof or adjacent roof-mounted items damaged as a result of work of this section.

3.5 SYSTEM STARTUP

- A. Obtain Owner's approval prior to performing system startup.
- B. Grid-Tied Systems: Obtain Utility Company's approval prior to performing system startup. The PV system supplies/installer shall be responsible for all coordination with the local Utility Company prior to start of work. PV system supplier/installer shall coordinate and submit all documentation for the local Utility Company PV system interconnection requirements. Notify Architect and Engineer if the Utility Company requires additional infrastructure for interconnection.
- C. Prepare and start system in accordance with manufacturer's instructions.

3.6 CLEANING

- A. Clean modules using only methods recommended by manufacturer to avoid scratches and other damage. Clean exposed surfaces on other components to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.7 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
- D. Training: Train Owner's personnel on operation, adjustment, and maintenance of photovoltaic system.
 - 01 Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 02 Provide minimum of four hours of training.
 - 03 Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed system.
 - 04 Location: At project site.

3.8 PROTECTION

- A. Protect installed products from subsequent construction operations.

3.9 MAINTENANCE

- A. Provide to Owner, a proposal as an alternate to the base bid, a separate maintenance contract for the service and maintenance of photovoltaic system for two years from date of Substantial Completion, to include the work described below; Include a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- B. Provide trouble call-back service upon notification by Owner:
 - 01 Include allowance for call-back service during normal working hours at no extra cost to Owner.
 - 02 Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

END OF SECTION

SECTION 27 41 16.55

INTEGRATED AUDIO-VIDEO SYSTEMS - DINING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 01 Provide complete instructional audio-video systems as described herein and on drawings, including:
 - a. Ceiling-mounted projector display systems
 - b. Display mount(s)
 - c. Local sound system.
 - d. Cabling and plates.
 - e. Other infrastructure appurtenant to the above.
- B. Reference Project drawings for locations, quantities, and coordination with other trades.
- C. Related Requirements:
 - 01 Division 27 Section "Integrated Audio-Video Systems and Equipment - Common Requirements for common requirement applicable to all AV systems.
 - 02 Division 27 Section "Audio-Video Cabling and Accessories" for system cabling and accessories and related procedures and standards.

PART 2 PRODUCTS

2.1 MAJOR SYSTEM COMPONENTS: DISPLAYS

- A. Projector: (VP)
 - 01 Epson EB-PU2113W Projector:
 - a. 13,000 lumen WUXGA (1920x1200) video projector.
 - b. 20,000 hour laser-phosphor light source.
 - c. Integral HDBaseT receiver.
 - 02 Front Projection Screen:
 - a. Tab-tensioned motorized projection screen.
 - b. Matte white fabric.
 - c. 87" H, 139" W viewable area (16:10 aspect ratio).
 - 03 Products:
 - a. Projector: Provide Epson #EB-PU1333W or Engineer approved equal.
 - b. Mount: Provide Chief #VCTUW, column, and structure mounts.
 - c. Screen (VS): Provide Da-Lite #34558L or Engineer approved equal.

2.2 MAJOR SYSTEM COMPONENTS: AUDIO PROCESSING AND AMPLIFICATION

- A. Digital Signal Processor: (DSP-D)
 - 01 DSP shall facilitate mixing and routing of audio
 - 02 DSP shall include ethernet and USB port for control and interface to PC and mobile devices.
 - 03 Basis-of-Design Product: Subject to compliance with requirements, provide Yamaha #TF-Rack. Substitutions by written Owner approval only.
 - 04 Provide DSP with Dante expansion interface card. Yamaha #NY64-D or Engineer-approved equal.

- B. Audio Power Amplifier: (AMP-D1)
 - 01 Amp shall provide two channels of amplification for low-impedance speaker zones
 - 02 Power rating: 600W per channel for 4Ω and 8Ω loads.
 - 03 Amp shall include auxiliary contacts for power-down on fire alarm.
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide Crown #DCi 2|600 or comparable product by one of the following:
 - a. Ashly
 - b. Electro-Voice
 - c. Lab Gruppen
 - d. Others by Engineer approval.
- C. Audio Power Amplifier: (AMP-D2)
 - 01 Amp shall provide two channels of amplification for low-impedance speaker zones
 - 02 Power rating: 300W per channel for 4Ω and 8Ω loads.
 - 03 Amp shall include auxiliary contacts for power-down on fire alarm.
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide Crown #DCi 2|300 or comparable product by one of the following:
 - a. Ashly
 - b. Electro-Voice
 - c. Lab Gruppen
 - d. Others by Engineer approval.
- D. Loudspeakers (DS)
 - 01 Yoke-mounted point-source loudspeaker with 12" cone LF, horn loaded HF w/ 120x60 coverage pattern.
 - 02 Power Rating: 600W Long-Term, 2400W peak.
 - 03 Sensitivity: Min. 98 dB_{SPL} 1W @ 1m.
 - 04 Nominal impedance: 8Ω.
 - 05 Basis-of-Design Product: Subject to compliance with requirements, provide Electro-Voice #EVF-1122S 126 or comparable product by one of the following:
 - a. Biamp
 - b. D&B Audiotechnik
 - c. JBL
 - d. Others by Engineer approval.

2.3 MAJOR SYSTEM COMPONENTS: RF TRANSMITTERS, RECEIVERS, AND ANTENNAS

- A. Wireless Microphone System: (WMRX-D1, -D2, -D3)
 - 01 Provide UHF Digital wireless microphone transmitter/receiver pair.
 - 02 Transmitter shall be handheld type.
 - 03 Provide rechargeable battery (Shure #SB903) and charging dock with sufficient spaces for total number of systems supplied (two (2) Shure #SBC203).
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide (3) #QLXD24/SM58Shure #SLXD24+/58 (handheld kits), or Engineer-approved equal.
- B. Wireless Microphone Antenna Distribution:
 - 01 Basis-of-Design Product: Provide Shure #UA844-SWB, or Engineer-approved equal.
- C. Wireless Microphone Architectural Remote Antenna: (above AVR1)
 - 01 Provide dual-feed Architectural diversity antenna for UHF wireless microphones.
 - 02 Color of antenna to be white
 - 03 Basis-of-Design Product: Subject to compliance with requirements, provide RFVenue #D-ARC
- D. Assistive Listening: (ADA-TX-D)

- 01 Unit shall provide compliant assistive listening service for accessibility via FM beltpack packaged with unit.
- 02 Basis-of-Design Product: Subject to compliance with requirements, provide Williams #FM ADA KIT 1 or approved equal.

2.4 MAJOR SYSTEM COMPONENTS: HDBASET & AV-OVER-IP SIGNAL EXTENDERS

- A. HDBaseT Transmitter, Wall Plate Type: (HDBT-TX)
 - 01 Transmitter device shall permit HDCP-compliant transport of 4k60, 4:2:0 HDMI video from input location to destination over twisted pair cabling.
 - 02 Device shall be US 1-gang wall plate form factor.
 - 03 Devices shall receive power via HDBaseT output.
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide Kramer #WP-789T or comparable product by one of the following:
 - a. Aten
 - b. Atlona
 - c. Crestron
 - d. Extron
 - e. Liberty AV
- B. HDBaseT Receiver, Box Type (HDBT-RX):
 - 01 Receiver device shall permit HDCP-compliant transport of 4k60, 4:2:0 HDMI video from input location over twisted pair cabling.
 - 02 Receiver shall be capable of either receiving power or accepting power via HDBaseT input.
 - 03 Receivers shall provide IR and RS-232 control outputs for display control.
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide Kramer #TP-789R or comparable product by one of the following:
 - a. Aten
 - b. Atlona
 - c. Crestron
 - d. Extron
 - e. Liberty AV
- C. HDBaseT Video Switcher & De-multiplexer:
 - 01 Switcher/demux shall provide HDMI inputs at rack for Owner use and demultiplex audio from HDMI input for routing through local sound system.
 - 02 Basis-of-Design Product: Subject to compliance with requirements, provide Kramer #VP-440H2. or comparable product by one of the following:
 - a. Aten
 - b. Atlona
 - c. Crestron
 - d. Extron
 - e. Liberty AV

2.5 MAJOR SYSTEM COMPONENTS: SIGNAL SOURCES

- A. Bluetooth Receiver: (BTRX-D).
 - 01 Receiver shall permit audio input from mobile devices via Bluetooth and shall output balanced audio to DSP.
 - 02 Basis-of-Design Product: Subject to compliance with requirements, provide Denon #DN-200BR or comparable product by one of the following:
 - a. Galaxy Audio
 - b. Radial

2.6 MAJOR SYSTEM COMPONENTS: ENCLOSURE & POWER SUPPLY EQUIPMENT

- A. Open Frame AV Rack: (AVR1)
 - 01 Provide wall-mounted open frame rack for support of equipment.
 - 02 Rack to be welded steel construction with black powdercoat finish.
 - 03 Rails to be drilled on standard EIA spacing, tapped 10-32.
 - 04 Dimensions:
 - a. Capacity: 20 RU.
 - b. Overall depth: 24".
 - 05 Basis-of-Design Product: Subject to compliance with requirements, provide nVent Hoffman Versarack #E19SWM20U24 or comparable product by:
 - a. Chatsworth
 - b. Others by Engineer Approval.
- B. Power Sequencer: (mounted inside AVR-D)
 - 01 Provide 3-stage 120V, 15-amp power sequencer with surge protection.
 - 02 Basis-of-Design Product: Subject to compliance with requirements, provide AtlasIED ECS-3 or comparable product by Engineer approval.

2.7 ACCESSORIES

- A. I/O Plates: Provide Input/Output Plates per the basis of design indicated on drawings. Subject to requirements, provide plates by Penn Elcom, RDL, Whirlwind, or approved equals.
- B. Connectors: Provide connectors at Input/Output Plates per the basis of design indicated on drawings. Subject to requirements, provide connectors by Leviton, Neutrik, or approved equals.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL & SYSTEM STARTUP

- A. Startup Service.
 - 01 Connect power as described above.
 - 02 Complete equipment installation and startup checks according to manufacturer's written instructions.
 - 03 Set up peak limiters on each DSP output to amplifiers for loudspeaker protection.
 - 04 Set coordinated radio channels on wireless microphone systems, etc. per manufacturer's instructions.
 - 05 Verify interactive display onboard PC functions correctly.
 - 06 Verify each wired AV and USB signal path passes signal.
 - 07 Set equalization curves and delays on loudspeakers as needed to deliver clear intelligible audio to occupants.
 - 08 Update firmware and software on all installed equipment to latest available version
- B. Prepare test and inspection reports.

END OF SECTION

SECTION 27 41 16.56

INTEGRATED AUDIO-VIDEO SYSTEMS - GYMNASIUM

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 01 Provide complete instructional audio-video systems as described herein and on drawings, including:
 - a. Local sound system.
 - b. Cabling and plates.
 - c. Other infrastructure appurtenant to the above.
- B. Reference Project drawings for locations, quantities, and coordination with other trades.
- C. Related Requirements:
 - 01 Division 27 Section "Integrated Audio-Video Systems and Equipment - Common Requirements for common requirement applicable to all AV systems.
 - 02 Division 27 Section "Audio-Video Cabling and Accessories" for system cabling and accessories and related procedures and standards.

PART 2 PRODUCTS

2.1 MAJOR SYSTEM COMPONENTS: AUDIO PROCESSING AND AMPLIFICATION

- A. Digital Signal Processor: (DSP-G)
 - 01 DSP shall facilitate mixing and routing of audio
 - 02 DSP shall include ethernet and USB port for control and interface to PC and mobile devices.
 - 03 Basis-of-Design Product: Subject to compliance with requirements, provide Yamaha #TF-Rack. Substitutions by written Owner approval only.
- B. Audio Power Amplifier: (AMP-G)
 - 01 Amp shall provide two channels of amplification for low-impedance speaker zones
 - 02 Power rating: 150W per channel for 4-ohm loads.
 - 03 Amp shall be fanless architecture.
 - 04 Amp shall include auxiliary contacts for power-down on fire alarm.
 - 05 Basis-of-Design Product: Subject to compliance with requirements, provide Crown DCi 2|600 or comparable product by one of the following:
 - a. Crown
 - b. Electro-Voice
 - c. Lab Gruppen
 - d. Others by Engineer approval.
- C. Loudspeakers (GS)
 - 01 Yoke-mounted point-source loudspeaker with 12" cone LF, horn loaded HF w/ 120x60 coverage pattern.
 - 02 Power Rating: 600W Long-Term, 2400W peak.
 - 03 Sensitivity: Min. 98 dB_{SPL} 1W @ 1m.
 - 04 Nominal impedance: 8Ω.

- 05 Basis-of-Design Product: Subject to compliance with requirements, provide Electro-Voice #EVF-1122S 126 or comparable product by one of the following:
 - a. Biamp
 - b. D&B Audiotechnik
 - c. JBL
 - d. Others by Engineer approval.

2.2 MAJOR SYSTEM COMPONENTS: RF TRANSMITTERS, RECEIVERS, AND ANTENNAS

- A. Wireless Microphone System: (WMRX-G)
 - 01 Provide UHF Digital wireless microphone transmitter/receiver pair
 - 02 Provide rechargeable battery ([Shure #SB903](#)) and charging dock ([Shure SBC203](#)).
 - 03 Gym shall have one beltack transmitter with headworn microphone.
 - 04 Basis-of-Design Product: Subject to compliance with requirements, provide (1) [#SLXD14/153TShure SLXD14+/SM35](#) (beltack & headworn mic kit), or comparable product by one of the following:
 - a. Sennheiser EW-D Series
- B. Wireless Microphone Architectural Remote Antenna: (above TDG)
 - 01 Provide dual-feed Architectural diversity antenna for UHF wireless microphones.
 - 02 Color of antenna to be white
 - 03 Basis-of-Design Product: Subject to compliance with requirements, provide RFVenue #D-ARC
- C. Assistive Listening: (TAS-TX)
 - 01 Unit shall provide compliant assistive listening service for accessibility via FM beltack packaged with unit.
 - 02 Basis-of-Design Product: Subject to compliance with requirements, provide Williams #FM ADA KIT 1 or approved equal.

2.3 MAJOR SYSTEM COMPONENTS: SIGNAL SOURCES

- A. Bluetooth Receiver: (BTRX-G).
 - 01 Receiver shall permit audio input from mobile devices via Bluetooth and shall output balanced audio to DSP.
 - 02 Basis-of-Design Product: Subject to compliance with requirements, provide Denon #DN-200BR or comparable product by one of the following:
 - a. Galaxy Audio
 - b. Radial

2.4 MAJOR SYSTEM COMPONENTS: ENCLOSURE & POWER SUPPLY EQUIPMENT

- A. Open Frame AV Rack: (AVR2)
 - 01 Provide wall-mounted open frame rack for support of equipment.
 - 02 Rack to be welded steel construction with black powdercoat finish.
 - 03 Rails to be drilled on standard EIA spacing, tapped 10-32.
 - 04 Dimensions:
 - a. Capacity: 12 RU.
 - b. Overall depth: 24".
 - 05 Basis-of-Design Product: Subject to compliance with requirements, provide nVent Hoffman Versarack #E19SWM12U24 or comparable product by:
 - a. Chatsworth
 - b. Others by Engineer Approval.
- B. Power Sequencer: (mounted inside AVR2)

- 01 Provide 3-stage 120V, 15-amp power sequencer with surge protection.
- 02 Basis-of-Design Product: Subject to compliance with requirements, provide AtlasIED ECS-3 or comparable product by Engineer approval.

2.5 ACCESSORIES

- A. I/O Plates: Provide Input/Output Plates per the basis of design indicated on drawings. Subject to requirements, provide plates by Penn Elcom, RDL, Whirlwind, or approved equals.
 - 01 Audio input plates for display: Provide wall plate with 3.5mm and RCA unbalanced stereo audio input jacks on face and balanced mono output to sound system on back. Subject to requirements, provide RDL #D-CIJ3 or equal.
- B. Connectors: Provide connectors at Input/Output Plates per the basis of design indicated on drawings. Subject to requirements, provide connectors by Leviton, Neutrik, or approved equals.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL & SYSTEM STARTUP

- A. Startup Service.
 - 01 Connect power as described above.
 - 02 Complete equipment installation and startup checks according to manufacturer's written instructions.
 - 03 Set up peak limiters on each DSP output to amplifiers for loudspeaker protection.
 - 04 Set coordinated radio channels on wireless microphone systems, etc. per manufacturer's instructions.
 - 05 Verify interactive display onboard PC functions correctly.
 - 06 Verify each wired AV and USB signal path passes signal.
 - 07 Set equalization curves and delays on loudspeakers as needed to deliver clear intelligible audio to occupants.
 - 08 Update firmware and software on all installed equipment to latest available version
- B. Prepare test and inspection reports.

END OF SECTION

SECTION 28 05 10

SCOPE OF THE ELECTRONIC SAFETY AND SECURITY WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Each Contractor's attention is directed to Section 28 00 00 – Common Electronic Safety and Security Requirements and all other Contract Documents as they apply to his work.

1.2 SCOPE

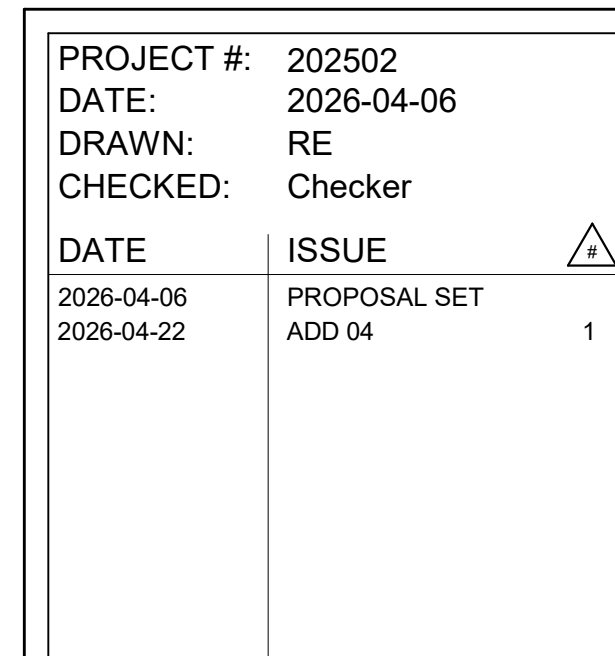
- A. The Electronic Safety and Security work for this project includes all labor, materials, equipment, devices, and related items required to completely install, test, place in service and deliver to the Owner complete safety and security systems in accordance with the accompanying plans and all provisions of these specifications. This work shall primarily include, but is not limited to the following:
 - 01 All j-hooks, fittings, etc.; coordinate with Division 26.
 - 02 All wiring devices and device plates.
 - 03 All system hardware, equipment and installation.
 - 04 All programming, scheduling and testing.
- B. Grounding, per NEC and the specified requirements.
- C. All necessary fees and cost for permits, inspections, etc.
- D. Coordination with Division 21 for interface with fire suppression systems.
- E. Coordination with Division 23 for interface with HVAC systems and instrumentation and control system.
- F. Coordination with Division 26 for power, rough-in, conduit and pathways.
- G. Coordination with Division 27 for low voltage structured cabling and intercommunications and program systems.
- H. Access control system and hardware devices as indicated.
- I. Intrusion detection system as indicated.
- J. Cabling for video surveillance system as indicated in communications copper horizontal cabling specification. Cameras are Owner Furnished, Owner Installed.
- K. Fire alarm system as indicated.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

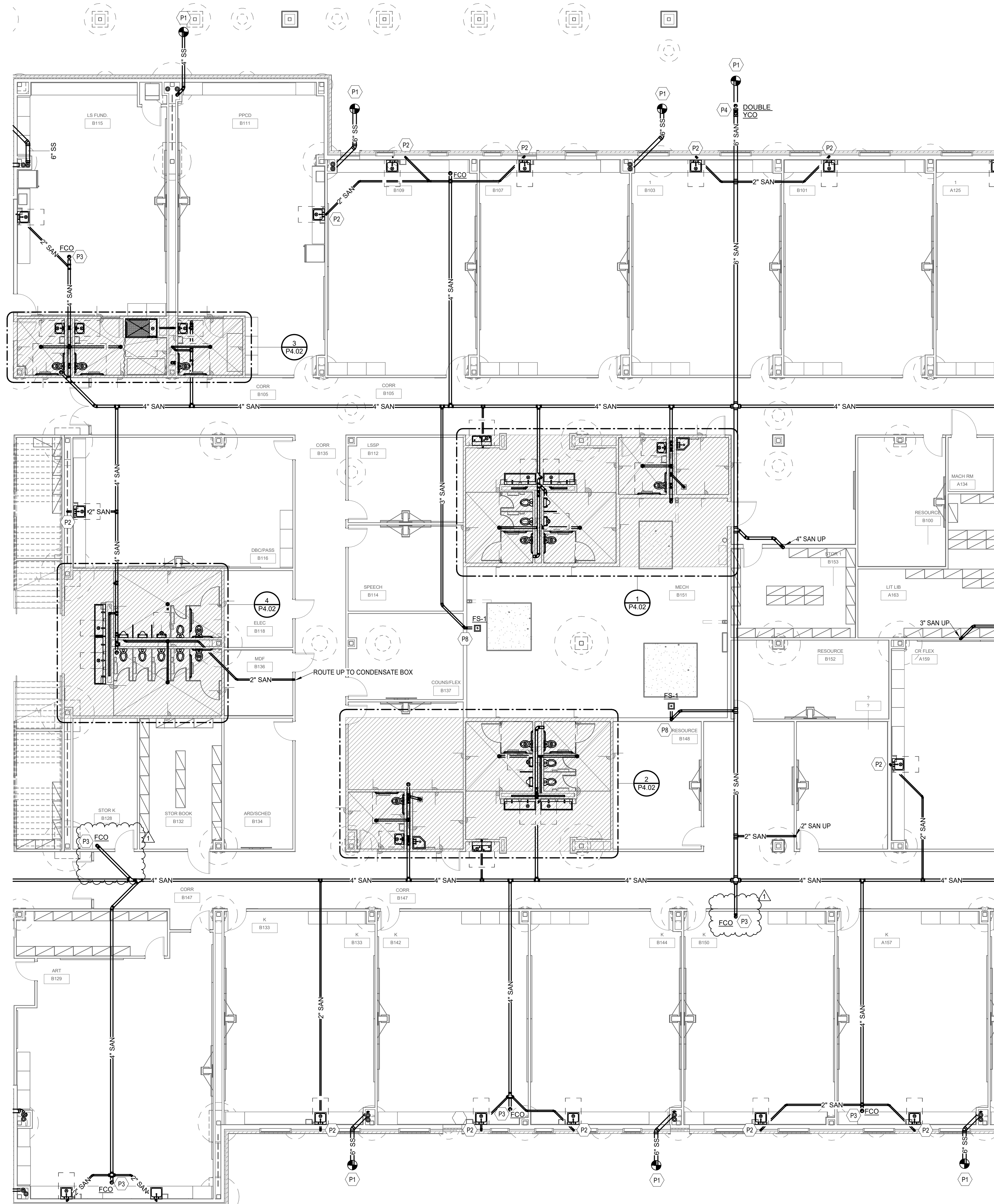
 **ARCADIS**
ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



PLAN
NORTH



Modified in ADD 04



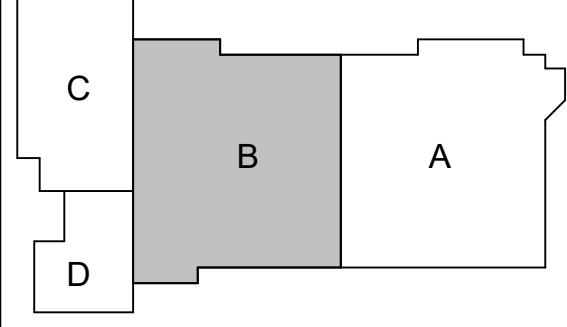
1 UNDERSLAB PLUMBING PLAN - AREA B0
1/8" = 1'-0"

TAGGED NOTES	
P1	REFER TO PLUMBING SITE PLAN FOR POINT OF CONNECTION INFORMATION
P2	ROUTE 2" SANITARY UP THROUGH GRADE/FLOOR TO SERVE PLUMBING FIXTURE/S. ROUTE 2" VENT UP WITHIN WALLCHASE TO VENT MAIN IN CEILING
P3	ROUTE 4" SANITARY UP THROUGH SLAB TO FLOOR CLEANOUT MOUNTED AT GRADE
P4	ROUTE 4" SANITARY UP THROUGH GRADE TO EXTERIOR CLEANOUT/S
P8	ROUTE 3" SANITARY UP THROUGH GRADE TO SERVE FLOOR DRAIN/S AND OR SINK/S ROUTE 2" VENT UP WITHIN WALLCHASE TO VENT MAIN IN CEILING

CONSULTANTS
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712
FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959
LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

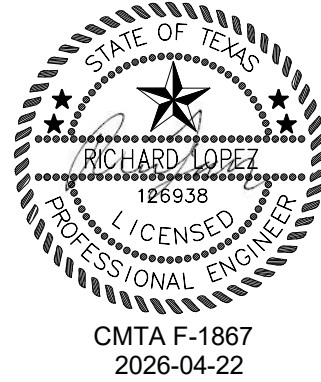
MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377



REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

ARCADIS
ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



PROJECT #:	202502
DATE:	2026-04-06
DRAWN:	RE
CHECKED:	Checker
DATE:	2026-04-06
2026-04-22	PROPOSAL SET ADD 04
	1

P2.02
UNDERSLAB
PLUMBING - AREA B0



TAGGED NOTES	#
P1 REFER TO PLUMBING SITE PLAN FOR POINT OF CONNECTION INFORMATION	
P2 ROUTE 2" SANITARY UP THROUGH GRADE/FLOOR TO SERVE PLUMBING FIXTURES. ROUTE 2" VENT UP WITHIN WALL/CHASE TO VENT MAIN IN CEILING	
P3 ROUTE 4" SANITARY UP THROUGH SLAB TO FLOOR CLEANOUT MOUNTED AT GRADE	

CONSULTANTS

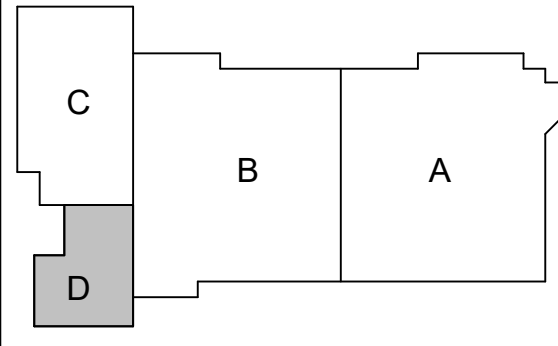
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

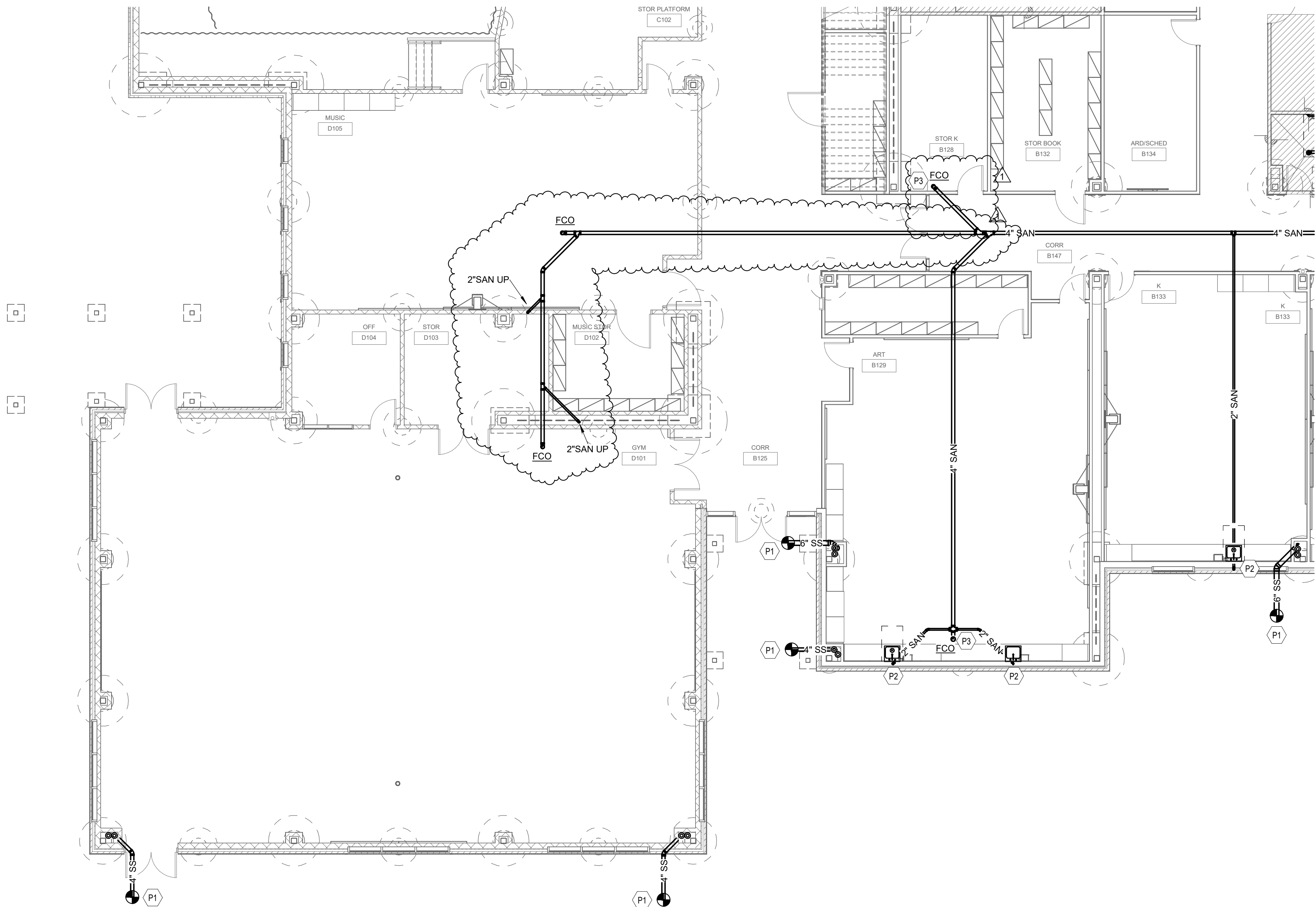
LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377



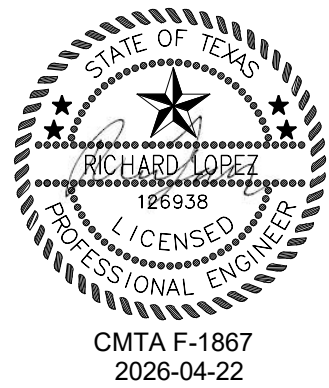
REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511



1 UNDERSLAB PLUMBING PLAN - AREA D0
1/8" = 1'-0"

ARCADIS

ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605

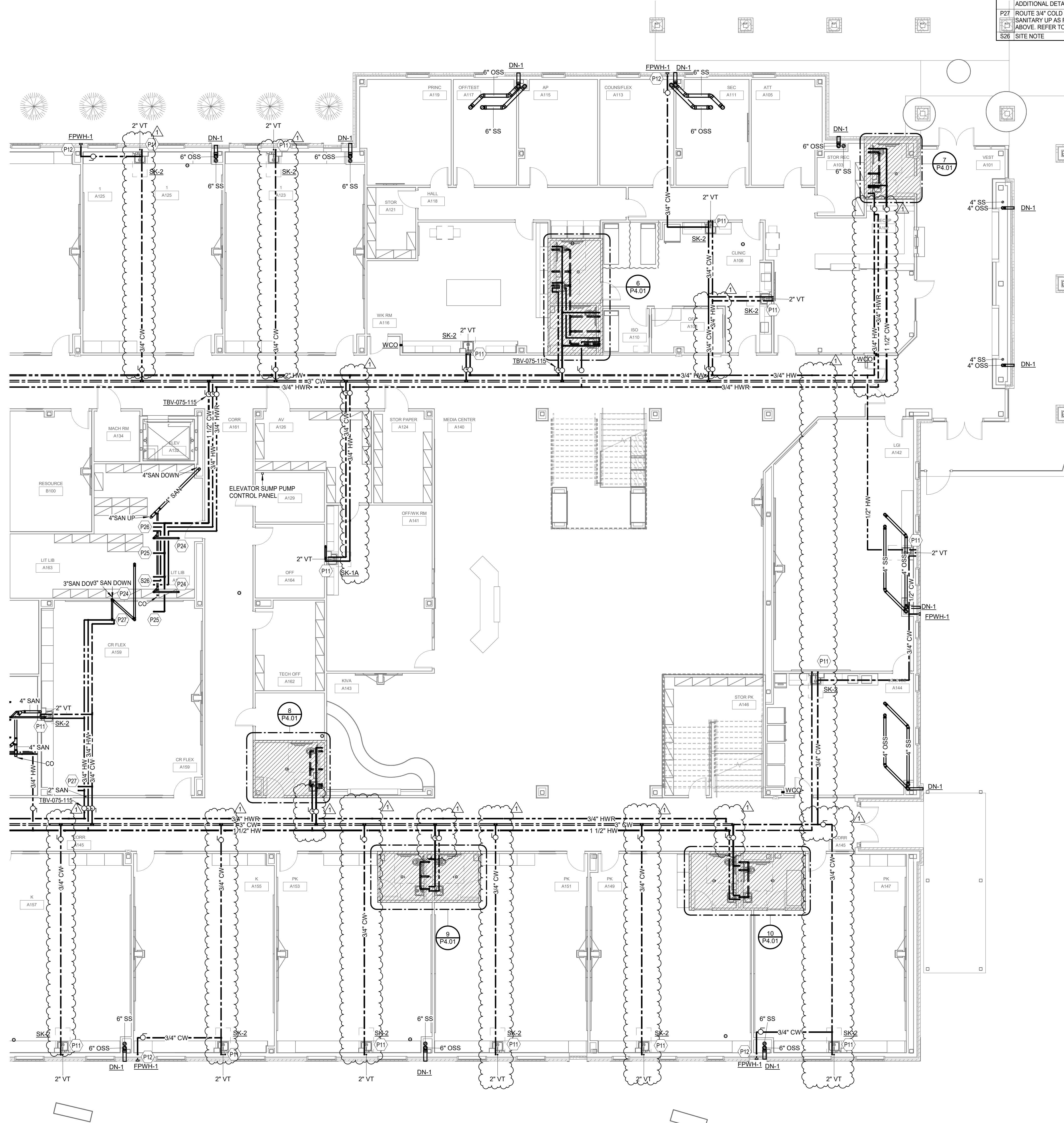


PROJECT #:	202502
DATE:	2026-04-06
DRAWN:	RE
CHECKED:	Checker
DATE:	ISSUE
2026-04-06	PROPOSAL SET
2026-04-22	ADD 04

P2.04

UNDERSLAB
PLUMBING - AREA D0





TAGGED NOTES	
P11	ROUTE 3/4" COLD AND HOT WATER LINES DOWN IN WALL/CHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES
P12	ROUTE 3/4" COLD WATER LINE DOWN IN WALL/CHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES
P24	ROUTE SANITARY UP IN WALL AND IN CEILING SPACE AS REQUIRED TO SERVE ABOVE FLOOR DRAIN(S)/SINK(S). REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL
P25	ROUTE COLD WATER AND SANITARY UP TO FLOOR ABOVE AS REQUIRED TO SERVE LOCAL FIXTURE(S). REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL
P26	ROUTE 3/4" COLD WATER LINE AND 2" SANITARY UP AS REQUIRED TO SERVE ALL LOCAL FIXTURES IN FLOOR ABOVE. ROUTE HOT WATER LOOP UP IN ABOVE WALL/CHASE AS REQUIRED TO WITHIN 6" OF FIXTURES SERVED. THEN ROUTE BACK DOWN IN WALL/CHASE TO CONTINUE IN CEILING SPACE. REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL
P27	ROUTE 3/4" COLD WATER LINE, 3/4" HOT WATER LINE, AND 2" SANITARY UP AS REQUIRED TO SERVE LOCAL FIXTURES IN FLOOR ABOVE. REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL
S26	SITE NOTE

1 Level 1 Plumbing Plan - AREA A1
1/8" = 1'-0"

CONSULTANTS

STRUCTURAL

CJG Engineers

3200 Wilcrest Drive, Suite 305

Houston, TX 77042

Tel: 713.780.3345

Fax: 713.780.3712

FOODSERVICE

Foodservice Design Professionals

594 Sawdust Road, Suite 139

Spring, TX 77380-1960

Tel: 281.350.2323

Fax: 281.350.5959

LANDSCAPE

PEA Group

16060 Dillard Drive, Suite 250

Houston, TX 77040

Tel: 844.813.2949

MEP

CMITA, INC

2201 Timberloch Place, Suite 110

The Woodlands, TX 77380

Tel: 281.419.9899

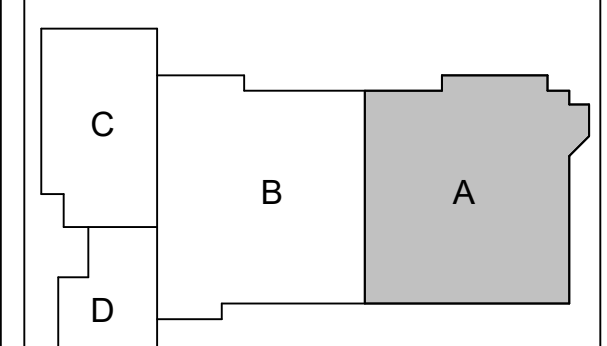
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S&G Engineering Consultants, LLC

1796 Avenue D, Suite B

Katy, Texas 77493

Tel: 832.437.7377



REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

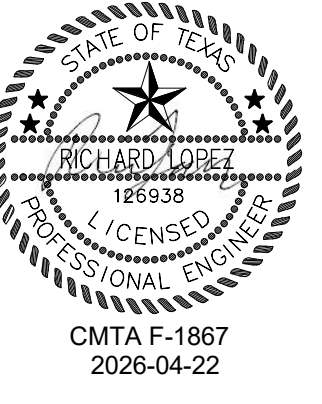
ARCADIS

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1330 POST OAK BOULEVARD, SUITE 2250

HOUSTON, TX 77056

tel 281.286.6605



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DATE:	2026-04-06
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DATE:	2026-04-06
2026-04-22	PROPOSAL SET ADD 04
1	

P2.11

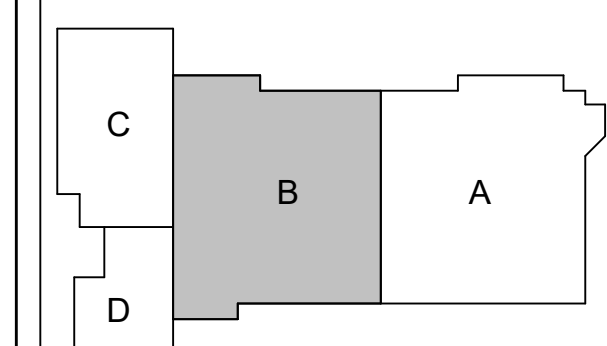
LEVEL 1 PLUMBING -
AREA A1



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2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

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S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377

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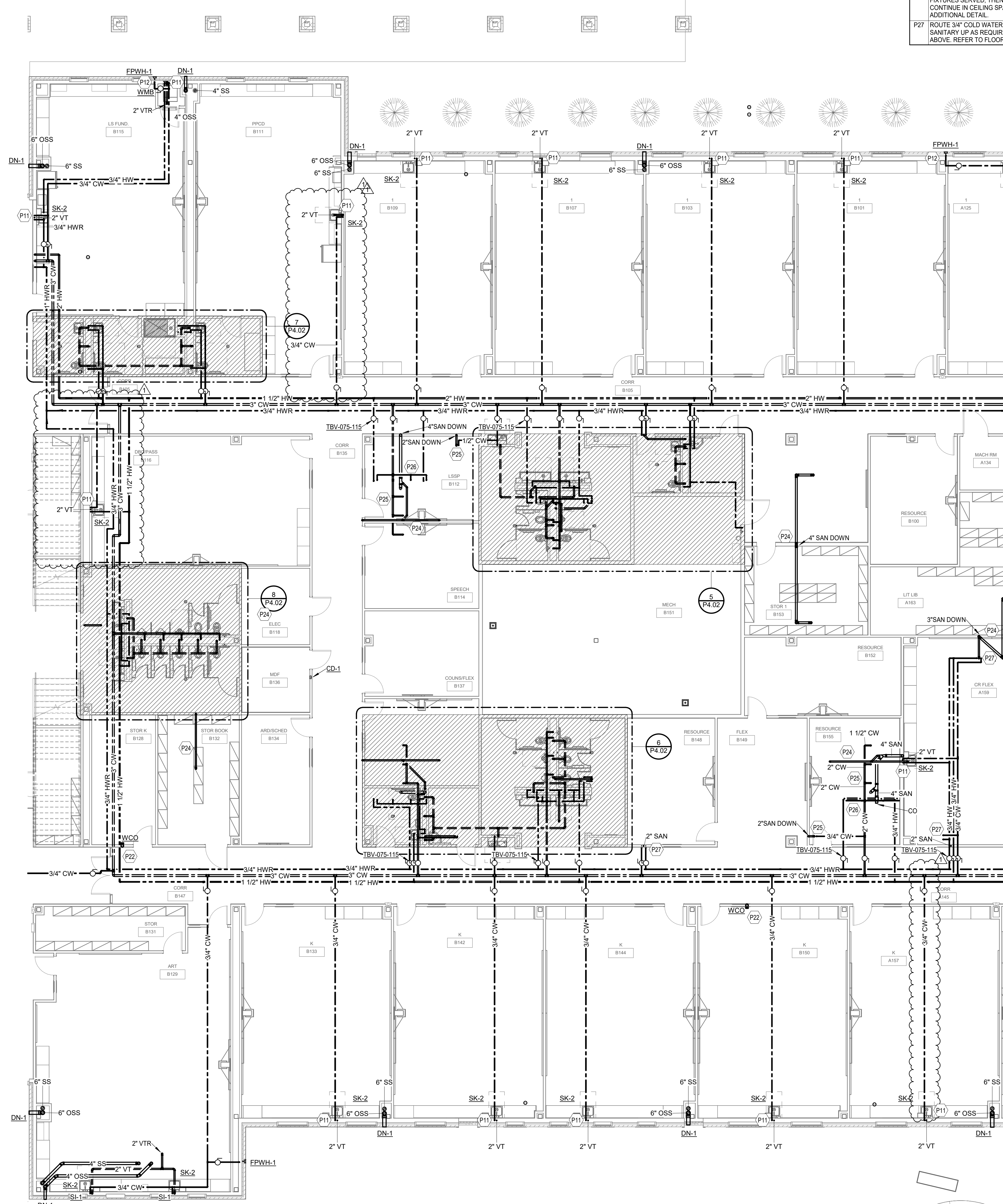


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HOUSTON, TX 77056
tel 281.286.6605



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P2.12
LEVEL 1 PLUMBING -
AREA B1



① Level 1 Plumbing Plan - AREA B1
1/8" = 1'-0"



TAGGED NOTES		#
P11	ROUTE 3/4" COLD AND HOT WATER LINES DOWN IN WALL/CHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES	
P12	ROUTE 3/4" COLD WATER LINE DOWN IN WALL/CHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES	
P22	ROUTE SANITARY UP THROUGH SLAB INTO WALL/CHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES	
P24	ROUTE SANITARY UP IN WALL AND IN CEILING SPACE AS REQUIRED TO SERVE ABOVE FLOOR DRAIN(S)/SINK(S). REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL	
P28	ROUTE COLD WATER UP TO FLOOR ABOVE AS REQUIRED TO SERVE LOCAL FIXTURE(S). REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL	

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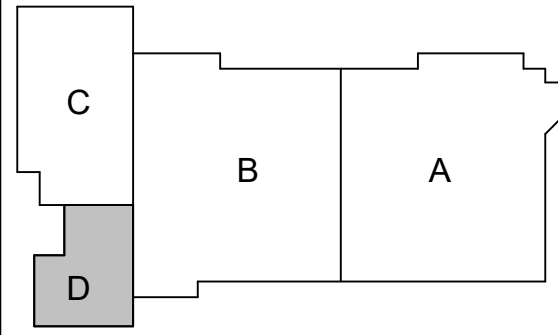
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CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
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2201 Timberloch Place, Suite 110
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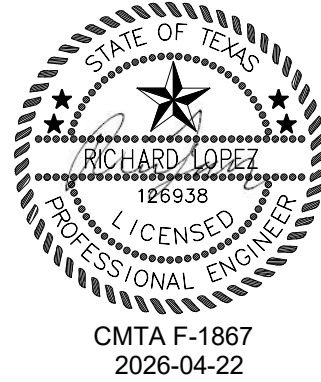
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Tel: 832.437.7377



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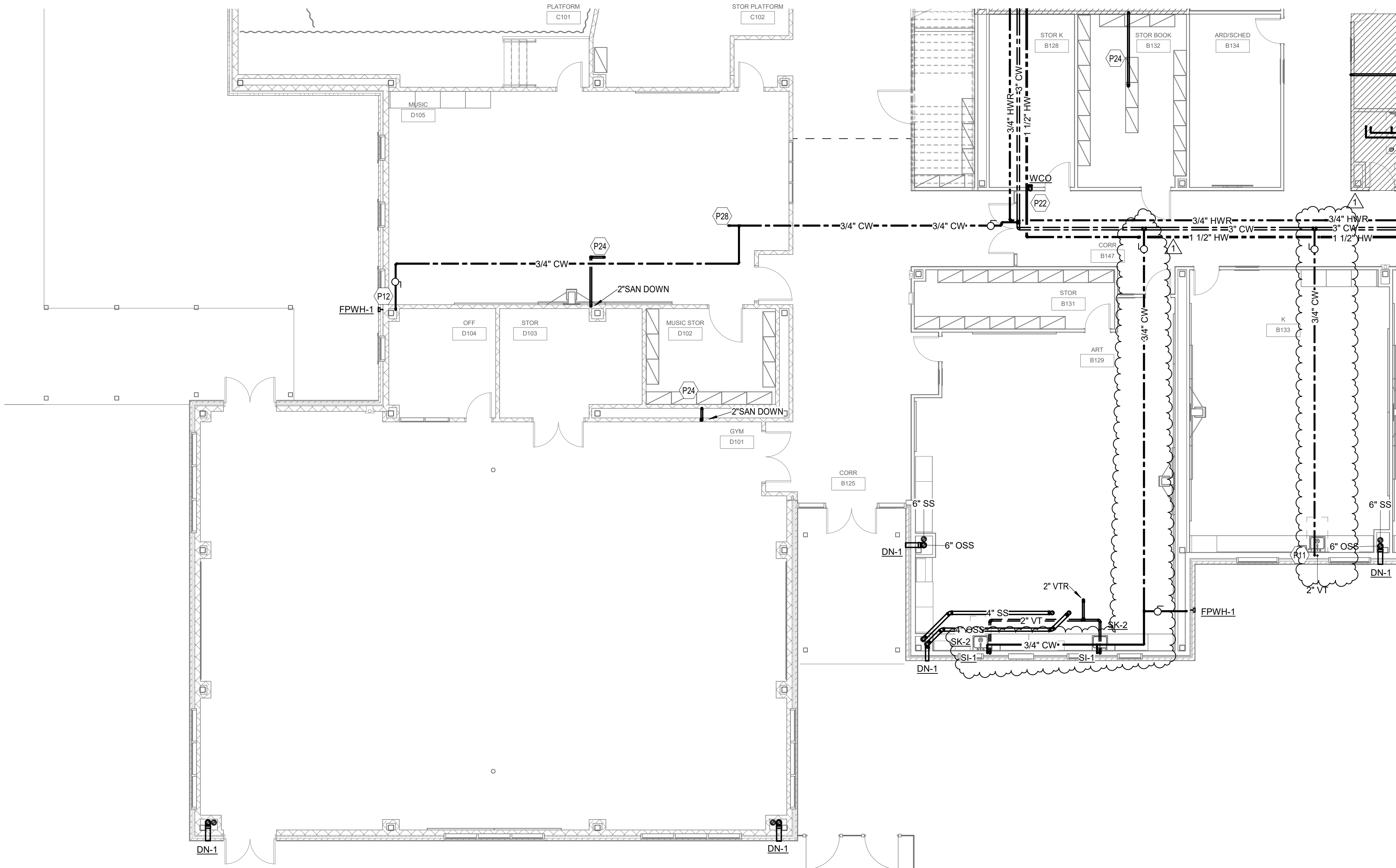
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1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



