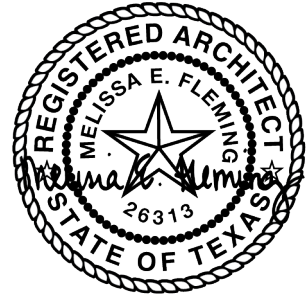


ADDENDUM NO. 2
TO THE
DRAWINGS AND PROJECT MANUAL
FOR
**CENTRAL MIDDLE SCHOOL RENOVATIONS
GALVESTON ISD
GALVESTON, TEXAS**

VLK ARCHITECTS, INC.
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04/08/2022

2.1 GENERAL

- A. This addendum modifies the drawings and project manual, dated March 24, 2022, as noted within and shall become part of the Contract Documents.
- B. Each holder of proposal documents registered with Galveston ISD will receive a copy of the addendum. Each prime proposer is responsible for distribution of information conveyed by this addendum to its sub-proposers and suppliers.
- C. Proposers shall acknowledge receipt of this addendum in the space provided on the proposal form. Failure to do so may subject proposer to disqualification.

2.2 MECHANICAL, ELECTRICAL AND PLUMBING ADDENDUM ITEMS

- A. Attached document by Salas O'Brien shall hereby become a part of this addendum.

2.3 REVISED DRAWINGS

- A. Sheet Nos. INDEX, A0.21, A2.01A, A2.11A, A2.14, A7.21, S2.01A, M4.01, and E2.01A, dated April 8, 2022 and attached hereto, are revised drawings and are hereby made a part of this addendum.

2.4 NEW DRAWINGS

- A. Sheets No. A4.10, A5.01 and FAS 1.10, dated April 8, 2022, attached hereto, are new drawings and are hereby made a part of this addendum.

END OF ADDENDUM NO. 2

Bradley Kalman



04/08/2022

| expect a difference |

SALAS O'BRIEN

Central Middle School Renovations
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April 8, 2022

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MECHANICAL, ELECTRICAL, PLUMBING, TECHNOLOGY (MEPT) – ADDENDUM NO. 2 ITEMS

SPECIFICATION ITEMS

1. Section 23 09 33 Building Management and Control System

A. This section, attached hereto, replaces previously issued Section 23 09 33 in its entirety.

2. Section 23 34 16 Fans

A. Part 2 Products, Article 2.3 Supplemental Equipment, Item E, Add the following sentence to the end of the paragraph. Curb shall be constructed of 3003-H24 Aluminum or stainless steel. The roof curb and fan shall be tested and approved to meet Power Ventilator Hurricane ratings.

DRAWING ITEMS

1. SHEET M3.11A – MECHANICAL FLOOR PLAN – LEVEL ONE

A. Revise mechanical keyed note 12 to read:
"CONNECT NEW EXHAUST FAN TO EXISTING DUCTWORK. MOUNT NEW EXHAUST FAN TO EXISTING CURB. FIELD VERIFY EXISTING CURB DIMENSIONS AND SIZE NEW FAN CURB CAP DIMENSIONS TO FIT ONTO EXISTING CURB FOR FASTENING. IF CURB ADAPTER IS REQUIRED, PROVIDE WITH ALUMINUM CONSTRUCTION."

2. SHEET M4.01 – MECHANICAL DETAILS

A. This drawing, attached hereto, replaces previously issued Sheet M4.01 in its entirety.

3. SHEET M5.01 – MECHANICAL LEGENDS AND SCHEDULES

A. Revise below sections of FAN schedule to read:
"MAX RPM = 1,075, HORSEPOWER = 0.04, MANUFACTURER = COOK, MODEL NUMBER = ACED"

B. Revise remark 2 on FAN schedule to read:
"PROVIDE WITH ALUMINUM ROOF CURB ADAPTER AS REQUIRED AND ALUMINUM BIRD SCREEN"

4. SHEET M6.01 – MECHANICAL ENLARGED PLANS – ALTERNATE

A. Revise below sections of FAN schedule to read:
"MAX RPM = 1,725, MANUFACTURER = COOK, MODEL NUMBER = ACED"

B. Revise remark 2 on FAN schedule to read:
"PROVIDE WITH 3003-H24 ALUMINUM OR STAINLESS STEEL ROOF CURB AND ALUMINUM BIRD SCREEN"

5. Sheet E2.01 – ELECTRICAL/TECHNOLOGY DEMOLITION FLOOR PLAN - LEVEL ONE

A. This drawing, attached hereto, replaces previously issued Sheet E2.01 in its entirety.

6. Sheet FAS 1.10 – FIRE ALARM AND SPRINKLER FLOOR PLANS

- A. This sheet, attached hereto, is included as part of the project in its entirety.