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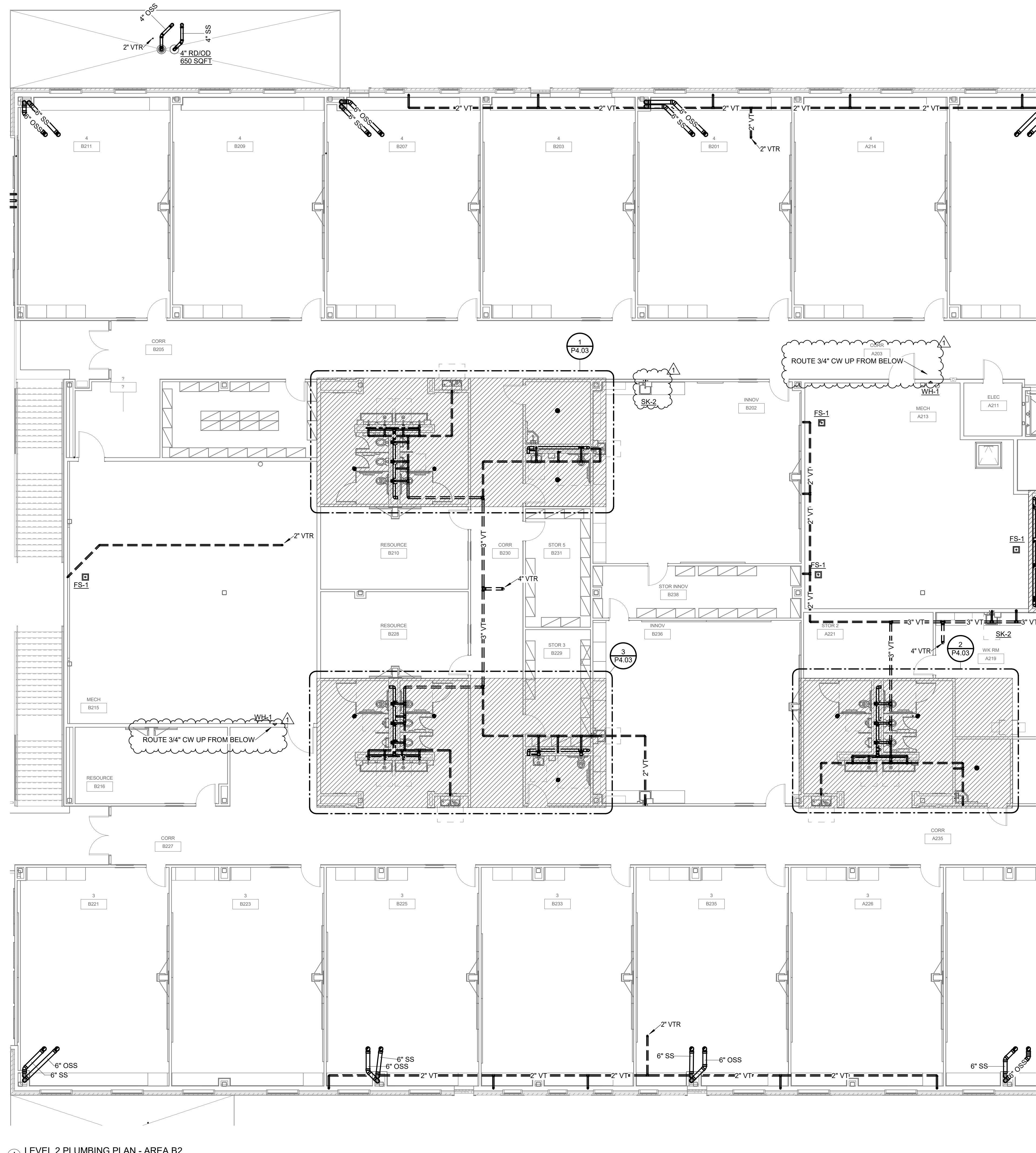
P2.14

LEVEL 1 PLUMBING -
AREA D1



1 Level 1 Plumbing Plan - AREA D1
1/8" = 1'-0"





1 LEVEL 2 PLUMBING PLAN - AREA B2
1/8" = 1'-0"

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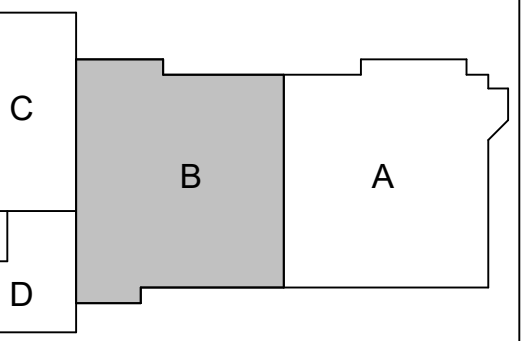
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CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
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594 Sawdust Road, Suite 139
Spring, TX 77380-1960
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PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
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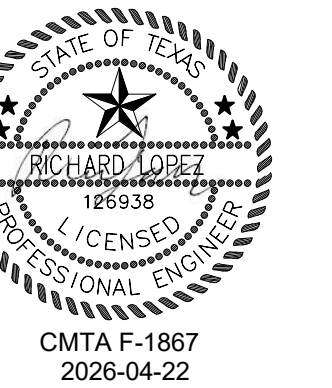
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The Woodlands, TX 77380
Tel: 281.419.9899

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1796 Avenue D, Suite B
Katy, Texas 77493
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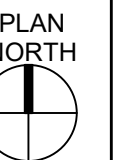
PROJECT #: 202502
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DRAWN: RE
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DATE: 2026-04-06
2026-04-22

ISSUE
PROPOSAL SET
ADD 04

1

P2.22
LEVEL 2 PLUMBING -
AREA B2



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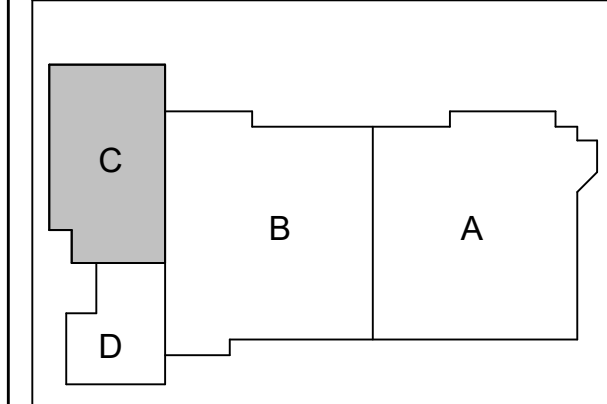
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Fax: 713.780.3712

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Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
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PEA Group
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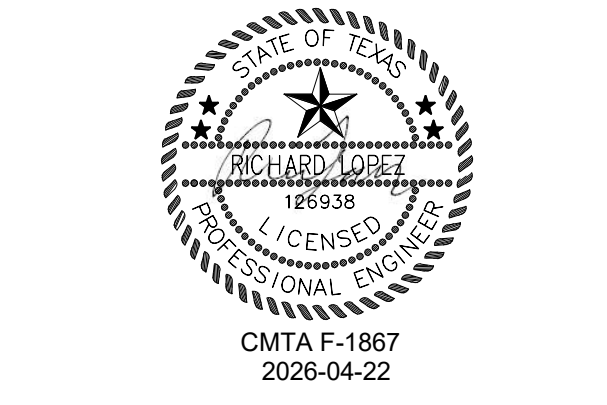
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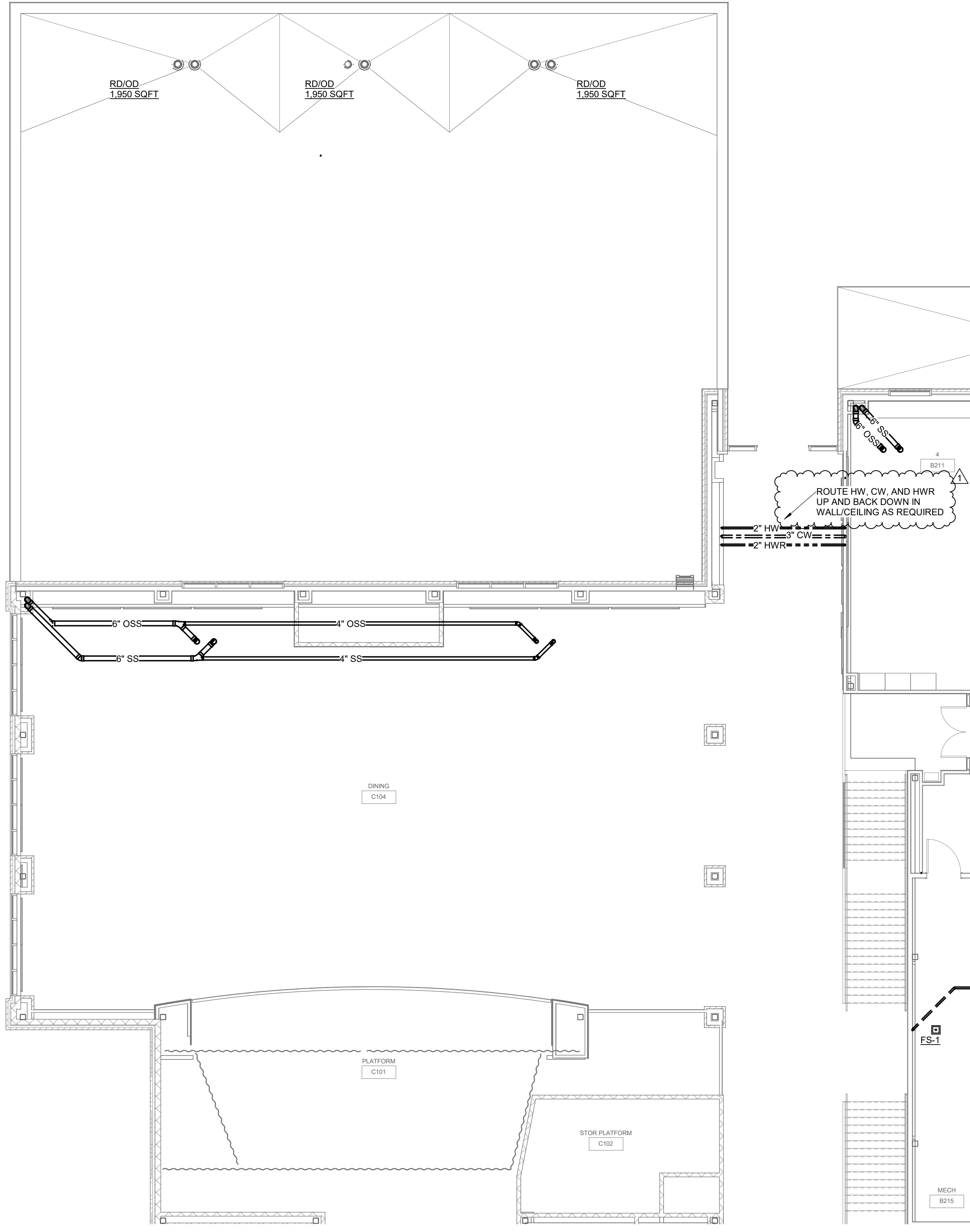
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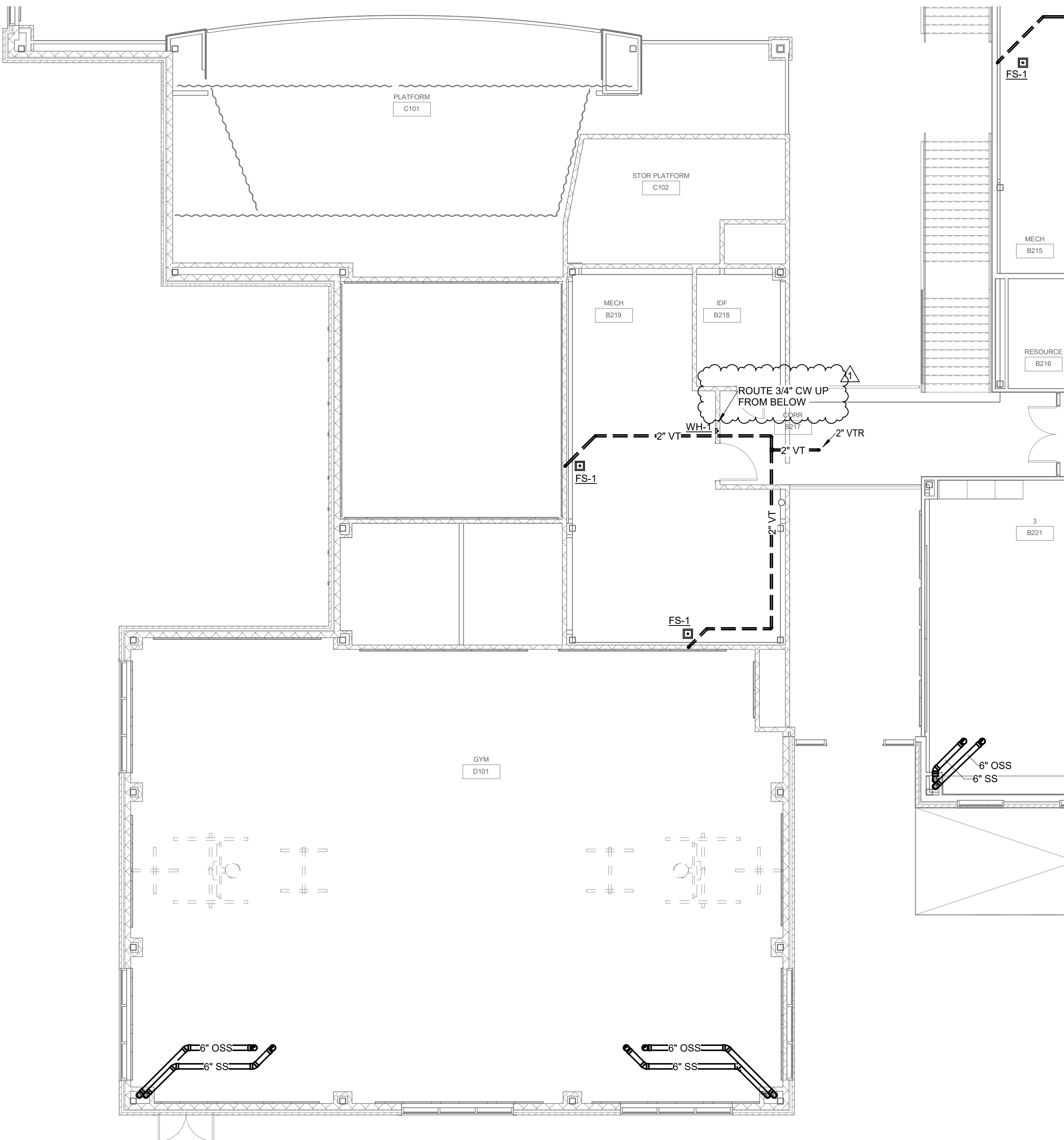


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P2.23
LEVEL 2 PLUMBING -
AREA C2

1 LEVEL 2 PLUMBING PLAN - AREA C2
1/8" = 1'-0"





1 LEVEL 2 PLUMBING PLAN - AREA D2
1/8" = 1'-0"

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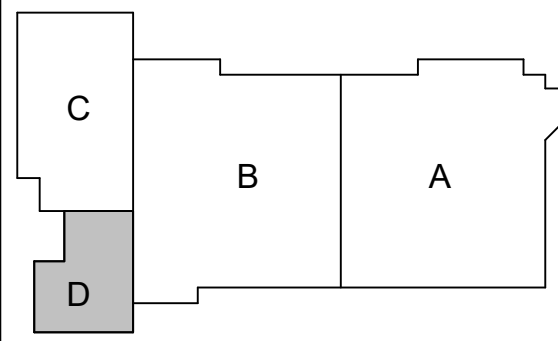
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3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
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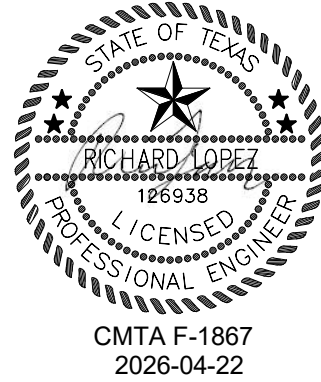
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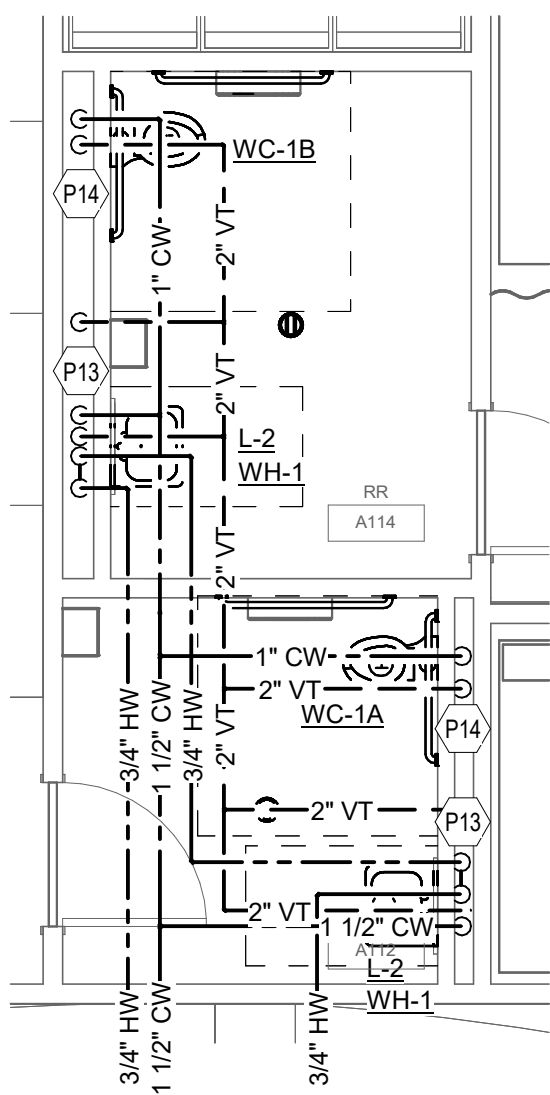
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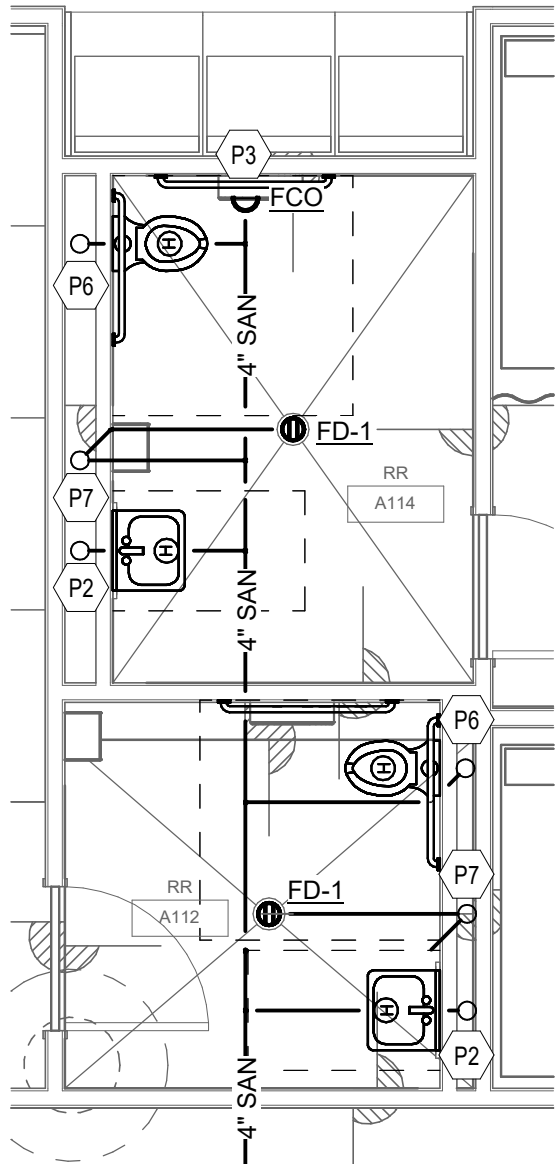
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P2.24
LEVEL 2 PLUMBING -
AREA D2

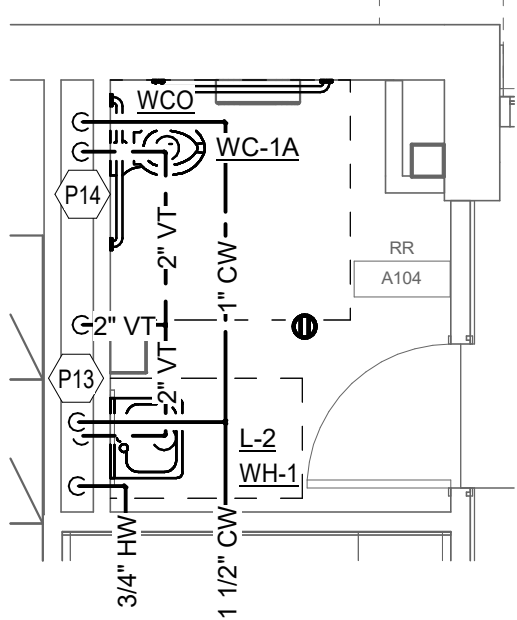




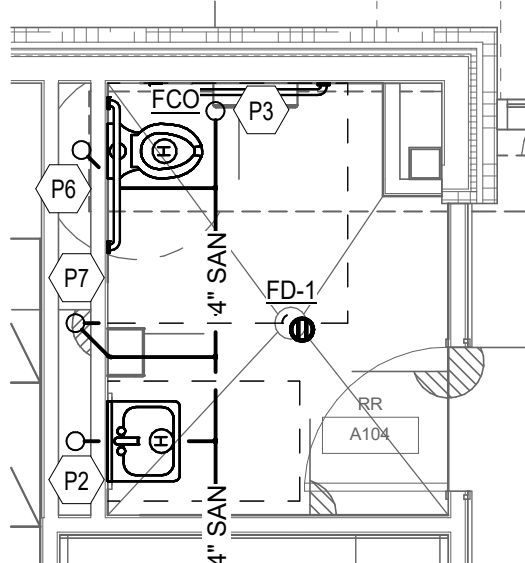
6 Level 1 Plumbing Plan - AREA A1 - Callout 1
1/4" = 1'-0"



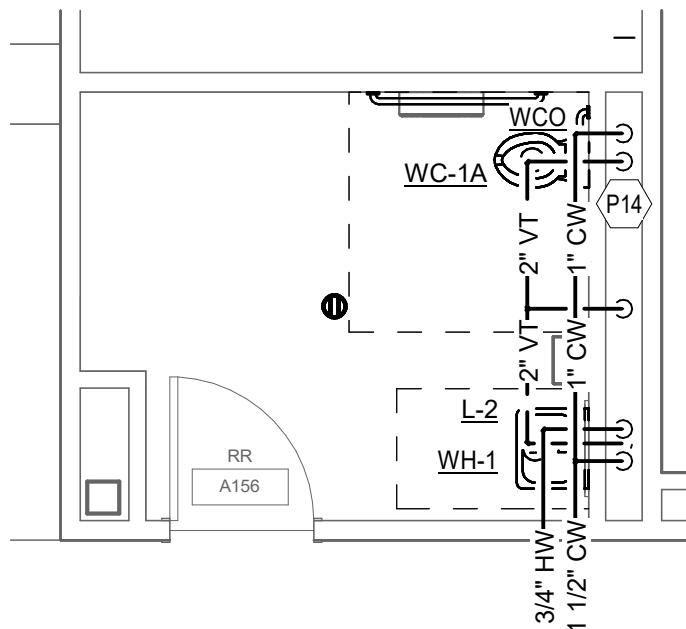
1 UNDERSLAB PLUMBING PLAN - AREA A0 - Callout 1
1/4" = 1'-0"



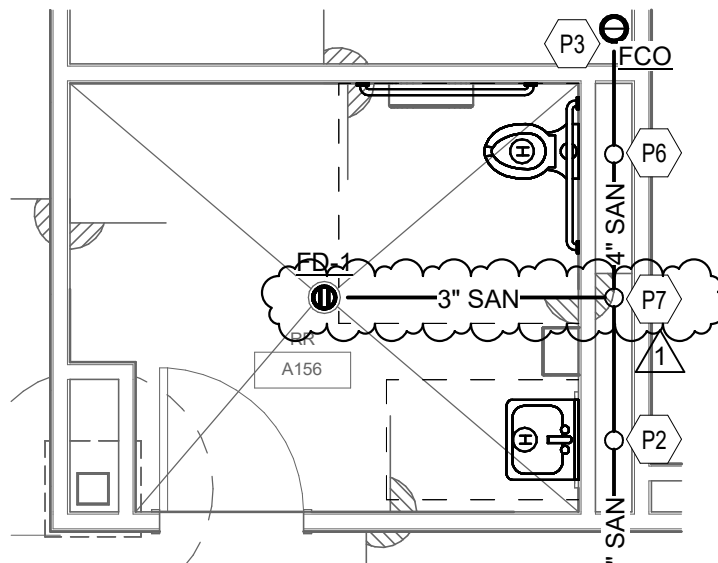
7 Level 1 Plumbing Plan - AREA A1 - Callout 2
1/4" = 1'-0"



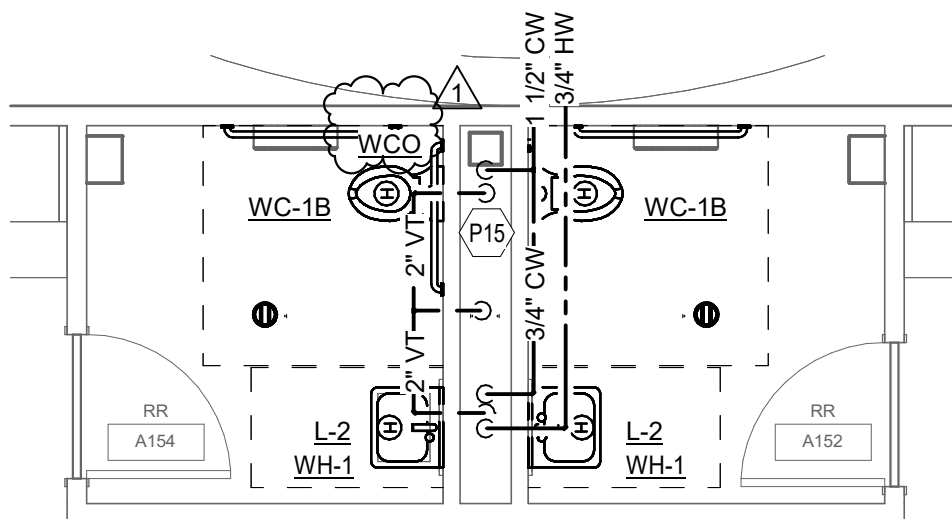
2 UNDERSLAB PLUMBING PLAN - AREA A0 - Callout 2
1/4" = 1'-0"



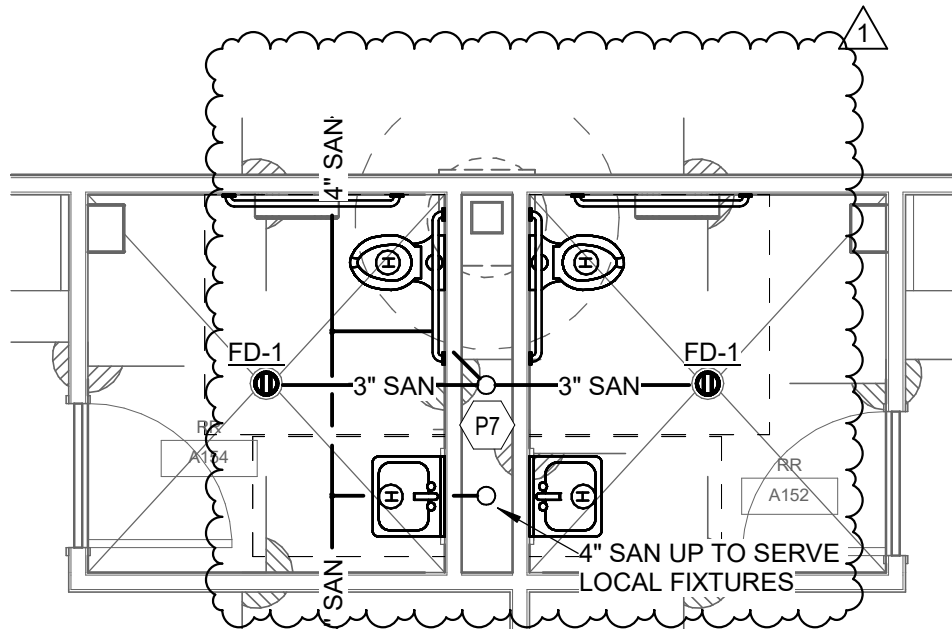
8 Level 1 Plumbing Plan - AREA A1 - Callout 3
1/4" = 1'-0"



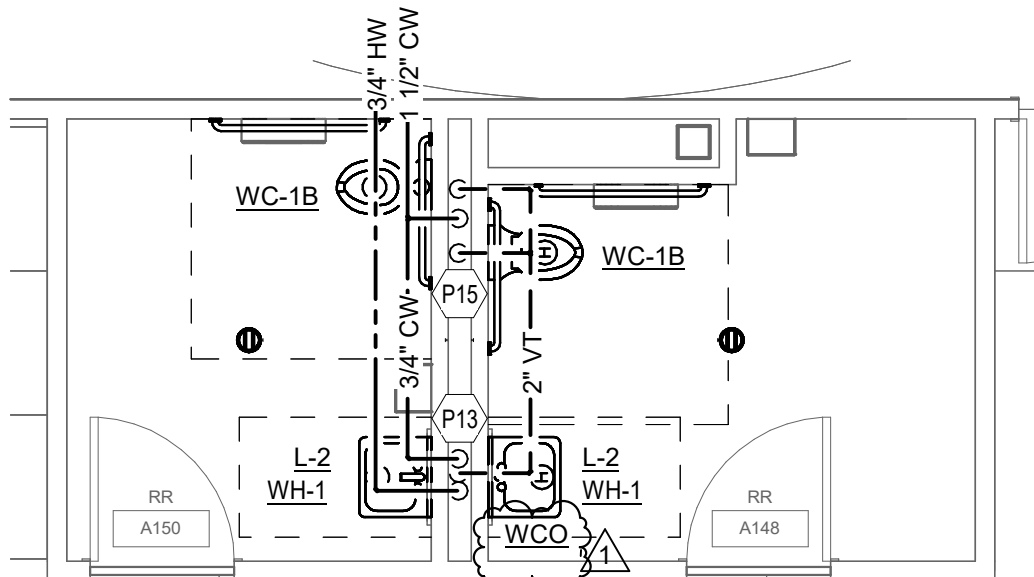
3 UNDERSLAB PLUMBING PLAN - AREA A0 - Callout 3
1/4" = 1'-0"



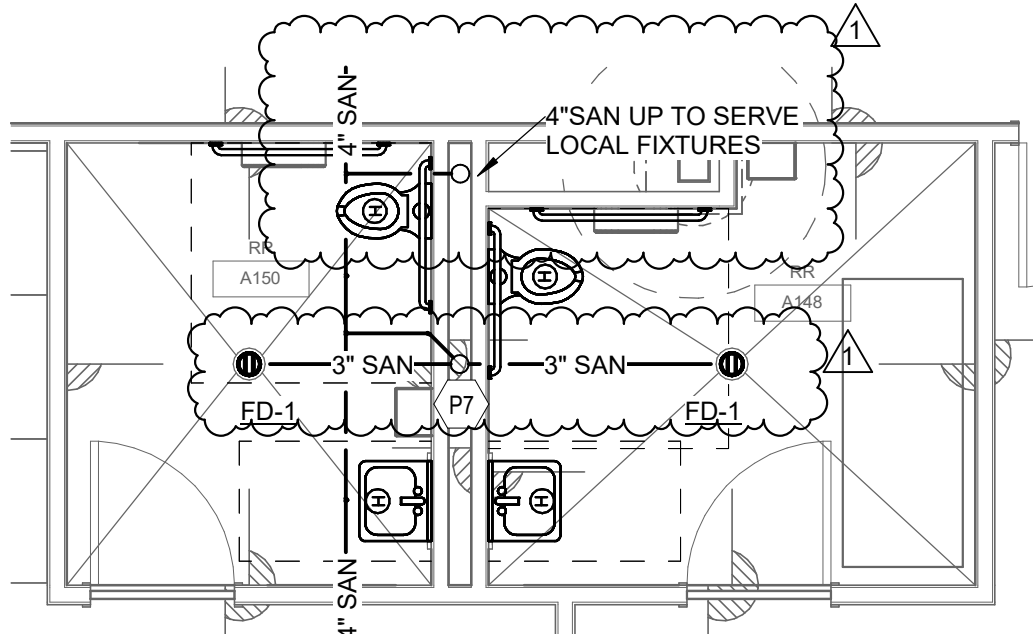
9 Level 1 Plumbing Plan - AREA A1 - Callout 4
1/4" = 1'-0"



4 UNDERSLAB PLUMBING PLAN - AREA A0 - Callout 4
1/4" = 1'-0"



10 Level 1 Plumbing Plan - AREA A1 - Callout 5
1/4" = 1'-0"



5 UNDERSLAB PLUMBING PLAN - AREA A0 - Callout 5
1/4" = 1'-0"

TAGGED NOTES		#
P2	ROUTE 2" SANITARY UP THROUGH GRADE/FLOOR TO SERVE PLUMBING FIXTURE/S. ROUTE 2" VENT UP WITHIN WALLCHASE TO VENT MAIN IN CEILING.	
P3	ROUTE 4" SANITARY UP THROUGH SLAB TO FLOOR CLEANOUT MOUNTED AT GRADE.	
P6	ROUTE 4" SANITARY UP THROUGH GRADE TO SERVE WATER CLOSETS. ROUTE 2" VENT UP WITHIN WALLCHASE TO VENT MAIN IN CEILING.	
P7	ROUTE 3" SANITARY UP THROUGH GRADE TO SERVE FLOOR DRAIN/SINK. ROUTE 2" VENT UP WITHIN WALLCHASE TO VENT MAIN IN CEILING.	
P13	ROUTE 3/4" COLD WATER LINE DOWN IN WALLCHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES. ROUTE HOT WATER LOOP DOWN IN WALLCHASE TO WITHIN 6" OF FIXTURES SERVED. THEN ROUTE BACK UP IN WALLCHASE TO CONTINUE IN CEILING SPACE.	
P14	ROUTE 1" COLD WATER LINE DOWN IN WALLCHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES.	
P15	ROUTE 1-1/2" COLD WATER LINE DOWN IN WALLCHASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES.	

CONSULTANTS

STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
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LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
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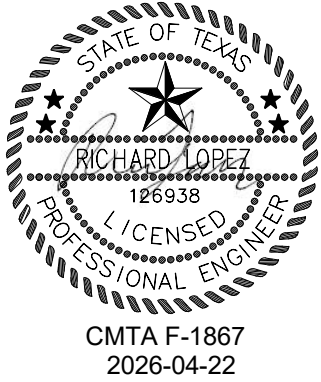
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CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

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S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
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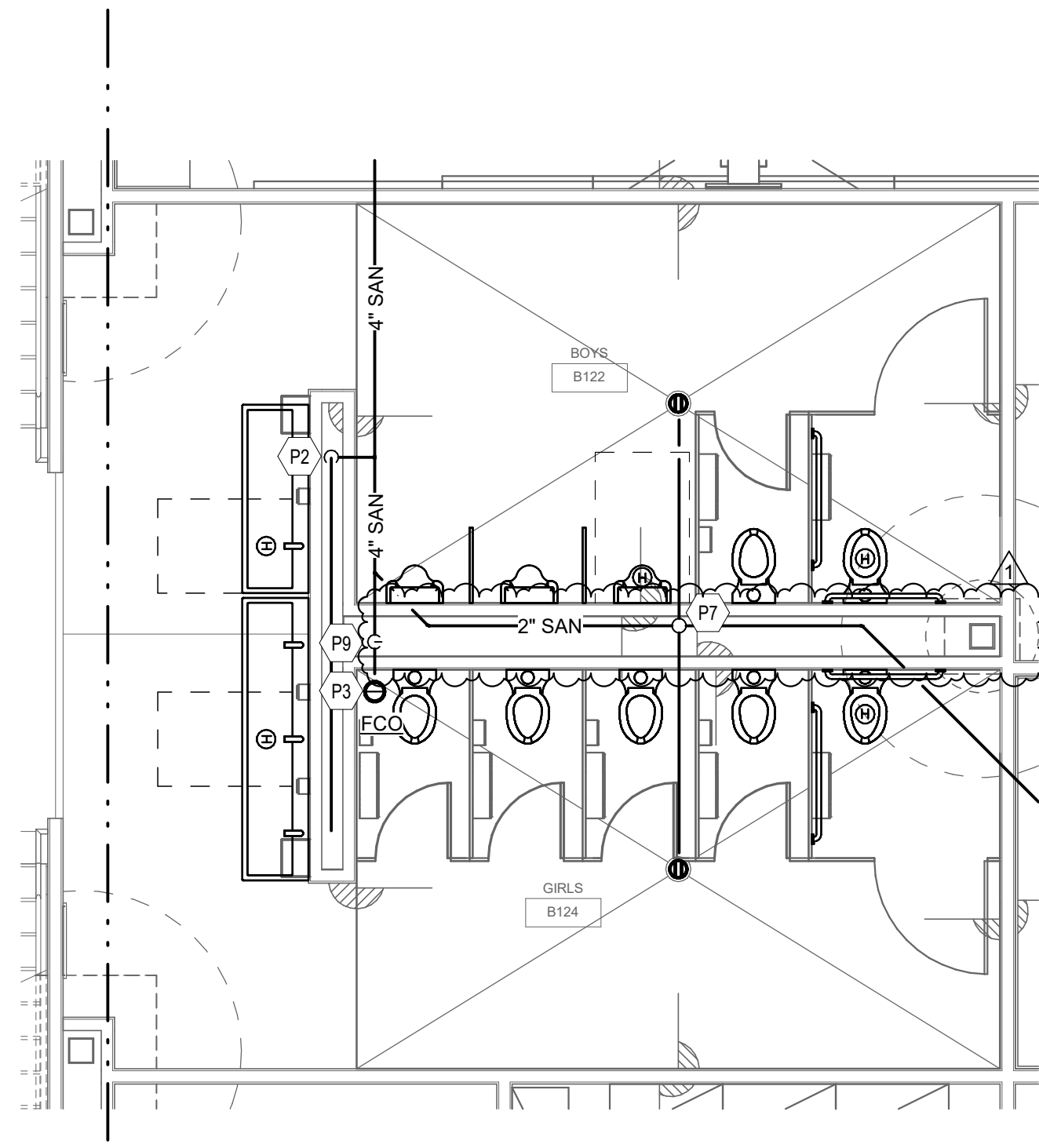
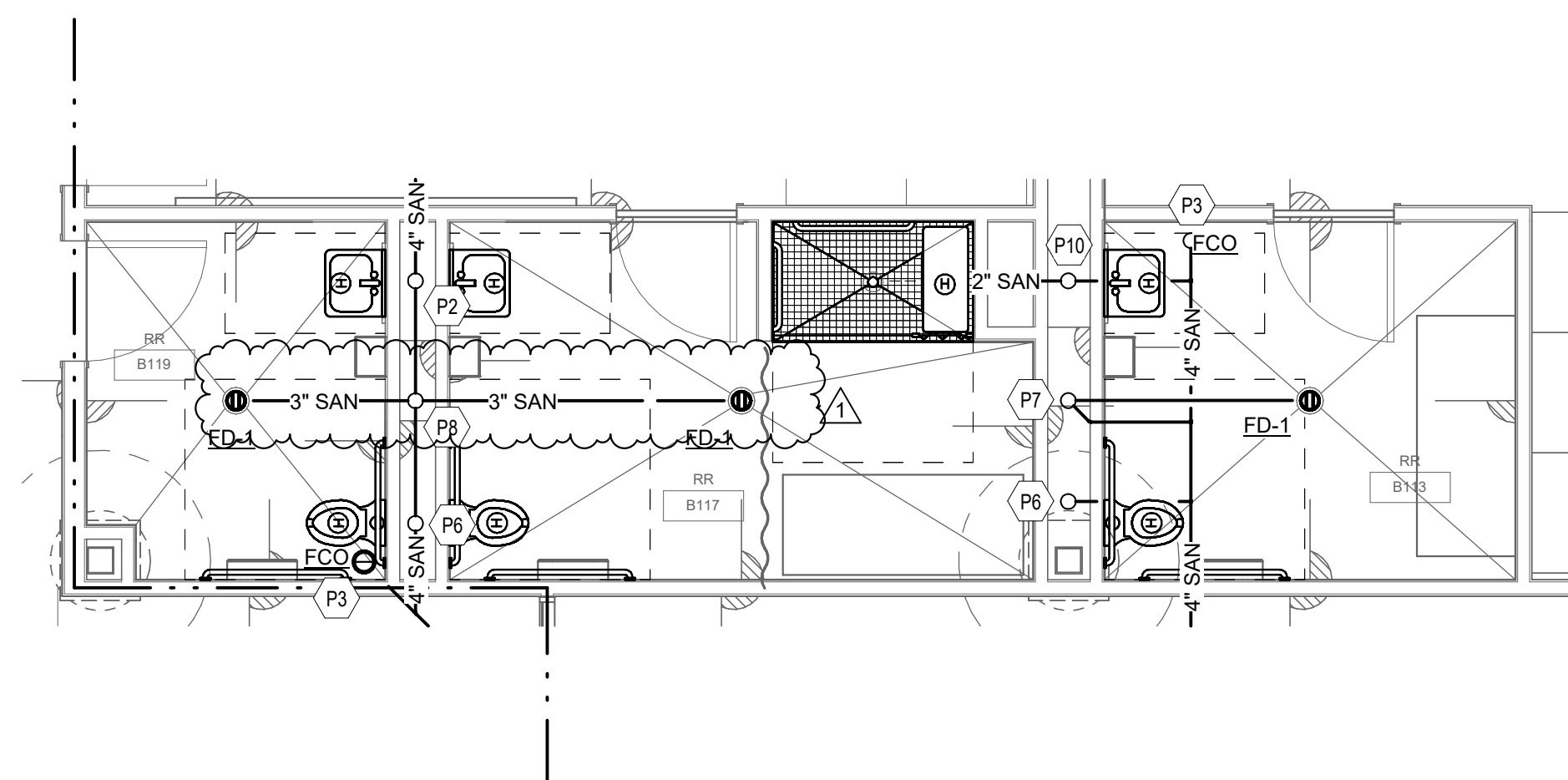
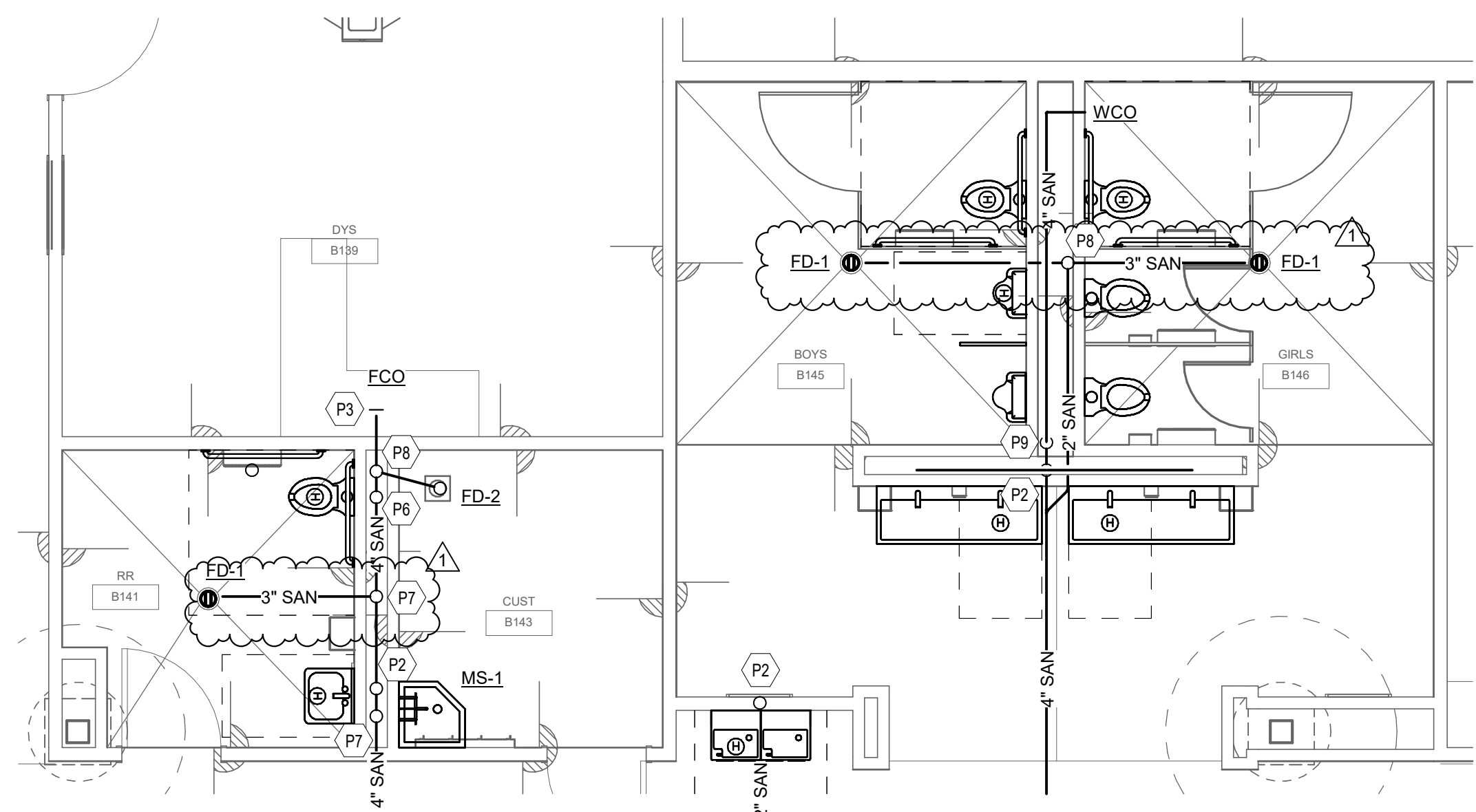
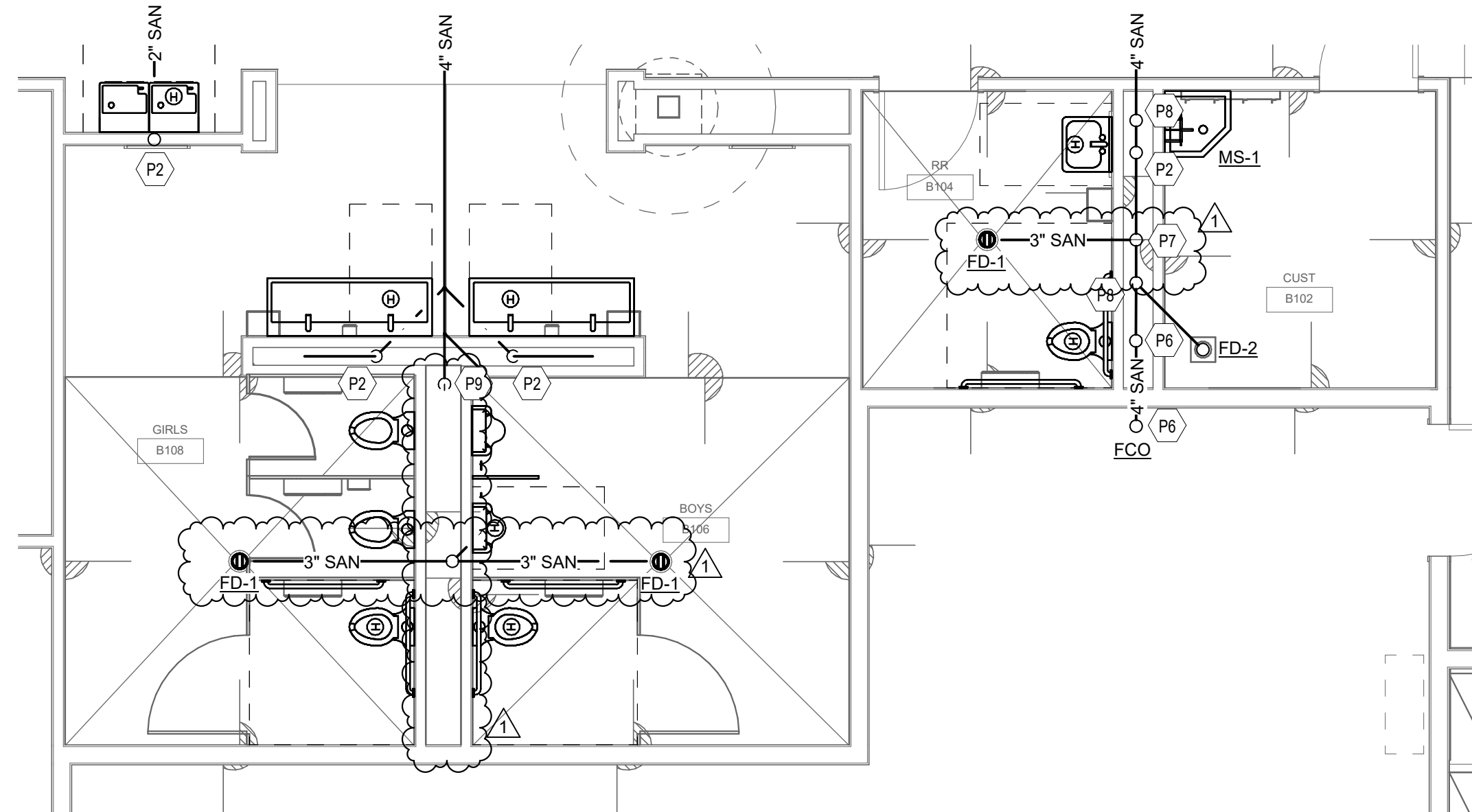
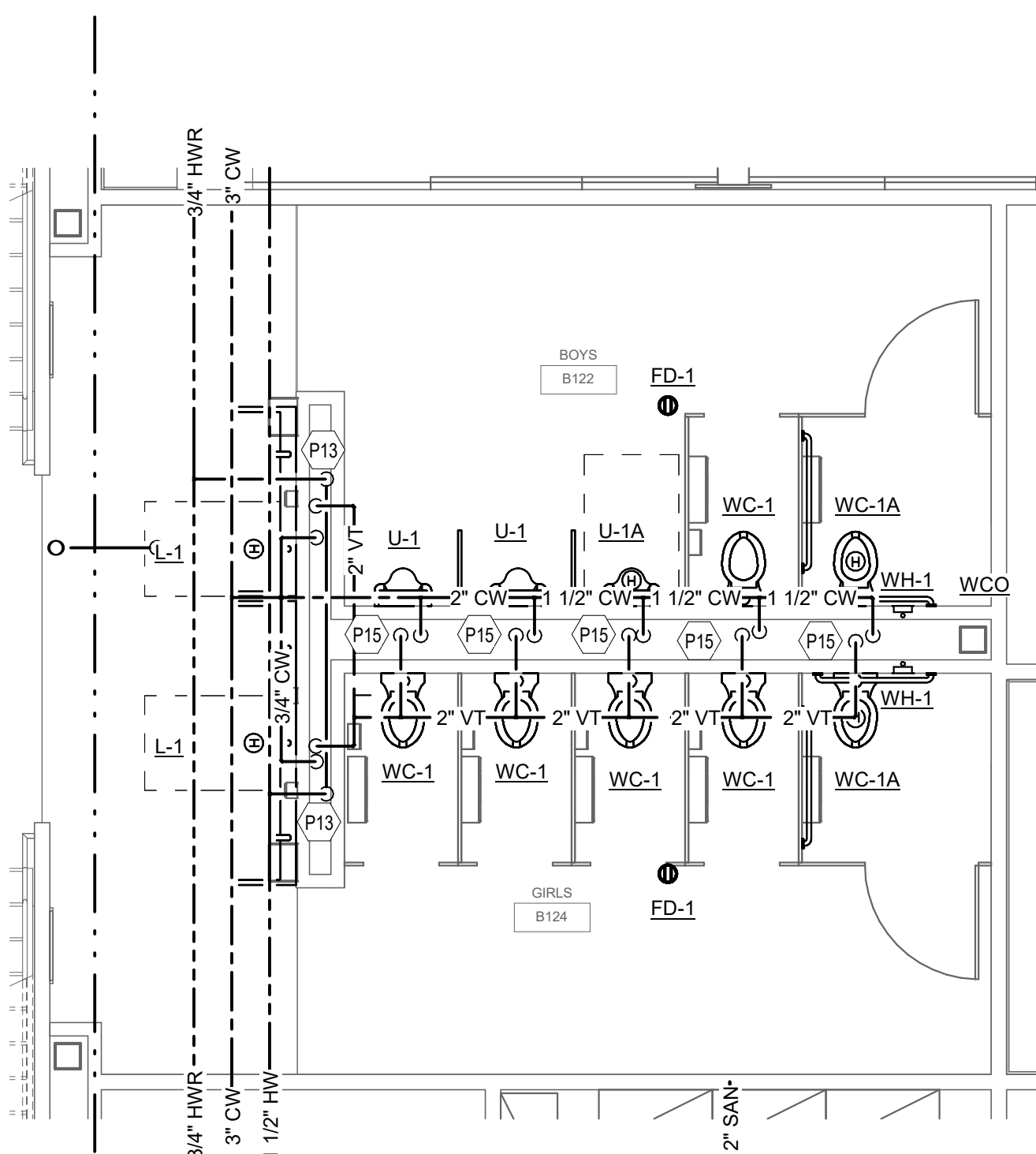
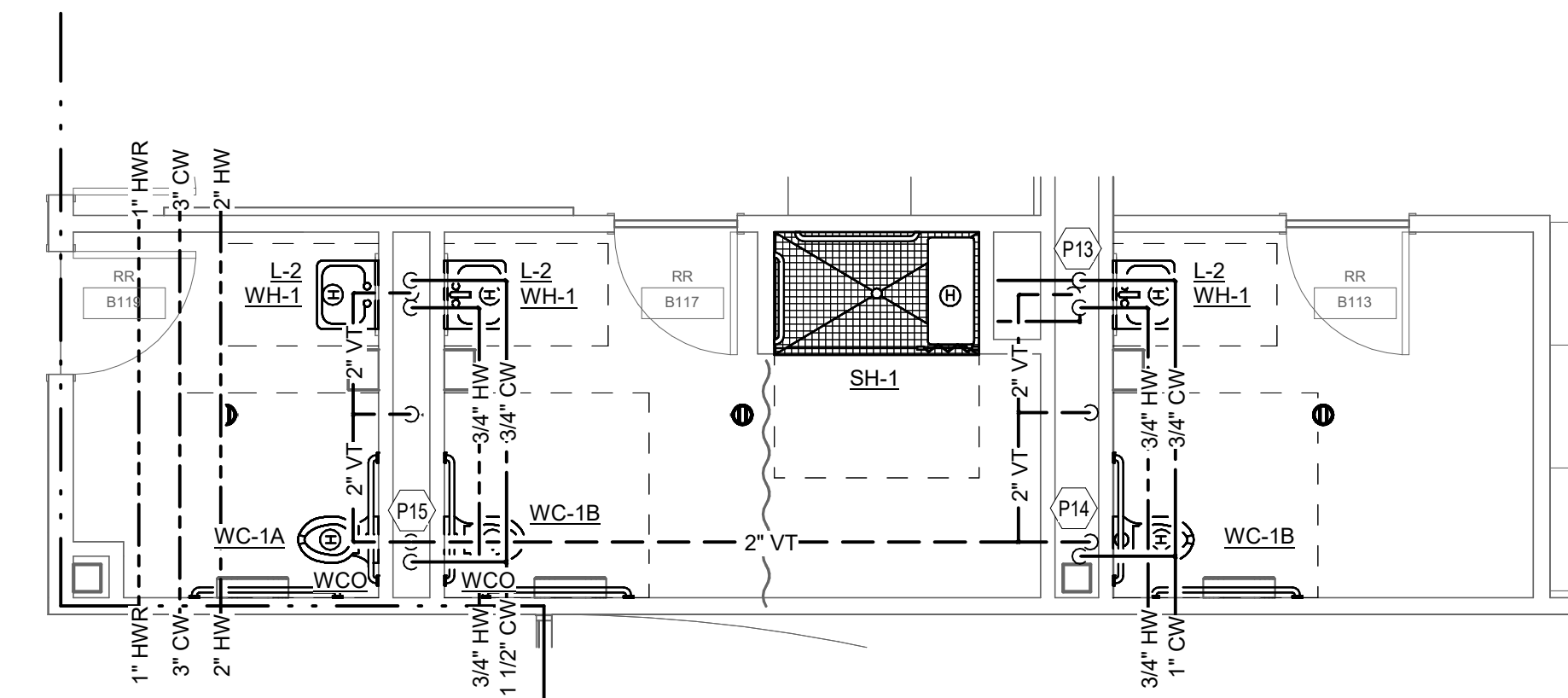
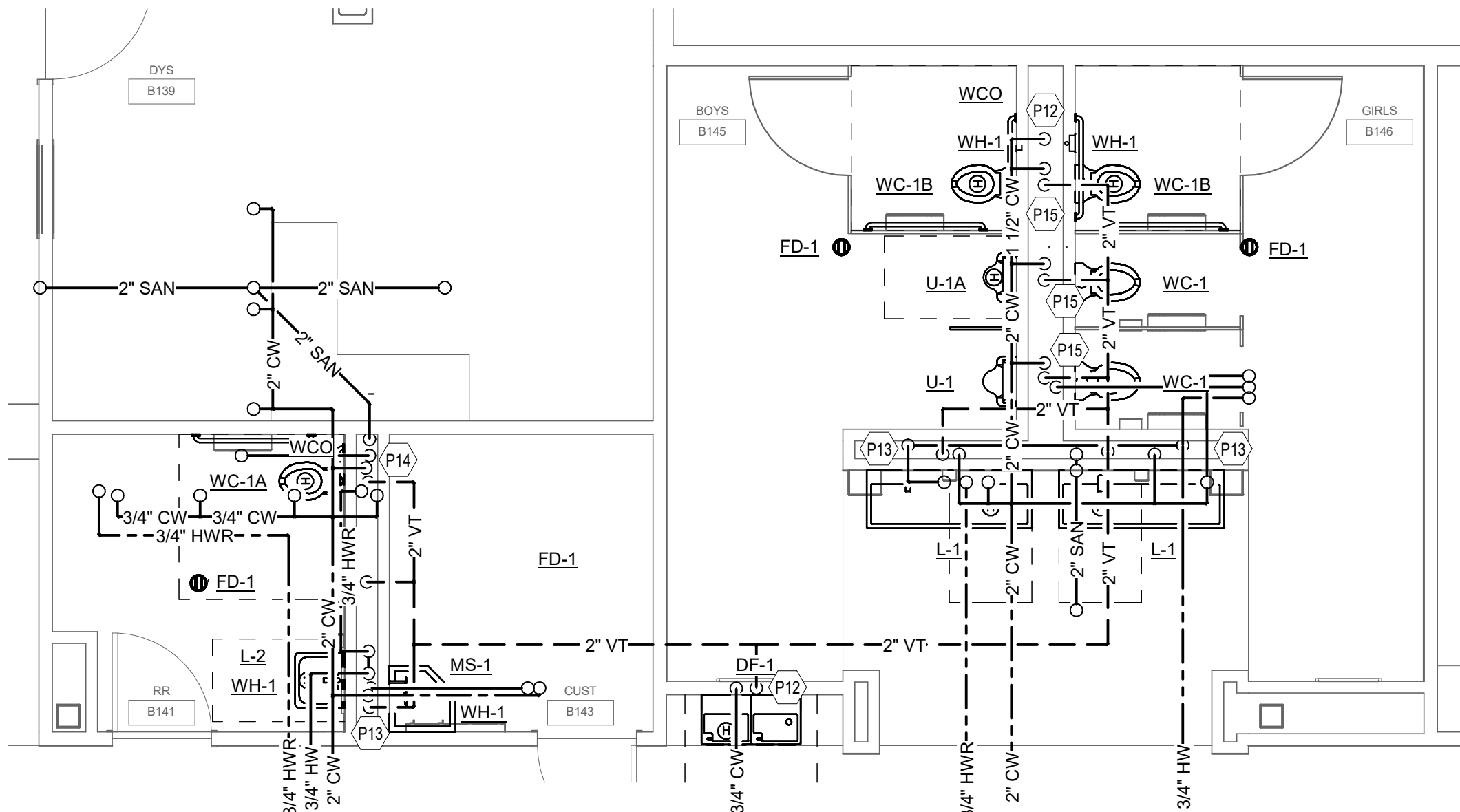
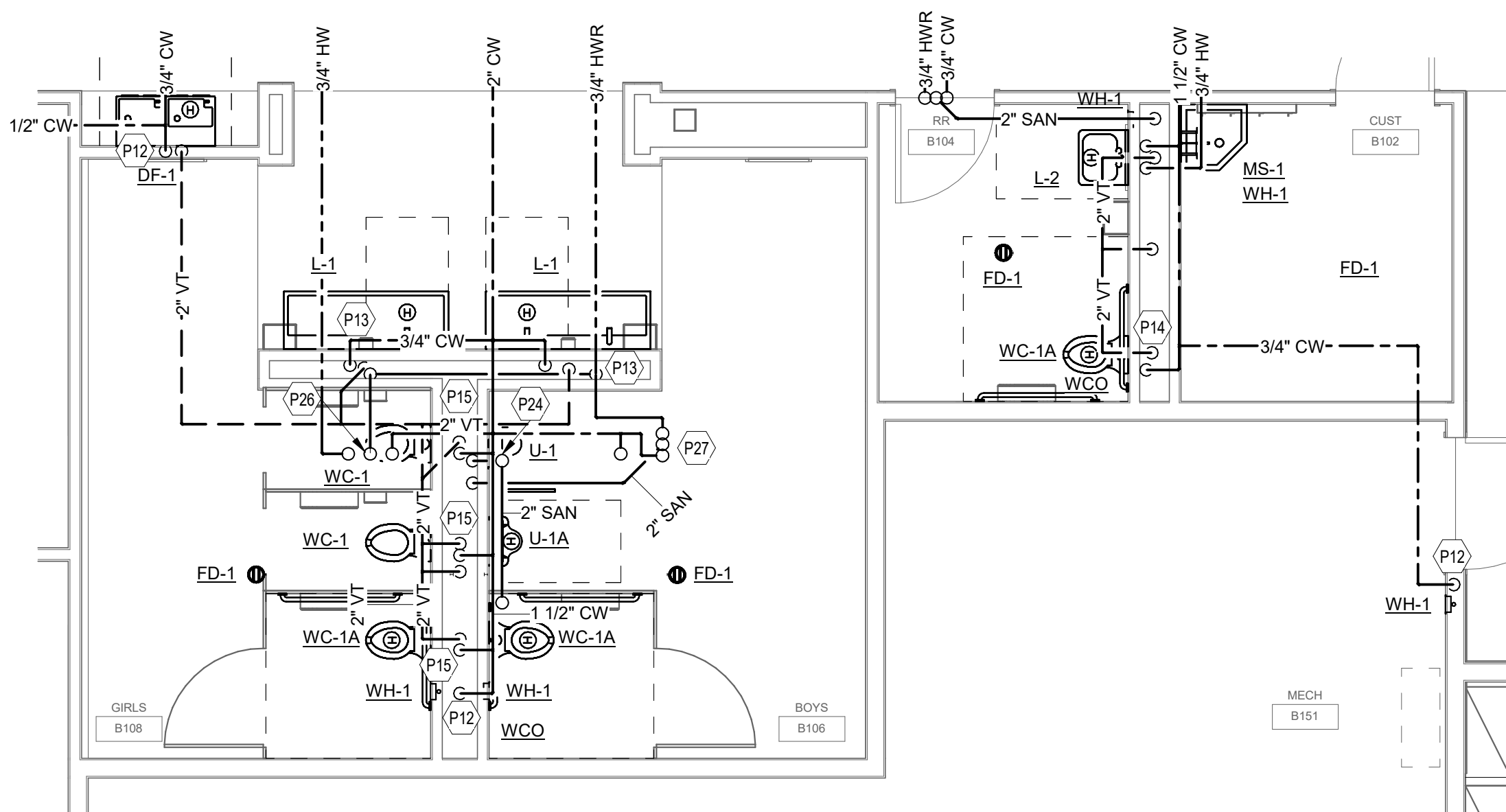
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ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
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tel 281.286.6605



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P4.01
ENLARGED
PLUMBING PLANS



TAGGED NOTES	
P2	ROUTE 2'S SANITARY UP THROUGH GRADE/FLOOR TO SERVE PLUMBING FIXTURES. ROUTE 2' UP WITHIN WALL/CASE TO VEINT MAIN IN CEILING.
P3	ROUTE 3'S SANITARY UP THROUGH SLAB TO FLOOR CLEANOUT MOUNTED AT GRADE.
R6	ROUTE 4'S SANITARY UP THROUGH GRADE TO SERVE WATER CLOSETS. ROUTE 2' UP WITHIN WALL/CASE TO VEINT MAIN IN CEILING.
P7	ROUTE 3'S SANITARY UP THROUGH GRADE TO SERVE FLOOR DRAIN. ROUTE 2' UP WITHIN WALL/CASE TO VEINT MAIN IN CEILING.
R8	ROUTE 3'S SANITARY UP THROUGH GRADE TO SERVE FLOOR DRAIN. OR HANG SINKS. ROUTE 2' UP WITHIN WALL/CASE TO VEINT MAIN IN CEILING.
R9	ROUTE 4'S SANITARY UP THROUGH GRADE TO SERVE WATER CLOSET/JOURNAL GRP. ROUTE SANITARY ALONG CHASE INTERIOR TO GRADE AND PROVIDE 1/2" HOT WATER LOOP DOWN IN HORIZONTAL SANITARY RUN. PROVIDE 2" VENT LINES FOR EACH CARRIER AS REQUIRED WHICH ARE TO BE ROUTED UP IN CHASE AND DOWN TO VEINT MAIN IN CEILING.
P12	ROUTE 3'S SANITARY UP THROUGH GRADE/FLOOR TO SERVE PLUMBING FIXTURES. ROUTE 2' UP WITHIN WALL/CASE TO VEINT MAIN IN CEILING.
P12	ROUTE 34'S COLD WATER LINE DOWN IN WALL/CASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES.
P13	ROUTE 34'S COLD WATER LINE DOWN IN WALL/CASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES IN FLOOR ABOVE. ROUTE HOT WATER LOOP DOWN IN WALL/CASE TO WITHIN 6" OF FIXTURES SERVED, THEN ROUTE BACK UP IN WALL/CASE TO CONTINUE IN CEILING SPACE.
P13	ROUTE 34'S COLD WATER LINE DOWN IN WALL/CASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES.
P16	ROUTE 1/12" COLD WATER LINE DOWN IN WALL/CASE AS REQUIRED TO SERVE ALL LOCAL FIXTURES.
P16	ROUTE 3'S SANITARY UP THROUGH GRADE IN CEILING SPACE AS REQUIRED TO SERVE ABOVE FLOOR DRAIN(S)/SINK(S). REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL.
P16	ROUTE 34'S COLD WATER LINE AND 2" SANITARY UP AS REQUIRED TO SERVE ALL LOCAL FIXTURES IN FLOOR ABOVE. ROUTE HOT WATER LOOP UP IN ABOVE WALL/CASE AS REQUIRED TO WITHIN 6" OF FIXTURES SERVED, THEN ROUTE BACK DOWN IN WALL/CASE TO WITHIN 6" OF CEILING SPACE. REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL.
P16	ROUTE 34'S COLD WATER LINE, 3/4" HOT WATER LINE, AND 2" SANITARY UP AS REQUIRED TO SERVE ALL LOCAL FIXTURES IN FLOOR ABOVE. REFER TO FLOOR PLAN ABOVE FOR ADDITIONAL DETAIL.

CONSULTANTS

STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
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Fax: 713.780.3712

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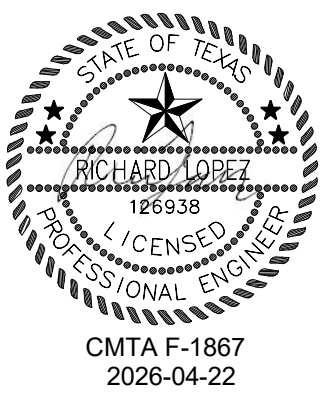
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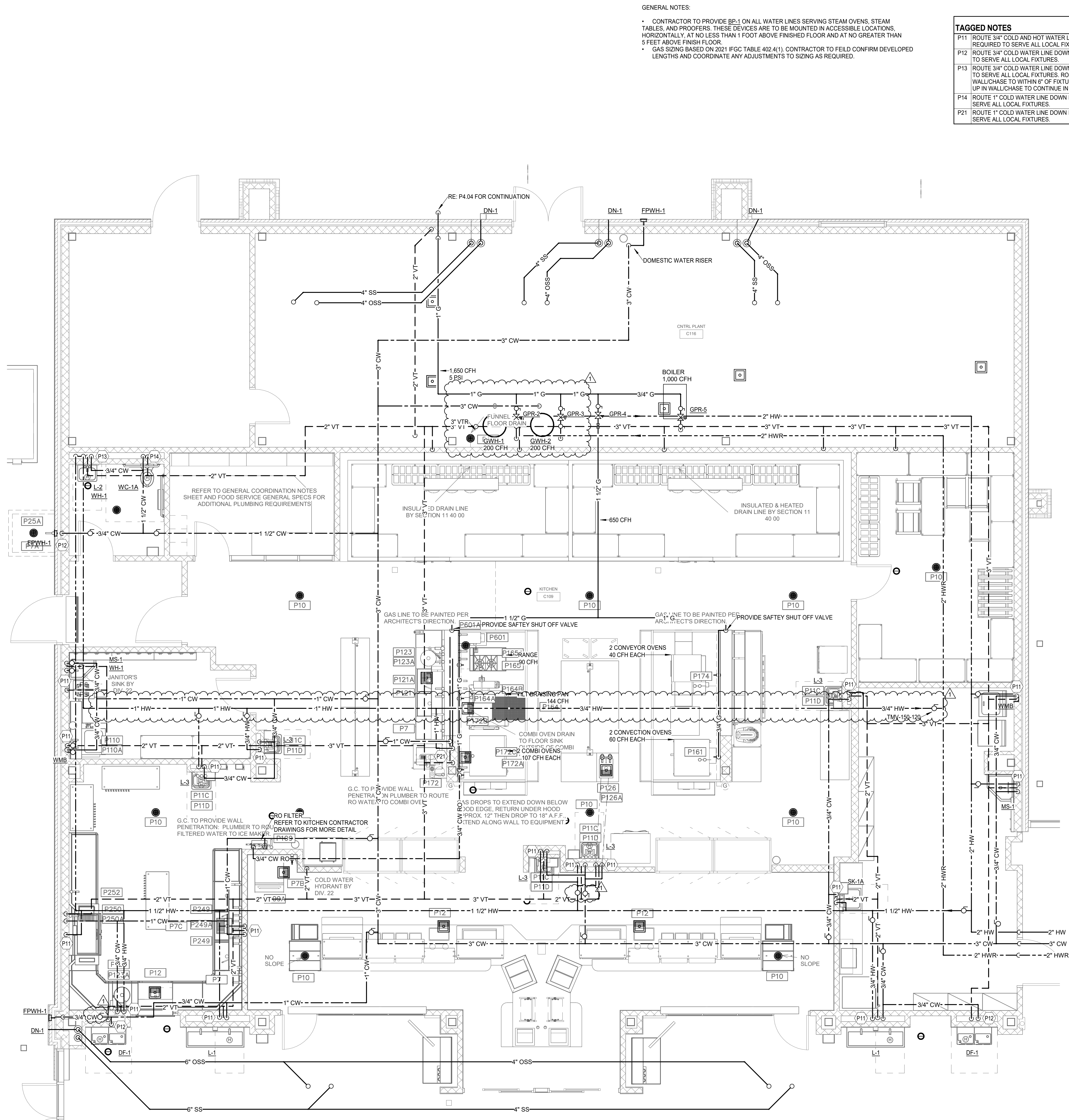
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tel 281.286.6605



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P4.02

ENLARGED PLUMBING PLANS



1 Level 1 Kitchen Plumbing Plan
1/4" = 1'-0"

CONSULTANTS

STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
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Spring, TX 77380-1960
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Tel: 844.813.2949

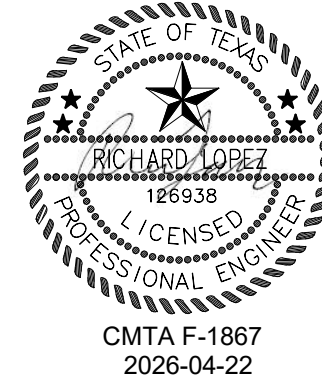
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Katy, Texas 77493
Tel: 832.437.7377

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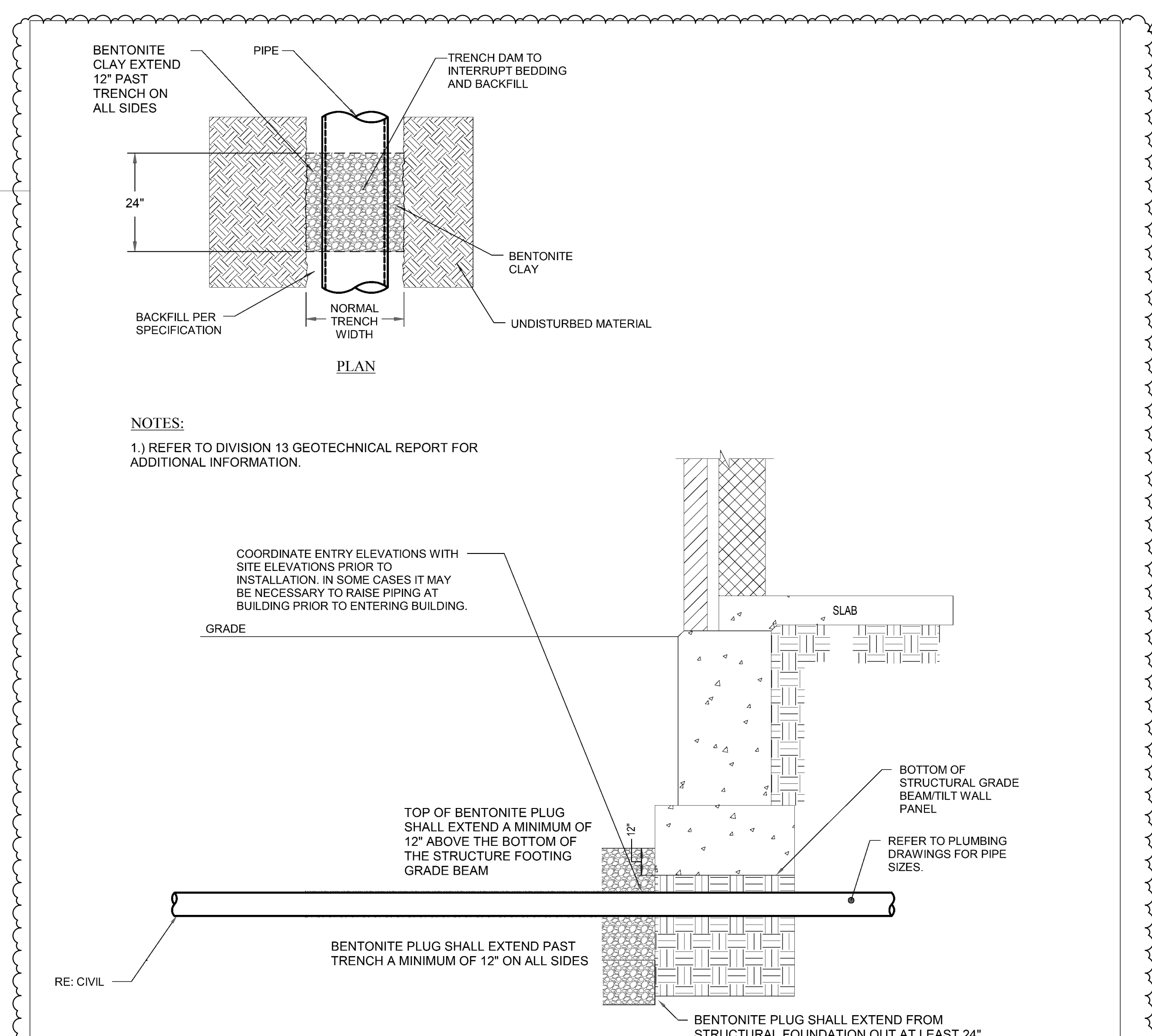
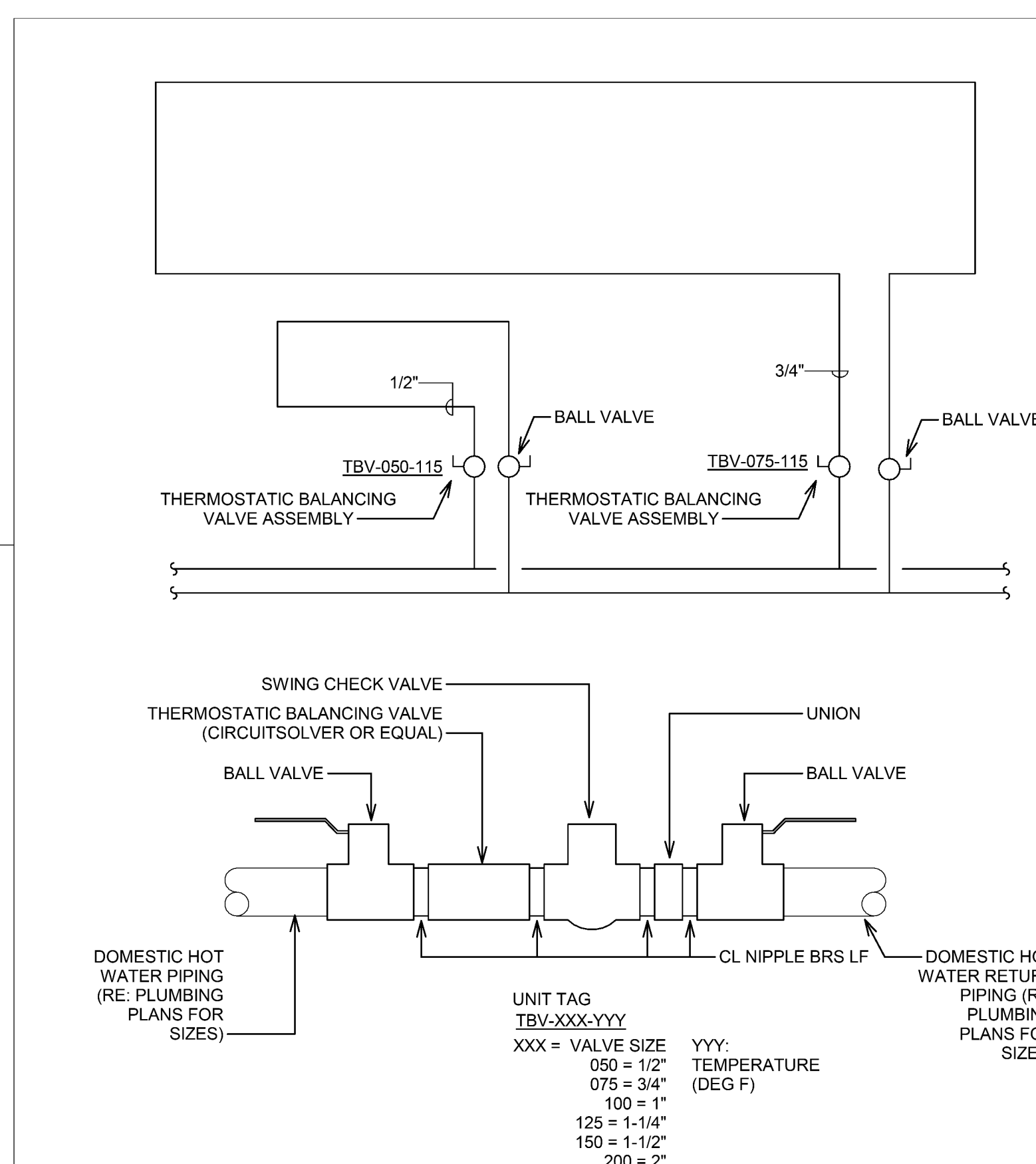
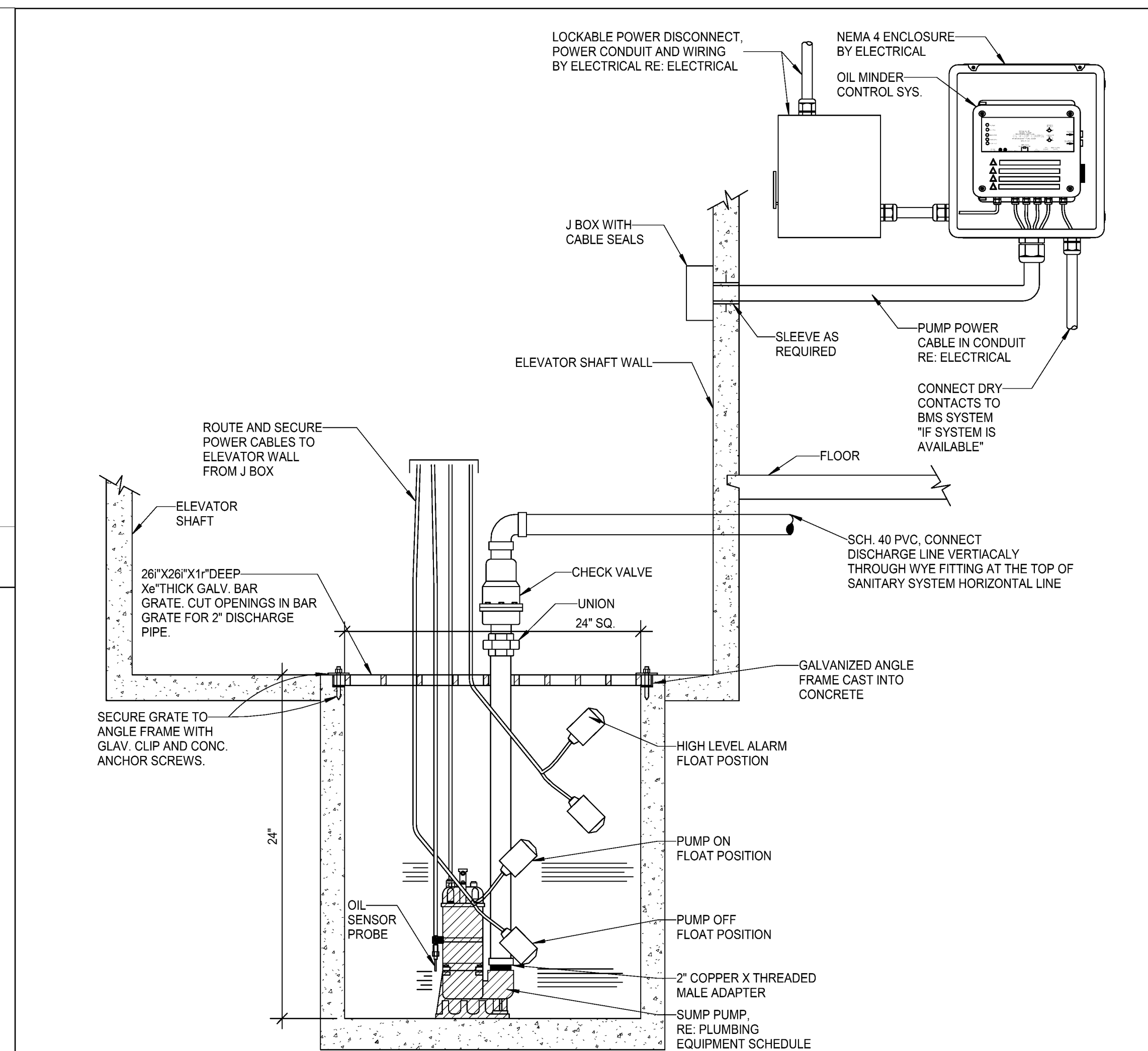
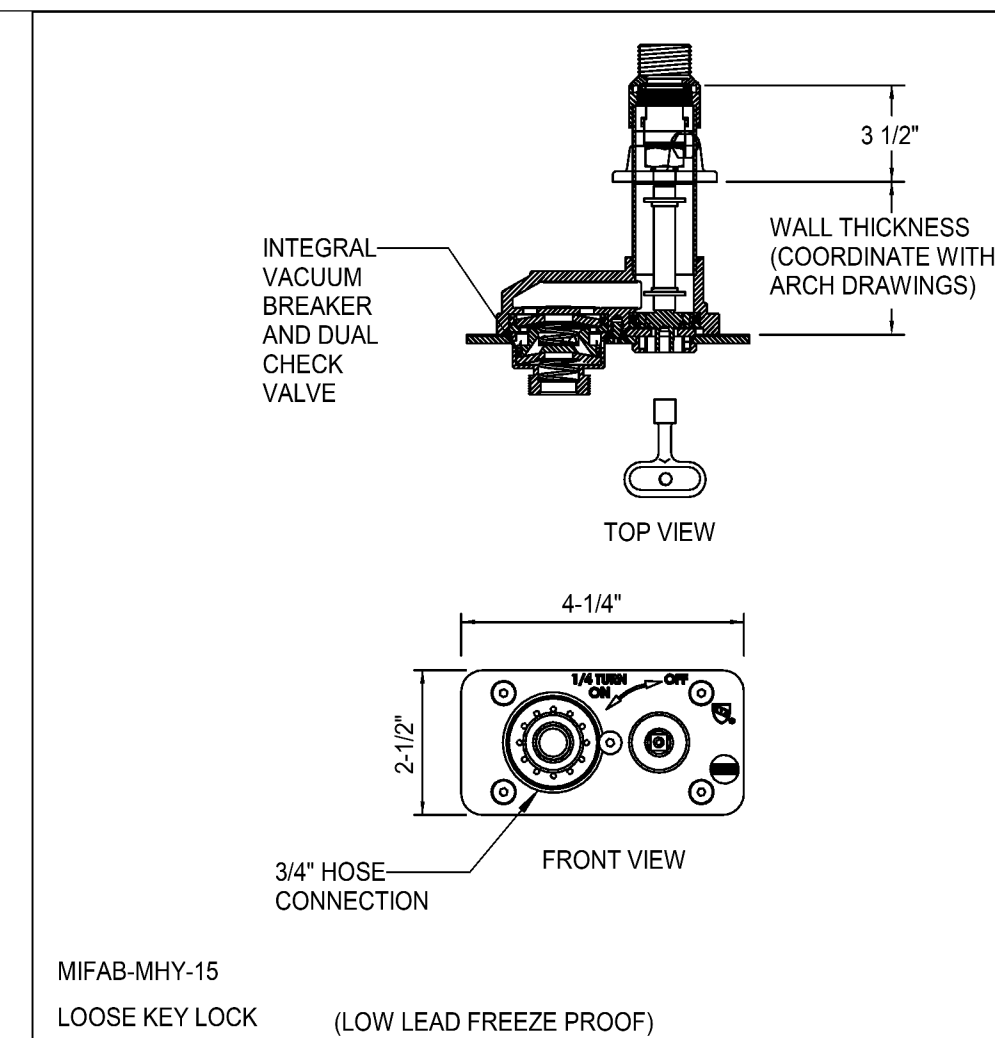
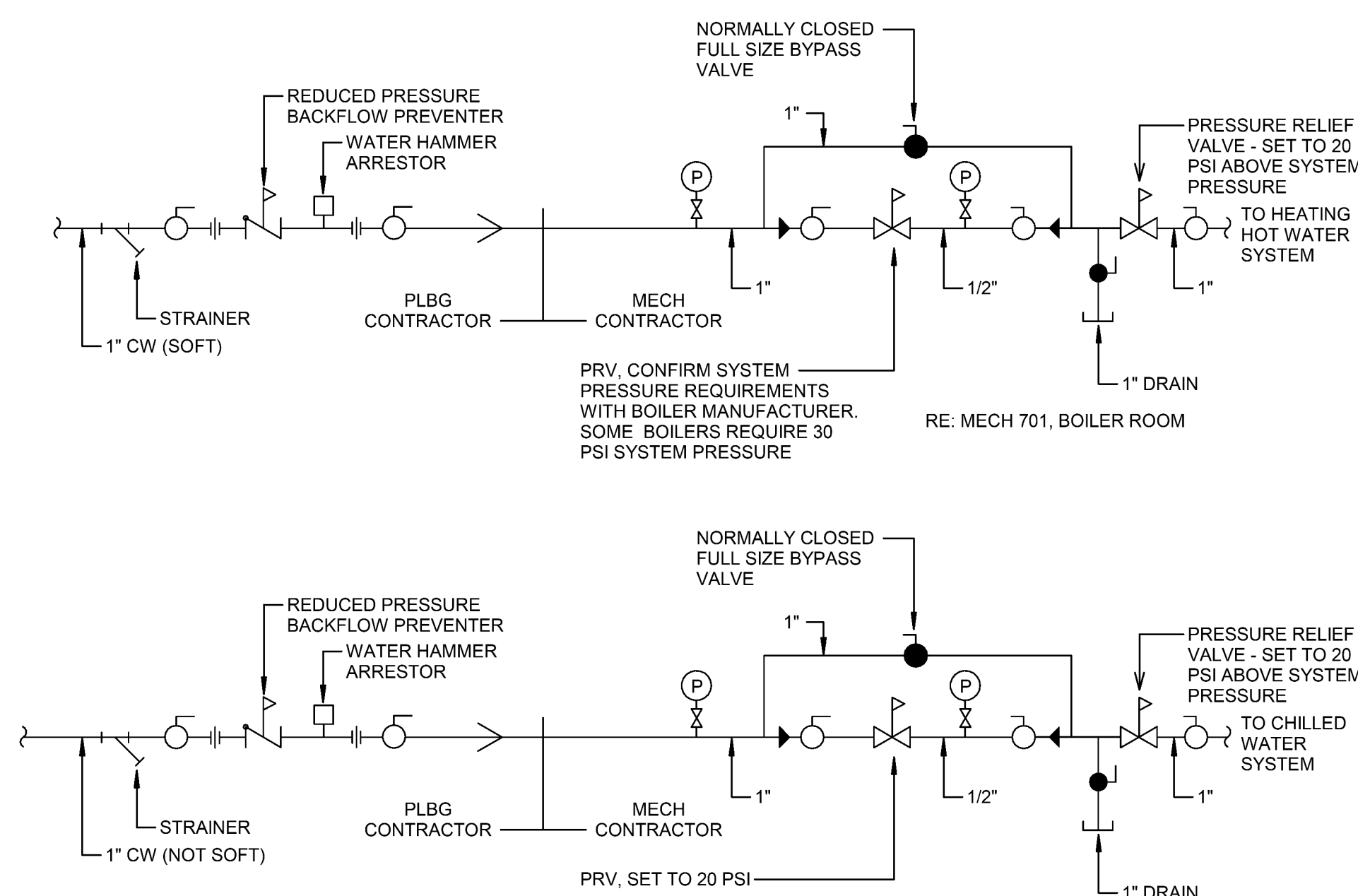
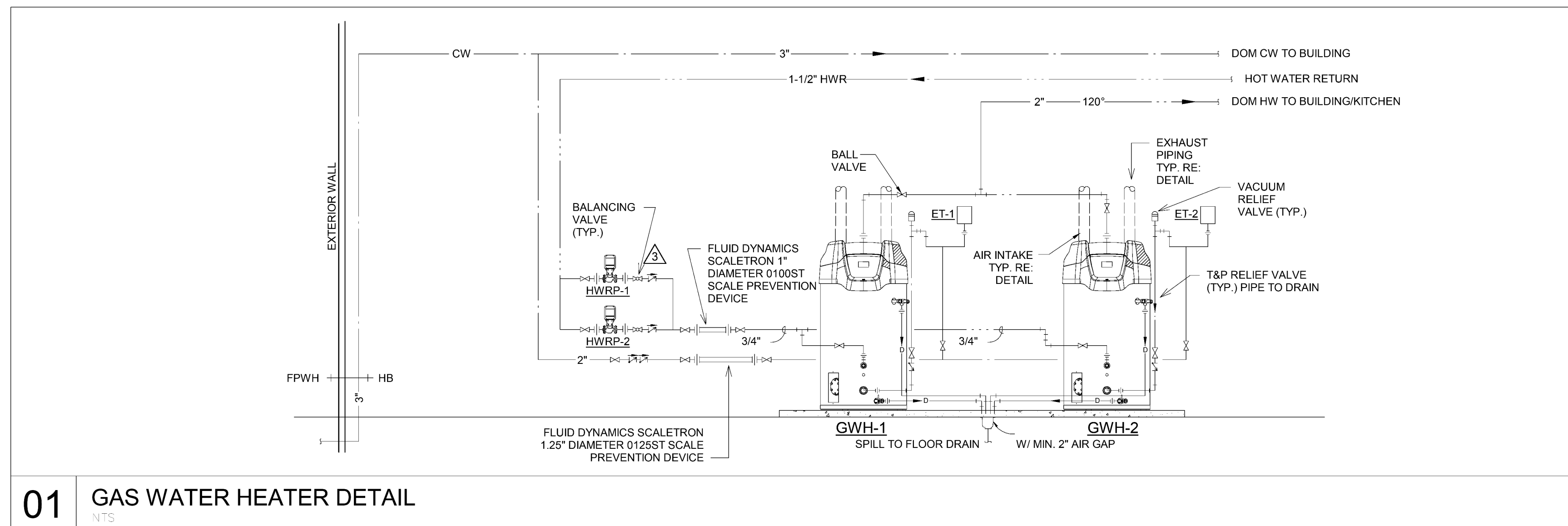
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P5.02

LEVEL 1 - KITCHEN
ENLARGED PLAN





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Tel: 713.780.3345
Fax: 713.780.3712

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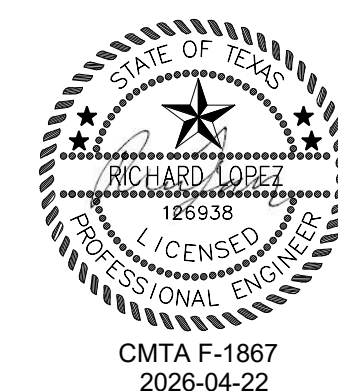
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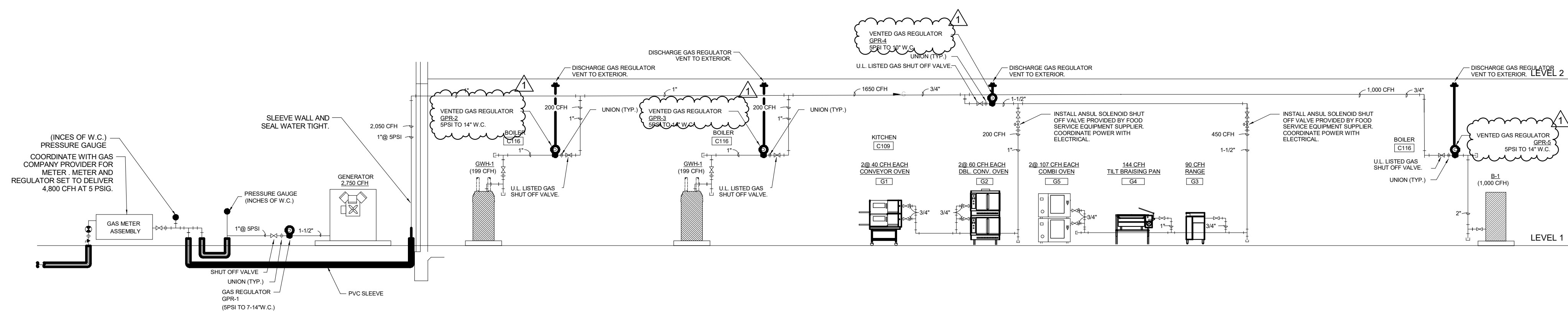
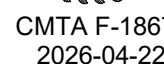
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P6.04

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PLUMBING RISER - NATURAL GAS

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CJG Engineers
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Houston, TX 77042
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Fax: 713.780.3712

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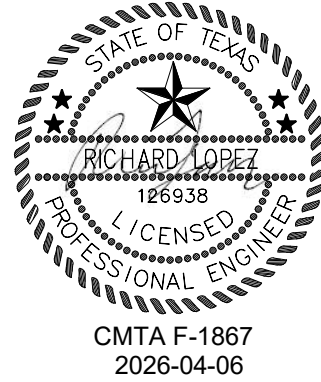
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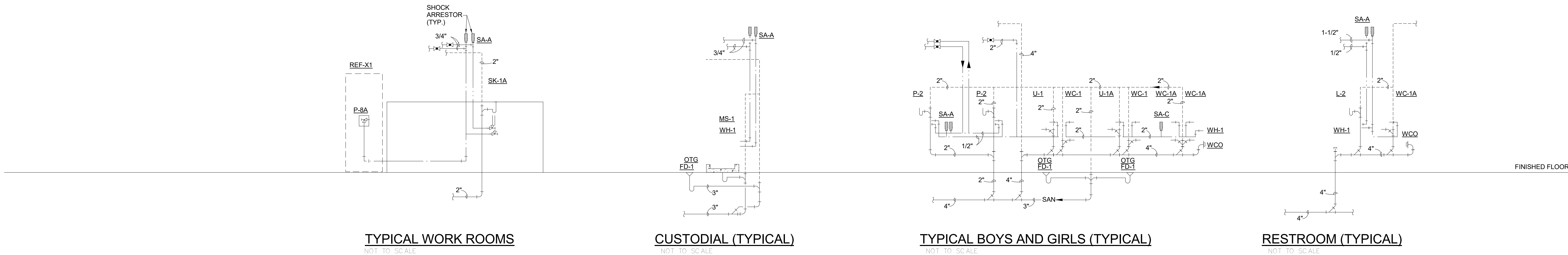
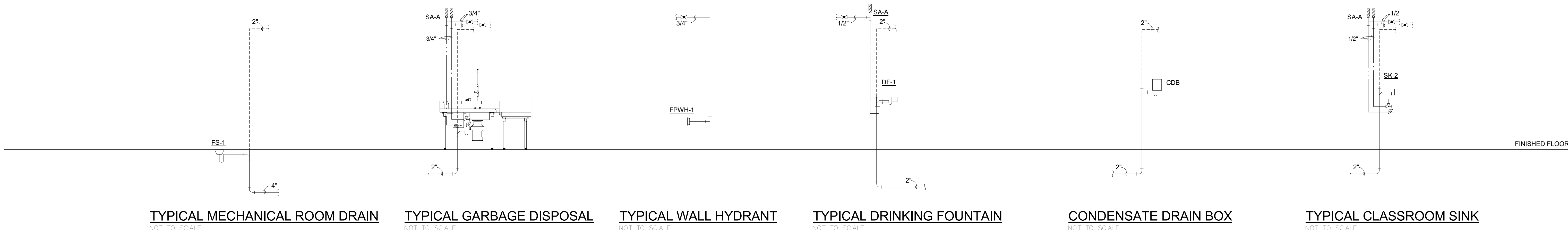


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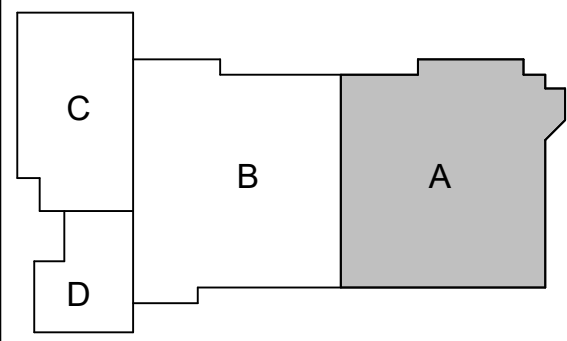
PLUMBING RISERS -
SANITARY



TAGGED NOTES
M11 FLARE OUT END OF DUCT 4" TO REDUCE FRICTION LOSS AND SOUND TRANSFER.
M14 DUCT STATIC PRESSURE SENSOR.

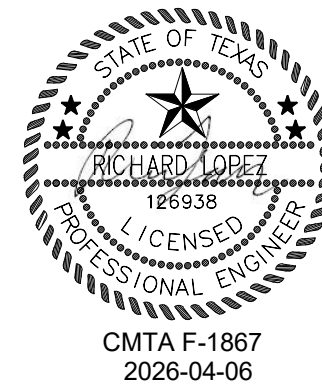
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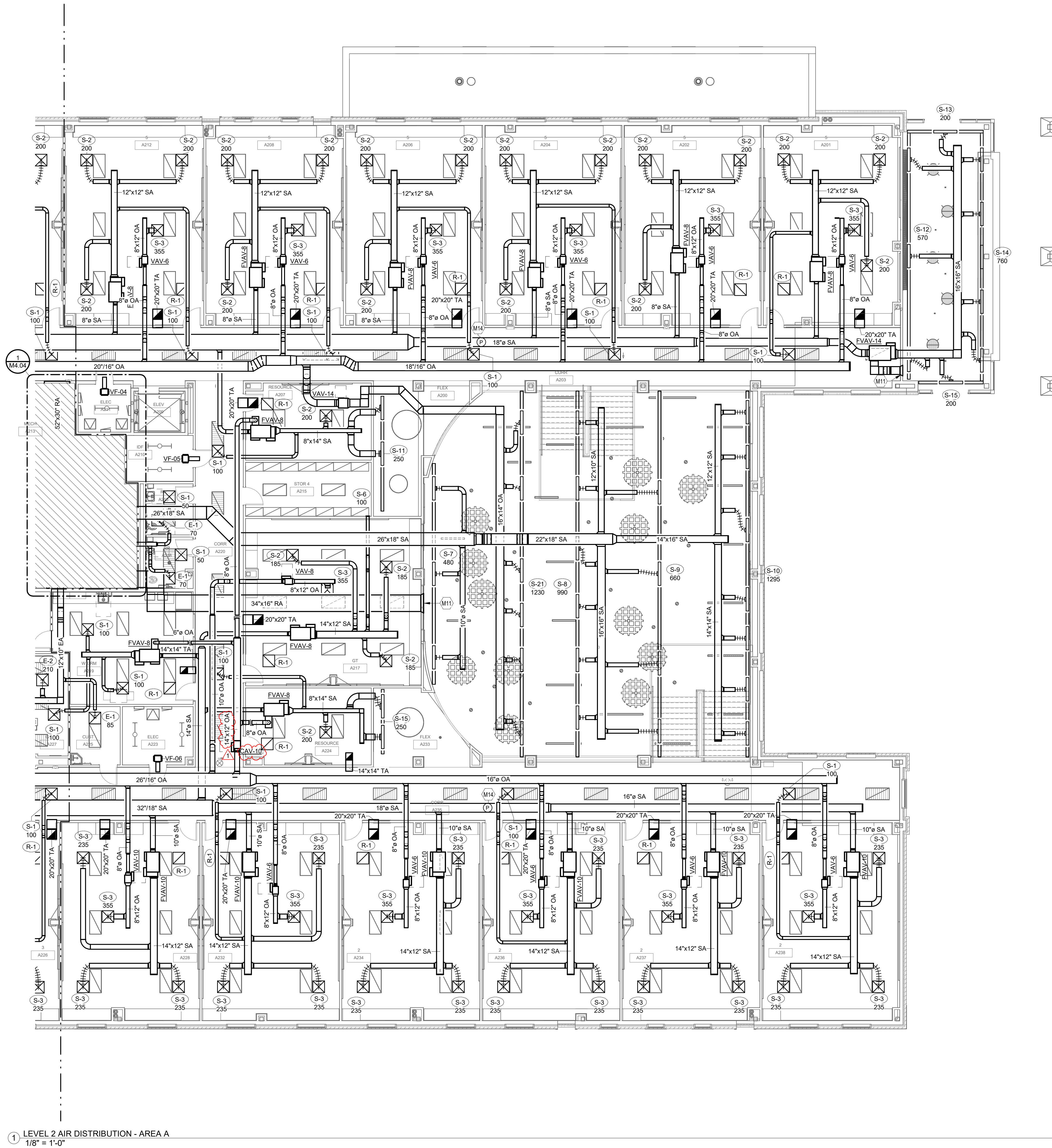
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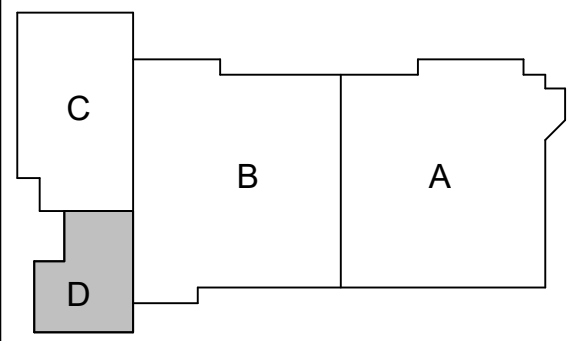
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AIR DISTRIBUTION -
LEVEL 2 AREA A



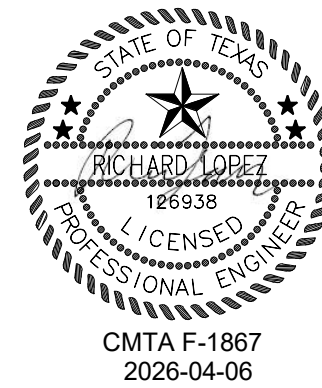
TAGGED NOTES	
M10	SEAL WALL OPENING AIR TIGHT AND PROVIDE ESCUTCHEON PLATE.
M11	FLARE OUT END OF DUCT 4" TO REDUCE FRICTION LOSS AND SOUND TRANSFER.
M18	RELIEF GRILLE TO BE MOUNTED UP HIGH.
M44	20"x20" TRANSFER AIR DUCT FOR RETURN AIR PATH TO CORRIDOR.

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CJG Engineers 3200 Wilcrest Drive, Suite 305 Houston, TX 77042 Tel: 713.780.3345 Fax: 713.780.3712	
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LANDSCAPE	
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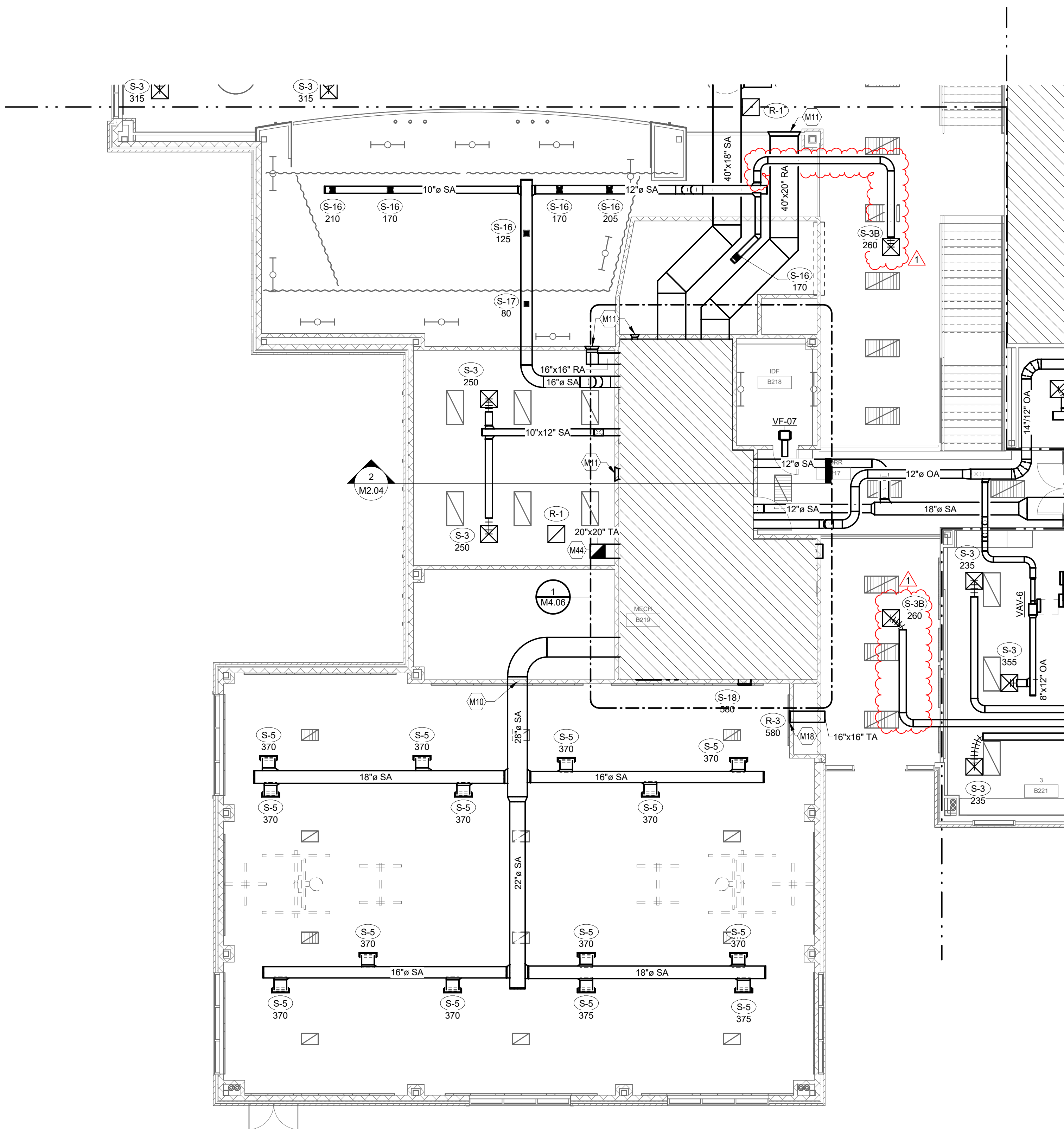
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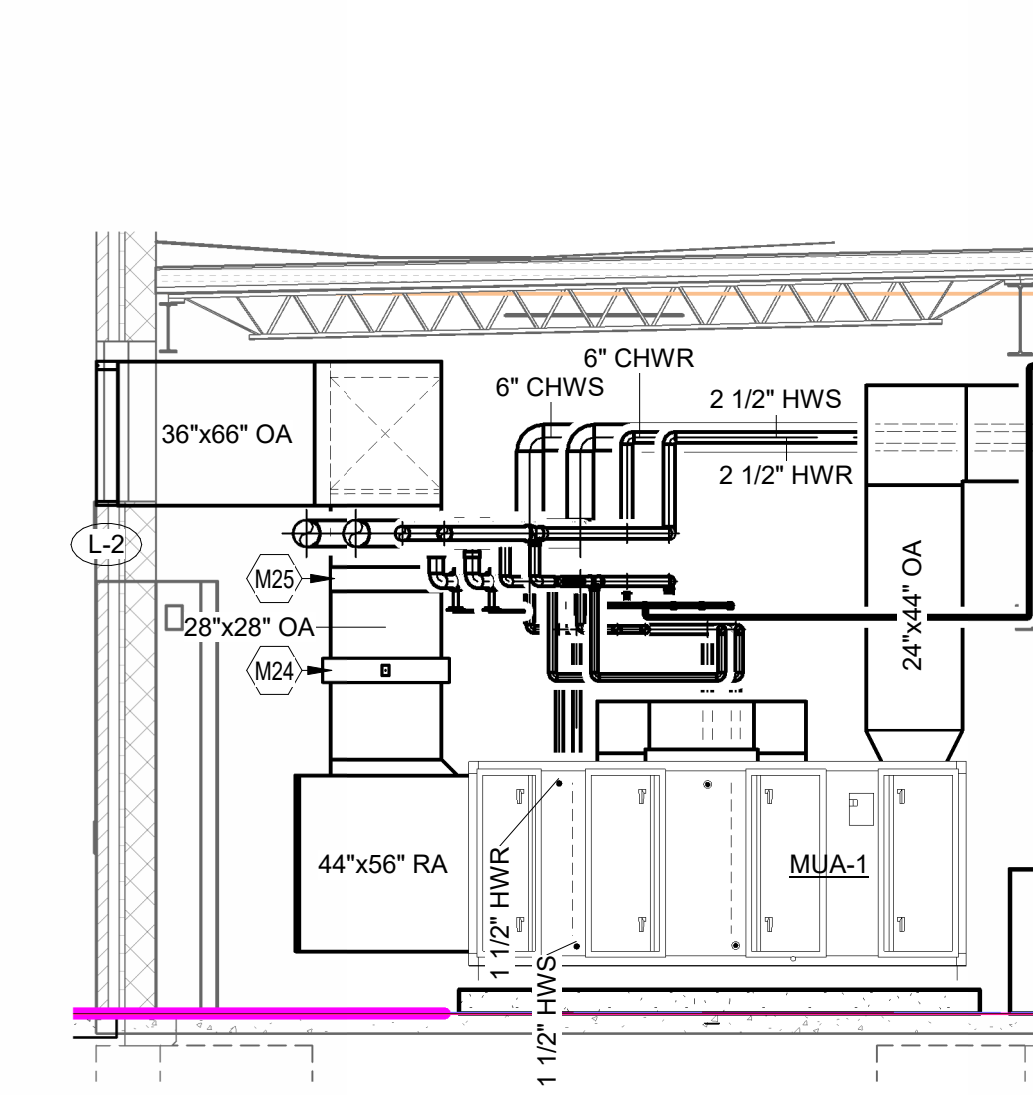
M2.08

AIR DISTRIBUTION -
LEVEL 2 AREA D

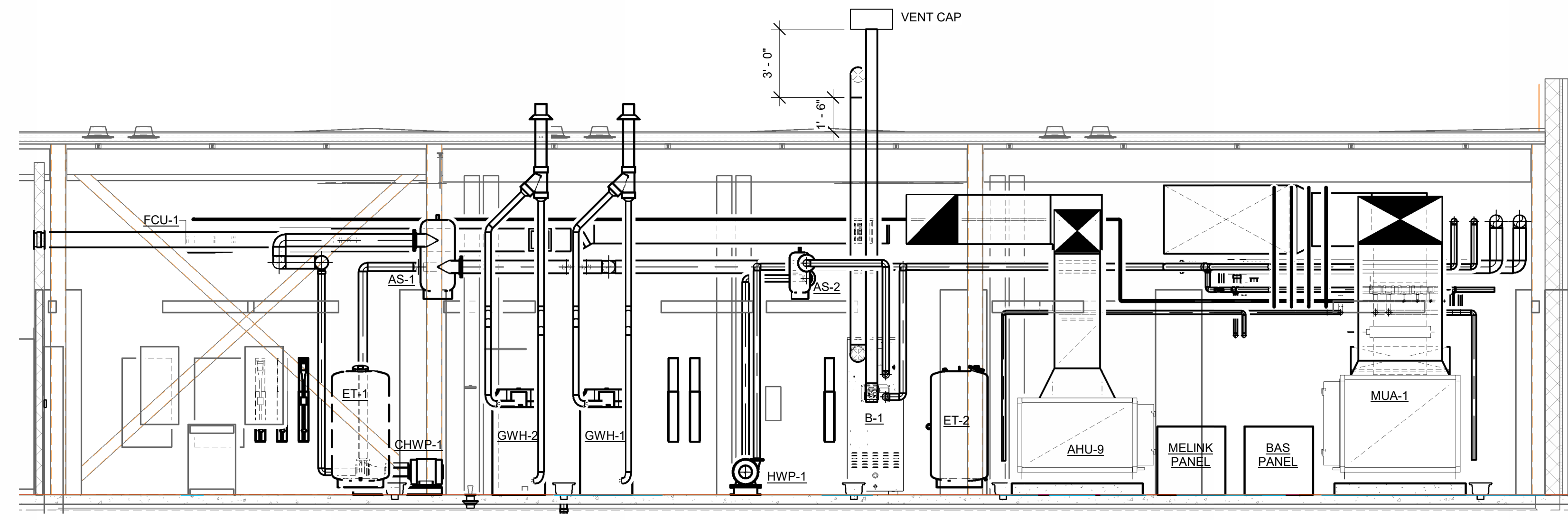


1 LEVEL 2 AIR DISTRIBUTION - AREA D
1/8" = 1'-0"





③ MAKEUP AIR UNIT SECTION VIEW
1/4" = 1'-0"



② SECTION VIEW LOOKING NORTH IN CENTRAL PLANT
1/4" = 1'-0"

- TAGGED NOTES**
- M11 FLARE OUT END OF DUCT 4" TO REDUCE FRICTION LOSS AND SOUND TRANSFER.
 - M15 DIFFUSER TO BE DUCT MOUNTED.
 - M24 MOTORIZED DAMPER, TYPICAL FOR ALL.
 - M25 MANUAL BALANCING DAMPER, TYPICAL FOR ALL.
 - M30 CARBON MONOXIDE SENSOR FOR BOILER. SENSOR SHALL DISABLE BOILER WHEN SENSOR DETECTS 100 PPM OF CARBON MONOXIDE IN SPACE. REFER TO BOILER CARBON MONOXIDE SENSOR SHUTOFF DETAIL.
 - M31 MOUNT VFDs ON UNISTRUT.
 - M32 PROVIDE STEEL STRUCTURE FROM GRADE BELOW FOR HYDRONIC PIPING SUPPORT. STEEL SUPPORT SHALL BE PROVIDED WITH CONCRETE PIER AND SHALL BE LOCATED AT EVERY ELBOW AND EVERY 8'-0" OR LESS. ANY SUPPORT SHALL NOT BLOCK ANY EQUIPMENT ACCESS. TYPICAL OF ALL. SEE MECHANICAL YARD PIPING SUPPORT DETAIL FOR MORE INFORMATION.
 - M33 HOT WATER HEATER CONCENTRIC VENT KIT. INSTALL AT ROOF LEVEL IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
 - M49 ROUTE FCU CONDENSATE TO NEAREST FLOOR DRAIN.
 - M70 6" CONCRETE PAD SHALL BE INSTALLED FOR EQUIPMENT AS NOTED ON PLANS.
 - M73 CONNECT 8" DIA. COMBUSTION AIR DUCT TO BOILER. ROUTE DUCT THROUGH ROOF AND PROVIDE GOOSENECK AND BIRD SCREEN ABOVE ROOF. TERMINATE DUCT 18 INCHES ABOVE ROOF. FLASH AND SEAL ROOF PENETRATION.
 - M74 CONNECT 6" VENT EXHAUST TO BOILER. ROUTE DUCT THROUGH ROOF AND CONNECT INTO VENT CAP. VENT CAP TO BE 3 FEET ABOVE TERMINATION POINT OF COMBUSTION DUCT.

CONSULTANTS

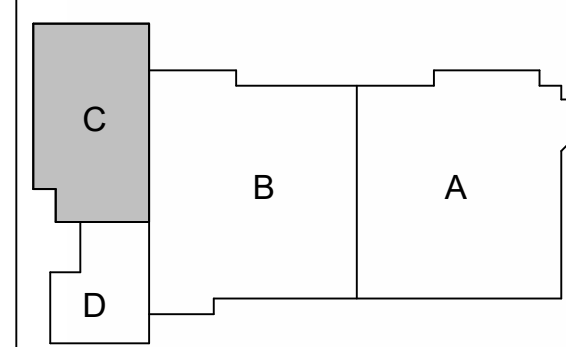
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3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
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Houston, TX 77040
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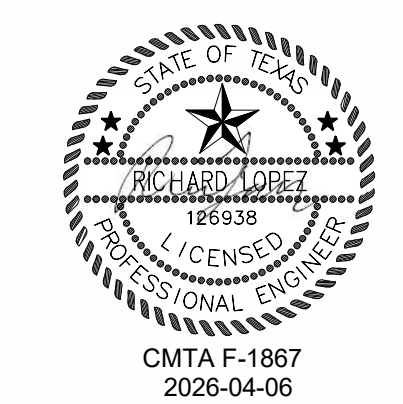
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Tel: 281.419.9899

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Katy, Texas 77493
Tel: 832.437.7377



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HOUSTON, TX 77056
tel 281.286.6605



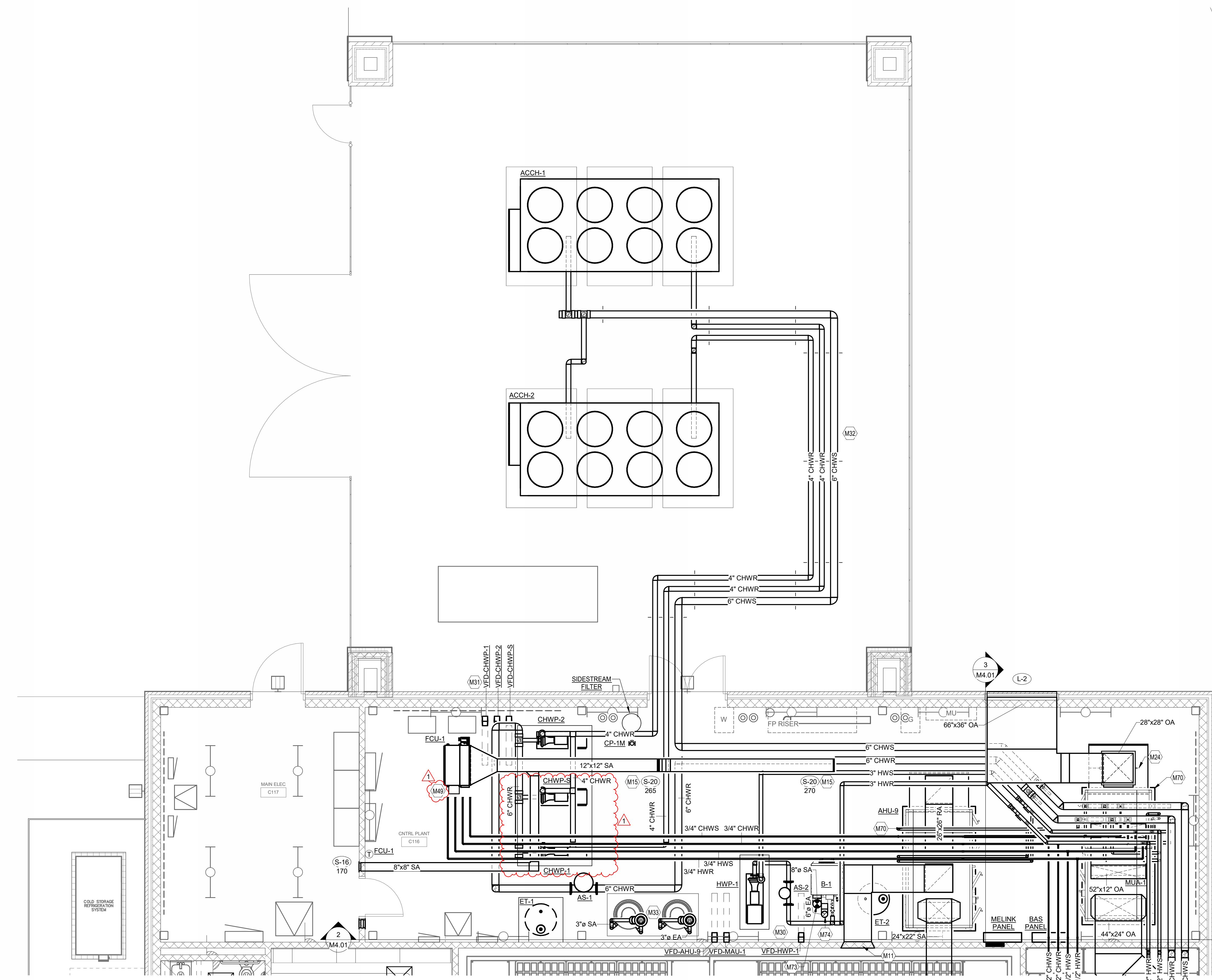
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M4.01
ENLARGED
MECHANICAL ROOM -
CENTRAL PLANT



① ENLARGED MECHANICAL ROOM - CENTRAL PLANT
1/4" = 1'-0"



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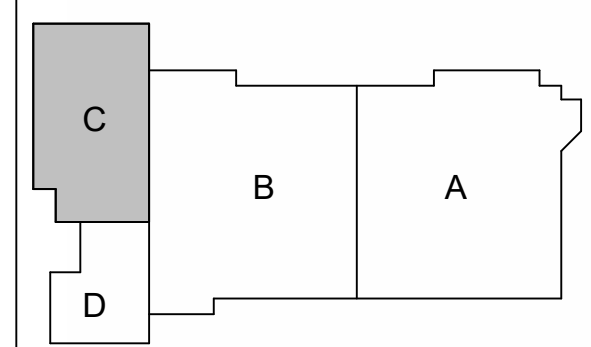
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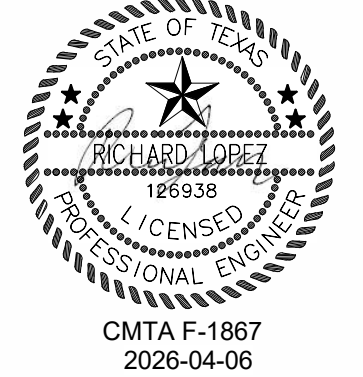
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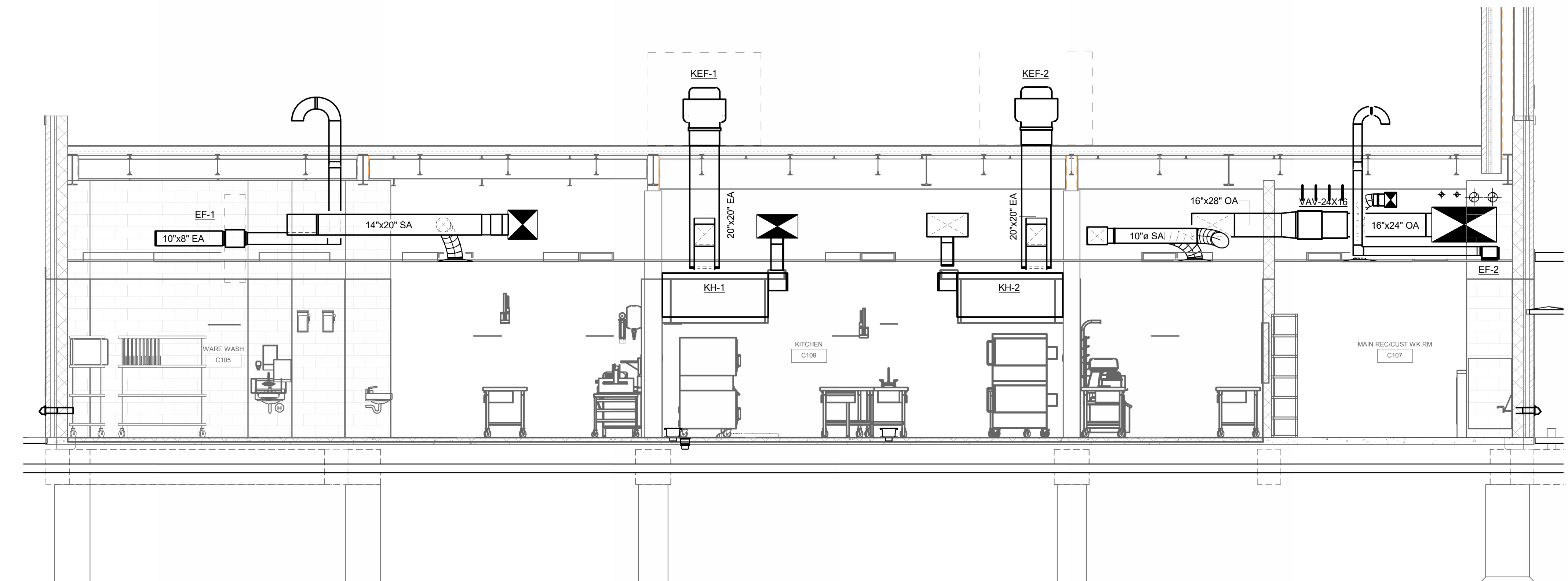
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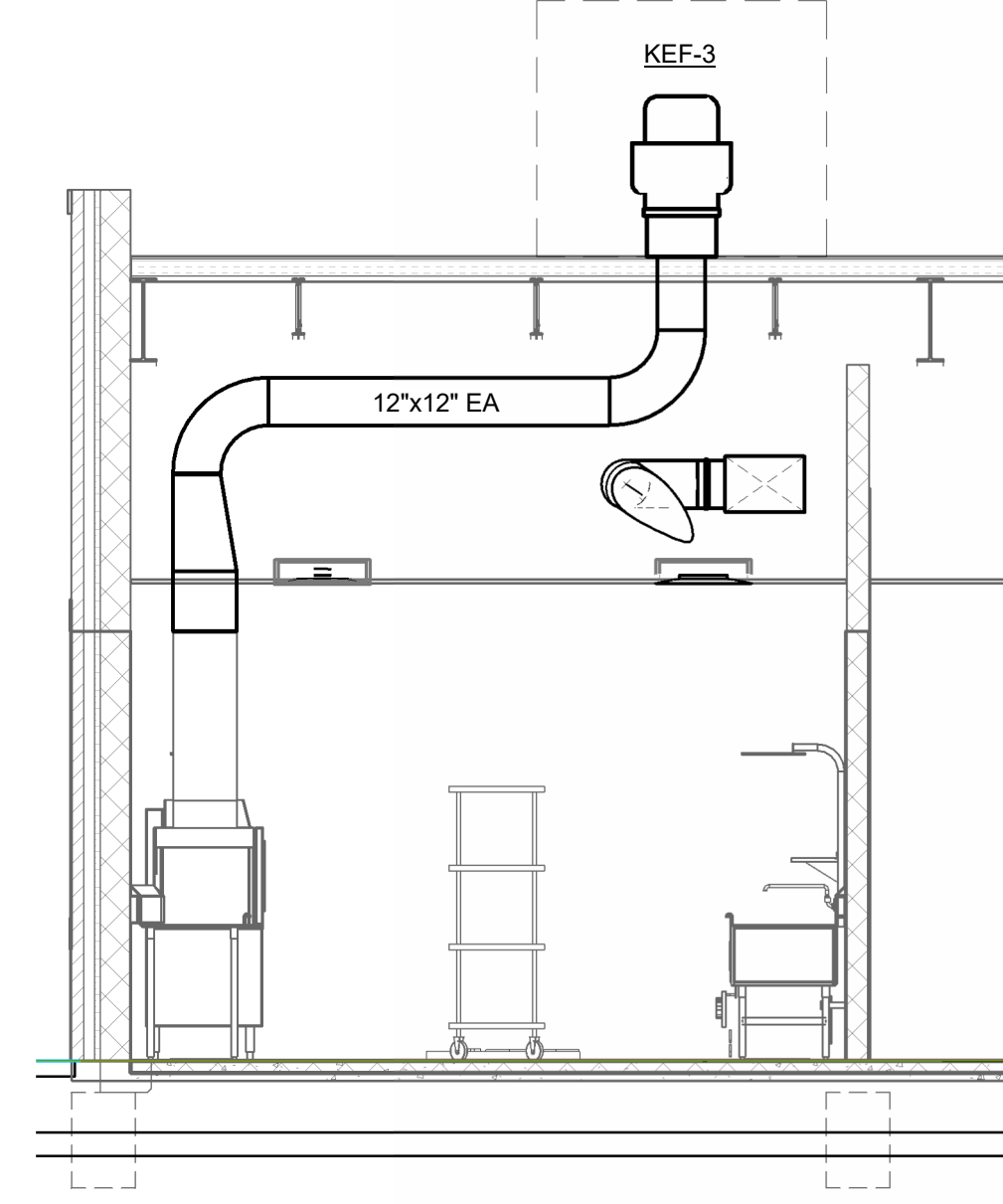
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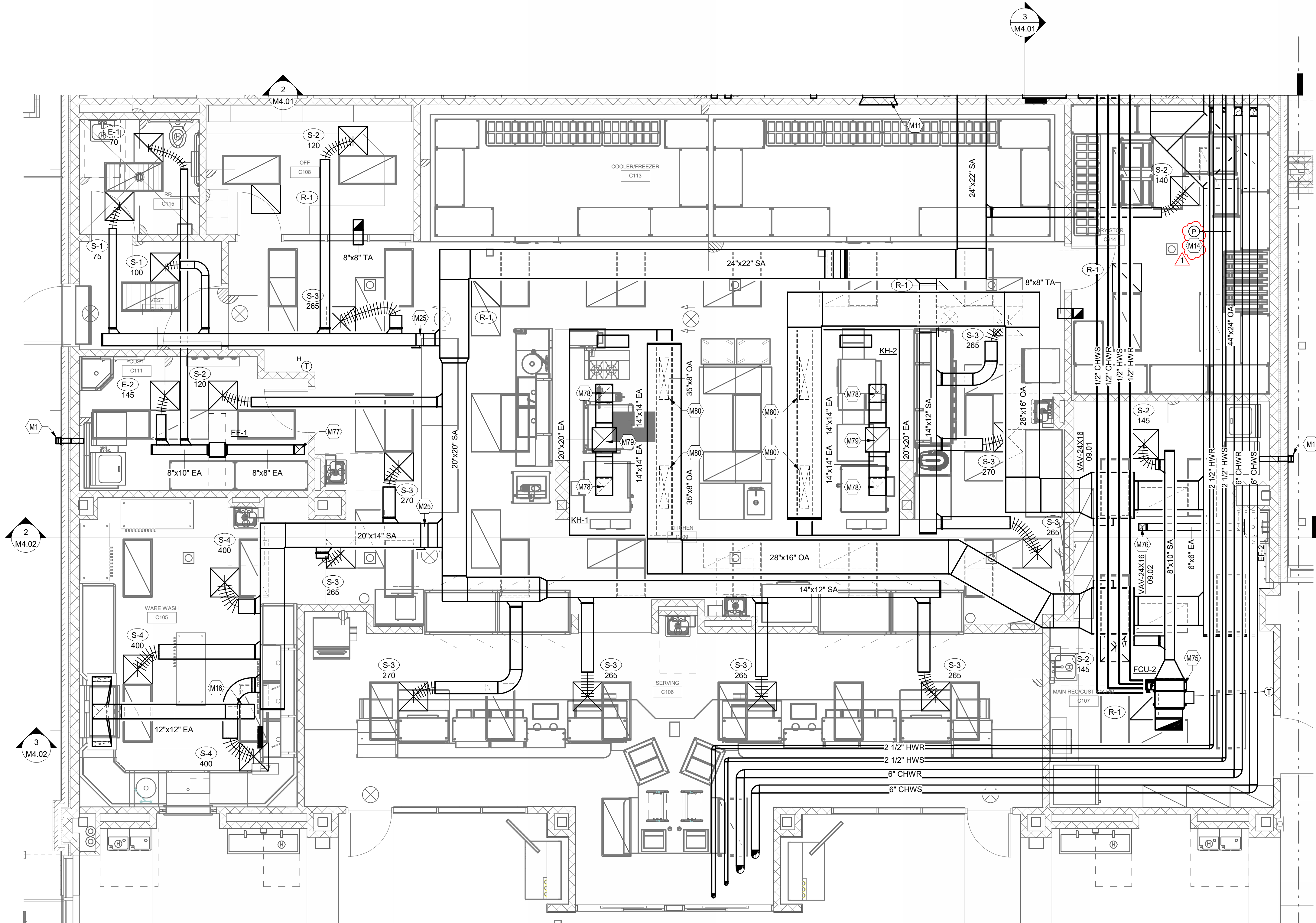
ENLARGED
MECHANICAL ROOM -
KITCHEN



2 KITCHEN HOOD SECTION VIEW
1/4" = 1'-0"



③ DISHWASHER EXHAUST AIR DUCT CONNECTION
1/4" = 1'-0"



1 ENLARGED PLAN - KITCHEN
1/4" = 1'-0"





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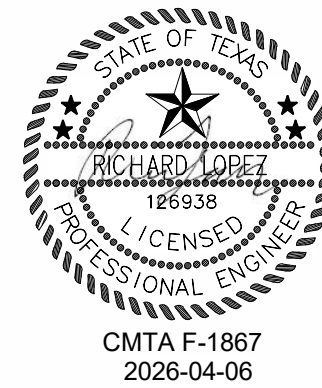
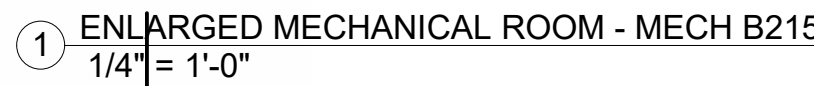
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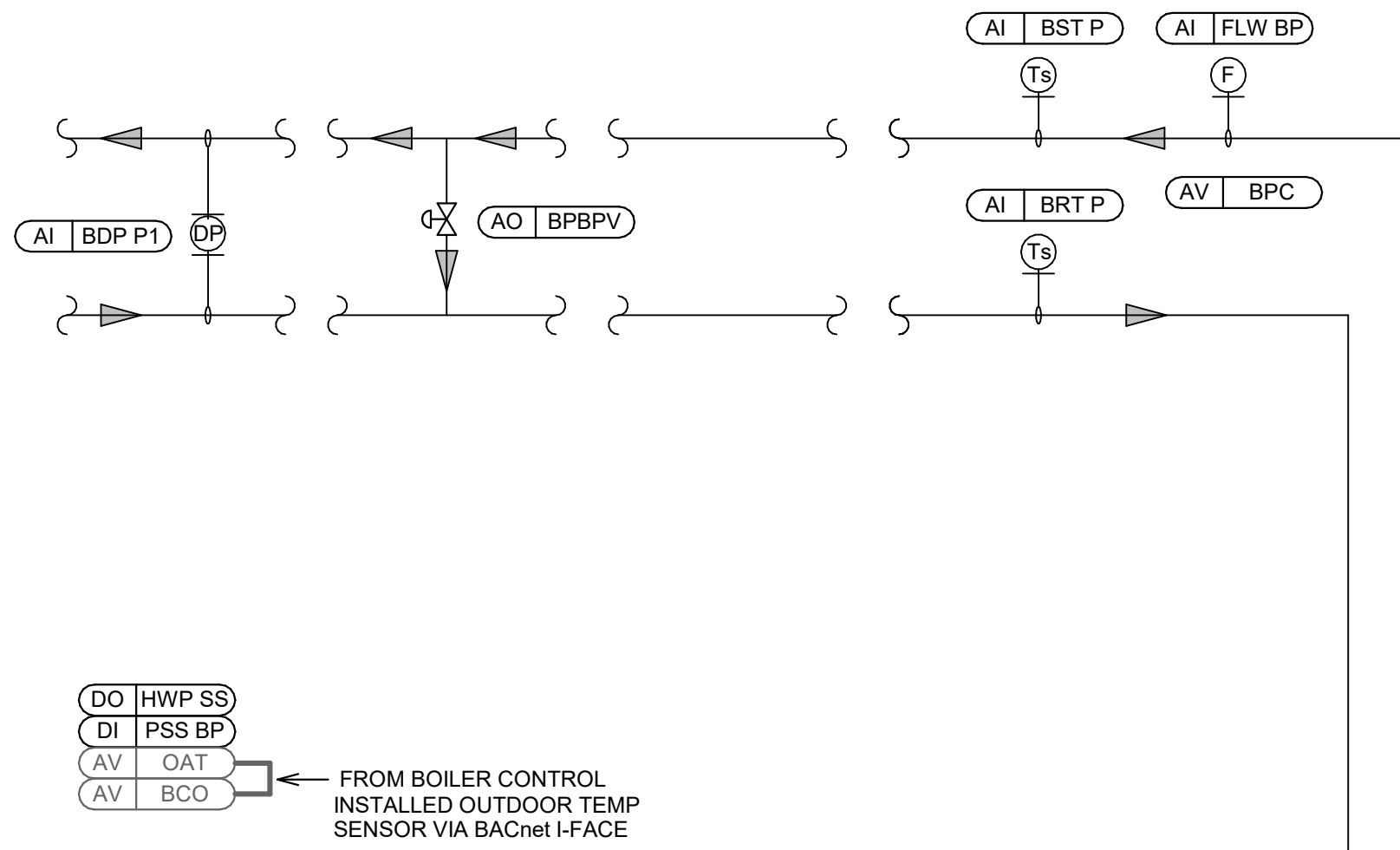
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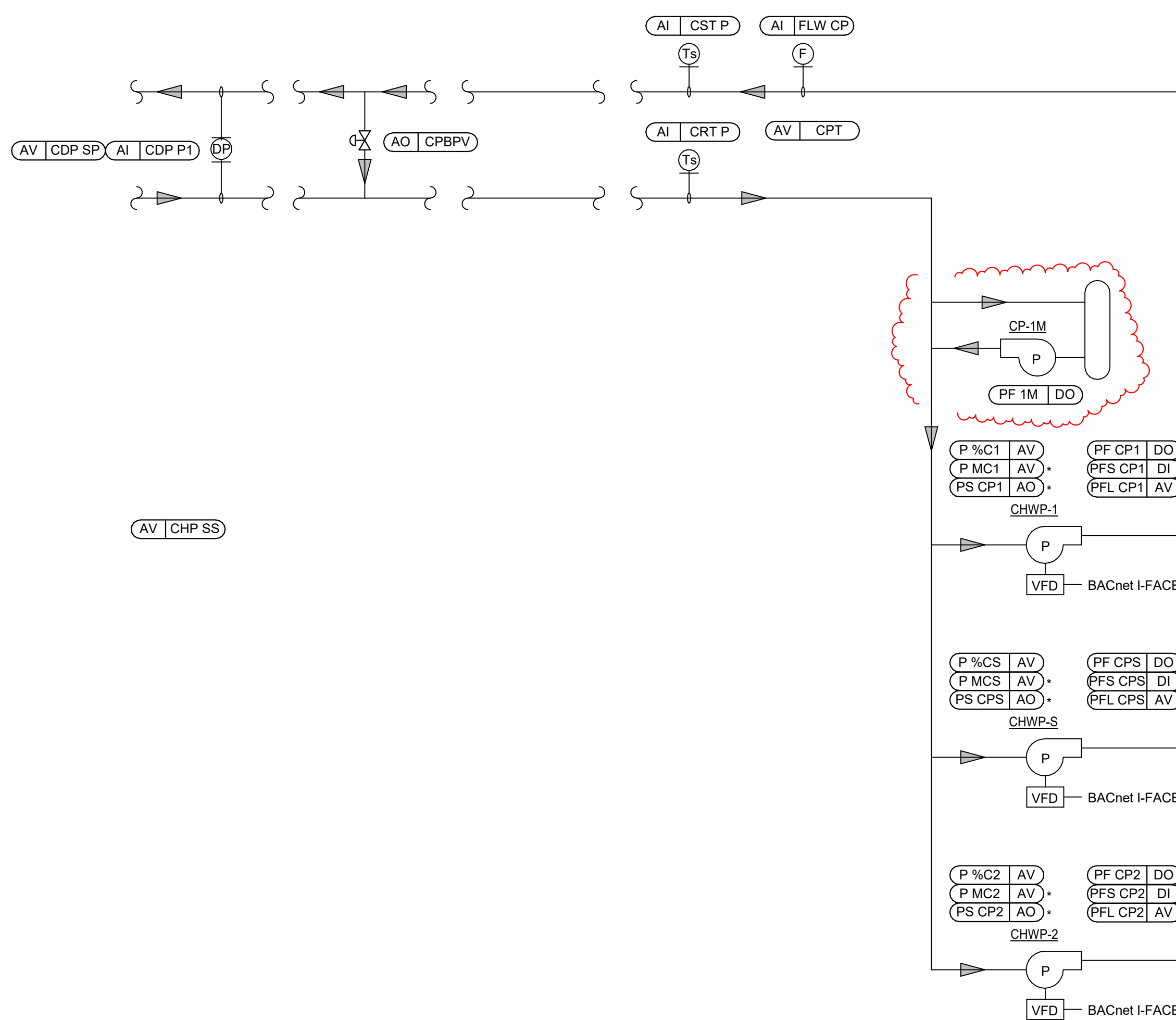
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ENLARGED
MECHANICAL ROOM -
SECOND FLOOR





HEATING HOT WATER PLANT



CHILLED WATER PLANT

GENERAL BUILDING AUTOMATION SYSTEM (BAS) NOTES:

- GRAPHIC DISPLAYS:
- PROVIDE A SUMMARY TABLE ACCESSIBLE AT THE FRONT END SHOWING THE FOLLOWING:
 1. CHILLED WATER CENTRAL PLANT INFORMATION:
 - A. CHILLERS STATUSES
 - B. PUMP STATUSES
 - C. CHWS TEMPERATURE TO BUILDING
 - D. CHWR TEMPERATURE FROM BUILDING
 - E. EQUIPMENT FAILURE ALARMS
 2. BOILER CENTRAL PLANT INFORMATION:
 - A. BOILER STATUS
 - B. PUMP STATUS
 - C. HWS TEMPERATURE TO BUILDING
 - D. CHWR TEMPERATURE FROM BUILDING
 - E. EQUIPMENT FAILURE ALARMS
 3. AIR HANDLING UNIT INFORMATION:
 - A. AHU SUPPLY FAN SPEEDS
 - B. AHU DISCHARGE AIR TEMPERATURES
 - C. AHU CHW VALVE % OPEN POSITIONS
 - D. AHU ZONE AVERAGE TEMPERATURES
 4. OUTDOOR AIR HANDLING UNIT INFORMATION:
 - A. OAU SUPPLY FAN SPEEDS
 - B. OAU DISCHARGE AIR TEMPERATURES
 - C. OAU CHW VALVE % OPEN POSITIONS
 - D. OAU EXHAUST DEW POINT TEMPERATURE
 5. RELATIVE HUMIDITY FROM BUILDING HUMIDITY SENSORS
 - PROVIDE A COLOR TEMPERATURE MAP OF THE SCHOOL FEATURING THE FOLLOWING:
 1. AHU ZONING
 2. SPACE TEMPERATURE
 3. SPACE CO2
 4. MISC. HUMIDITY SENSORS
 5. ZONE COLORS BASED ON ZONE TEMPERATURE OFFSET FROM SETPOINT
 6. ROOM NUMBERS
 - A. ROOM NUMBERS MUST BE UPDATED TO MATCH THE ACTUAL ROOM NUMBERS PROVIDED WITH THE BUILDING SIGNAGE. COORDINATE THESE ROOM NUMBERS WITH THE OWNER/DESIGN TEAM DURING CONSTRUCTION.
- NOTES:
1. WHERE A SINGLE ROOM IS SUPPLIED VIA A FAN POWERED TERMINAL UNIT AND SINGLE DUCT TERMINAL UNIT, BOTH TERMINAL UNITS' GRAPHICS SHALL BE DISPLAYED ON A SINGLE WEBPAGE.
 2. TERMINAL UNITS HAVE BEEN PROVIDED WITH INSTANCE TAGS BASED OFF THE CURRENT ROOM NUMBER ASSIGNMENTS. THE BAS CONTRACTOR SHALL VERIFY ADJUST THESE INSTANCE TAG NUMBERS TO MATCH THE ACTUAL BUILDING ROOM SIGNAGE NUMBERS.
 3. REFER TO SPECIFICATION 23 09 93 SEQUENCE OF OPERATIONS FOR SEQUENCES OF OPERATIONS THAT ACCOMPANY THE CONTROL SCHEMATICS.

POINT TYPES:

AN: ANALOG VIRTUAL
AO: ANALOG OUTPUT
AI: ANALOG INPUT
DV: DIGITAL VIRTUAL
DO: DIGITAL OUTPUT
DI: DIGITAL INPUT
NA: CONTROL INTEGRAL TO EQUIPMENT AND DOES NOT REQUIRE BAS POINT

*POINTS NOTED WITH AN * ARE NOT REQUIRED TO BE DISPLAYED GRAPHICALLY ON THE FRONT END

POINT NAMES:

AHU R: AHU RUN COMMAND
BCO: BOILER CARBON MONOXIDE SENSOR
BDP P#: BOILER PLANT DIFFERENTIAL PRESSURE SENSOR, HARDWIRED POINT BACK TO HEATING HOT WATER PUMP CONTROLLER
BPBPV: HEATING HOT WATER PLANT BYPASS VALVE POSITION (CALCULATED, % OPEN), THIS POINT MUST BE HARDWIRED BACK TO THE BOILER PLANT CONTROLLER
BPC: BOILER PLANT CAPACITY (CALCULATED)
BRT B#: B# BOILER RETURN WATER TEMP
BRT P: HEATING HOT WATER PLANT RETURN TEMP
BST B: HEATING HOT WATER PLANT SUPPLY TEMP FOR BOILER STAGING CONTROL
BST P: HEATING HOT WATER PLANT SUPPLY TEMP
BST B#: B# BOILER SUPPLY WATER TEMP
CCST: COOLING COIL SUPPLY TEMP
CCST SP: COOLING COIL SUPPLY TEMP SETPOINT
CDL C#: CHILLER ACCH-# DEMAND LIMIT
CDP C#: CHILLER DIFFERENTIAL PRESSURE SENSOR
CDP SP: CHILLED WATER PLANT DIFFERENTIAL PRESSURE SENSOR (TOTAL OF 2), HARDWIRED POINT BACK TO CHILLER PLANT UNITARY CONTROLLER
CFL C#: CHILLER FAILURE ALARM, PLAN FOR TWO FAILURE POINT CONNECTIONS TO EACH CHILLER AND VERIFY TOTAL QUANTITY WITH ACCEPTED CHILLER MANUFACTURER
CHP SS: CHILLED WATER PLANT START/STOP
CHWR: CHILLED WATER RETURN TEMP
CHWV: CHILLED WATER VALVE POSITION (CALCULATED % OPEN)
CLG SP: COOLING DRY BULB TEMP SETPOINT
CLP C#: CHILLER CURRENT OUTPUT
CO2 SP: SETPOINT OF CO2 DIFFERENTIAL BETWEEN OUTDOOR AIR AND SPACE SAMPLE, 500 PPM
CPBPV: CHILLED WATER PLANT BYPASS VALVE POSITION (CALCULATED, % OPEN), HARDWIRED THIS POINT BACK TO THE CHILLED PLANT CONTROL PANEL (LOCATED REMOTELY)
CPT: CHILLED WATER PLANT TOTAL TONNAGE
CRT C#: ACCH-# RETURN CHILLED WATER TEMP
CRT P: CHILLED WATER PLANT RETURN WATER TEMP
CSR P: CHILLED WATER PLANT SUPPLY WATER TEMP
CSS C#: CHILLER ACCH-# START/STOP
CST C#: ACCH-# SUPPLY CHILLED WATER TEMP
CST SP: CONSTANT VOLUME EXHAUST DUCT PRESSURE
CUEP SP: CONSTANT VOLUME EXHAUST DUCT PRESSURE SETPOINT
DP C#: DUCT STATIC PRESSURE
DSP: DUCT STATIC PRESSURE SETPOINT
EADP SP: EXHAUST AIR DEW POINT TEMP SETPOINT
EADPT: EXHAUST AIR DEW POINT TEMP
EARH: EXHAUST AIR RELATIVE HUMIDITY
EAT: EXHAUST AIR DRY BULB TEMP
EFSS: EXHAUST FAN START/STOP
EF FLT: EXHAUST FAN FAULT
EF MAX: EXHAUST FAN MAX SPEED AS SET BY TAB
EF SPD: EXHAUST FAN SPEED
EF %SP: EXHAUST FAN SPEED AS % OF MAX, CALCULATED AS [EF %SP] = [EF SPD] / [EF MAX]
EF CT: EXHAUST FAN STATUS, 1 PER FAN (VIA CT INSTALLED ON FAN)
EHC: ELECTRIC HEATING COIL SCR OUTPUT
EWBD: ENERGY RECOVERY WHEEL BYPASS DAMPER POSITION (OPEN/CLOSED)
EWET: ENERGY RECOVERY WHEEL DISCHARGE EXHAUST AIR DRY BULB TEMP
EWOT: ENERGY RECOVERY WHEEL DISCHARGE OUTDOOR AIR DRY BULB TEMP
EW FLT: ENERGY RECOVERY WHEEL FAULT
EW SPD: ENERGY RECOVERY WHEEL FAN SPEED
EWSS: ENERGY RECOVERY WHEEL START/STOP
FBD: FACE AND BYPASS DAMPER POSITION (CALCULATED % OPEN FACE)
FLW C#: ACCH-# CHILLER FLOW
FLW B#: B# BOILER FLOW
FLW BP: HEATING HOT WATER PLANT SUPPLY FLOW
FLW CP: CHILLED WATER PLANT SUPPLY FLOW
FRZ: FREEZE STAT
FRZ C#: CHILLER # LOW AMBIENT TEMPERATURE PUMP-START
F SS: HVLS FAN START/STOP
F SPD: HVLS FAN SPEED
GEAD: GENERAL EXHAUST AIR MODULATING DAMPER POSITION (CALCULATED % CLOSED)
HCST: HEATING COIL SUPPLY TEMP
HTA: HIGH TEMPERATURE ALARM
HTG SP: HEATING DRY BULB SUPPLY TEMP
HWP SS: HEATING HOT WATER BOILER PLANT START/STOP
HWR: HOT WATER RETURN TEMP
HWRV: HOT WATER VALVE POSITION (CALCULATED % OPEN)
ID: ISOLATION DAMPER (DAMPER AND CONTROL ARE INTEGRAL TO FAN)
ELC: EXTERIOR LIGHTING CONTROLS ON/OFF
ELDW: ELECTRIC METER MSB-# DEMAND (KW)
ELDT: TOTAL ELECTRIC METER DEMAND (KW)
EMCH: ELECTRIC METER MSD-# CONSUMPTION (KWH)
EMCT: TOTAL ELECTRIC METER CONSUMPTION (KWH)
KHA: KITCHEN HOOD ANSUL SYSTEM ACTIVATION
KHET#: REPRESENTS HOOD NUMBER
KHL: KITCHEN HOOD EXHAUST SYSTEM ON LIGHT SIGNAL
KHS: KITCHEN HOOD EXHAUST SYSTEM SWEEP-OFF
MAT: MIXED AIR TEMPERATURE
HSPCO: HIGH DUCT STATIC PRESSURE CUT-OFF
OA CO2: OUTDOOR AIR CO2, OBTAINED FROM FACILITIES MONITORING SYSTEM
OAT: DRY BULB OUTDOOR AIR TEMP
PF BP#: HWP-# PUMP START/STOP
PF CP#: CHWP-# PUMP START/STOP
PFL BP#: HWP-# PUMP FAILURE ALARM
PFL CP#: CHWP-# PUMP FAILURE ALARM
PF IM: CP-1M PUMP ON/OFF COMMAND
PFS BP#: HWP-# PUMP STATUS VIA FLOW SWITCH
PFS CP#: CHWP-# PUMP STATUS VIA FLOW SWITCH
PHCT: PREHEAT COIL DISCHARGE TEMP
PHCT SP: PREHEAT COIL DISCHARGE TEMP SETPOINT
PIS: STAND-BY PUMP TEMPORARY IDENTITY (CHWP-1A, CHWP-1B, CHWP-1S)
PS BP#: HWP-# PUMP SPEED
P MB#: HWP-# MAX PUMP SPEED
PS %B#: HWP-# PUMP SPEED AS PERCENT OF MAX, CALCULATED AS [PS %B] = [PS BP#] / [P MB#]
PS CP#: CHWP-# PUMP SPEED
P MC#: CHWP-# MAX PUMP SPEED
PS %C#: CHWP-# PUMP SPEED AS PERCENT OF MAX, CALCULATED AS [PS %C] = [PS CP#] / [P MC#]
PSS BP: HEATING HOT WATER PLANT PUMPING SYSTEM START/STOP (FROM BOILER CONTROL PANEL)
RADPT: DEW POINT RETURN AIR TEMP
RADP SP: RETURN AIR DEW POINT SETPOINT
RAH: RETURN AIR RELATIVE HUMIDITY
RAT: DRY BULB RETURN AIR TEMP
RH: RELATIVE HUMIDITY
RH SP: RELATIVE HUMIDITY SETPOINT
RPSS: RECIRCULATION PUMP START/STOP
SADPT: SUPPLY AIR DEW POINT TEMP
SARH: SUPPLY AIR RELATIVE HUMIDITY
SAT SP: DRY BULB SUPPLY AIR TEMP SETPOINT
SAT: DRY BULB SUPPLY AIR TEMP
SD: DUCT SMOKE DETECTOR
SEAD: SHUT-OFF EXHAUST AIR CONTROL DAMPER POSITION (OPEN/CLOSED)
SF MAX: MAX SUPPLY FAN SPEED (CONFIRM WITH TAB MAX SPEED SETTINGS)
SFSS: SUPPLY FAN START/STOP
SF FLT: SUPPLY FAN FAULT
SF SPD: SUPPLY FAN SPEED
SF %SP: SUPPLY FAN % SPEED OF MAX, CALCULATED BY [SF %SP] = [SF SPD] / [SF MAX]
SF CT: SUPPLY FAN STATUS, 1 PER FAN (VIA CT INSTALLED ON FAN)
SOAD: SHUT-OFF OUTDOOR AIR CONTROL DAMPER POSITION (OPEN/CLOSED)
TUD: TERMINAL UNIT PRIMARY AIR VALVE POSITION (CALCULATED, % OPEN)
TUF SP: TERMINAL UNIT PRIMARY AIR VALVE AIRFLOW
TUFS: TERMINAL UNIT FAN START/STOP
TUP: TERMINAL UNIT PRIMARY AIR VALVE DIFFERENTIAL PRESSURE
UV: UV LIGHT STATUS
VES#: CHW STAND-BY PUMP ISOLATION POSITION (VIA END SWITCH)
VESMC: CHW STAND-BY PUMP ISOLATION VALVE # OPEN/CLOSED COMMAND
ZCO2: ZONE CO2, OBTAINED FROM FACILITIES MONITORING SYSTEM
ZCO2D: DIFFERENTIAL IN CO2 BETWEEN OUTDOOR AIR AND SPACE SAMPLE
ZTEMP: DRY BULB ZONE TEMPERATURE

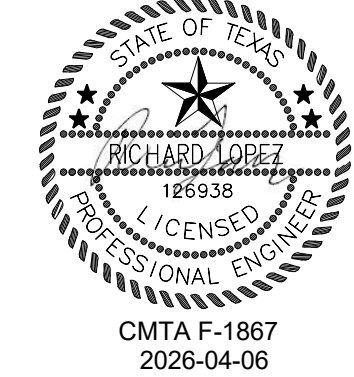
SENSOR TYPES:

DUCT PROBE SENSOR
OR
INSERTION FLOW METER
INSERTION THERMOWELL PIPE SENSOR
ACTUATED CONTROL DAMPER
SERPENTINED ACROSS COIL SENSOR

CONSULTANTS
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712
FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959
LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949
MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899
CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377

REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

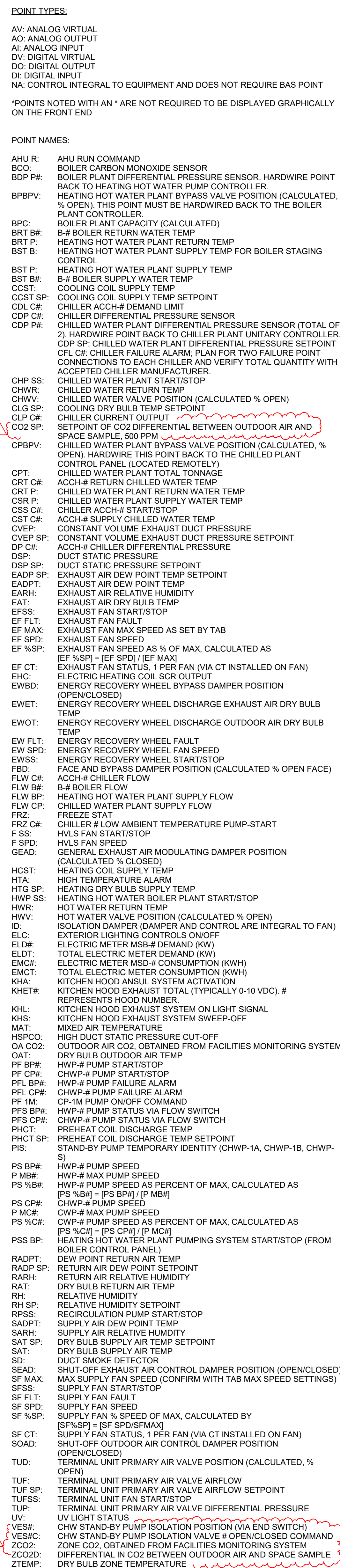
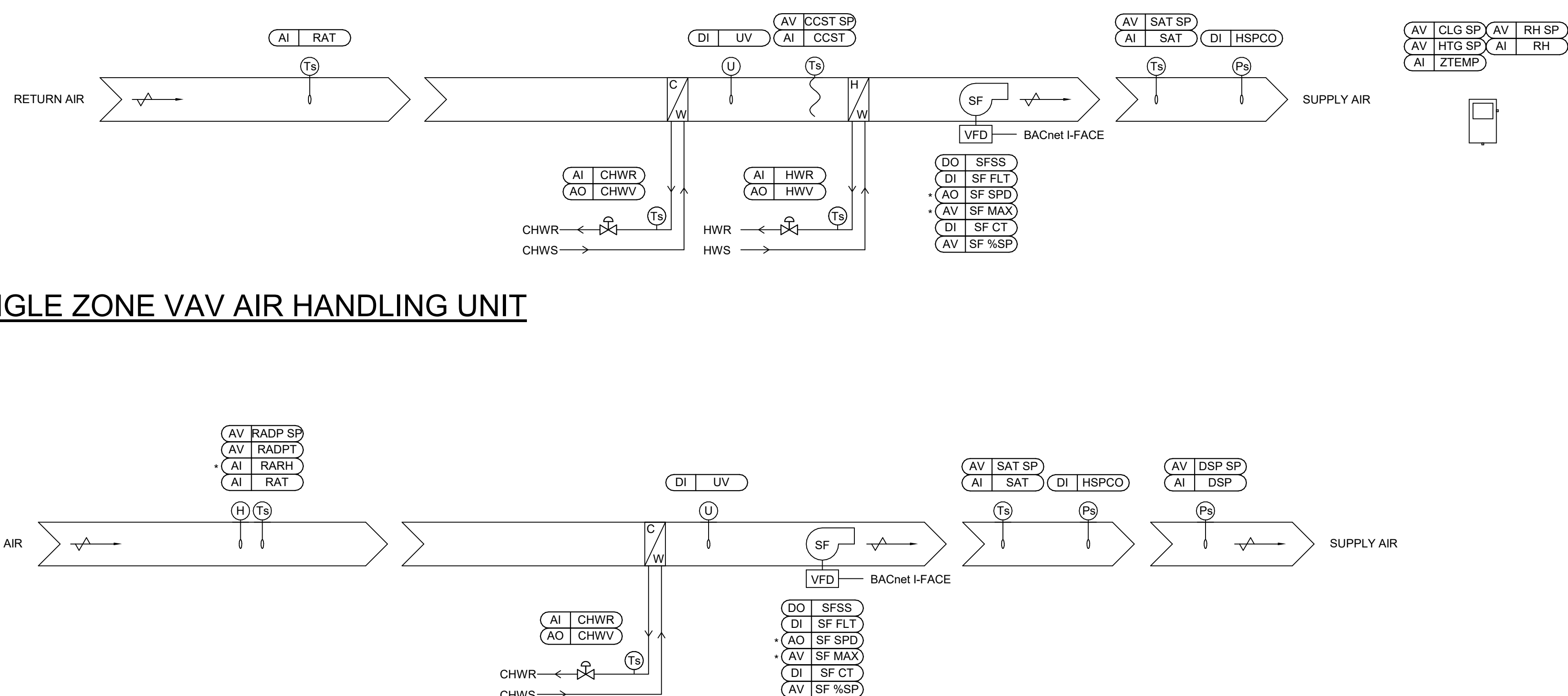
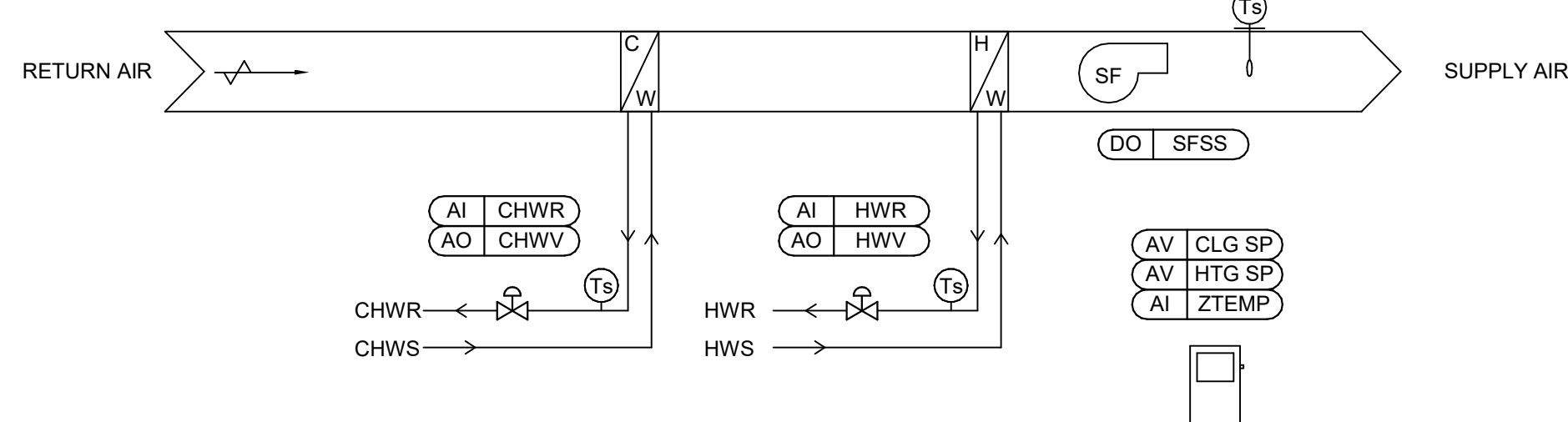
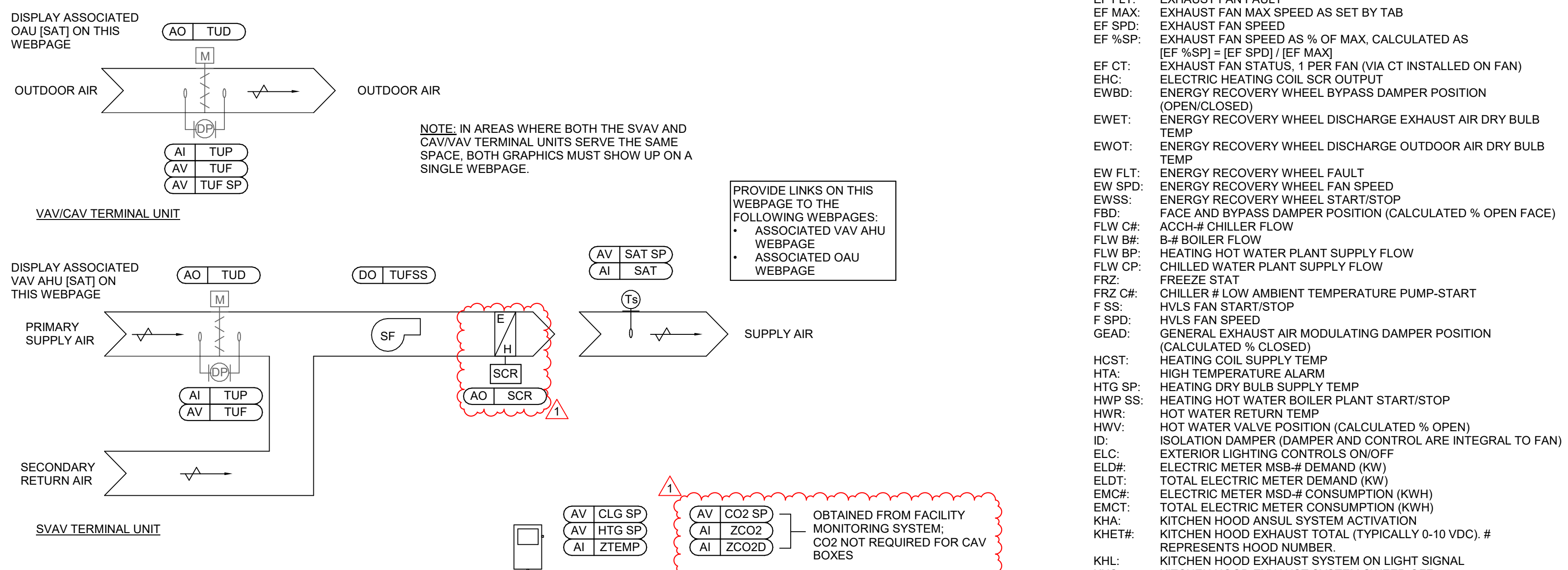
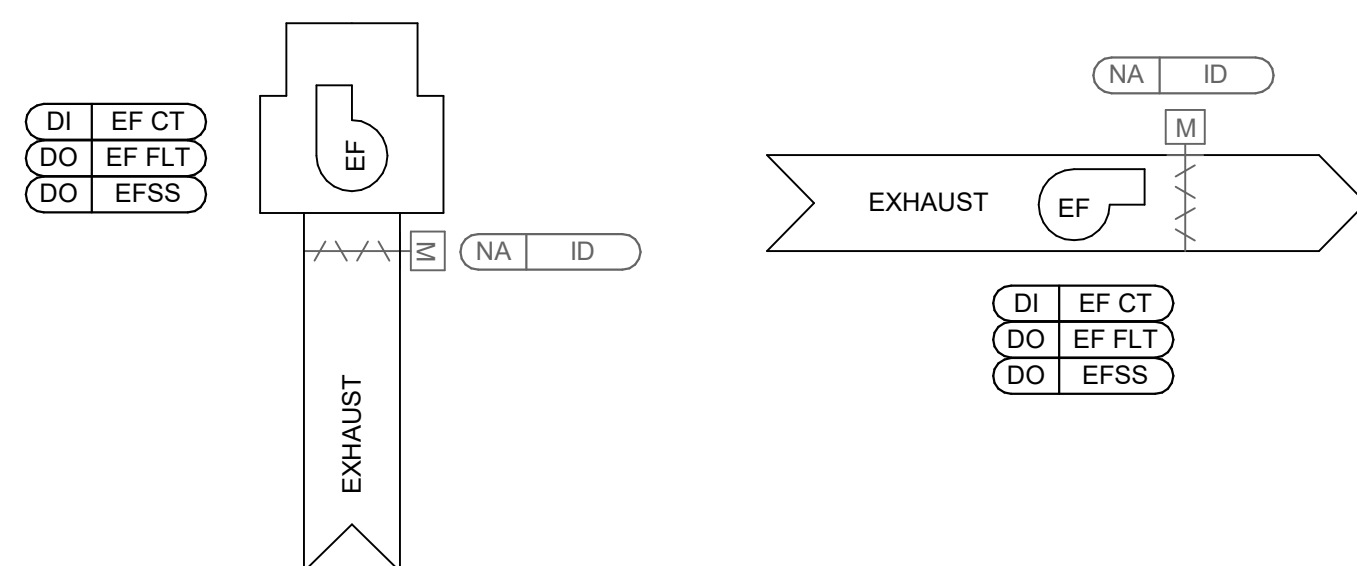
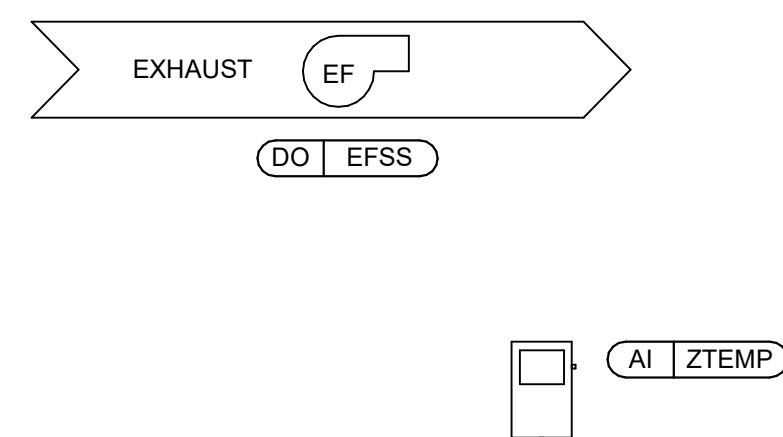
ARCADIS
ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



PROJECT #: 202502
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CHECKED: Checker
DATE: 2026-04-06
2026-04-22
PROPOSAL SET
ADD 04
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M5.06
MECHANICAL
CONTROL
SCHEMATICS

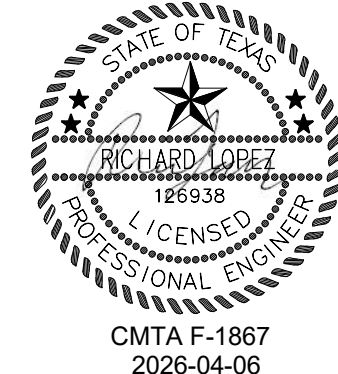




CONSULTANTS
STRUCTURAL
CJG Engineers 3200 Wilcrest Drive, Suite 305 Houston, TX 77042 Tel: 713.780.3345 Fax: 713.780.3712
FOODSERVICE
Foodservice Design Professionals 514 Sawdust Road, Suite 139 Spring, TX 77380-1960 Tel: 281.350.2323 Fax: 281.350.5959
LANDSCAPE
PEA Group 16060 Dillard Drive, Suite 250 Houston, TX 77040 Tel: 844.813.2949
MEP
CMTA, INC 2201 Timberloch Place, Suite 110 The Woodlands, TX 77380 Tel: 281.419.9899
CIVIL
S&G Engineering Consultants, LLC 1796 Avenue D, Suite B Katy, Texas 77493 Tel: 832.437.7377

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ELEMENTARY SCHOOL
ON MUSTANG ROAD**
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



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2026-04-22	ADD 04	1

M5.07

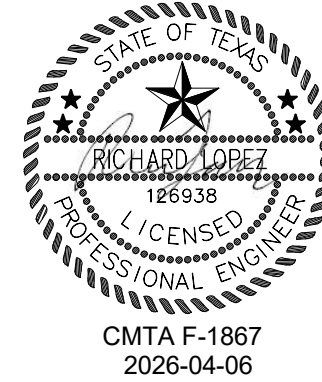
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CONSULTANTS
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
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1796 Avenue D, Suite B
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ALVIN INDEPENDENT SCHOOL DISTRICT
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ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



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M6.01
MECHANICAL
SCHEDULES

FAN COIL UNIT SCHEDULE																				
MARK	MFG	MODEL	CONFIGURATION	LOCATION	SUPPLY AIR (CFM)	TS/ESP (IN WG)	CHILLED WATER COOLING COIL				HOT WATER HEAT COIL				ELECTRICAL				UNIT SIZE (LxWxH (NGH))	UNIT WEIGHT (LBS)
							TMBH/SMBH	EAT (DB/WB) (°F)	EWTLWT (°F)	COOL GPM/MAX PRESSURE DROP	TMBH	EAT/LAT (DB/WB) (°F)	EWTLWT (°F)	GPM/MAX PRESSURE DROP (FT)	MOTOR HP	MCA	MOCP	VOLT/PH/Hz		
FCU-1	YORK	FHP-08	HORIZONTAL CONCEALED PLENUM RETURN	CENTRAL PLANT C116	700	-0.5	20.42/15.51	74/63	42/57	2.76/4.15	16.9	65/66.9	130/100	1.13/6.82	1/4	1.88	15	277/1/60	25-3/8"x47-1/2" X10-1/2"	102
FCU-2	YORK	FHP-04	HORIZONTAL CONCEALED PLENUM RETURN	MAIN REC/CUSTODIAN WORKROOM C107	300	-0.5	8.54/6.53	74/63	42/57	1.15/3.76	7.86	65/68.7	130/100	0.52/1.46	1/4	1.88	15	277/1/60	25-3/8"x33-3/4" X10-1/2"	64

AIR HANDLING UNIT SCHEDULE																																					
MARK	MFG	MODEL	CONFIGURATION	AREA SERVED	LOCATION	SUPPLY AIR (CFM)	TS/ESP (IN WG)	CHILLED WATER COOLING COIL								PRE-HEAT / RE-HEAT COIL								FILTERS				VFD	UNIT SIZE (LxWxH INCH)	UNIT WEIGHT (LBS)							
								TMBH/SMBH	EAT (DBWB) (°F)	LAT (DBWB) (°F)	EWTLWT (°F)	FACE VELOCITY/MAX APD (INCH)	GPM/MAX PD (FT)	PRE-HEAT / RE-HEAT	TMBH	EAT (DBWB) (°F)	LAT (DBWB) (°F)	EWTLWT (°F)	FACE VELOCITY/APD (INCH)	GPM/MAX PD (FT)	FILTER EFF	FILTER RESISTANCE (CLEAN/DIRTY)	# OF FANS	MOTOR HP	MOTOR BHP	FLA (AMPS)	MCA				MOCP	VOLT/PH/Hz					
AHU-1	CARRIER	39MN	TYPE 2 AHU	ADMIN	MECHANICAL ROOM B151	4550	3.21/1.80	132/99	74/63	54.4/53.1	42/57	4500.48	17.5/15	NA	-	-	-	-	-	-	-	-	-	-	-	2" MERV8	CLEAN	1	5	3.1	6.6	8.3	10	460/3/60	Yes	84"x65"x55"	1595
AHU-2	CARRIER	39MN	TYPE 1 AHU	LIBRARY	MECHANICAL ROOM A213	3450	2.95/1.5	100/74	74/63	54.7/53.1	42/57	4500.42	13.2/15	RE-HEAT	82	65/-	86.8/-	130/100	4500.09	5.5/10	2" MERV8	CLEAN	1	3	2.5	4.1	5.1	6	460/3/60	Yes	106"x53"x58"	1672					
AHU-3	CARRIER	39MN	TYPE 2 AHU	1ST GRADE CLASSROOMS	MECHANICAL ROOM B151	8550	3.64/2.25	247/182	74/63	54.9/53.1	42/57	4500.44	32.7/15	NA	-	-	-	-	-	-	-	-	-	-	-	2" MERV8	CLEAN	1	7.5	6.9	11	13.8	20	460/3/60	Yes	84"x68"x64"	2147
AHU-4	CARRIER	39MN	TYPE 2 AHU	PRE-KK CLASSROOMS	MECHANICAL ROOM B151	11050	4.26/2.75	314/232	74/63	55/53.3	42/57	4500.44	41.5/15	NA	-	-	-	-	-	-	-	-	-	-	-	2" MERV8	CLEAN	2	7.5	10.8	18.4	21.4	30	460/3/60	Yes	95"x106"x64"	2885
AHU-5	CARRIER	39MN	TYPE 2 AHU	4TH/5TH GRADE CLASSROOMS	MECHANICAL ROOM A213	13300	4.06/2.5	395/288	74/63	54.7/53	42/57	4500.49	52.6/15	NA	-	-	-	-	-	-	-	-	-	-	-	2" MERV8	CLEAN	2	7.5	11.8	18.4	21.4	30	460/3/60	Yes	95"x112"x70"	3256
AHU-6	CARRIER	39MN	TYPE 2 AHU	2ND/3RD GRADE CLASSROOMS	MECHANICAL ROOM A213	15850	4.56/3	473/343	74/63	54.4/52.8	42/57	4500.45	63/15	NA	-	-	-	-	-	-	-	-	-	-	-	2" MERV8	CLEAN	2	10	16.1	21.6	27	35	460/3/60	Yes	95"x121"x76"	3703
AHU-7	CARRIER	39MN	TYPE 1 AHU	GYM	MECHANICAL ROOM B219	5200	2.7/1.25	146/110	74/63	54.9/53.4	42/57	4500.42	19.3/15	RE-HEAT	121	65/-	86.4/-	130/100	4500.09	8.2/10	2" MERV8	CLEAN	1	5	3.1	7.3	9.1	15	460/3/60	Yes	112"x68"x58"	2099					
AHU-8	CARRIER	39MN	TYPE 1 AHU	DINING	MECHANICAL ROOM B219	6050	3.08/1.55	175/129	74/63	54.9/53.1	42/57	4500.49	23.1/15	RE-HEAT	138	65/-	86/-	130/100	4500.09	9.3/10	2" MERV8	CLEAN	1	5	4.2	7.3	9.1	15	460/3/60	Yes	111"x80"x55"	2259					
AHU-9	CARRIER	39MN	TYPE 1 AHU	KITCHEN	CENTRAL PLANT C116	4600	3.03/1.5	134/100	74/63	54.4/53	42/57	4500.41	17.9/15	RE-HEAT	100	65/-	85/-	130/100	4500.09	6.7/10	2" MERV8	CLEAN	1	5	2.9	7.3	9.1	15	460/3/60	Yes	112"x71"x52"	2013					
MUA-1	CARRIER	39MN	TYPE 3 AHU	KITCHEN HOOD MAKEUP	CENTRAL PLANT C116	6712	3.14/1.3	581/347	97.6/76.6	52.4/51.4	42/57	4500.92	77.1/15	PRE-HEAT	347	25/-	62/-	130/100	3130.10	23.4/10	2" MERV8	CLEAN	1	5	4.4	11	13.8	20	460/3/60	Yes	71"x124"x64"	2725					

- REMARKS: (AHU AND MAU)
- ENTIRE UNIT SHALL BE DOUBLE WALL CONSTRUCTION. REFER TO SPECIFICATION DIVISION 23 FOR MORE DETAIL.
 - PROVIDE STAINLESS STEEL IAQ CONDENSATE DRAIN PAN. ENTIRE PAN SHALL BE PITCHED TO OUTLET.
 - PROVIDE STAINLESS STEEL CHILLED WATER COIL CASING.
 - PROVIDE ALL COIL SECTIONS WITH A MINIMUM OF 18 INCH ACCESS DOOR.
 - PROVIDE CONDENSATE TRAP SIZED PER MANUFACTURERS RECOMMENDATIONS.
 - PROVIDE UNITS WITH A FLAT FILTER SECTION WITH 4.4 INCH FILTER RACK.
 - PROVIDE ALL UNITS WITH MERV 8 FILTERS. SECTION SHALL BE BASED ON DIRTY FILTER STATIC PRESSURE 0.64" WG FOR MERV 8.
 - ALL UNITS TO BE PROVIDED WITH DIRECT DRIVE PLENUM FANS.
 - PROVIDE BLANK OFF PLATE ON MULTIPLE MOTOR UNITS.
 - PROVIDE ALL UNITS WITH WALL MOUNTED VFD(S). VFD ID NUMBER SHALL MATCH WITH AHU NUMBER. IT IS THE MANUFACTURERS RESPONSIBILITY TO COORDINATE LOCATION OF VFD WITH MECHANICAL PLANS.
 - ALL UNIT MOTOR(S) SHALL BE FACTORY WIRED TO AN EXTERNAL UNIT MOUNTED MOTOR OVERLOAD PROTECTION PANEL. THIS PANEL CONTAINS ALL MOTOR OVERLOAD AND TERMINAL BLOCK FOR CONNECTION BY DIVISION 26 CONTRACTOR.
 - TOTAL STATIC PRESSURE OF THE SUPPLY FAN SHALL INCLUDE THE FOLLOWING: (A) THE LISTED ESP ON THE ABOVE SCHEDULE, (B) DIRTY FILTER ALLOWANCE FOR PRE FILTER AND ACTUAL PRESSURE DROPS OF UNIT CONFIGURATIONS (COILS, AIR BLENDER, ETC.).
 - COORDINATE FACTORY CUT OPENINGS IN ALL OF THE SUPPLY AIR FAN SECTIONS.
 - PROVIDE 6 INCH HOUSE KEEPING PAD THAT EXTENDS 6 INCHES FROM ALL UNIT SIDES. COORDINATE WITH MECHANICAL PLANS FOR UNITS WITH 6 INCH HOUSE KEEPING PADS.
 - SMOKE DETECTORS TO BE FURNISHED AND INSTALLED IN THE SUPPLY AND RETURN AIR DUCT PLENUMS AND INTERLOCKED WITH AIR HANDLER FAN ON ALL AIR HANDLERS GREATER THAN 2000 CFM. SMOKE DETECTOR IN THE SUPPLY AIR STREAM MAY BE OMITTED IN SYSTEMS 2000 CFM OR LESS CAPACITY.
 - MECHANICAL CONTRACTOR TO SUBMIT UNIT SUBMITTAL BEFORE ORDERING TO COORDINATE IF PERFORMANCE MEETS BASIS OF DESIGN AND TO VERIFY DIMENSIONS/WEIGHT WON'T CONFLICT WITH SPACE.
 - SPACE IS LIMITED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING UNIT SELECTED WILL FIT IN THE SPACE DESIGNATED WITH ALL REQUIRED CLEARANCES TO STRUCTURE AND OTHER EQUIPMENT, AS WELL AS THE ABILITY TO BE DELIVERED IN SECTIONS THROUGH AVAILABLE ACCESS DOORS.
 - PROVIDE MUA-1 UNIT WITH FACE AND BYPASS DAMPER THAT BYPASSES CHILLED WATER COIL.
 - REFER TO DETAILS ON M5.02 FOR ADDITIONAL UNIT REQUIREMENTS.
 - COIL CONNECTIONS AND CONDENSATE CONNECTIONS SHALL BE ON SAME SIDE OF UNIT.

OUTSIDE AIR UNIT SCHEDULE																																		
MARK	MFG	MODEL	LOCATION	OUTSIDE AIR FAN					EXHAUST AIR FAN					CHILLED WATER COOLING COIL					HOT WATER HEAT COIL					FILTERS		UNIT SIZE (LWXHXINCH)	UNIT WEIGHT (LBS)							
				DESIGN CFM	TS/ESP (IN WG)	# OF FANS	MOTOR HP	TOTAL BHP	VOLT/PH/Hz	DESIGN CFM	TS/ESP (IN WG)	# OF FANS	MOTOR HP	TOTAL BHP	VOLT/PH/Hz	AIRFLOW CFM	TMBH/SMBH	EWTLWT (°F)	FACE VELOCITY/MAX APD	GPM/WPD	DESIGN EAT (DB/WB) (°F)	DESIGN LAT (DB/WB) (°F)	AIRFLOW CFM	TMBH	EWTLWT (°F)			FACE VELOCITY/ APD	GPM/WPD	DESIGN EAT (DB) (°F)	DESIGN LAT (DB) (°F)	FILTER TYPE	FILTER RESISTANCE EXHAUST AIR (CLEAN/DIRTY)	FILTER RESISTANCE SUPPLY (CLEAN/DIRTY)
OAU-1	CARRIER	39MN	MECH / B215	19000	6.61/3	2	15	25.6	460/3/60	16150	3.51/1.5	2	7.5	11.7	460/3/60	19000	1139/521	42/57	500/-	150.5/15FT	77.7/71.6	52 / 52	19000	528	130/100	500	23/10	46.2/-	65	2"	DIRTY	DIRTY	254"x129"x156"	16805

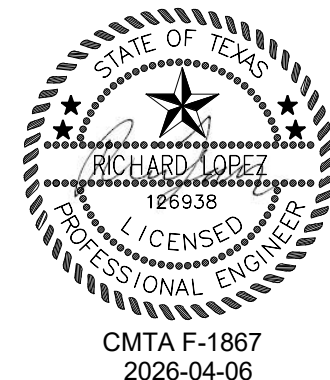
CONSULTANTS
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712
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594 Sawdust Road, Suite 139
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Tel: 281.350.2323
Fax: 281.350.5959
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PEA Group
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Houston, TX 77040
Tel: 844.813.2949

MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377

REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

ARCADIS
ARCADIS INC.
1330 Post Oak Boulevard, Suite 2250
Houston, TX 77056
tel 281.286.6605



PROJECT #: 202502
DATE: 2026-04-06
DRAWN: Author
CHECKED: Checker
DATE: 2026-04-06
2026-04-22
ISSUE
PROPOSAL SET
ADD 04
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M6.02
MECHANICAL
SCHEDULES

HIGH VOLUME LOW SPEED CEILING FAN SCHEDULE								
MARK	MFG	MODEL	TYPE	SERVICE	ELECTRICAL		UNIT WEIGHT (LBS)	REMARKS
					VOLT/PH/Hz	AMPS		
HVLS-1	BIGASS FAN	ESSENCE	DIRECT DRIVE CIRCULATING FAN	DINING	120/160	4.1	83	ALL
HVLS-2	BIGASS FAN	ESSENCE	DIRECT DRIVE CIRCULATING FAN	DINING	120/160	4.1	83	ALL

- REMARKS:
- PROVIDE WITH ONBOARD NEMA 1 VFD WITH WALL MOUNTED CONTROLLER.
 - COORDINATE MOUNTING HARDWARE WITH THE MANUFACTURER PRIOR TO PURCHASING.
 - CONFIRM INSTALLATION HEIGHT WITH ARCHITECT. BOTTOM OF FANS SHALL BE NO LESS THAN A MINIMUM 10 FEET AFF.
 - FANS SHALL BE A MINIMUM OF 2 FEET FROM ANY OBSTRUCTIONS.
 - FANS SHALL NOT BE MOUNTED LESS THAN TWO TIMES THE FAN DIAMETER FROM EACH OTHER, EXHAUST / RETURN INTAKES, ETC.
 - EXTENSION TUBES 48 INCHES AND LONGER SHALL BE INSTALLED WITH GUY WIRES PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.
 - PROVIDE SWITCH ON WALL TO TURN FAN ON AND OFF.
 - PROVIDE UNIT WITH FIRE ALARM INTERFACE CONNECTION TO SHUT OFF UNIT IN THE EVENT OF FIRE ALARM.
 - PROVIDE FAN WITH BAFCO CONTROLLER OR EQUAL LOCATED IN C102STOR STAGE. CONTRACTOR SHALL COORDINATE POWER AND DATA TO THIS LOCATION.

LOUVER SCHEDULES									
MARK	MFG	MODEL	CFM	AREA SERVED	CONSTRUCTION	DEPTH (INCH)	PHYSICAL SIZE (WxH INCH)	ACCESSORIES	
								FINISH	DRAINABLE BLADE
L-1	GREENHECK	EVH-501	725	CLINIC EXHAUST	EXTRUDED ALUMINUM WIND-DRIVEN RAIN HURRICANE LOUVER	5	18X24	BY ARCH	BY ARCH
L-2	RUSKIN	HZ700	6712	MAKEUP AIR UNIT	EXTRUDED ALUMINUM WIND-DRIVEN RAIN HURRICANE LOUVER	5	66X30	BY ARCH	BY ARCH

- REMARKS:
- PROVIDE WITH BIRD SCREEN.
 - COLOR AND FINISH TO BE SELECTED BY ARCHITECT. REFER TO ARCH PLANS.
 - COORDINATE LOCATIONS WITH ARCHITECTURE ELEVATIONS.
 - LOUVERS MUST BE AMCA 540 AND AMCA 550 RATED.

EXPANSION TANK SCHEDULE									
MARK	MFG	MODEL	TYPE	SERVICE	ACCEPT VOLUME (GAL)	TOTAL VOLUME (GAL)	UNIT SIZE (LxWxH INCH)	UNIT WEIGHT (LBS)	
ET-1	GRUNDFOS	GNLA-300	DIAPHRAGM	CHILLED WATER	79	79	24X55	225	
ET-2	GRUNDFOS	GNLA-400	DIAPHRAGM	HEATING HOT WATER	106	106	30X49	300	

- REMARKS:
- INSTALL EXPANSION TANKS ON 4 INCH CONCRETE PAD.

AIR SEPARATOR SCHEDULE									
MARK	MFG	MODEL	SERVICE	INLET/OUTLET SIZE (INCH)	GPM	MAX WPD	INTEGRAL STRAINER	ACCESSORIES	
								AIR PRESSURE CHARGE	ASME RATED
AS-1	BELL & GOSSETT	RL-6	CHILLED WATER	6	300	0.29	No	Yes	Yes
AS-2	BELL & GOSSETT	RL-3	HEATING HOT WATER	3	78	0.3	No	Yes	Yes

- REMARKS:
- PROVIDE STRUCTURAL FLOOR STAND FOR MOUNTING OF AIR SEPARATOR FOR AS-1.
 - INSULATE AIR SEPARATORS.

GRAVITY VENTILATOR SCHEDULE								
MARK	MFG	MODEL	SERVICE	CFM/APD	DIMENSION		UNIT WEIGHT (LBS)	REMARKS
					THROAT SIZE (LxW INCH)	OVERALL SIZE (LxW INCH)		
GI-OAU1-OA	GREENHECK	FGI-60X60	OAU-1 INTAKE AIR	19000/0.0763	60X60	111X104	379	ALL
GR-OAU1-EA	GREENHECK	FGR-60X54	OAU-1 EXHAUST AIR	16150/0.0715	60X54	87X81	266	ALL

- REMARKS:
- PROVIDE FACTORY ROOF CURB. FIELD VERIFY ROOF PITCH AND INSULATION DEPTH PRIOR TO ORDERING.
 - ALL HOODS MUST BE ANCHORED TO ROOF TO WITHSTAND WIND SPEED IN ACCORDANCE WITH ASCE 7.
 - PROVIDE WITH BIRD SCREEN.
 - HOOD TO BE FACTORY PAINTED WITH BAKED ENAMEL FINISH. COORDIANTE COLOR WITH ARCHITECT PRIOR TO ORDERING.

OUTDOOR SPLIT SYSTEM CONDENSER SCHEDULE								
MARK	MFG	MODEL	COOL/HEAT MBH	SEER	ELECTRICAL			UNIT WEIGHT (LBS)
					MCA	MCCP	VOLT/PH/HZ	
CU-B1	HITACHI	PAS-24	22½	21.5	14.3	25	208/1/60	104.5

- REMARKS:
- PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION. POWER TO INDOOR UNIT SHALL COME FROM OUTDOOR UNIT. IF MECHANICAL CONTRACTOR SELECTS OTHER MANUFACTURER, MECHANICAL CONTRACTOR SHALL PROVIDE DISCONNECT AND NECESSARY WIRING FOR INDOOR UNIT.
 - NO CONDENSATE PUMP SHALL BE USED. DRAINS MUST ALL BE GRAVITY DRAINED.
 - PROVIDE INDOOR UNIT WITH FACTORY WALL MOUNTING HARDWARE. INSTALL PER MANUFACTURERS CLEARANCE RECOMMENDATIONS.
 - TEMPERATURE SENSOR FOR SPLIT SYSTEM SHALL BE REMOTE WALL MOUNTED WITH NO LOCAL CONTROLS. ALL SETPOINTS / OCCUPANCY CONTROLS SHALL BE THROUGH THE BAS.
 - ALL ROOF MOUNTED EQUIPMENT SHALL BE ANCHORED TO ROOF TO WITHSTAND WIND SPEED IN ACCORDANCE WITH ASCE 7.
 - CONDENSER COIL TO HAVE COIL COATING.

INDOOR SPLIT SYSTEM SCHEDULE						
MARK	MFG	MODEL	TYPE	AREA SERVED	AIRFLOW CFM	UNIT WEIGHT (LBS)
AC-B1	HITACHI	PPK-B24	WALL-MOUNTED DUCTLESS MINISPLIT	MDF B136	735	54

FAN SCHEDULE													
MARK	MFG	MODEL	FAN TYPE	AREA SERVED	LOCATION	EA DESIGN CFM	EA TSP/ESP (IN WG)	FAN SONES	ELECTRICAL		UNIT WEIGHT (LBS)	REMARKS	
									MOTOR HP	VOLTPH/Hz			
EF-1	GREENHECK	SQ-70-VG	DIRECT DRIVE INLINE EXHAUST FAN	KITCHEN RESTROOM & CUSTODIAN	CEILING	215	-0.25	5.5	1/15	115/160	27	7.12	
EF-2	GREENHECK	CSPA125	DIRECT DRIVE INLINE EXHAUST FAN	MAIN REC/UST WK RM	CEILING	100	-0.25	40.3	22 W	115/160	16	7.12	
EF-3	GREENHECK	SQ-120-VG	DIRECT DRIVE INLINE EXHAUST FAN	ADMIN	CEILING	725	-0.35	3.5	1/2	115/160	61	7.12	
KEF-1	GREENHECK	CUE-160-A	DIRECT DRIVE UPBALST CENTRIFUGAL ROOF EXHAUST FAN	KITCHEN HOOD	ROOF	3950	-J1	27	2	460/360	174	1,2,3,4,5,8,9,11	
KEF-2	GREENHECK	CUE-160-A	DIRECT DRIVE UPBALST CENTRIFUGAL ROOF EXHAUST FAN	KITCHEN HOOD	ROOF	3950	-J1	27	2	460/360	174	1,2,3,4,5,8,9,11	
KEF-3	GREENHECK	CUE-120-VG	DIRECT DRIVE UPBALST CENTRIFUGAL ROOF EXHAUST FAN	DISHWASHER	ROOF	1200	-0.3	8.8	1/4	115/160	86	1,2,3,4,5,8,10	
VF-01	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	ELEC A126	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-02	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	ELEC A158	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-03	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	AV A126	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-04	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	ELEC A211	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-05	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	IDF A210	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-06	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	ELEC A223	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	
VF-07	GREENHECK	SPA-A390	CEILING MOUNTED - DIRECT DRIVE	IDF B218	CEILING	300	-0.125	2.5	135 W	115/160	35	6.7	

- REMARKS:
- PROVIDE FACTORY ROOF CURB. FIELD VERIFY ROOF PITCH AND INSULATION DEPTH PRIOR TO ORDERING.
 - ALL ROOF MOUNTED EQUIPMENT SHALL BE ANCHORED TO ROOF TO WITHSTAND WIND SPEED IN ACCORDANCE WITH ASCE 7.
 - PROVIDE FAN WITH INTEGRAL DISCONNECT.
 - PROVIDE FAN WITH AUTOMATIC BACKDRAFT DAMPER.
 - PROVIDE WITH VARIABLE MOTOR SPEED CONTROLLER. FAN VFD PROVIDED IN KITCHEN HOOD CONTROL ENCLOSURE.
 - FAN TO BE CONTROLLED ON/OFF BY ROOM MOUNTED TEMPERATURE SENSOR (MONITORED BY BAS). PROVIDE CONTACTS AND RELAYS AS NECESSARY TO WIRE FAN TO SENSOR.
 - PROVIDE FACTORY CEILING HUNG VIBRATION ISOLATORS. INSTAL PER MANUFACTURERS RECOMMENDATIONS.
 - FAN TO BE INTERCONNECTED TO TURN ON WITH ASSOCIATED KITCHEN HOOD. COORDINATE STARTER LOCATION AND CONNECTION WITH ELECTRICAL CONTRACTOR (BY ELECTRICAL CONTRACTOR).
 - FAN TO BE UL 762 LISTED FOR "POWER VENTILATORS FOR RESTAURANT EXHAUST APPLIANCES".
 - FAN TO BE INTERCONNECTED TO TURN ON WITH ASSOCIATED DISHWASHER.
 - REFER TO THE CORRESPONDING CONTROL SHEET.
 - FAN SHALL BE CONTROLLED ON/OFF BY BAS. FAN SHOULD RUN DURING OCCUPIED HOURS.

GRILLES, REGISTERS, & DIFFUSERS SCHEDULE								
MARK	MFG	MODEL	TYPE	PANEL SIZE (INCH)	GRILLE SIZE (INCH)	INLET DUCT SIZE (INCH)	CFM RANGE	REMARKS
E-1	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	24"x24"	6"Ø	50-100	1.3,4
E-1A	TITUS	50F	ALUMINUM 1/2" EGG CRATE	12"x12"	12"x12"	6"Ø	50-100	1.3,4
E-2	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	24"x24"	8"Ø	101-225	1.3,4
E-3	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	24"x24"	10"Ø	226-375	1.3,4
E-4	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	24"x24"	12"Ø		1.3,4
E-5	TITUS	50F	ALUMINUM 1/2" EGG CRATE	6"x6"	6"x6"	6"x6"	0-100	1.3,4
R-1	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	24"x24"	6"Ø	-	1.3,4
R-2	TITUS	25RL	STEEL RETURN GRILLE, 30 DEGREE DEFLECTION, 1/2" SPACING	50"x26"	48"x24"	48"x24"	-	2.6
R-3	TITUS	350FL	ALUMINUM LOUVERED RETURN GRILLE, 3/4" BLADE SPACING, 35 DEGREE DEFLECTION	18"x18"	16"x16"	16"x16"	-	2.6
S-1	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	6"x6"	6"Ø	50-100	1.3,4
S-1A	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	12"x12"	6"x6"	6"Ø	50-100	1.3,4
S-2	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	9"x9"	8"Ø	101-225	1.3,4
S-2B	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	8"x8"	8"Ø	101-225	1.3,4
S-3	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	12"x12"	10"Ø	226-375	1.3,4
S-3B	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	10"x10"	10"Ø	226-375	1.3,4
S-4	TITUS	TDCA-AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	12"x12"	12"Ø	376-600	1.3,4
S-5	TITUS	DL	HIGH CAPACITY DRUM LOUVER	20"x8"	18"x6"	18"x6"	370-375	2.6
S-6	TITUS	271FL	ALUMINUM SINGLE DEFLECTION GRILLE, 3/4" BLADE SPACING	8"x8"	6"x6"	6"x6"	100	2.4
S-7	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (3) 48" ENGINEERED PLENUM	37"-8"x6"	-	8"Ø	480	6,7,8,9,10,11
S-8	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (6) 48" ENGINEERED PLENUM	62"-4"x6"	-	8"Ø	990	6,7,8,9,10,11
S-9	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (4) 48" ENGINEERED PLENUM	62"-4"x6"	-	8"Ø	660	6,7,8,9,10,11
S-10	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (7) 48" ENGINEERED PLENUM	62"-4"x6"	-	8"Ø	1295	6,7,8,9,10,11
S-11	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (1) 48" ENGINEERED PLENUM	19"-7"x6"	-	6"Ø	200	6,7,8,9,10,11
S-12	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (3) 48" ENGINEERED PLENUM	42"-0"x6"	-	8"Ø	570	6,7,8,9,10,11
S-13	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (1) 48" ENGINEERED PLENUM	12"-11"x6"	-	8"Ø	190	6,7,8,9,10,11
S-14	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (6) 48" ENGINEERED PLENUM	42"-3"x6"	-	8"Ø	760	6,7,8,9,10,11
S-15	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (1) 48" ENGINEERED PLENUM	11"-0"x6"	-	8"Ø	250	6,7,8,9,10,11
S-16	TITUS	300FL	ALUMINUM DOUBLE DEFLECTION, 3/4" BLADE SPACING	10"x10"	8"x8"	8"x8"	125-210	2.4
S-17	TITUS	300FL	ALUMINUM DOUBLE DEFLECTION, 3/4" BLADE SPACING	8"x8"	6"x6"	6"x6"	80	2.4
S-18	TITUS	DL	HIGH CAPACITY DRUM LOUVER	20"x10"	18"x8"	18"x8"	580	2.6
S-19	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (1) 48" ENGINEERED PLENUM	14"-7"x6"	-	6"Ø	250	6,7,8,9,10,11
S-20	TITUS	300FL	ALUMINUM DOUBLE DEFLECTION, 3/4" BLADE SPACING	12"x12"	10"x10"	10"x10"	265-270	2.4
S-21	TITUS	FL-10	ALUMINUM CONSTRUCTION (1) 1" OPENING LINEAR SLOT DIFFUSER, (6) 48" ENGINEERED PLENUM	62"-4"x6"	-	8"Ø	1230	6,7,8,9,10,11
T-1	TITUS	350FL	ALUMINUM LOUVERED RETURN GRILLE, 3/4" BLADE SPACING, 35 DEGREE DEFLECTION	12"x12"	10"x10"	10"x10"	200	2.4

- REMARKS:
- CEILING T-BAR MOUNTED IN 24"x24" ALUMINUM PANEL, UNLESS MARKED OTHERWISE. REFER TO GENERAL NOTES FOR SPECIAL MARK CALLOUTS.
 - SIDEWALL OR DUCT MOUNTED.
 - INLET TRANSITION BOX, ROUND TO RECTANGULAR AS INDICATED ON PLANS.
 - WHITE IN COLOR.
 - BLACK IN COLOR.
 - COORDINATE COLOR WITH ARCHITECT PRIOR TO ORDERING. IF COLOR CHOICE IS NOT AVAILABLE, DIFFUSER/GRILLE SHALL BE FIELD PAINTED.
 - LINEAR SLOT DIFFUSERS SHALL BE CONTINUOUS LOOK. PROVIDE FILLER SECTION, CORNERS, AND RETURN BAFFLES FOR NON-ACTIVE AREAS AS NEEDED.
 - PROVIDE LINEAR SLOT DIFFUSERS WITH INSULATED PLENUM.
 - LINEAR SLOT DIFFUSER INSIDE TO BE PAINTED BLACK.
 - FIELD VERIFY SIZES OF LINEAR SLOT DIFFUSERS WITH ARCHITECT PRIOR TO ORDERING.
 - ALL ACTIVE LINEAR SLOTS TO BE PROVIDED WITH YOUNG REGULATOR MODEL 270-275 BOWDEN REMOTE CABLE CONTROL WITH 502CC DAMPER OR APPROVED EQUAL.
 - PROVIDE GRILLE WITH VC55 DAMPER FOR BALANCING.

- GENERAL NOTES:
- GRDs MARKED WITH 'A' ARE TO BE INSTALLED IN A HARD CEILING AND PROVIDED WITH A 12"X12" FRAME SIZE.
 - GRDs MARKED WITH 'B' ARE TO BE PROVIDED WITH THE PATTERN FLAPS OPTION.

CONSULTANTS

STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

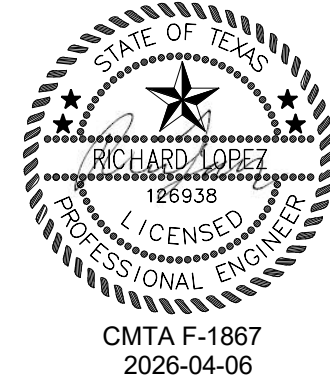
MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377

REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

ARCADIS

ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



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M6.03

MECHANICAL
SCHEDULES

FAN POWERED TERMINAL UNIT W/
ELECTRIC HEAT RUNOUT
SCHEDULE

MARK	ZONE	INLET DIAMETER (IN)	PRIMARY VALVE MIN AIRFLOW CFM	CONNECTED CFM	PRIMARY VALVE MAX AIRFLOW
FVAV-8	01.01	8	125	500	700
FVAV-6	01.02	6	65	400	400
FVAV-6	01.03	6	65	400	400
FVAV-6	01.04	6	65	400	400
FVAV-8	01.05	8	125	550	700
FVAV-8	01.06	8	125	500	700
FVAV-12	01.07	12	310	1200	1400
FVAV-6	01.08	6	65	310	400
FVAV-6	01.09	6	65	240	400
FVAV-8	03.01	8	125	675	700
FVAV-10	03.02	10	220	925	1000
FVAV-8	03.03	8	125	625	700
FVAV-8	03.04	8	125	700	700
FVAV-8	03.05	8	125	665	700
FVAV-8	03.06	8	125	700	700
FVAV-8	03.07	8	125	700	700
FVAV-8	03.08	8	125	700	700
FVAV-8	03.09	8	125	600	700
FVAV-8	03.10	8	125	450	700
FVAV-6	03.11	6	65	200	400
FVAV-8	03.12	8	125	600	700
FVAV-8	03.13	8	65	465	700
FVAV-12	04.01	12	310	1075	1400
FVAV-6	04.02	6	65	300	400
FVAV-10	04.03	10	220	730	1000
FVAV-6	04.04	6	65	285	400
FVAV-10	04.05	10	220	730	1000
FVAV-10	04.06	10	220	730	1000
FVAV-8	04.07	8	125	470	700
FVAV-10	04.08	10	220	730	1000
FVAV-6	04.09	6	65	420	400
FVAV-10	04.10	10	220	730	1000
FVAV-10	04.11	10	220	730	1000
FVAV-10	04.12	10	220	730	1000
FVAV-10	04.13	10	220	780	1000
FVAV-10	04.14	10	220	680	1000
FVAV-10	04.15	10	220	780	1000
FVAV-10	04.16	10	220	680	1000
FVAV-10	05.01	10	220	850	1000
FVAV-8	05.02	8	125	700	700
FVAV-8	05.03	8	125	700	700
FVAV-8	05.04	8	125	400	700
FVAV-8	05.05	8	125	400	700
FVAV-8	05.06	8	125	700	700
FVAV-8	05.07	8	125	700	700
FVAV-10	05.08	10	220	800	1000
FVAV-8	05.09	8	125	700	700
FVAV-8	05.10	8	125	700	700
FVAV-8	05.11	8	125	550	700
FVAV-8	05.12	8	125	700	700
FVAV-8	05.13	8	125	700	700
FVAV-8	05.14	8	125	700	700
FVAV-8	05.15	8	125	600	700
FVAV-8	05.16	8	125	700	700
FVAV-14	05.17	14	435	1730	1800
FVAV-12	06.01	12	310	855	1400
FVAV-12	06.02	12	310	1295	1400
FVAV-10	06.03	10	220	965	1000
FVAV-10	06.04	10	220	805	1000
FVAV-10	06.05	10	220	705	1000
FVAV-8	06.06	8	125	450	700
FVAV-10	06.07	10	220	805	1000
FVAV-10	06.08	10	220	990	1000
FVAV-10	06.09	10	220	705	1000
FVAV-10	06.10	10	220	805	1000
FVAV-10	06.11	10	220	705	1000
FVAV-8	06.12	8	125	300	700
FVAV-8	06.13	8	125	550	700
FVAV-10	06.14	10	220	805	1000
FVAV-8	06.15	8	125	655	700
FVAV-10	06.16	10	220	705	1000
FVAV-10	06.17	10	220	805	1000
FVAV-10	06.18	10	220	705	1000
FVAV-10	06.19	10	220	805	1000

SINGLE DUCT VAV TERMINAL
RUNOUT SCHEDULE

MARK	ZONE	INLET DIAMETER (IN)	MIN CFM	CONNECTED CFM	MAX CFM
VAV-6	03.01	6	65	350	375
VAV-6	03.02	6	65	250	375
VAV-6	03.03	6	65	270	375
VAV-6	03.05	6	65	355	375
VAV-6	03.06	6	65	355	375
VAV-6	03.07	6	65	355	375
VAV-6	03.08	6	65	355	375
VAV-6	03.09	6	65	355	375
VAV-6	03.12	6	65	355	375
VAV-6	04.01	6	125	470	675
VAV-6	04.02	6	65	355	375
VAV-6	04.03	6	65	355	375
VAV-6	04.04	6	65	355	375
VAV-6	04.05	6	65	355	375
VAV-6	04.07	6	65	355	375
VAV-6	04.08	6	65	370	375
VAV-6	04.09	6	65	355	375
VAV-6	04.10	6	65	355	375
VAV-6	04.11	6	65	355	375
VAV-6	04.12	6	65	355	375
VAV-6	04.13	6	65	320	375
VAV-6	04.14	6	65	355	375
VAV-6	04.15	6	65	155	375
VAV-16	05.02	16	575	2605	2800
VAV-6	05.03	6	65	355	375
VAV-6	05.04	6	65	355	375
VAV-6	05.05	6	65	355	375
VAV-6	05.06	6	65	355	375
VAV-6	05.07	6	65	355	375
VAV-6	05.08	6	65	355	375
VAV-6	05.09	6	65	355	375
VAV-6	05.10	6	65	355	375
VAV-6	05.11	6	65	355	375
VAV-6	05.12	6	65	355	375
VAV-14	05.13	14	400	1230	1800
VAV-6	05.14	6	65	355	375
VAV-6	05.15	6	65	355	375
VAV-6	05.16	6	65	355	375
VAV-6	06.02	6	125	580	675
VAV-6	06.03	6	65	355	375
VAV-6	06.04	6	65	355	375
VAV-6	06.05	6	65	355	375
VAV-6	06.07	6	65	355	375
VAV-6	06.08	6	65	225	375
VAV-6	06.09	6	65	355	375
VAV-6	06.10	6	65	355	375
VAV-10	06.11	10	210	355	1050
VAV-6	06.12	6	125	225	675
VAV-6	06.14	6	65	355	375
VAV-6	06.15	6	65	355	375
VAV-6	06.16	6	65	355	375
VAV-6	06.17	6	65	355	375
VAV-6	06.18	6	65	355	375
VAV-24X16	09.01	24X16	675	3356	8400
VAV-24X16	09.02	24X16	675	3356	8400

SINGLE DUCT CAV
TERMINAL UNIT
RUNOUT SCHEDULE

MARK	ZONE	INLET DIAMETER (IN)	CONNECTED CFM
CAV-6	03.04	6	300
CAV-6	03.10	6	310
CAV-6	03.11	6	110
CAV-8	03.13	8	500
CAV-6	04.06	6	130
CAV-6	05.01	6	350
CAV-8	06.01	8	500
CAV-8	06.06	8	460
CAV-10	06.13	10	730

FVAV TERMINAL BOXES W/ ELECTRIC HEAT SCHEDULE																
MARK	MFG	MODEL	TYPE	INLET DIA. (INCH)	NORMAL OPERATING CFM	MAX CFM	ELECTRIC HEAT COIL				ELECTRICAL				PRESSURE INDEPENDENT CONTROLS	QTY OF UNITS
							KW	EAT/LAT (°F)	ECM MOTOR	MOTOR HP	MCA (A)	MOCP (A)	VOLT/PH/Hz			
FVAV-6	PRICE	FDC10	SERIES FAN POWERED VAV WITH ELECTRIC COIL	6	REFER TO REMARKS	400	2	67/82.8	Yes	1/3	12	15	277/1/60	Yes	9	
FVAV-8	PRICE	FDC10	SERIES FAN POWERED VAV WITH ELECTRIC COIL	8	REFER TO REMARKS	700	3	67/80.5	Yes	1/3	16.5	20	277/1/60	Yes	33	
FVAV-10	PRICE	FDC20	SERIES FAN POWERED VAV WITH ELECTRIC COIL	10	REFER TO REMARKS	1000	5	67/82.8	Yes	1/3	25.6	30	277/1/60	Yes	27	
FVAV-12	PRICE	FDC40	SERIES FAN POWERED VAV WITH ELECTRIC COIL	12	REFER TO REMARKS	1400	7	67/82.8	Yes	3/4	18	20	460/3/60	Yes	4	
FVAV-14	PRICE	FDC50	SERIES FAN POWERED VAV WITH ELECTRIC COIL	14	REFER TO REMARKS	1800	8	67/81	Yes	1	20	25	460/3/60	Yes	1	

- REMARKS:
- ALL BOXES SHALL BE PROVIDED WITH SINGLE POINT ELECTRICAL CONNECTION.
 - NORMAL OPERATING CFM IS THE TOTAL CFM OF FVAV BOX SUPPLYING TO ASSOCIATED GRD(S).
 - SOUND SELECTION SHALL BE AT LISTED NORMAL OPERATING CFM, NOT MAX CFM.
 - TERMINAL BOXES SUPPLY FAN SHALL BE BALANCED TO AIRFLOW INDICATED ON PLANS.
 - CONTRACTOR SHALL ENSURE THAT REQUIRED N.E.C. WORKING CLEARANCE IS MAINTAINED WHERE INSTALLED ABOVE CEILING.
 - ELECTRICAL HEATER AND ITS FVAV POWER SHALL BE INTERLOCKED WITH SINGLE POINT CONNECT.
 - PROVIDE INTEGRAL DISCONNECT.
 - PROVIDE FVAV BOXES WITH SCR HEATING CONTROLS.
 - ROUND DUCT INLET SIZE SHALL MATCH INLET DIAMETER SCHEDULE. WHERE DUCT SHOWS TRANSITIONING TO LARGER DUCT UPSTREAM OF INLET, SIZE OF LARGER DUCT SHALL BE INLET DIAMETER +2" UNLESS NOTED OTHERWISE ON DRAWINGS.

TERMINAL BOX SCHEDULE

MARK	MFG	MODEL	INLET DIA. (INCH)	MAX CFM	PRESSURE INDEPENDENT CONTROLS	VOLT/PH/Hz
CAV-6	PRICE	SDV	6	375	Yes	120/1/60
CAV-8	PRICE	SDV	8	675	Yes	120/1/60
CAV-10	PRICE	SDV	10	1050	Yes	120/1/60
VAV-6	PRICE	SDV	6	375	Yes	120/1/60
VAV-8	PRICE	SDV	8	675	Yes	120/1/60
VAV-10	PRICE	SDV	10	1050	Yes	120/1/60
VAV-14	PRICE	SDV	14	1800	Yes	120/1/60
VAV-16	PRICE	SDV	16	2800	Yes	120/1/60
VAV-24X16	PRICE	SDV	24X16	8400	Yes	120/1/60

- REMARKS:
- ALL BOXES SHALL BE PROVIDED WITH SINGLE POINT ELECTRICAL CONNECTION.
 - PROVIDE INTEGRAL DISCONNECT.
 - CONTRACTOR SHALL VERIFY LAYOUT OF EACH CAV / VAV BOX ON MECHANICAL DRAWINGS PRIOR TO ORDERING
 - BOXES SHALL BE SINGLE WALL WITH 1/2 INCH POLYURETHANE FOAM INSULATION OR EQUAL.
 - PROVIDE WITH REMOVABLE ACCESS PANEL.



1 ELECTRICAL PLAN - LIGHTING - LEVEL 1 AREA - A1
1/8" = 1'-0"

GENERAL NOTES (LIGHTING):

- REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.
- CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAY-OUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING.
- IF ADDITIONAL CONDUCTORS ARE RUN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER N.E.C. #310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER N.E.C. #300.17 AND ANNEX C.
- MULTIWIRE BRANCH CIRCUITS AS DEFINED IN N.E.C. #100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.
- IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING ON OUTSIDE OF COVER PLATE. ALSO, MARK INSIDES OF ALL DEVICE BOXES WITH PANEL AND CIRCUIT NUMBER.
- LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING. TO MAXIMIZE AVAILABLE LIGHT SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM. PROVIDE ADDITIONAL FIXTURES OF SAME TYPE AS NEEDED TO FULFILL THIS REQUIREMENT.
- LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
- PROVIDE UNSWITCHED CONDUCTOR FOR ALL LIGHTING CIRCUITS SERVING EMERGENCY LIGHTING, WHETHER OR NOT INDICATED BY TICK MARKS. WHERE EXIT SIGNS, EMERGENCY BATTERY PACKS, OR EMERGENCY CONTROL RELAYS ARE PROVIDED, CONNECT TO UNSWITCHED LINE(S) PER MANUFACTURER INSTRUCTIONS.
- ALL LIGHTING FIXTURE OPTICS SHALL BE HANDLED WITH COTTON GLOVES DURING INSTALLATION AND LAMPING TO AVOID FINGERPRINTS OR DIRT DEPOSITS. IT IS PREFERRED THAT FIXTURES BE SHIPPED AND INSTALLED WITH CLEAR PLASTIC BAGS TO PROTECT OPTICS. AT CLOSE OF PROJECT, AND AFTER CONSTRUCTION AIR FILTERS ARE CHANGED, REMOVE BAGS. ANY OPTICS SHOWING DIRT OR FINGERPRINTS SHALL BE CLEANED WITH SOLVENT RECOMMENDED BY THE MANUFACTURER, OR REPLACED AS NECESSARY IN ORDER TO TURN OVER TO THE OWNER NEW FIXTURES AT OCCUPANCY.
- RECESSED LUMINAIRES SHALL BE SECURED SUCH THAT THE FORCE REQUIRED INSERTING LAMPS, TRIMS, LENSES, LOUVERS, OR DOOR FRAMES DOES NOT SHIFT HOUSING. ALL TRIMS SHALL BE COMPLETELY FLUSH WITH FINISHED CEILINGS AT COMPLETION OF CONSTRUCTION.

TAGGED NOTES

- | # | NOTE |
|-----|--|
| E4 | ELEVATOR PIT DEVICES (PER 2023 NEC 620.24): PROVIDE UNSWITCHED, NEMA 5-20, GFCI RECEPTACLE(S). PROVIDE SEPARATE BRANCH CIRCUITS TO SUPPLY PIT RECEPTACLE(S) AND LIGHTING. MOUNT RECEPTACLE AND SWITCH SIDE-BY-SIDE NEXT TO PIT LADDER, 12" BELOW LEVEL ONE FINISHED FLOOR. |
| E8 | REFER TO SECOND FLOOR LIGHTING PLANS FOR LIGHT FIXTURES AND CEILING MOUNTED LIGHTING CONTROLS IN THIS AREA. |
| E16 | CONTINUE LIGHTING CIRCUIT TO SECOND FLOOR LIGHT FIXTURES. |
| E18 | EXIT SIGN SHALL BE MULLION MOUNTED. |
| E20 | EXTERIOR BUILDING MOUNTED LIGHTING SHALL BE ROUTED THROUGH LIGHTING CONTRACTOR LCB IN ELECTRICAL ROOM B118. REFER TO DETAIL 9 ON SHEET E8.06 FOR INFORMATION. |

CONSULTANTS

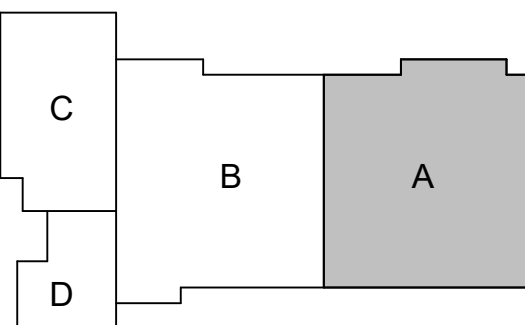
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

MEP
CMTA, INC.
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

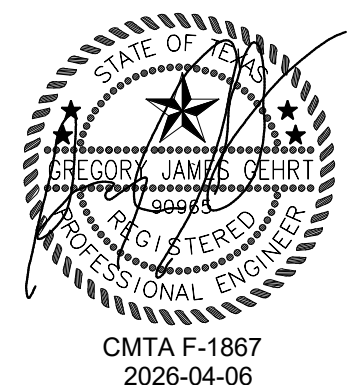
CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377



**REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD**
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511



ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605

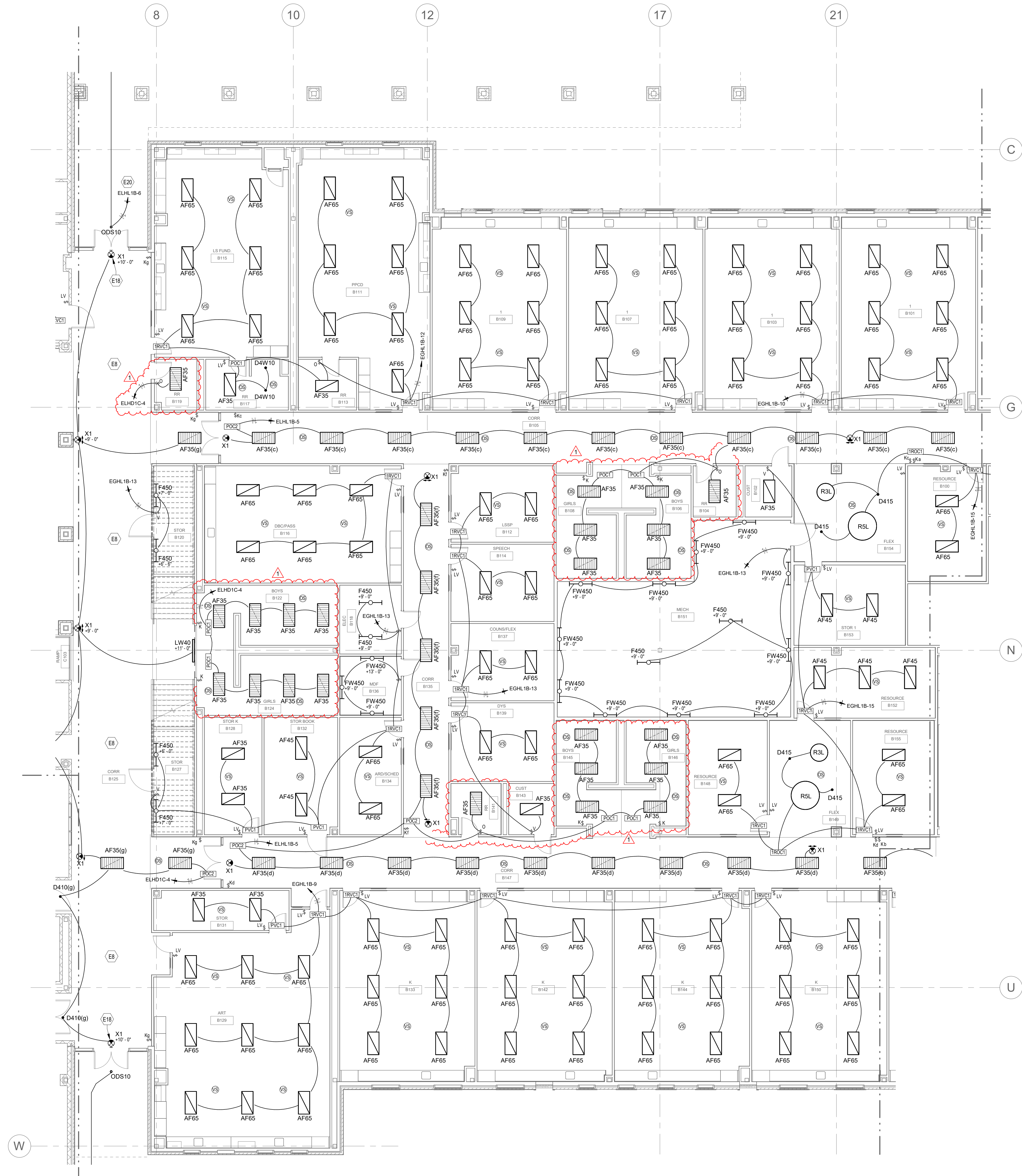


PROJECT #:	202502
DATE:	2026-04-06
DRAWN:	AR
CHECKED:	GJG
DATE:	2026-04-06
DATE:	2026-04-22
ISSUE	PROPOSAL SET
ADD 04	1

E3.01

ELECTRICAL
LIGHTING PLAN -
LEVEL 1 AREA - A1





1 ELECTRICAL PLAN - LIGHTING - LEVEL 1 AREA - B1
1/8" = 1'-0"

GENERAL NOTES (LIGHTING):

- REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.
- CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAYOUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING.
- IF ADDITIONAL CONDUCTORS ARE RUN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER N.E.C. #310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER N.E.C. #300.17 AND ANNEX C.
- MULTIWIRE BRANCH CIRCUITS AS DEFINED IN N.E.C. #100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.
- IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING ON OUTSIDE OF COVER PLATE. ALSO, MARK INSIDES OF ALL DEVICE BOXES WITH PANEL AND CIRCUIT NUMBER.
- LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING. TO MAXIMIZE AVAILABLE LIGHT, SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM. PROVIDE ADDITIONAL FIXTURES OF SAME TYPE AS NEEDED TO FULFILL THIS REQUIREMENT.
- LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
- PROVIDE UNSWITCHED CONDUCTOR FOR ALL LIGHTING CIRCUITS SERVING EMERGENCY LIGHTING, WHETHER OR NOT INDICATED BY TICK MARKS. WHERE EXIT SIGNS, EMERGENCY BATTERY PACKS OR EMERGENCY CONTROL RELAYS ARE PROVIDED, CONNECT TO UNSWITCHED LINE(S) PER MANUFACTURER INSTRUCTIONS.
- ALL LIGHTING FIXTURE OPTICS SHALL BE HANDLED WITH COTTON GLOVES DURING INSTALLATION AND LAMPING TO AVOID FINGERPRINTS OR DIRT DEPOSITS. IT IS PREFERRED THAT FIXTURES BE SHIPPED AND INSTALLED WITH CLEAR PLASTIC BAGS TO PROTECT OPTICS. AT CLOSE OF PROJECT, AND AFTER CONSTRUCTION AIR FILTERS ARE CHANGED, REMOVE BAGS. ANY OPTICS SHOWING DIRT OR FINGER PRINTS SHALL BE CLEANED WITH SOLVENT RECOMMENDED BY THE MANUFACTURER, OR REPLACED AS NECESSARY IN ORDER TO TURN OVER TO THE OWNER NEW FIXTURES AT OCCUPANCY.
- RECESSED LUMINAIRES SHALL BE SECURED SUCH THAT THE FORCE REQUIRED INSERTING LAMPS, TRIMS, LENSES, LOUVERS, OR DOOR FRAMES DOES NOT SHIFT HOUSING. ALL TRIMS SHALL BE COMPLETELY FLUSH WITH FINISHED CEILINGS AT COMPLETION OF CONSTRUCTION.

TAGGED NOTES

- E8 REFER TO SECOND FLOOR LIGHTING PLANS FOR LIGHT FIXTURES AND CEILING MOUNTED LIGHTING CONTROLS IN THIS AREA.
E18 EXIT SIGN SHALL BE MULLION MOUNTED.
E20 EXTERIOR BUILDING MOUNTED LIGHTING SHALL BE ROUTED THROUGH LIGHTING CONTRACTOR LCB IN ELECTRICAL ROOM B118. REFER TO DETAIL 'D' ON SHEET E6.06 FOR INFORMATION.

CONSULTANTS

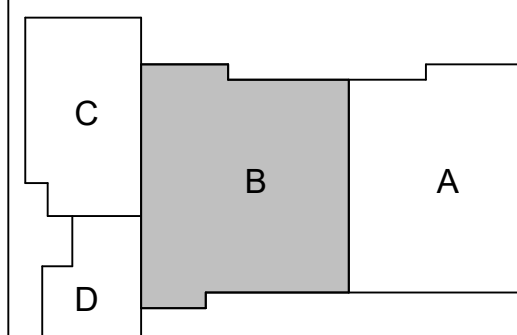
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

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Spring, TX 77380-1960
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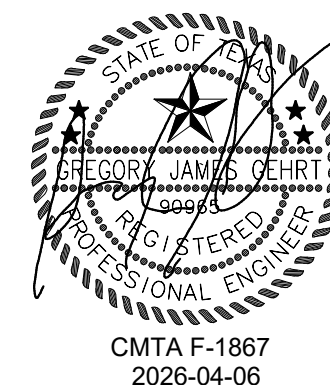


**REPLACEMENT
ELEMENTARY SCHOOL
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ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511



ARCADIS INC.

1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



PROJECT #: 202502
DATE: 2026-04-06
DRAWN: RH
CHECKED: GJG

DATE: 2026-04-06
2026-04-22

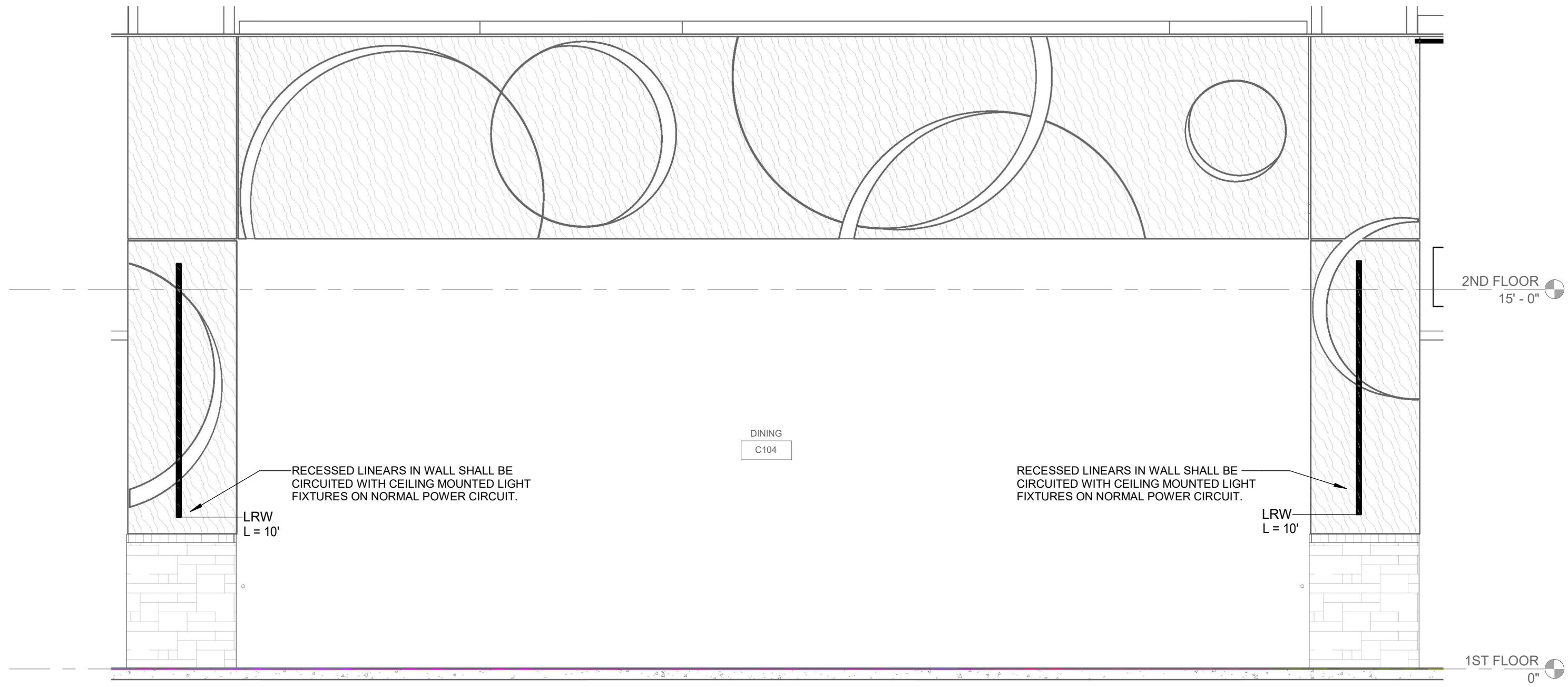
ISSUE
PROPOSAL SET
ADD 04

1

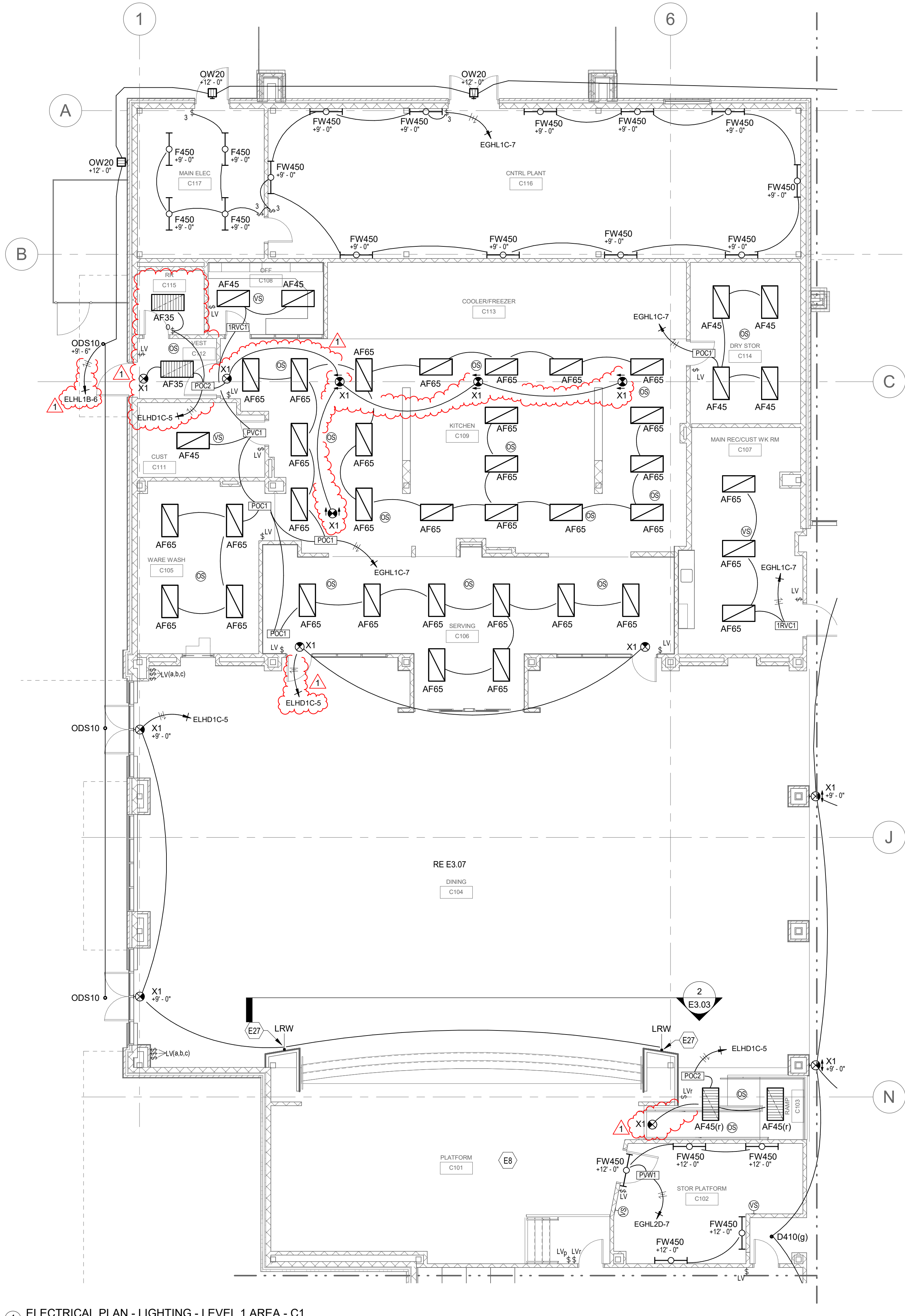
E3.02

ELECTRICAL
LIGHTING PLAN -
LEVEL 1 AREA - B1





2 PLATFORM WALL RECESSED LIGHTING
1/4" = 1'-0"



1 ELECTRICAL PLAN - LIGHTING - LEVEL 1 AREA - C1
1/8" = 1'-0"

GENERAL NOTES (LIGHTING):

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- IF ADDITIONAL CONDUCTORS ARE RUN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER N.E.C. #310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER N.E.C. #300.17 AND ANNEX C.
- MULTIWIRE BRANCH CIRCUITS AS DEFINED IN N.E.C. #100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.
- IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING ON OUTSIDE OF COVER PLATE. ALSO, MARK INSIDES OF ALL DEVICE BOXES WITH PANEL AND CIRCUIT NUMBER.
- LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING. TO MAXIMIZE AVAILABLE LIGHT, SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM. PROVIDE ADDITIONAL FIXTURES OF SAME TYPE AS NEEDED TO FULFILL THIS REQUIREMENT.
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TAGGED NOTES

- E8 REFER TO SECOND FLOOR LIGHTING PLANS FOR LIGHT FIXTURES AND CEILING MOUNTED LIGHTING CONTROLS IN THIS AREA.
E27 LINEAR FIXTURES RECESSED IN WALL SHALL BE CIRCUITED AND CONTROLLED WITH CEILING MOUNTED FIXTURES ON NORMAL POWER CIRCUIT. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS.

CONSULTANTS

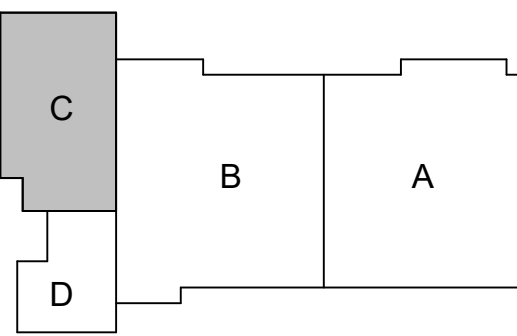
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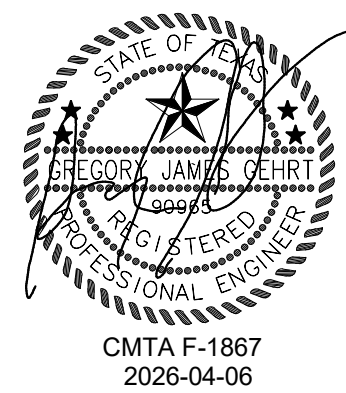
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1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
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PROJECT #: 202502
DATE: 2026-04-06
DRAWN: AR
CHECKED: GJG
DATE: 2026-04-06
2026-04-22
ISSUE
PROPOSAL SET
ADD 04
1

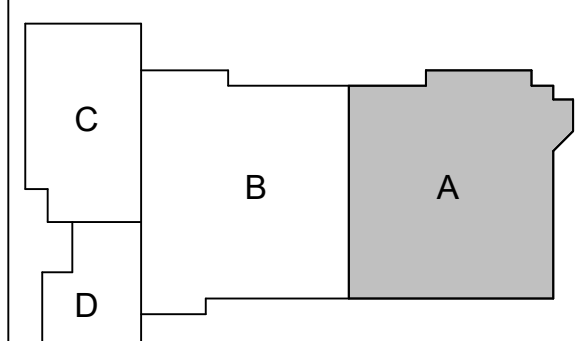
E3.03

ELECTRICAL
LIGHTING PLAN -
LEVEL 1 AREA - C1



- A. REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.
- B. CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAYOUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRIERS.
- C. IF ADDITIONAL CONDUCTORS ARE RUN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CAPACITIES PER N.E.C. 90.10 (167.19). AND PER CONDUIT SCHEDULE 40 REQUIRED PER N.E.C. #300.17 AND ANNEX C.
- D. MULTITHREE BRANCH CIRCUITS AS DEFINED IN N.E.C. #210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.
- E. IDENTIFY THE PANEL AND CIRCUIT NUMBER ON ALL RECEPTABLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING ON OUTSIDE OF COVER PLATE. ALSO, MARK INDICES OF ALL DEVICE BOXES WITH PANEL AND CIRCUIT NUMBER.
- F. LOCATE CHANGING-HAND, DISTURBANCE, FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING. TO MAXIMIZE AVAILABLE LIGHT, SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM. PROVIDE ADDITIONAL FIXTURES OF SAME TYPE AS NEEDED TO FULFILL THIS REQUIREMENT.
- G. LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
- H. PROVIDE UNSWITCHED CONDUCTOR FOR ALL LIGHTING CIRCUITS SERVING EMERGENCY LIGHTING, WHETHER OR NOT INDICATED BY TICK MARKS. WHEN NOT SERVED BY EMERGENCY POWER SOURCE OR EMERGENCY CONTROL RELAYS ARE PROVIDED, CONDUCTOR TO UNSWITCHED LINE(S) PER MANUFACTURER INSTRUCTIONS.
- I. ALL LIGHTING FIXTURE OPTICS SHALL BE HANDLED WITH COTTON GLOVES DURING INSTALLATION AND LAMPING TO AVOID FINGERPRINTS OR DIRTY SURFACES. IS PREPARED TO BE PROTECTED BY SHIPBOARD AND INSTALLED WITH CLEAR PLASTIC BAGS TO PROTECT OPTICS. AT CLOSE OF PROJECT, AND AFTER CONSTRUCTION AIR FILTERS ARE CHANGED, REMOVE BAGS. ANY OPTICS SHOWING DISCOLOR OR FINGERPRINTS OR SOOTS OR OTHER DAMAGE SHOULD BE RECOMMENDED BY THE MANUFACTURER, OR REPLACED AS NECESSARY IN ORDER TO TURN OVER TO THE OWNER NEW FIXTURES AT OCCUPANCY.
- J. RECESSED LUMINAIRES SHALL BE SECURED SUCH THAT THE FORCE REQUIRED INSERTING LAMPS, TRIMS, LENSES, COVERS, OR DORR FRAMES DOES NOT SHIFT HOUSING, ALL TRIMS SHALL BE SECURED TO FULLY FLUSH WITH FINISHED CEILING AT COMPLETION OF CONSTRUCTION.

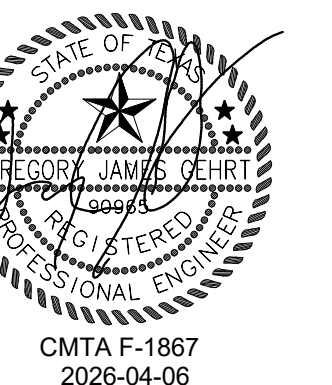
CONSULTANTS
STRUCTURAL
CJG Engineers 3200 Wilcrest Drive, Suite 305 Houston, TX 77042 Tel: 713.780.3345 Fax: 713.780.3712
FOODSERVICE
Foodservice Design Professionals 594 Sawdust Road, Suite 139 Spring, TX 77380-1960 Tel: 281.350.2323 Fax: 281.350.5959
LANDSCAPE
PEA Group 16080 Dillard Drive, Suite 250 Houston, TX 77040 Tel: 844.813.2949
MEP
CMTA, INC 2201 Timberloch Place, Suite 110 The Woodlands, TX 77380 Tel: 281.419.9399
CIVIL
S&G Engineering Consultants, LLC 1796 Avenue D, Suite B Katy, Texas 77493 Tel: 832.437.7377



**REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD**
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511



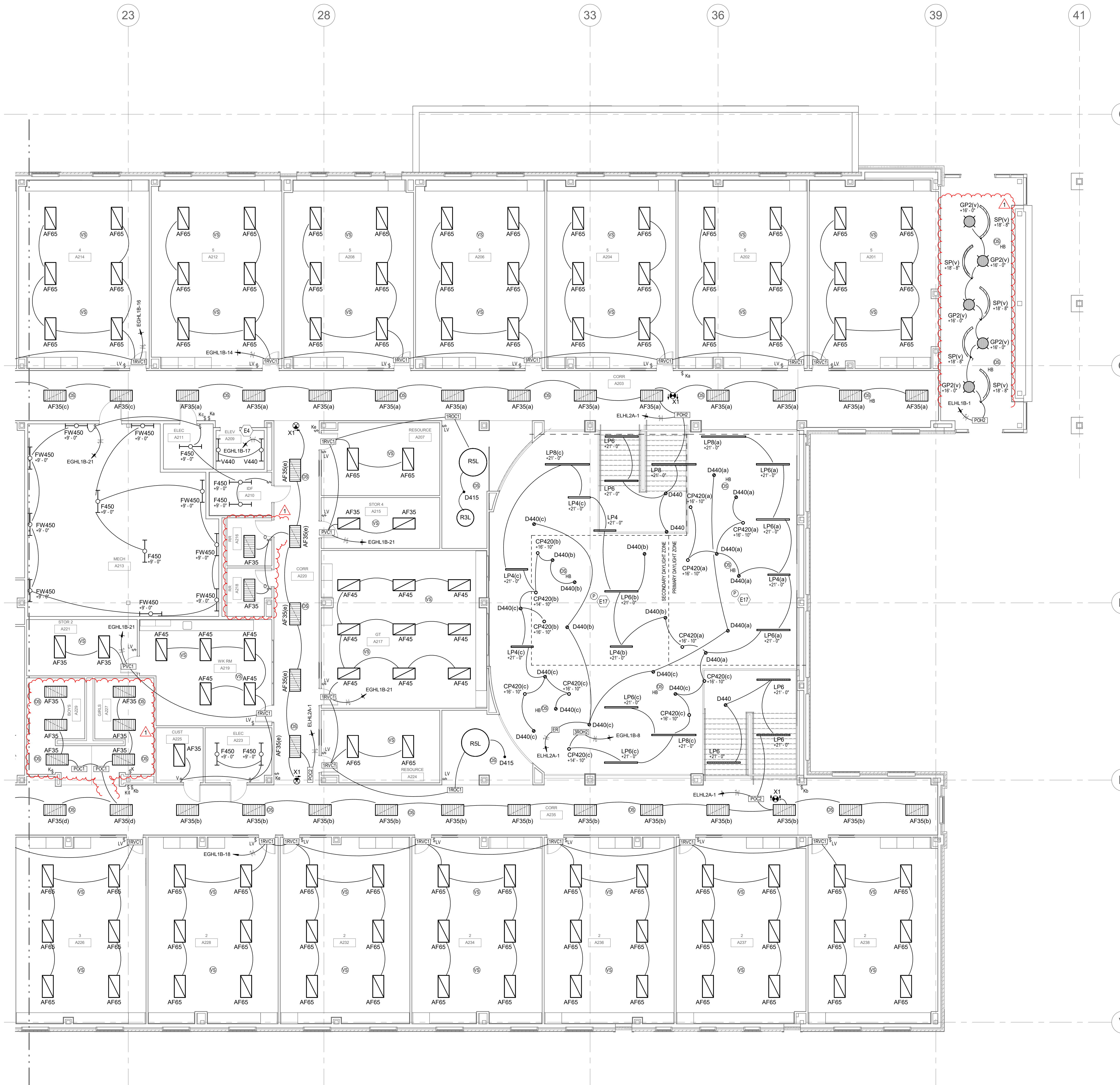
ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



PROJECT #:		202502
DATE:		2026-04-06
DRAWN:		RH
CHECKED:		GJG
DATE	ISSUE	
2026-04-06	PROPOSAL SET	
2026-04-22	ADD 04	1

E3.05

ELECTRICAL
LIGHTING PLAN -
LEVEL 2 AREA - A2



1 ELECTRICAL PLAN - LIGHTING - LEVEL 2 AREA - A2
1/8" = 1'-0"





1 ELECTRICAL PLAN - LIGHTING - LEVEL 2 AREA - B2
1/8" = 1'-0"

GENERAL NOTES (LIGHTING):

- REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.
- CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAY-OUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING.
- IF ADDITIONAL CONDUCTORS ARE RUN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER N.E.C. #310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER N.E.C. #300.17 AND ANNEX C.
- MULTIWIRE BRANCH CIRCUITS AS DEFINED IN N.E.C. #100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.
- IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING ON OUTSIDE OF COVER PLATE. ALSO, MARK INSIDES OF ALL DEVICE BOXES WITH PANEL AND CIRCUIT NUMBER.
- LOCATE CHAIN-HUNG INDUSTRIAL FIXTURES IN MECHANICAL ROOMS TO AVOID DUCTWORK AND PIPING. TO MAXIMIZE AVAILABLE LIGHT, SPACE AROUND EQUIPMENT, AIR HANDLERS, ETC. TO PROVIDE ADEQUATE LIGHTING TO ALL AREAS OF ROOM. PROVIDE ADDITIONAL FIXTURES OF SAME TYPE AS NEEDED TO FULFILL THIS REQUIREMENT.
- LOCATE EXIT SIGNS FOR MAXIMUM VIEWING AREA TO IDENTIFY EGRESS PATHS AS INDICATED ON PLANS. COORDINATE LOCATIONS SUCH THAT ARCHITECTURAL FEATURES OR EQUIPMENT FROM OTHER TRADES DO NOT OBSTRUCT VIEW.
- PROVIDE UNSWITCHED CONDUCTOR FOR ALL LIGHTING CIRCUITS SERVING EMERGENCY LIGHTING, WHETHER OR NOT INDICATED BY TICK MARKS. WHERE EXIT SIGNS, EMERGENCY BATTERY PACKS, OR EMERGENCY CONTROL RELAYS ARE PROVIDED, CONNECT TO UNSWITCHED LINE(S) PER MANUFACTURER INSTRUCTIONS.
- ALL LIGHTING FIXTURE OPTICS SHALL BE HANDLED WITH COTTON GLOVES DURING INSTALLATION AND LAMPING TO AVOID FINGERPRINTS OR DIRT DEPOSITS. IT IS PREFERRED THAT FIXTURES BE SHIPPED AND INSTALLED WITH CLEAR PLASTIC BAGS TO PROTECT OPTICS. AT CLOSE OF PROJECT, AND AFTER CONSTRUCTION AIR FILTERS ARE CHANGED, REMOVE BAGS. ANY OPTICS SHOWING DIRT OR FINGER PRINTS SHALL BE CLEANED WITH SOLVENT RECOMMENDED BY THE MANUFACTURER, OR REPLACED AS NECESSARY IN ORDER TO TURN OVER TO THE OWNER NEW FIXTURES AT OCCUPANCY.
- RECESSED LUMINAIRES SHALL BE SECURED SUCH THAT THE FORCE REQUIRED INSERTING LAMPS, TRIMS, LENSES, LOUVERS, OR DOOR FRAMES DOES NOT SHIFT HOUSING. ALL TRIMS SHALL BE COMPLETELY FLUSH WITH FINISHED CEILINGS AT COMPLETION OF CONSTRUCTION.

TAGGED NOTES

CONSULTANTS

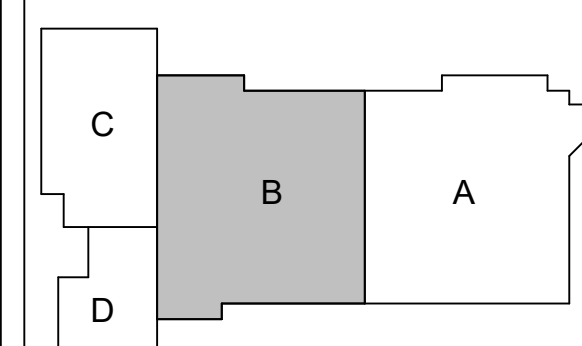
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

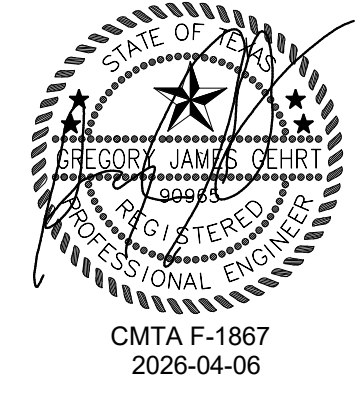
MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377



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ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd, Alvin, TX 77511

ARCADIS
ARCADIS INC.
1330 POST OAK BOULEVARD, SUITE 2250
HOUSTON, TX 77056
tel 281.286.6605



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2026-04-22

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E3.06

ELECTRICAL
LIGHTING PLAN -
LEVEL 2 AREA - B2



A. ALL ROOM LAYOUTS ARE TYPICAL AND MAY VARY OR MIRROR OTHER ASSOCIATED ROOMS. CONTRACTOR SHALL REFER TO ARCHITECTURAL ELEVATIONS AND COORDINATE EACH ROOM PRIOR TO ROUGH-IN.

CONSULTANTS

CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
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Tel: 832.437.7377

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CMTA F-1867
2026-04-22

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2026-04-22	ADD 04	1

ELECTRICAL ENLARGED PLANS



NEC LOAD ANALYSIS CHART - GENERATOR

LIGHTING CONNECTED LOAD =	40.66 kVA
RECEPTACLE CONNECTED LOAD =	46.78 kVA
MOTOR CONNECTED LOAD =	38.28 kVA
HEAT CONNECTED LOAD =	2 kVA
KITCHEN CONNECTED LOAD =	17.84 kVA
ELEVATOR CONNECTED LOAD =	30 kVA
OTHER CONNECTED LOAD =	7.5 kVA
	183.06kVA

NEC LOAD ANALYSIS PER ARTICLE 220.86 SCHOOLS:

BUILDING AREA: 106690 FT ²	1.72 VA/FT ²
TOTAL VA PER FT ² =	
FIRST 3 VA/FT ² @ 100% =	1.72 VA/FT ²
3 - 20 VA/FT ² @ 75% =	0 VA/FT ²
OVER 20 VA/FT ² @ 25% =	0 VA/FT ²
DIVERSIFIED POWER DENSITY PER 220.86 =	1.72VA/FT ²
DIVERSIFIED LOAD PER 220.86 =	183 kVA
183.06kVA / 831.4V	220 A
220 * 1.25 =	275 A
SERVICE SIZE =	200kW/250kVA GENERATOR

NEC LOAD ANALYSIS CHART - MSB

LIGHTING CONNECTED LOAD =	44.9 kVA
RECEPTACLE CONNECTED LOAD =	106.76 kVA
MOTOR CONNECTED LOAD =	693.2 kVA
HEAT CONNECTED LOAD =	383.4 kVA
KITCHEN CONNECTED LOAD =	81.53 kVA
ELEVATOR CONNECTED LOAD =	30 kVA
OTHER CONNECTED LOAD =	113.45 kVA
	1513.28kVA

NEC LOAD ANALYSIS PER ARTICLE 220.86 SCHOOLS:

BUILDING AREA: 106690 FT ²	14.18 VA/FT ²
TOTAL VA PER FT ² =	
FIRST 3 VA/FT ² @ 100% =	3 VA/FT ²
3 - 20 VA/FT ² @ 75% =	8.39 VA/FT ²
OVER 20 VA/FT ² @ 25% =	0 VA/FT ²
DIVERSIFIED POWER DENSITY PER 220.86 =	11.39VA/FT ²
DIVERSIFIED LOAD PER 220.86 =	1215 kVA
1214.98kVA / 831.4V	1461 A
1461 * 1.25 =	1827 A
SERVICE SIZE =	2000A/277Y/480V/3Ø/4W

GENERAL NOTES:

- PROVIDE ENGRAVED LAMACOD LABELS FOR ALL POWER DISTRIBUTION EQUIPMENT FURNISHED OR MODIFIED IN THIS PROJECT. LABELS PER DETAILS AND SPECIFICATIONS.
- SERVICE EQUIPMENT SHALL BE MARKED WITH THE MAXIMUM AVAILABLE FAULT-CURRENT AT THE EQUIPMENT AND THE DATE THE CALCULATION WAS PERFORMED. APPLY A TYPE-WRITTEN ADHESIVE LABEL WITH WHITE BACKGROUND, 1/2" HIGH BLACK LETTERING.
- CONTRACTOR SHALL INSTALL SEPARATE CONDUITS, PULL BOXES, ETC. FOR EACH EMERGENCY POWER BRANCH & NORMAL POWER PER NEC FOR COMPLETE SEPARATION OF POWER SERVICES.
- ALL CIRCUIT BREAKERS AND/OR DISCONNECTS SERVING THE PRIMARY SIDE OF A TRANSFORMER WHICH ARE NOT WITHIN LINE OF SIGHT OF THE TRANSFORMER SHALL BE PROVIDED WITH PERMANENTLY INSTALLED MEANS TO LOCK THE BREAKER IN THE OFF POSITION. SUCH TRANSFORMERS SHALL HAVE THE ROOM NAME AND NUMBER OF THE PRIMARY DISCONNECTING MEANS ENGRAVED ON THE EQUIPMENT NAMEPLATE.
- CONTRACTOR SHALL PERFORM COORDINATION/FAULT CURRENT STUDY AND ARC FLASH HAZARD ANALYSIS AND SUBMIT STUDY RESULTS CONCURRENTLY WITH ELECTRICAL DISTRIBUTION EQUIPMENT SUBMITTALS. REFER TO SPECIFICATION SECTION 260573 FOR POWER SYSTEM STUDY REQUIREMENTS.
- CONTRACTOR SHALL SET TRIP SETTINGS ON ALL ADJUSTABLE CIRCUIT BREAKERS ACCORDING TO RECOMMENDATIONS DETERMINED IN OCPD STUDIES, UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
- ALL METERING EQUIPMENT SHALL INCLUDE FACTORY START-UP, COMMISSIONING, AND OWNER TRAINING BY FACTORY PERSONNEL.

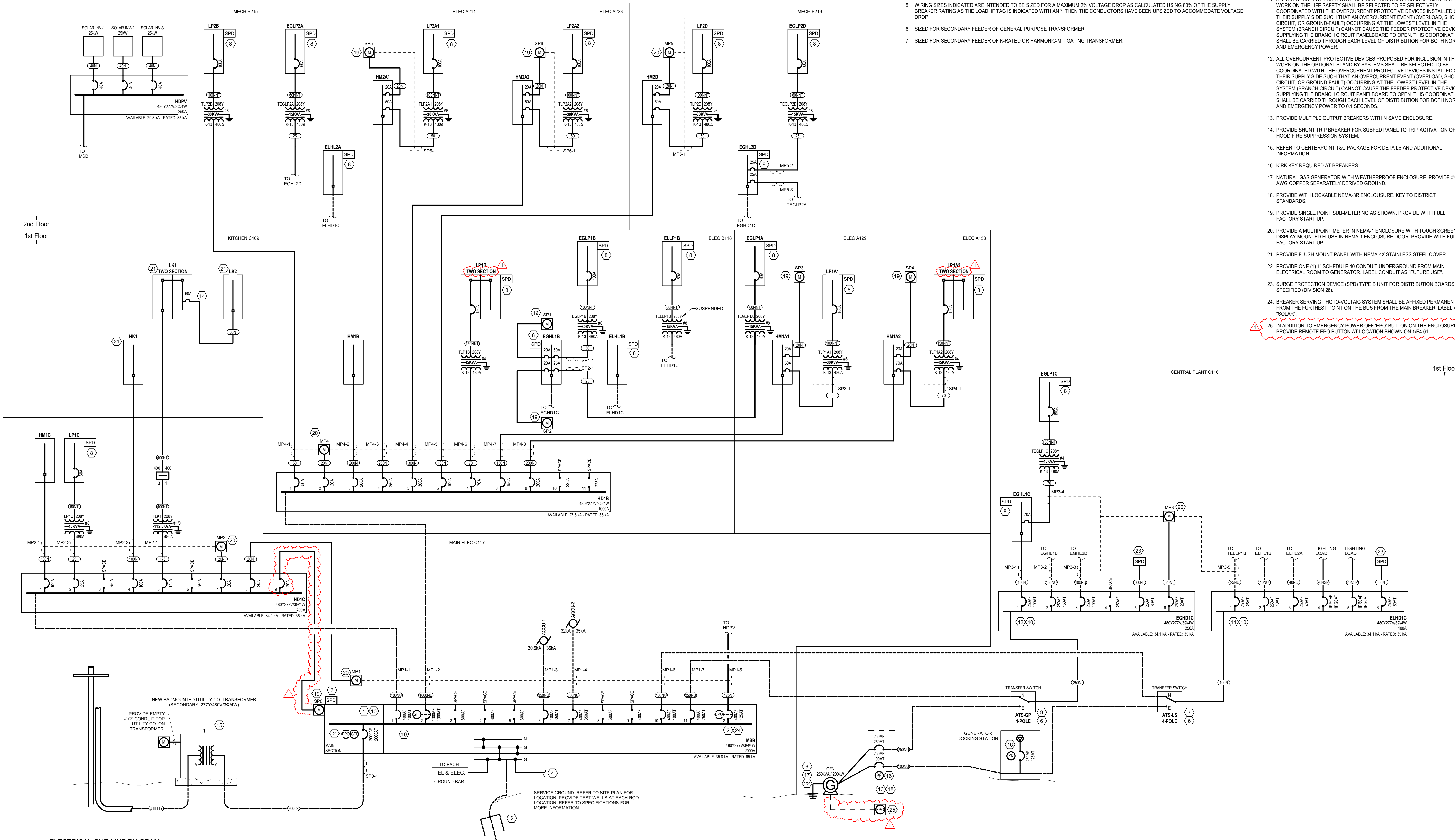
COPPER FEEDER SCHEDULE

TAG	OCPD SETTING		1LINE FEEDER PARALLEL RUNS	PHASE CONDUCTORS	NEUTRAL	EQUIP GROUND	CONDUIT SIZE	REMARKS
20N	20A	-		3#12	1#12 N	1#12 G	3/4" C	1.5
20NSP	20A	-		1#12	1#12 N	1#12 G	3/4" C	1.5
25	25A	-		3#10	1#10 N	1#10 G	3/4" C	1.5
25NU	25A	-		3#10	1#10 N	1#10 G	1" C	1.3,5
40N	40A	-		3#8	1#8 N	1#10 G	3/4" C	1.5
40NU	40A	-		3#8	1#8 N	1#10 G	1" C	1.3,5
50	50A	-		3#6	1#6 N	1#10 G	1" C	1.5
60N	60A	-		3#4	1#4 N	1#10 G	1-1/4" C	1.5
60NNT	60A	-		3#4	2#10 N	1#8 G	1-1/4" C	1.2,5,7
70NT	60A	-		3#4	1#4 N	1#8 G	1-1/4" C	1.5
70	70A	-		3#4	1#4 N	1#8 G	1-1/4" C	1.5
100N	100A	-		3#1	1#1 N	1#8 G	1-1/2" C	1.5
100NNT	100A	-		3#1	2#1 N	1#8 G	2" C	1.2,5,7
100NU	100A	-		3#1	1#1 N	1#8 G	1-1/2" C	1.3,5
125N	125A	-		3#1/0	1#1/0 N	1#8 G	2" C	1.5
150N	150A	-		3#2/0	1#2/0 N	1#4 G	2" C	1.5
150NNT	150A	-		3#2/0	2#2/0 N	1#4 G	2" C	1.2,5,7
150NU	150A	-		3#2/0	1#2/0 N	1#4 G	2" C	1.3,5
175	175A	-		3#2/0	1#2/0 N	1#6 G	1-1/2" C	1.5
200N	200A	-		3#4/0	1#4/0 N	1#4 G	2-1/2" C	1.5
250N	250A	-		3#350KCM	1#350KCM N	1#2 G	2-1/2" C	1.5
250NU	250A	-		3#350KCM	1#350KCM N	1#2 G	3" C	1.3,5
300N	300A	-		3#400KCM	1#400KCM N	1#2 G	3" C	1.5
350NU	350A	2 SETS		3#4/0	1#4/0 N	1#1 G	2" C	1.3,5
400NT	400A	2 SETS		3#4/0	1#4/0 N	1#10 G	2" C	1.5,6
400NU	400A	2 SETS		3#4/0	1#1 G	1#1 G	2" C	1.3,5
1000NU	1000A	3 SETS		3#500KCM	1#500KCM N	1#20 G	4" C	1.3,5
2000S	2000A	6 SETS		3#600KCM	1#600KCM N	-	4" C	1.4,5
UTILITY				-	-	-	-	-

- THIS SCHEDULE IS BASED ON 60 DEGREE C WIRE (TYPE THW) AND TERMINATIONS FOR SIZES #12 AWG TO #1 AWG; AND 75 DEGREE C WIRE (TYPE THHN) AND TERMINATIONS FOR SIZES GREATER THAN #10 AWG. IF CONTRACTOR CHOOSES TO USE CONDUCTORS WITH LARGER DIAMETER, THE CONDUIT SIZES MUST BE REVISED ACCORDINGLY. CONDUIT SIZING IS BASED ON EMT CONDUIT UNLESS NOTED OTHERWISE.
- THE NEUTRAL OF THE INDICATED FEEDER IS 200% OF THE AMPACITY OF THE INDIVIDUAL PHASE CONDUCTORS. FOR SIZES #10 AND LARGER, THE INDICATED FEEDER CONSISTS OF 2 CONDUCTORS IN EACH RACEWAY TERMINATED TO THE SAME LUG. MAKE CAREFUL SELECTION OF LUG AMPACITY AND NEUTRAL BUS SIZE DUE TO HARMONIC CURRENTS CARRIED BY THE NEUTRAL.
- SIZED FOR SCHEDULE 40 PVC CONDUIT, DIRECT BURIED. IF CONCRETE ENCASED, CONDUCTOR SIZE WILL NEED TO BE INCREASED FOR DERATING.
- SERVICE FEEDER IS SIZED TO BE A CONCRETE-ENCASED PVC DUCTBANK WITH MINIMUM 2-INCH CONCRETE ENCASEMENT AROUND CONDUITS.
- WIRING SIZES INDICATED ARE INTENDED TO BE SIZED FOR A MAXIMUM 2% VOLTAGE DROP AS CALCULATED USING 80% OF THE SUPPLY BREAKER RATING AS THE LOAD. IF TAG IS INDICATED WITH AN *, THEN THE CONDUCTORS HAVE BEEN UPSIZED TO ACCOMMODATE VOLTAGE DROP.
- SIZED FOR SECONDARY FEEDER OF GENERAL PURPOSE TRANSFORMER.
- SIZED FOR SECONDARY FEEDER OF K-RATED OR HARMONIC-MITIGATING TRANSFORMER.

TAGGED NOTES:

- NEW TWO SECTION 2000A/277Y/480V/3Ø/4W MAIN SERVICE SWITCHBOARD "MSB" RATED AT 65 KAC MIN. WITH COPPER BUSSING, SQUARE D OED-2 STYLE WITH THE FOLLOWING SECTIONS:
 - MAIN: SECTION SHALL HOUSE 2000A/3P TWO-STEP 100% RATED, ELECTRONIC TRIP, FULL FUNCTION INSULATED CASE G.F.I. MAIN CIRCUIT BREAKER AND SQUARE D #CM3250 CIRCUIT MONITOR OR EQUAL.
 - DIST. 1 (SECTION): 2000A DOUBLE - ROW SECTION WITH 117" OF BREAKER MOUNTING SPACE FOR 14LINE ELECTRONIC TRIP TYPE CIRCUIT BREAKERS (U.O.N.)
- EMERGENCY POWER OFF (EPO) FOR SERVICE DISCONNECT SHALL BE A RED MUSHROOM STYLE PUSH BUTTON MOUNTED WITHIN A 6"X6"X4" STAINLESS STEEL NEMA 4X BOX WITH A HINGED DOOR AND (1) 1/4" TURN SLOT LATCH. THE BOX WILL INCLUDE A 1" RED ENGRAVED NAME PLATE WITH 3/4" WHITE LETTERS AND A HAMMOND ELUXIPSE JR SERIES PADLOCK ADAPTER ASSEMBLY (OR EQUAL), MOUNT ON EXTERIOR WALL ADJACENT TO ELECTRICAL ROOM.
- SURGE PROTECTION DEVICE (SPD) TYPE 8A UNIT FOR SERVICE SWITCHBOARD AS SPECIFIED (DIVISION 26). MOUNT UNIT ON END OF SWITCHBOARD. PROVIDE WITH FACTORY TAPS.
- COPPER GROUNDING CONDUCTOR BONDED TO UNDERGROUND METAL COLD WATER SERVICE. CONCRETE ENCASED "UFER" GROUND & CALDWELD TO BUILDING STEEL.
- PROVIDE ONE (1) #250 KCMIL COPPER GROUNDING ELECTRODE FROM NEW GROUND BAR AT NEW SWITCHBOARD "MSB" TO THREE 8"X10" COPPERWELD GROUND RODS AS REQUIRED. TEST GROUND SYSTEM IMPEDANCE LEVEL AND IF NOT < 5 OHMS, ADD GROUND RODS AS NECESSARY TO MEET THIS REQUIREMENT. GROUND RODS SHALL ALSO BE CONNECTED TO BUILDING STEEL AND COLD WATER ENTRANCE PIPING PER NEC.
- PROVIDE CONTROL WIRING IN 1" CONDUIT AS REQUIRED FROM GENERATOR CONTROL PANEL TO AUTOMATIC TRANSFER SWITCH FOR START-UP CONTROLS.
- LIFE SAFETY AUTOMATIC TRANSFER SWITCH, ATS-US, 400A, 4-POLE. PROVIDE WIRING FROM AUXILIARY CONTACTS ON EMERGENCY SIDE OF ATS TO EGRESS LIGHTING POWER PACKS. WHEN POWER PACKS RECEIVE INPUT FROM ATS, THE "HOLD ON" FUNCTION IS ENABLED AND LIGHTS ILLUMINATE TO 100 PERCENT.
- SURGE PROTECTION DEVICE (SPD) TYPE C UNIT FOR PANELBOARDS AS SPECIFIED (DIVISION 26). MOUNT UNIT TO SIDE OF PANELBOARD WITH MAXIMUM 3" WIRE LEAD LENGTH.
- OPTIONAL STAND-BY AUTOMATIC TRANSFER SWITCH, ATS-GP, 400A, 4-POLE.
- PROVIDE ELECTRONIC TRIP BREAKERS.
- ALL OVERCURRENT PROTECTIVE DEVICES PROPOSED FOR INCLUSION IN THE WORK ON THE LIFE SAFETY SHALL BE SELECTED TO BE SELECTIVELY COORDINATED WITH THE OVERCURRENT PROTECTIVE DEVICES INSTALLED ON THEIR SUPPLY SIDE SUCH THAT AN OVERCURRENT EVENT (OVERLOAD, SHORT-CIRCUIT, OR GROUND-FAULT) OCCURRING AT THE LOWEST LEVEL IN THE SYSTEM (BRANCH CIRCUIT) CANNOT CAUSE THE FEEDER PROTECTIVE DEVICE SUPPLYING THE BRANCH CIRCUIT PANELBOARD TO OPEN. THIS COORDINATION SHALL BE CARRIED THROUGH EACH LEVEL OF DISTRIBUTION FOR BOTH NORMAL AND EMERGENCY POWER.
- ALL OVERCURRENT PROTECTIVE DEVICES PROPOSED FOR INCLUSION IN THE WORK ON THE OPTIONAL STAND-BY SYSTEMS SHALL BE SELECTED TO BE COORDINATED WITH THE OVERCURRENT PROTECTIVE DEVICES INSTALLED ON THEIR SUPPLY SIDE SUCH THAT AN OVERCURRENT EVENT (OVERLOAD, SHORT-CIRCUIT, OR GROUND-FAULT) OCCURRING AT THE LOWEST LEVEL IN THE SYSTEM (BRANCH CIRCUIT) CANNOT CAUSE THE FEEDER PROTECTIVE DEVICE SUPPLYING THE BRANCH CIRCUIT PANELBOARD TO OPEN. THIS COORDINATION SHALL BE CARRIED THROUGH EACH LEVEL OF DISTRIBUTION FOR BOTH NORMAL AND EMERGENCY POWER TO 0.1 SECONDS.
- PROVIDE MULTIPLE OUTPUT BREAKERS WITHIN SAME ENCLOSURE.
- PROVIDE SHUNT TRIP BREAKER FOR SUBFEED PANEL TO TRIP ACTIVATION OF HOOD FIRE SUPPRESSION SYSTEM.
- REFER TO CENTERPOINT T&C PACKAGE FOR DETAILS AND ADDITIONAL INFORMATION.
- KIRK KEY REQUIRED AT BREAKERS.
- NATURAL GAS GENERATOR WITH WEATHERPROOF ENCLOSURE. PROVIDE #4 AWG COPPER SEPARATELY DERIVED GROUND.
- PROVIDE WITH LOCKABLE NEMA-3R ENCLOSURE. KEY TO DISTRICT STANDARDS.
- PROVIDE SINGLE POINT SUB-METERING AS SHOWN. PROVIDE WITH FULL FACTORY START UP.
- PROVIDE A MULTIPoint METER IN NEMA-1 ENCLOSURE WITH TOUCH SCREEN DISPLAY MOUNTED FLUSH IN NEMA-1 ENCLOSURE DOOR. PROVIDE WITH FULL FACTORY START UP.
- PROVIDE FLUSH MOUNT PANEL WITH NEMA-4X STAINLESS STEEL COVER.
- PROVIDE ONE (1) 1" SCHEDULE 40 CONDUIT UNDERGROUND FROM MAIN ELECTRICAL ROOM TO GENERATOR. LABEL CONDUIT AS "FUTURE USE".
- SURGE PROTECTION DEVICE (SPD) TYPE B UNIT FOR DISTRIBUTION BOARDS AS SPECIFIED (DIVISION 26).
- BREAKER SERVING PHOTO-VOLTAIC SYSTEM SHALL BE AFFIXED PERMANENTLY FROM THE FURTHEST POINT ON THE BUS FROM THE MAIN BREAKER. LABEL AS "SOLAR".
- IN ADDITION TO EMERGENCY POWER OFF "EPO" BUTTON ON THE ENCLOSURE, PROVIDE REMOTE EPO BUTTON AT LOCATION SHOWN ON 1E4.01.



CONSULTANTS

STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
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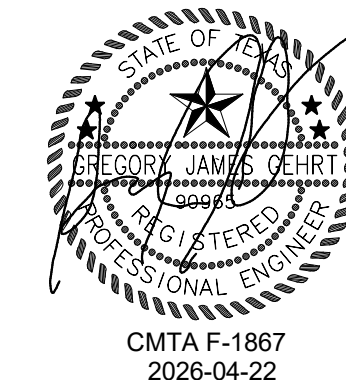
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tel 281.286.6605



PROJECT #:	202502
DATE:	2026-04-06
DRAWN:	AM
CHECKED:	GJG
DATE:	2026-04-06
ISSUE:	PROPOSAL SET
DATE:	2026-04-22
ADD 04	1

E5.01

**ELECTRICAL
ONE-LINE DIAGRAM**

LIGHT FIXTURE SCHEDULE - EXTERIOR							
TYPE	DESCRIPTION	BASIS OF DESIGN	MOUNTING	LAMPS / CCT	MINIMUM LUMENS	MAXIMUM WATTAGE	VOLTAGE
OAL52	DUAL HEAD PARKING LOT FIXTURE TYPE 5 WIDE ON 25' ALUMINUM TAPERED SQUARE POLE.	MCGRAW-EDISON #SAC3-340-U-SWO-XX-2@180 LITHONIA LIGHTING #RSX2 LED-PX-40K-RV-MVOLT-LRPA-XXXX-2 HEADS BEACON #VP-2-320L-145-4K3-SQW-UNV-A-XXX-2 HEADS GARCO #OPF-M-A11-840-TSW-A-R1-UNV-XX-2 HEADS	25' ALUM TAPERED SQUARE POLE ON 4' BASE	LED 4000K	21000 EACH HEAD	320	277
OD410	EXTERIOR 4" ROUND RECESSED DOWNLIGHT WITH WIDE DISTRIBUTION.	PORTFOLIO #LD4C10904D-D010-W1-L1-GSKT4IP66 GOTHAM #EV04SH-4010-DPR-SM0-MVOLT-EZ1 PRESCOLITE #LTR-4RD-H-SL10L-DM1-LTR-4RD-T-SHSL40K8-WT-ACL LIGHTOLIER #4RN-CAL10940WZ10U-CARSLWH	RECESSED	LED 4000K	900	10	277
ODS10	EXTERIOR 4" ROUND SURFACE MOUNTED DOWNLIGHT WITH WIDE DISTRIBUTION AND SEMI-SPECULAR FINISH.	PORTFOLIO #LER4D10010XX-EC4DR600210940-4LBDP3L1-LNE4RUD GOTHAM #V05CYL-SC-D-10L-40K-80CRI-WD-MIN10-ZT-WL PRESCOLITE #LTC-4RD-S-10L40KWD-DM1-SSXX LIGHTOLIER #C4SLD10540WZ10UCLX	SURFACE	LED 4000K	900	11	277
OW20	EXTERIOR LOW-PROFILE WALL PACK WITH FULL CUT-OFF.	LUMARK #AXC3SA STONCO #LPW16-2L-740-3-UNV-XX LITHONIA LIGHTING #WPX1-LED-P2-40K-MVOLT-XXXX BEACON #RWL1-48-154K-7-20V-XXXX	WALL	LED 4000K	2000	22	277
PROVIDE A 10-YEAR WARRANTY. ALL FIXTURES SHALL BE WET LOCATION LISTED. LIGHT FIXTURES SHALL BE DLC-LISTED OR ENERGY STAR RATED. EACH MANUFACTURER SHALL BE BID AS ALTERNATE. REFER TO SPECIFICATIONS FOR MORE INFORMATION.							

LIGHT FIXTURE SCHEDULE - PLATFORM							
TYPE	DESCRIPTION	BASIS OF DESIGN	MOUNTING	LAMPS / CCT	MINIMUM LUMENS	MAXIMUM WATTAGE	VOLTAGE
THC	COLORSOURCE PAR FIXTURE WITH MEDIUM ROUND OPTIC, C-CLAMP, AND SAFETY CABLE.	ETC #CSPAR-400CC-400SC-DPA-A-SELRM-7.5-D-PA-DMX COLORONIX #SS2-RGBW-SR-10 OR APPROVED EQUAL	TRACK	LED	3000	90	120
TL45	ADJUSTABLE TRACK HEAD WITH HIGH OUTPUT AND WIDE FLOOD DISTRIBUTION.	ERALUX #AE-TL-CDX-12-XXV-WF-P-40-MOUNTING-BK-T1-8-BK LUMENURE #FT96-40H-3000-20-XXX-XX OR APPROVED EQUAL	TRACK	LED 4000K	4500	45	277

LIGHTING CONTROL SCHEDULES - WIRED NETWORKED ROOM CONTROLLERS						
TYPE	DESCRIPTION	SEQUENCE OF OPERATION	CONTROLLER	SENSOR	SWITCH	REMARKS
1R0C1	SINGLE ZONE NETWORKED ROOM CONTROLLER WITH CEILING-MOUNTED OCCUPANCY SENSING AND MANUAL DIMMING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" 2. OCCUPANCY SENSOR - AUTO "ON" AT 50% 3. MANUAL 0-10V DIMMING FROM 10%-100% 4. OCCUPANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 5. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	ROOM CONTROLLER: 1. WATSTOPPER #LMRC-111+LMBC-300 2. LUTRON #PP-DV2-MVOLT-E-1 3. NUGHT #PP16-D-EFP-SA(+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #LMDC-100 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LMDM-101 2. LUTRON #INTSTV-WH 3. NUGHT #NPODM-DX-XX	DETAIL 6/6E.06
1RV1C1	SINGLE ZONE ROOM NETWORKED CONTROLLER WITH CEILING-MOUNTED VACANCY SENSING AND MANUAL DIMMING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" 2. VACANCY SENSOR - MANUAL "ON" AT 50% 3. MANUAL 0-10V DIMMING FROM 10%-100% 4. VACANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 5. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	ROOM CONTROLLER: 1. WATSTOPPER #LMRC-111+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-SA(+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #LMDC-100 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10+ADCX	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LMDM-101 2. LUTRON #INTSTV-WH 3. NUGHT #NPODM-DX-XX	DETAIL 10/E6.06
1RVH1	SINGLE ZONE NETWORKED ROOM CONTROLLER WITH CEILING-MOUNTED HIGH-BAY VACANCY SENSING AND MANUAL DIMMING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" 2. VACANCY SENSOR - MANUAL "ON" AT 50% 3. MANUAL 0-10V DIMMING FROM 10%-100% 4. VACANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 5. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	ROOM CONTROLLER: 1. WATSTOPPER #LMRC-111+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-SA(+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #LMDC-100-5 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-6	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LMDM-101 2. LUTRON #INTSTV-WH 3. NUGHT #NPODM-DX-XX	DETAIL 11/E6.06
3R0H2	ONE (1) SINGLE ZONE AND ONE (1) TWO ZONE NETWORKED ROOM CONTROLLER TIED TOGETHER WITH CEILING-MOUNTED HIGH-BAY OCCUPANCY SENSING AND AUTO DIMMING	1. LOW-VOLTAGE MOMENTARY SWITCH PER ZONE WILL TURN LIGHTS "ON/OFF" 2. OCCUPANCY SENSOR - AUTO "ON" AT 50% PER ZONE 3. AUTO 0-10V DIMMING FOR DAYLIGHT SENSING ZONE 4. MANUAL 0-10V DIMMING FROM 10%-100% IN NON-DAYLIGHT ZONE 5. OCCUPANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 6. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	ROOM CONTROLLER: 1. WATSTOPPER #LMRC-112 (2) +LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-PA (3) (+HBRG 8")	HIGH BAY SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #LMDC-100-5 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-6+ADCX	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LMDM-101 2. LUTRON #INTSTV-WH 3. NUGHT #NPODM-DX-XX	DETAIL 12/E6.06
4RV1C1	(2) TWO ZONE ROOM CONTROLLERS TIED TOGETHER WITH CEILING-MOUNTED VACANCY SENSING AND MANUAL DIMMING	1. LOW-VOLTAGE MOMENTARY SWITCH PER ZONE WILL TURN LIGHTS "ON/OFF" 2. VACANCY SENSOR - MANUAL "ON" AT 50% 3. MANUAL 0-10V DIMMING FROM 10%-100% 4. VACANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 5. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	ROOM CONTROLLER: 1. WATSTOPPER #LMRC-112 (2) +LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-PA (4) (+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #LMDC-100 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10+ADCX	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LMDM-101 2. LUTRON #INTSTV-WH 3. NUGHT #NPODM-DX-XX	DETAIL 13/E6.06

LIGHTING CONTROL SCHEDULES - WIRED NETWORKED POWER PACKS						
TYPE	DESCRIPTION	SEQUENCE OF OPERATION	CONTROLLER	SENSOR	SWITCH	REMARKS
POC1	SINGLE ZONE NETWORKED POWER PACK WITH CEILING-MOUNTED OCCUPANCY SENSING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" (WHERE INDICATED ON DRAWINGS) 2. OCCUPANCY SENSOR - AUTO "ON" AT 100% 3. OCCUPANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 4. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	POWER PACK: 1. WATSTOPPER #BZ-150 (set to auto)+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-PA (4) (+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LWSW-101 2. LUTRON #NTR-CS-1 3. NUGHT #NPODM-XX	DETAIL 6/E6.06
POC2	SINGLE ZONE NETWORKED POWER PACK WITH CEILING-MOUNTED OCCUPANCY SENSING WITH HOLD "ON" FUNCTION	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" (WHERE INDICATED ON DRAWINGS) 2. OCCUPANCY SENSOR - AUTO "ON" AT 100% 3. OCCUPANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 4. ON SIGNAL FROM ATS-LS WHILE OPERATING ON GENERATOR, SENSORS WILL BE BYPASSED AND LIGHTS HELD "ON" AT 100% 5. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	POWER PACK: 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-PA (4) (+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10	LOW-VOLTAGE KEY SWITCH (QUANTITY AS SHOWN) *PROVIDE LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN) IN ADMIN AND KITCHEN CORRIDORS. 1. WATSTOPPER #LWSW-101 2. LUTRON #NTR-CS-1 3. NUGHT #NPODM-XX	
POH2	SINGLE ZONE NETWORKED POWER PACK WITH CEILING-MOUNTED HIGH-BAY OCCUPANCY SENSING WITH HOLD "ON" FUNCTION	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" (WHERE INDICATED ON DRAWINGS) 2. HIGH-BAY OCCUPANCY SENSOR - AUTO "ON" AT 100% 3. HIGH-BAY OCCUPANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 4. ON SIGNAL FROM ATS-LS WHILE OPERATING ON GENERATOR, SENSORS WILL BE BYPASSED AND LIGHTS HELD "ON" AT 100%	POWER PACK: 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-D-EFP-PA (4) (+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10	LOW-VOLTAGE KEY SWITCH (QUANTITY AS SHOWN)	
PVC1	SINGLE ZONE NETWORKED POWER PACK WITH CEILING-MOUNTED VACANCY SENSING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" 2. VACANCY SENSOR - MANUAL "ON" AT 100% 3. VACANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 4. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	POWER PACK: 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-EFP-SA(+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #CMC-PDT-10	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LWSW-101 2. LUTRON #NTR-CS-1 3. NUGHT #NPODM-XX	DETAIL 7/E6.06
PVW1	SINGLE ZONE NETWORKED POWER PACK WITH WALL-MOUNTED VACANCY SENSING	1. LOW-VOLTAGE MOMENTARY SWITCH WILL TURN LIGHTS "ON/OFF" 2. VACANCY SENSOR - MANUAL "ON" AT 100% 3. VACANCY SENSOR - AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.) 4. ONCE DEMAND RESPONSE SIGNAL IS INITIATED, LIGHTING SHALL BE ADJUSTED TO 80% OUTPUT IF ABOVE THIS SETPOINT	POWER PACK: 1. WATSTOPPER #BZ-150 (set to manual)+LMBC-300 2. LUTRON #PP-DV4M-LUT-LTE-1 3. NUGHT #PP16-EFP-SA(+HBRG 8")	SENSOR (QUANTITY AS REQUIRED BY MANUFACTURER): 1. WATSTOPPER #BZ-150+LMBC-300 2. LUTRON #LOS-CDT-2000-WH 3. NUGHT #NVP-PDT-16-KIT	LOW-VOLTAGE DIM SWITCH (QUANTITY AS SHOWN): 1. WATSTOPPER #LWSW-101 2. LUTRON #NTR-CS-1 3. NUGHT #NPODM-XX	DETAIL 8/E6.06

LIGHTING CONTROL SCHEDULES - LINE VOLTAGE SWITCHES				
TYPE	DESCRIPTION	SEQUENCE OF OPERATION	SWITCH	
O	LINE VOLTAGE, WALL MOUNT, DUAL TECHNOLOGY OCCUPANCY SENSOR	1. AUTO "ON" AT 100% 2. AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.)	SWITCH: 1. NUGHT #WWSXA-PDT-LV 2. LUTRON #MS-B102 3. WATSTOPPER #DSW-301	
V	LINE VOLTAGE, WALL MOUNT, DUAL TECHNOLOGY VACANCY SENSOR	1. MANUAL "ON" AT 100% 2. AUTO "OFF" AFTER 20 MINUTE DELAY (ADJ.)	SWITCH: 1. NUGHT #WWSXA-PDT-LV 2. LUTRON #MS-B102-V 3. WATSTOPPER #DSW-301	

LIGHT FIXTURE SCHEDULE - INTERIOR									
TYPE	DESCRIPTION	BASIS OF DESIGN	MOUNTING	LAMPS / CCT	MINIMUM LUMENS	MAXIMUM WATTAGE	VOLTAGE		
AF35	2' X 4' FLAT PANEL, LOW LUMEN PACKAGE.	METALUX #24CGTX-35-L840 LITHONIA #CPX-2X4-3000LM-80CRI-40K-SWL-MIN10-ZT-MVOLT COLUMBIA #NB124-40L036G-SF-ED1-U DAY-BRITE #2FPZ38L840-4-DS-UNV-DIM	RECESSED	LED 4000K	3300	26	277		
AF45	2' X 4' FLAT PANEL, MEDIUM LUMEN PACKAGE.	METALUX #24CGTX-45-L840 LITHONIA #CPX-2X4-4000LM-80CRI-40K-SWL-MIN10-ZT-MVOLT COLUMBIA #NB124-40L048G-SF-ED1-U DAY-BRITE #2FPZ38L840-4-DS-UNV-DIM	RECESSED	LED 4000K	4400	36	277		
AF65	2' X 4' FLAT PANEL, HIGH LUMEN PACKAGE.	METALUX #24CGTX-65-L840 LITHONIA #CPX-2X4-7200LM-80CRI-40K-SWL-MIN10-ZT-MVOLT COLUMBIA #NB124-40L076G-SF-ED1-U DAY-BRITE #2FPZ38L840-4-DS-UNV-DIM	RECESSED	LED 4000K	6400	53	277		
CF420	4" CYLINDER PENDANT WITH WIDE DISTRIBUTION AND SEMI-SPECULAR FINISH WITH STEM MOUNT.	PORTFOLIO #LER4D20D010XX-EC4DR600210940-4LBDP3L1P436PX GOTHAM #V04CYL-PC-D-20LM-40K-80CRI-WD-MIN10-MVOLT-ZT-SSXX PRESCOLITE #LTC-4RD-PPC-20L40K8-WC-DM1-SSXX LIGHTOLIER #C4-P-DL-20-940-W-Z10-L-LV-CA-SK-XX-WH	PENDANT	LED 4000K	1900	23	277		
CP605	6" CYLINDER PENDANT WITH STEM MOUNT, GLOW SOLID DIFFUSER, AND CUSTOM COLOR.	ALW #NR6-05-90-40-GD-NN-JND-V01-CCMXX-RSXX ALPHABET #BETA-4R-S-SW-10LM-40K-80DPR-HEAD-CC-RP-UNV-DIM10 CORONET #GLDODROP-W-4-40K-HIGH-UNV-DB-X-AC-SD-NA-NA LIGHTEHEAD #CSP-R-8-CC-XX-C-060-40-8320-P-UNV-S-4-CM-A1	PENDANT	LED 4000K	500	4	277		
D4W10	4" ROUND RECESSED DOWNLIGHT WITH WIDE DISTRIBUTION, WET LOCATION LISTED.	PORTFOLIO #LD4C10940D010-W1-L1-GSKT4IP66 GOTHAM #EV04SH-4010-DPR-SM0-MVOLT-EZ1 PRESCOLITE #LTR-4RD-H-SL10L-DM1-LTR-4RD-T-SHSL40K8-WT-ACL LIGHTOLIER #4RN-CAL10940WZ10L-CARSLWH	RECESSED	LED 4000K	900	10	277		
D410	4" ROUND RECESSED DOWNLIGHT WITH WIDE DISTRIBUTION.	PORTFOLIO #LD4C10940D010-W1/L GOTHAM #EV04-4010-40-SS-WD-MVOLT-EZ10 PRESCOLITE #LTR-4RD-H-SL10L-DM1-LTR-4RD-T-SL40K8WD-SS LIGHTOLIER #C4L-15-940-W-Z10-U	RECESSED	LED 4000K	900	10	277		
D415	4" ROUND RECESSED DOWNLIGHT WITH WIDE DISTRIBUTION.	PORTFOLIO #LD4C10940D010-W1/L GOTHAM #EV04-4015-40-SS-WD-MVOLT-EZ10 PRESCOLITE #LTR-4RD-H-SL15L-DM1-LTR-4RD-T-SL40K8WD-SS LIGHTOLIER #C4L-15-940-W-Z10-U	RECESSED	LED 4000K	1400	17	277		
D440	4" ROUND RECESSED DOWNLIGHT WITH WIDE DISTRIBUTION AND SEMI-SPECULAR FINISH.	PORTFOLIO #LD4C0940D010-W1/L GOTHAM #EV06-4020-40-SS-WD-MVOLT-EZ10 PRESCOLITE #LTR-6RD-H-SL20L-DM1-LTR-4RD-T-SL40K8WD-SS LIGHTOLIER #C6L-20-940-W-Z10-U	RECESSED	LED 4000K	3900	48	277		
F450	4" STRIP WITH SEMI-FROSTED ROUND LENS AND NARROW DISTRIBUTION, PROVIDE FIXTURE WITH CHAIN HANGER KIT FOR SUSPENDED LOCATIONS ONLY.)	METALUX #4SNLED-LD5-46LN-UNV-L840-CD1-AVC-CHAN/SET LITHONIA #ZLN-LN-L48-5000LM-FST-MVOLT-40K-80CRI-XX-HC36-M12 COLUMBIA #MPS4-40ML-CN-ED1-U-CSHC DAY-BRITE #FS8455L840-UNV-DIM-FKR-126	SUSPENDED	LED 4000K	4500	35	277		
FW450	4" WALL MOUNTED STRIP WITH SEMI-FROSTED ROUND LENS AND NARROW DISTRIBUTION.	METALUX #4SNLED-LD5-46LN-UNV-L840-CD1 LITHONIA #ZLN-LN-L48-5000LM-FST-MVOLT-40K-80CRI-XX COLUMBIA #MPS4-40ML-CN-ED1-U-CSHC DAY-BRITE #FS8455L840-UNV-DIM	SUSPENDED	LED 4000K	4500	35	277		
GP2	24" DIAMETER DIFFUSE GLOBE PENDANT WITH STEM MOUNT.	CAMIAN LIGHTING #P7105-24-LN-40K-CLV-MV-WP-XXX-ST VISA LIGHTING #CP7120-LS-64K-MVOLT-SDC SPI LIGHTING #AIP12380-24-L28V-120-277V-4000K-DF-30HE-PSS CASBY ARCHITECTURAL LIGHTING #GLB-322X-XX-ST-19-XX-40	PENDANT	LED 4000K	3000	40	277		
HB18	HIGH BAY RECTANGULAR FIXTURE WITH SAFETY LOOP AND FROSTED LENS.	METALUX #OHB-18SE-MFL-UNV-L840-CD-3-3-Y-TOGGLE-10-2PK LITHONIA #HGB-18000LM-SEF-AFL-WD-MVOLT-G210-40K-80CRI-HBAC1 20M100 COLUMBIA #PEL4-40MM-FA-ED-U-93302311 DAY-BRITE #FBX-16L-840-UNV-W-LFA-HCHS-VHOOK	SUSPENDED	LED 4000K	17000	105	277	PROVIDE FIXTURE WITH SAFETY LOOP.	
LP4	4" X 6" DIFFUSE ROUND LINEAR PENDANT FIXTURE.	BARBICAN LIGHTING #26-S-4D-48L-ACM-SCDL-UNV-XXX-4000K-90CRI-0800LM-S0 10V01 SPI LIGHTING #SIP12154-4FT-L32W-UNV-UNV-4000K-CEC EUREKA #74285 CORONET #FLRD-4-40-HIGH-UNV-DB-X-AC-SD-NA-NA	SUSPENDED	LED 4000K	800LM/FT	34	277	FIXTURE WATTAGE VARIES BY LENGTH. 7 WATTS PER LINEAR FOOT.	

LIGHT FIXTURE SCHEDULE - INTERIOR									
TYPE	DESCRIPTION	BASIS OF DESIGN	MOUNTING	LAMPS / CCT	MINIMUM LUMENS	MAXIMUM WATTAGE	VOLTAGE	REMARKS	
LP6	4" X 6" DIFFUSE ROUND LINEAR PENDANT FIXTURE.	BARBICAN LIGHTING #26-S-4D-72L-ACM-SCDL-UNV-XXX-4000K-90CRI-0800LM-S0 10V01 SPI LIGHTING #SIP12154-6FT-L32W-UNV-4000K-CEC PRUDENTIAL #BP03-LIN-FLSH-MO-LO-X-TMW-TMW-SL-MCW-SC-CA48"-X3-DM01 CORONET #FLRD-6-40-HIGH-UNV-DB-X-AC-SD-NA-NA	SUSPENDED	LED 4000K	800LM/FT	50	277	FIXTURE WATTAGE VARIES BY LENGTH. 7 WATTS PER LINEAR FOOT.	
LP8	4" X 8" DIFFUSE ROUND LINEAR PENDANT FIXTURE.	BARBICAN LIGHTING #26-S-4D-96L-ACM-SCDL-UNV-XXX-4000K-90CRI-0800LM-S0 10V01 SPI LIGHTING #SIP12154-8FT-L32W-UNV-4000K-CEC PRUDENTIAL #BP03-LIN-FLSH-MO-LO-X-TMW-TMW-SL-MCW-SC-CA48"-X3-DM01 CORONET #FLRD-8-40-HIGH-UNV-DB-X-AC-SD-NA-NA	SUSPENDED	LED 4000K	800LM/FT	67	277	FIXTURE WATTAGE VARIES BY LENGTH. 7 WATTS PER LINEAR FOOT.	
LR5	5" DIRECT LINEAR RECESSED FIXTURE. REFER TO LIGHTING PLANS FOR REQUIRED LINEAR LENGTH.	NEORAY #S125DR-S6100840-FES-10FD-1-UDD-F-X AXIS LIGHTING #B6RLED-500-80-40-FL-X-X-UNV-DP-1-DF PRUDENTIAL #BP05-REC-FLSH-LED4-MO-X-XXX-SAL-LP-SC-UNV-X1-D-M01 LITECONTROL #L2L-G-D-X-XX-SOF-X1-40K8-DS00-D01-1C-UNV	RECESSED	LED 4000K	500LM/FT	19	277		
LRW	2" X 10" LINEAR RECESSED IN WALL. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION AND LINEAR LENGTH.	NEORAY #S122DR-S2900840-FES-10FD-1-UDD-F-X AXIS LIGHTING #B2SQRLED-XXX-80-40-SO-10DML-ED-X-UNV-DP-1-D PRUDENTIAL #BP02-REC-FLSH-LED4-MO-X-XXX-SAL-LP-SC-UNV-X1-D-M01 LITECONTROL #L2L-G-D-X-XX-SOF-X1-40K8-DS00-D01-1C-UNV	RECESSED	LED 4000K	200LM/FT	19	277		
LW40	4" DIRECT LINEAR WALL MOUNT.	NEORAY #S124DW-C7950840-XFO-1-UDD-F-X AXIS LIGHTING #TB4WLED-800LM/FT-80-840-SO-4-M16LED-XX-UNV-DP-1-D PRUDENTIAL #BP04-LIN-FLSH-LED4-SO-X-XXX-SAL-NU-SC-UNV-WM-D-M01 LITECONTROL #L4L-W-D-X-04-SOF-X1-40K8-DS00-D01-1C-UNV	WALL	LED 4000K	750LM/FT	27	277	FIXTURE SHALL BE CONTINUOUS WHEN NEXT TO OTHER ON PLAN.	
R3H	3" X 36" SURFACE MOUNTED RING FIXTURE. HIGH LUMEN PACKAGE.	ALW #MR3-D3-CM-HI-80-4000K-V01-LENS-N-SW AXIS #SK3S-CIR(18)-1300-80-40-SO-W-UNV-DP-S OCL #SL1-C1NA-36-MW-MWP-LED2-40K-UNV-DM1 PMC LIGHTING #ARCMXD-FL-40K-HD-3D-FPC-WHT-UNV	SURFACE	LED 4000K	10000	108	277		
R3L	3" X 36" SURFACE MOUNTED RING FIXTURE. LOW LUMEN PACKAGE.	ALW #MR1.5-D3-CM-MIN-80-4000K-V01-LENS-N-SW AXIS #SK3S-CIR(18)-300-80-40-SO-W-UNV-DP-S OCL #SL1-C1NA-36-MW-MWP-LED1-40K-UNV-DM1 PMC LIGHTING #ARCMXD-FL-40K-HD-3D-FPC-WHT-UNV	SURFACE	LED 4000K	3300	34	277		
R5H	3" X 60" SURFACE MOUNTED RING FIXTURE. HIGH LUMEN PACKAGE.	ALW #MR3-D5-CM-HI-80-4000K-V01-LENS-N-SW AXIS #SK3S-CIR(30)-1300-80-40-SO-W-UNV-DP-S OCL #SL1-C1NA-60-MW-MWP-LED2-40K-UNV-DM1 PMC LIGHTING #ARCMXD-FL-40K-HD-3D-FPC-WHT-UNV	SURFACE	LED 4000K	17500	183	277		
R5L	3" X 60" SURFACE MOUNTED RING FIXTURE. LOW LUMEN PACKAGE.	ALW #MR1.5-D5-CM-MIN-80-4000K-V01-LENS-N-SW AXIS #SK3S-CIR(30)-300-80-40-SO-W-UNV-DP-S OCL #SL1-C1NA-60-MW-MWP-LED1-40K-UNV-DM1 PMC LIGHTING #ARCMXD-FL-40K-HD-3D-FPC-WHT-UNV	SURFACE	LED 4000K	5900	58	277		
SP	DIRECT CURVED ARCH PENDANT WITH 42" RADIUS BEND AND STEM MOUNT.	ALW #SK3Q42-S3-L0W-V01-LENS-N-X-UNV-AXIS #SK3PD-ARC-AL(42")-750LM/FT-80-40-SO-XX-UNV-DP-PAL LIGHTING #L1-D-140-HQ-40-80-X-P-AL-UNV-DM10-0-10V-33R/45 PMC LIGHTING #D-P-40K-085-FVIOA-XX-X-UNV-8Q	PENDANT	LED 4000K	3000	30	277		
V440	4" SURFACE MOUNTED VAPORITITE FIXTURE.	METALUX #4VT2-LD5-4-DR-UNV-1.840-CD1-WL LITHONIA #FEM4-48-4000LM-IMAF-MD-40K-80CRI COLUMBIA #LXEM4-40L-W-DCA-EDJ DAY-BRITE #DWE4K3.840-4-UNV	SURFACE	LED 4000K	4000	30	277		
X1	DIE-FORMED STEEL SINGLE FACE UNIVERSAL MOUNT EXIT SIGN.	SURE-LITE #SLX-7 LITHONIA LOC-XX DUAL-LITE SE-X-XX-X-E CHLORIDE #ER46L-X-X-X		LED		2	277		
X2	DIE-FORMED STEEL UNIVERSAL MOUNT EXIT SIGN WITH WIRE GUARD.	SURE-LITE #SLX-7WG10 LITHONIA LOC-ELAWG1 DUAL-LITE SE-ELWGLX CHLORIDE #ER4L-WG4		LED		2	277		
PROVIDE A 10-YEAR WARRANTY. LIGHT FIXTURES SHALL BE DLC-LISTED OR ENERGY STAR RATED. EACH MANUFACTURER SHALL BE BID AS ALTERNATE. REFER TO SPECIFICATIONS FOR MORE INFORMATION.									

PANELBOARD AND WIRING SCHEDULE										AVAILABLE FAULT CURRENT: 1.9 KA									
PANEL: ELLP1B										MAINS TYPE: 60A MCB									
VOLTAGE: 208Y/120V/3P/4W										SPD: Yes									
AMPERES: 100 A										MOUNTING: SURFACE									
LOCATION: ELEC B118										SUPPLY FROM: TELLP1B									
CIRCUIT DESCRIPTION		WIRE	GND	C	OC	P	CKT	A	B	C	CKT	P	OC	C	GND	WIRE	CIRCUIT DESCRIPTION		
MDF B136 - RACK QUAD		--	--	--	--	20	1	1.2	--	--	2	1	--	--	--	--	SPACE		
MDF B136 - IT RACK		--	--	--	--	20	2	5	2.0	--	6	1	--	--	--	--	SPACE		
SPARE		--	--	--	--	20	1	7	0.0	--	8	1	--	--	--	--	SPACE		
SPARE		--	--	--	--	20	1	9	--	0.0	--	10	1	--	--	--	SPACE		
SPARE		--	--	--	--	20	1	11	--	--	0.0	--	12	1	--	--	SPACE		
SPARE		--	--	--	--	20	1	13	0.0	0.0	--	14	1	--	--	--	SPACE		
SPARE		--	--	--	--	20	1	15	--	0.0	0.0	--	16	3	30	8	8	SPD	
SPARE		--	--	--	--	20	1	17	--	--	0.0	0.0	18	3	--	--			
TOTAL LOAD (KVA):					12 kVA					2.0 kVA					2.0 kVA				
TOTAL CURRENT (A):					10 A					18 A					18 A				
LOAD CLASSIFICATION										PANEL TOTALS									
EQUIP										TOTAL CONNECTED LOAD: 5200 VA									
REC										TOTAL ESTIMATED DEMAND: 5200 VA									
										TOTAL CONNECTED CURRENT: 14 A									
										TOTAL ESTIMATED DEMAND CURRENT: 14 A									
NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.																			

PANELBOARD AND WIRING SCHEDULE														AVAILABLE FAULT CURRENT: 3 kA													
PANEL: LP1A2														MAINS TYPE: 150A MCB													
VOLTAGE: 208Y/120V/3P/4W														SPD: Yes													
AMPERES: 225 A														MOUNTING: SURFACE													
LOCATION: ELEC A158														SUPPLY FROM: TLP1A2													
CIRCUIT DESCRIPTION	WIRE	GND	C	OC	P	CKT	A	B	C	CKT	P	OC	C	GND	WIRE	CIRCUIT DESCRIPTION											
ELEC A158RR A158 - 2 REC; EF			20	1	0.4	0.2				2	1	0			8	8	EXTERIOR - 1 REC										
ELEC A158 - FA PANEL			20	1	3			0.1	0.2		4	1	0			4	1 QUAD										
TECH OFFICE A162 - 1PC; 4 REC			20	1	5				0.7	0.7	6	1	0			20	WKRM A141 - 3 REC; 2 QUAD										
CR FLEX A159 - 3 REC; 2 QUAD			20	1	7	0.5	1.0				8	1	0			20	WKRM A141 - COPIER										
CR FLEX A159 - DISPSAT REC			20	1	9			0.5	1.0		10	1	0			20	WKRM A141 - LAMINATOR										
RESOR B148 - DISPSAT; 2 QUAD			20	1	11				0.7	0.9	12	1	0			20	MEDIA A140 - 5 REC										
FLEX B149 - COPIER; 2 QUAD			20	1	13	0.5	0.4				14	1	0			20	MEDIA A140 - 2 PC										
K B150 - 4 REC; 1 QUAD			20	1	15			0.7	0.4		16	1	0			20	MEDIA A140 - DISPSAT										
K B150 - DISPSAT; 1 QUAD			20	1	17				0.5	0.7	18	1	0			20	RESOR B150 - DISPSAT; 2 QUAD										
K A157 - 4 REC; 1 QUAD			20	1	19	0.7	0.7				20	1	0			20	RESOR B150 - DISPSAT; 2 QUAD										
K A157 - DISPSAT; 1 QUAD			20	1	21			0.5	0.5		22	1	0		8	8	PROF DEV A142 - DISPSAT REC										
K A155 - 4 REC; 1 QUAD			20	1	23				0.7	0.7	24	1	0			20	LOUNGE A144 - 3 REC; 2 QUAD										
K A155 - DISPSAT; 1 QUAD			20	1	25	0.5	1.2				26	1	0			20	LOUNGE A144 - MICROWAVE										
PK A153 - 4 REC; 1 QUAD			20	1	27			0.9	1.2		28	1	0			20	LOUNGE A144 - VENDING										
PK A153 - DISPSAT; 1 QUAD			20	1	29				0.5	1.2	30	1	0			20	LOUNGE A144 - ICE MAKER										
PK A151 - 4 REC; 1 QUAD			20	1	31	0.9	1.0				32	1	0			20	LOUNGE A144 - VENDING										
PK A151 - DISPSAT; 1 QUAD			20	1	33			0.5	1.0		34	1	0			20	ELEC A158 - VENDING										
PK A149 - 4 REC; 1 QUAD			20	1	35				0.9	0.3	36	1	0			20	ELEC A158 - CONTACTOR CKT										
PK A149 - DISPSAT; 1 QUAD			20	1	37	0.5	0.5				38	1	0			20	10 VAV's [AREA B]										
PK A147 - 4 REC; 1 QUAD			20	1	39			0.7	0.1		40	1	0			20	1 CAV's [AREA B]										
PK A147 - DISPSAT; 1 QUAD			20	1	41				0.7	--	42	1	--	--	--	--	SPARE										
RR A148 - BED LIFT			20	1	43	0.2	--				44	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	45	--	0.0	--			46	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	47	--	--	--	0.0	--	48	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	49	0.0	--	--			50	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	51	--	0.0	--			52	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	53	--	--	--	0.0	--	54	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	55	0.0	0.0	--			56	1	--	--	--	--	SPARE										
SPARE	--	--	20	1	57	--	0.0	0.0			58	3	30		8	8	SP40										
SPARE	--	--	20	1	59	--	--	--	0.0	0.0	60	1	--	--	--	--	SPARE										
TOTAL LOAD (kVA):			9.3 kVA			8.4 kVA			9.4 kVA																		
CONNECTED LOAD			75 A			75 A			75 A																		
TOTAL LOADS			PANEL TOTALS			PANEL TOTALS			PANEL TOTALS																		
TOTAL CONNECTED LOAD			6130 VA			6130 VA			6130 VA			TOTAL CONNECTED LOAD: 27090 VA															
EQUIP			50 VA			100.00%			50 VA			TOTAL ESTIMATED DEMAND: 21635 VA															
REC			20910 VA			73.91%			15455 VA			TOTAL CONNECTED CURRENT: 75 A															
												TOTAL ESTIMATED DEMAND CURRENT: 60 A															
NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE THE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P PROVIDE 200% NEUTRAL BUS.																											

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P. PROVIDE 200% NEUTRAL BUS.

PANEL BOARD AND WIRING SCHEDULE														AVAILABLE FAULT CURRENT: 23 kA			
PANEL: LP2B				MAINS TYPE: 100A MCB				PANEL INTERRUPTING RATING: 10 kA									
VOLTAGE: 208Y/120V/3P/4W				SPD: Yes				LOCATION: MECH B215									
AMPERES: 100 A				MOUNTING: SURFACE				SUPPLY FROM: TL12B									
CIRCUIT DESCRIPTION	WIRE	GND	C	OC	P	CT	A	B	C	CKT	P	OC	C	GND	WIRE	CIRCUIT DESCRIPTION	
3 B2323 - DIS/SPSTAT: 1 REC			20	1	1	0.5	0.5			2	1	20			5 B2003 - DIS/SPSTAT: 1 REC		
3 B2323 - 5 REC			20	1	3			0.7	0.7	4	1	20			5 B2003 - 5 REC		
3 B2325 - DIS/SPSTAT: 1 REC			20	1	5				0.5	0.5	6	1	20		5 B2007 - DIS/SPSTAT: 1 REC		
3 B2325 - 5 REC			20	1	7	0.7	0.7			8	1	20			5 B2007 - 5 REC		
3 B2323 - DIS/SPSTAT: 1 REC			20	1	9			0.5	0.5	10	1	20			5 B2009 - DIS/SPSTAT: 1 REC		
3 B2323 - 5 REC			20	1	11				0.7	0.7	12	1	20		5 B2009 - 5 REC		
3 B2321 - DIS/SPSTAT: 1 REC			20	1	13	0.5	0.5			14	1	20			5 B2111 - DIS/SPSTAT: 1 REC		
3 B2321 - 5 REC			20	1	15			0.7	0.7	16	1	20			5 B2111 - 5 REC		
FLEX B216 - DIS/SPSTAT: 3 REC			20	1	17			0.7	0.5	18	1	20			PRINT B213 - COPIER 2 QUAD		
PRINT B220 - COPIER 2 QUAD			20	1	19	0.5	0.1			20	1	20			RR B204 B206B208B212 - 4 REC		
RR B220B206B208 - 4 REC			20	1	21			0.7	0.7	22	1	20			STOR B210 - 4 REC		
REC B215 B203 - 4 REC			20	1	23				0.7	0.2	24	1	20		ROOF - 1 REC		
MECH B215 - 3 REC			20	1	25	0.5	0.1			26	1	20			MECH B215 - CONTACTOR CKT		
UV LIGHT QAU-1			20	1	27			0.5	0.5	28	1	20			9 VARS (AREA B)		
SPARE	--	--	20	1	29				0.0	0.2	30	1	20		3 VARS (AREA B)		
SPARE	--	--	20	1	31	0.0	--			32	1	--	--	--	SPACE		
SPARE	--	--	20	1	33			0.0	--	34	1	--	--	--	SPACE		
SPARE	--	--	20	1	35				0.0	--	36	1	--	--	--	SPACE	
SPARE	--	--	20	1	37	0.0	0.2			38	1	--	--	--			
SPARE	--	--	20	1	39					40	3	--	--	--			
SPARE	--	--	20	1	41				0.0	0.2	42	3	30	8	8	SPD	
TOTAL LOAD (VA):				52 A		6.0 kVA		6.5 kVA		5.0 kVA							
TOTAL CURRENT (A):				52 A		56 A		42 A									
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND		PANEL TOTALS												
EQUIP	1100 VA	100.00%	1100 VA		TOTAL CONNECTED LOAD: 17540 VA												
Motor	600 VA	100.00%	600 VA		TOTAL ESTIMATED DEMAND: 1450 VA												
REC	15840 VA	81.57%	12920 VA		TOTAL CONNECTED CURRENT: 49 A												
					TOTAL ESTIMATED DEMAND CURRENT: 41 A												
NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P. PROVIDE 200% NEUTRAL BUS.																	

PANEL BOARD AND WIRING SCHEDULE													AVAILABLE FAULT CURRENT: 32 kA					
PANEL: LP2A2			MAINS TYPE: 100A MCB							PANEL INTERRUPTING RATING: 10 kA								
VOLTAGE: 200V/120V/3P/4W			SPD: Yes							LOCATION: ELEC A223								
AMPERS: 100 A			MOUNTING: SURFACE							SUPPLY FROM: LP12A2								
CIRCUIT DESCRIPTION		WIRE	GND	C	OCF	P	CKT	A	B	C	CKT	P	OCF	C	GND	WIRE	CIRCUIT DESCRIPTION	
3 B235 - 5 REC					20	1	1	0.7	0.5		2	1	20				3 A234 - DISP/STAT: 1 REC	
3 B235 - DISP/STAT: 1 REC					20	1	3		0.5	0.7		4	1	20			3 A234 - 5 REC	
3 A226 - 5 REC					20	1	5				6	1	20				3 A236 - DISP/STAT: 1 REC	
3 A226 - DISP/STAT: 1 REC					20	1	7	0.5	0.7	0.7	0.5	8	1	20			3 A236 - 5 REC	
3 A228 - DISP/STAT: 1 REC					20	1	9		0.5	0.5		10	1	20			3 A237 - DISP/STAT: 1 REC	
3 A228 - 5 REC					20	1	11				0.7	0.7	12	1	20		3 A237 - 5 REC	
3 A232 - DISP/STAT: 1 REC					20	1	13						14	1	20		3 A238 - DISP/STAT: 1 REC	
3 A232 - 5 REC					20	1	15		0.7	0.4			16	1	20		3 A238 - 5 REC	
INNOV B236 - 1 REC; 3 QUAD					20	1	17				1.3	0.7	18	1	20		RESC A224 - DISP/STAT: 2 QUAD	
INNOV B236 - DISP/STAT: 3 REC					20	1	19	0.7	0.4				20	1	20		FLEX A233 - COPIER: 1 QUAD	
WKRM A219 - MICROWAVE					20	1	21		1.2	0.7			22	1	20		GT A217 - 4 REC	
WKRM A219 - MICROWAVE					20	1	23				1.2	0.5	24	1	20		GT A217 - DISP/STAT: 1 REC	
WKRM A219 - REFRIGERATOR					20	1	25	0.5	0.7				26	1	20		RR A229-A221/A225/A221 - 4 REC	
WKRM A219 - COPIER					20	1	27		1.0	0.3			28	1	20		CORR B227 - ELEC DRINK FNT	
A219A27-B216 - 4 REC; 2 QUAD					20	1	29				0.9	0.3	30	1	20		CORR B227 - ELEC DRINK FNT	
ELEC A223 - CONTACTOR CKT					20	1	31	0.1	0.2				32	1	20		CORR B227 - COPIER	
2 CAV's [AREA A]					20	1	33		0.1	0.2			34	1	20		ELEC A223 - 1 REC	
10 VAV's [AREA A]					20	1	35				0.5	0.1	36	1	20		ELEC A223 - FA PANEL	
SPARE	--	--	--	--	20	1	37	0.0	--				38	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	39	--	0.0	--			40	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	41	--			0.0	--	42	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	43	0.0	--				44	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	45	--	0.0	--			46	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	47	--			0.0	--	48	1	--	--	SPACE	
SPARE	--	--	--	--	20	1	49	0.0	0.0				50				SPACE	
SPARE	--	--	--	--	20	1	51	--	0.0	0.0	0.0	0.0	52	3	30	8	8	SPD
SPARE	--	--	--	--	20	1	53	--										
TOTAL LOAD (WVA):				62 kVA		69 kVA		8.1 kVA										
TOTAL CURRENT (A):				52 A		59 A		69 A										
LOAD CLASSIFICATION		CONNECTED LOAD		DEMAND FACTOR		ESTIMATED DEMAND		PANEL TOTALS										
EQUIP		3600 VVA		100.00%		3600 VVA		TOTAL CONNECTED LOAD: 21270 VVA										
Motor		650 VVA		100.00%		650 VVA		TOTAL ESTIMATED DEMAND: 17760 VVA										
REC		17020 VVA		79.38%		13510 VVA		TOTAL CONNECTED CURRENT: 69 A										
								TOTAL ESTIMATED DEMAND CURRENT: 49 A										
NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/IP. PROVIDE 200% NEUTRAL BUS.																		

PANELBOARD AND WIRING SCHEDULE

PANEL: HM2A2

VOLTAGE: 480Y/277V, 3P, 4W

AMPERES: 400 A

MAINS TYPE: MLO

SPD: NO

MOUNTING: SURFACE

AVAILABLE FAULT CURRENT: 14.5 kA

PANEL INTERRUPTING RATING: 22 kA

LOCATION: ELEC A223

SUPPLY FROM: HD18

CIRCUIT DESCRIPTION		WIRE	GND	C	OP	P	CKT	A		B		C		CKT	P	C	GND	WIRE	CIRCUIT DESCRIPTION	
TLP2A2*		*	*	*			50	3	1	6.2	0.2			2					METER	
							3	2						4						
							5	7						6						
							7	10.5	5.5				8.1	0.2	6					
QAU-1 5A [MECH B215]							60	3	11					8					QAU-1 EA [MECH B215]	
							11							3	35					
							13	0.3	5.8				10.5	5.5	12					
							15	13						10	30	10	10	10		
QAU-1 EW [MECH B215]							15	15						16	30	10	10	10	FVAV-10 [2 A238]	
							17							18	30	10	10	10		
							19	5.8	5.8					20	30	10	10	10		
							20	30						21	30	10	10	10		
FVAV-10 [2 A234]							20	30						22	30	10	10	10	FVAV-10 [2 A237]	
							21							23	30	10	10	10		
							22							24	30	10	10	10		
							23							25	30	10	10	10		
FVAV-10 [2 A232]							20	30						26	20				FVAV-10 [2 A236]	
							21							27	20					
							22							28	30	10	10	10		
							23							29	30	10	10	10		
FVAV-10 [2 A228]							20	30						30	1	20			FVAV-8 [COPR B230]	
							21							31	1					
							22							32	1					
							2													
FVAV-10 [2 A224]							20	30						33	1				FVAV-8 [COPR B230]	
							21							34	1					
							22							35	1					
							23							36	1					
FVAV-8 [COPR B230]							20	30						37	1				FVAV-8 [COPR B230]	
							21							38	1					
							22							39	1					
							23							40	1					
FVAV-8 [COPR B230]							20	30						41	1				FVAV-8 [COPR B230]	
							21							42	1					
							22							43	1					
							23							44	1					
FVAV-8 [COPR B230]							20	30						45	1				FVAV-8 [COPR B230]	
							21							46	1					
							22							47	1					
							23							48	1					
FVAV-8 [COPR B230]							20	30						49	1				FVAV-8 [COPR B230]	
							21							50	1					
							22							51	1					
							23							52	1					
FVAV-8 [COPR B230]							20	30						53	1				FVAV-8 [COPR B230]	
							21							54	1					
							22							55	1					
							23							56	1					
FVAV-8 [COPR B230]							20	30						57	1				FVAV-8 [COPR B230]	
							21							58	1					
							22							59	1					
							23							60	1					
FVAV-8 [COPR B230]							20	30						61	1				FVAV-8 [COPR B230]	
							21							62	1					
							22							63	1					
							23							64	1					
FVAV-8 [COPR B230]							20	30						65	1				FVAV-8 [COPR B230]	
							21							66	1					
							22							67	1					
							23							68	1					
FVAV-8 [COPR B230]							20	30						69	1				FVAV-8 [COPR B230]	
							21							70	1					
							22							71	1					
							23							72	1					
FVAV-8 [COPR B230]							20	30						73	1				FVAV-8 [COPR B230]	
							21							74	1					
							22							75	1					
							23							76	1					
FVAV-8 [COPR B230]							20	30						77	1				FVAV-8 [COPR B230]	
							21							78	1					
							22							79	1					
							23							80	1					
FVAV-8 [COPR B230]							20	30						81	1				FVAV-8 [COPR B230]	
							21							82	1					
							22							83	1					
							23							84	1					
FVAV-8 [COPR B230]							20	30						85	1				FVAV-8 [COPR B230]	
							21							86	1					
							22							87	1					
							23							88	1					
FVAV-8 [COPR B230]							20	30						89	1				FVAV-8 [COPR B230]	
							21							90	1					
							22							91	1					
							23							92	1					
FVAV-8 [COPR B230]							20	30						93	1				FVAV-8 [COPR B230]	
							21							94	1					
							22							95	1					
							23							96	1					
FVAV-8 [COPR B230]							20	30						97	1				FVAV-8 [COPR B230]	
							21							98	1					
							22							99	1					
							23							100	1					
FVAV-8 [COPR B230]							20	30						101	1				FVAV-8 [COPR B230]	
							21							102	1					
							22							103	1					
							23							104	1					
FVAV-8 [COPR B230]							20	30						105	1				FVAV-8 [COPR B230]	
							21							106	1					
							22							107	1					
							23							108	1					
FVAV-8 [COPR B230]							20	30						109	1				FVAV-8 [COPR B230]	
							21							110	1					
							22							111	1					
							23							112	1					
FVAV-8 [COPR B230]							20	30						113	1				FVAV-8 [COPR B230]	
							21							114	1					
							22							115	1					
							23							116	1					
FVAV-8 [COPR B230]							20	30						117	1				FVAV-8 [COPR B230]	
							21							118	1					
							22							119	1					
							23							120	1					
FVAV-8 [COPR B230]							20	30						121	1				FVAV-8 [COPR B230]	
							21							122	1					
							22							123	1					
							23							124	1					
FVAV-8 [COPR B230]							20	30						125	1				FVAV-8 [COPR B230]	
							21							126	1					
							22							127	1					
							23							128	1					
FVAV-8 [COPR B230]							20	30						129	1				FVAV-8 [COPR B230]	
							21							130	1					
							22							131	1					
							23							132	1					
FVAV-8 [COPR B230]							20	30						133	1				FVAV-8 [COPR B230]	
							21							134	1					
							22							135	1					
							23							136	1					
FVAV-8 [C																				

PANELBOARD AND WIRING SCHEDULE

PANEL EGPL2A

VOLTAGE: 208Y/120V/3P/4W

AMPERES: 100 A

MAINS TYPE: 60A MCB

SPD: Yes

MOUNTING: SURFACE

AVAILABLE FAULT CURRENT: 21 kA

PANEL INTERRUPTING RATING: 10 kA

LOCATION: ELEC A211

SUPPLY FROM: TELGP2A

CIRCUIT DESCRIPTION	WIRE	GND	C	OCP	P	CKT	A	B	C	CKT	P	OCP	C	GND	WIRE	CIRCUIT DESCRIPTION
IDF A210 - 4 REC			20	1	1	0.8	0.4			2	1	2				IDF A210 - RACK QUAD
IDF A210 - RACK QUAD			20	1	3			0.4	2.0		4	2	20			IDF A210 - IT RACK
IDF A210 - IT RACK			20	1	5						8	1	20			
				7		2.0	0.4				8	1	20	10	8	CORR B205 - 2 REC
CORR A203 - 2 REC			20	1	9			0.4	0.2		10	1	20			CORR A220 - 1 REC
CORR B205 - 2 REC			20	1	11				0.4	0.2	12	1	20			CORR B230 - 1 REC
CORR A235 - 2 REC			10	8	1	13	0.4	0.2			14	1	20			MECH B215 - BAS
CORR A235 - 2 REC			10	8	20	1	15		0.4	--	16	1	--	--	--	SPACE
MECH A231 - BAS						20	1	17		0.2	--	18	--	--	--	SPACE
SPARE	--	--	--	20	1	19	0.0	--			20	1	--	--	--	SPACE
SPARE	--	--	--	20	1	21		0.0	--		22	1	--	--	--	SPACE
SPARE	--	--	--	20	1	23			0.0	--	24	1	--	--	--	SPACE
SPARE	--	--	--	20	1	25	0.0	0.0		0.0	--	24	1	--	--	SPACE
SPARE	--	--	--	20	1	27			0.0	0.0		28	3	30	8	8 SPD
SPARE	--	--	--	20	1	29				0.0	0.0	30				
TOTAL LOAD (kVA):			4.0 kVA			3.3 kVA			4.7 kVA							
TOTAL CURRENT (A):			35.8 A			27 A			49 A							
LOAD CLASSIFICATION	CONNECTED LOAD		DEMAND FACTOR		ESTIMATED DEMAND				PANEL TOTALS							
Equip	0 VA		0.00%		0 VA				TOTAL CONNECTED LOAD: 12010 VA							
Motor	50 VA		100.00%		50 VA				TOTAL ESTIMATED DEMAND: 11030 VA							
REC	11960 VA		91.81%		10980 VA				TOTAL CONNECTED CURRENT: 33 A							
							TOTAL ESTIMATED DEMAND CURRENT: 31 A									

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE THE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P. PROVIDE 20% NEUTRAL BUS.

PANELBOARD AND WIRING SCHEDULE

PANEL: EHLH2A

VOLTAGE: 480Y/277V-3P-4W

AMPERES: 100 A

MAINS TYPE: M.L.O.

SPD: Yes

MOUNTING: SURFACE

AVAILABLE FAULT CURRENT: 1.2 KA

PANEL INTERRUPTING RATING: 10 KA

LOCATION: ELEC A211

SUPPLY FROM: ELHC1C

CIRCUIT DESCRIPTION	WIRE	GND	C	OCP	P	CKT	A	B	C	CTK	P	OCP	C	GND	WIRE	CIRCUIT DESCRIPTION						
A213/A214/C215 C20R-MEDIAL	--	--	--	--	--	20	1	1.6	--	--	2	1	--	--	--	SPACE						
CORR B20S/B23O/B27 LTG	--	--	--	--	--	10	1	3	--	--	4	1	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	5	--	--	--	6	1	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	7	--	--	--	8	1	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	9	--	--	--	10	1	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	11	--	--	--	12	1	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	13	0.0	--	--	13	--	--	--	--	SPACE						
SPACE	--	--	--	--	--	1	15	--	--	--	16	3	30	8	8	SPD						
SPACE	--	--	--	--	--	1	17	--	--	--	18	--	--	--	--	SPACE						
TOTAL LOAD (VA):							1.6 KVA	1.3 KVA	0.0 KVA	18												
TOTAL CURRENT (A):							7 A	6 A	0 A													
LOAD CLASSIFICATION	CONNECTED LOAD			DEMAND FACTOR			ESTIMATED DEMAND			PANEL TOTALS												
EQUIP	0 VA			0.00%			0 VA			TOTAL CONNECTED LOAD: 2966 VA												
LTTNG	2966 VA			125.00%			3708 VA			TOTAL ESTIMATED DEMAND: 3708 VA												
										TOTAL CONNECTED CURRENT: 4 A												
										TOTAL ESTIMATED DEMAND CURRENT: 4 A												

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE THE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20 AMP.

[illegible]

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CONSULTANTS
STRUCTURAL
CJG Engineers
3200 Wilcrest Drive, Suite 305
Houston, TX 77042
Tel: 713.780.3345
Fax: 713.780.3712

FOODSERVICE
Foodservice Design Professionals
594 Sawdust Road, Suite 139
Spring, TX 77380-1960
Tel: 281.350.2323
Fax: 281.350.5959

LANDSCAPE
PEA Group
16060 Dillard Drive, Suite 250
Houston, TX 77040
Tel: 844.813.2949

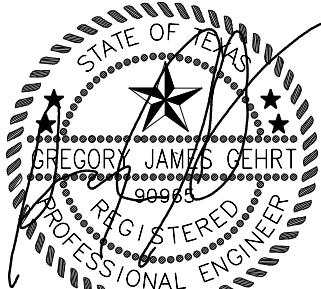
MEP
CMTA, INC
2201 Timberloch Place, Suite 110
The Woodlands, TX 77380
Tel: 281.419.9899

CIVIL
S&G Engineering Consultants, LLC
1796 Avenue D, Suite B
Katy, Texas 77493
Tel: 832.437.7377

**REPLACEMENT
ELEMENTARY SCHOOL
ON MUSTANG ROAD**
ALVIN INDEPENDENT SCHOOL DISTRICT
5000 Mustang Rd. Alvin, TX 77511



ARCADIS INC.
330 POST OAK BOULEVARD, SUITE 225
HOUSTON, TX 77056
tel 281.286.6605



PROJECT #: 202502	
DATE: 2026-04-06	
DRAWN: AM	
CHECKED: GJG	
DATE	ISSUE
2026-04-06	PROPOSAL SET
2026-04-22	ADD 04

E7.04

PANEL SCHEDULES