END OF SALAS O'BRIEN ADDENDA ITEMS

SECTION 23 09 33

BUILDING MANAGEMENT AND CONTROL SYSTEM

PART 1 - GENERAL

1.1 SCOPE

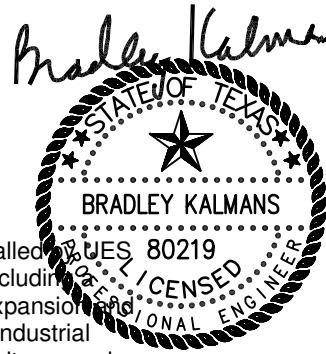
- A. The existing campus is controlled by an existing Automated Logic Control system installed in Houston. All new equipment shall be fully integrated into the existing control system including a completely new graphics package for all new equipment and is a part of this scope. Expansion and modifications to the Building Management and Control System (BMCS), shall include industrial instrumentation necessary to obtain functions and results specified. Also, shall include items such as sensors, valves, dampers, valve and damper operators, DDC panels, relays, terminal equipment controllers, mounting brackets and thermowell, etc. Integrate all components to provide a complete and functioning system.
- B. Temperature Control System components:
1. Electronic instruments as specified
 2. Electric instruments as specified
 3. Microcomputer instruments as specified
- C. All control devices of the same type of product shall be of a single manufacturer.
- D. Control, power, and interlock wiring necessary to accomplish sequences specified in this Section shall be provided and installed by the Control Subcontractor. Materials and methods of execution as specified in Division 26, Electrical.
1. Coordinate current characteristics of all electrical instruments and equipment with Division 26 of the specifications and related electrical drawings.
- E. The entire Building Management and Control System (BMCS) shall be installed by the Automation System Manufacturer or Authorized Distributor.
1. All components and elements
 2. The testing and acceptance procedure
- F. The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.
- G. The entire Building Management and Control System (BMCS) shall be installed, Commissioned, and tested; all performed by the Automation System Manufacturer or Authorized Distributor if approved by engineer.
1. All components and elements.
 2. Start-up and point verification.
 3. The testing and acceptance procedure.

1.2 RELATED WORK

- A. Division 23, Mechanical
- B. Division 26, Electrical

1.3 SUBMITTALS

- A. Submit items of the Building Management and Control System (BMCS).
1. Temperature control equipment & Field devices.
 2. Wiring & Flow diagrams.
 3. Sequence of operation.
 4. Complete, detailed, control and interlock-wiring diagram.
 5. Indicate mechanical and electrical equipment furnished and electrical interlocks, indicating



BUILDING MANAGEMENT AND CONTROL SYSTEM

terminal designation of equipment. Respective equipment manufacturers shall furnish through the Mechanical Contractor, approved drawings of equipment to be incorporated in this diagram.

6. Submit Input / Output summary of all points.
7. Submit an outline of testing procedures from section Testing and Acceptance.
8. Mark up a copy of the specifications for the product. Indicate in the margin of each paragraph the following: "Comply", "Do Not Comply", or "Not Applicable". Explain all "Do Not Comply" statements.
9. Submit sample of space temperature sensor and guards for review prior to purchase or installation.

1.4 COOPERATION WITH OTHER TRADES

- A. Furnish control valves, temperature sensing element wells, flow and pressure sensing devices, dampers, and other similar devices to the Mechanical Contractor in a timely manner for installation under the Building Management and Control System (BMCS), Subcontractor's supervision.

1.5 WARRANTY

- A. Provide with a manufacturer's parts and labor warranty for a period of two years from substantial completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Automated Logic Branch Office - WebCTRL

2.2 SYSTEM ARCHITECTURE

- A. The Building Management and Control System (BMCS) shall consist of an information-sharing network of stand-alone Direct Digital Control Panels (DDCP) to monitor and control equipment as specified of the control sequence and input/output summary.
- B. "Information sharing" shall be defined as: The function of each DDCP to exchange data on the network trunk with other DDCP's without the need for additional devices such as network managers, gateways, or central computers.
- C. "Stand-alone" shall be defined as: The function of each DDCP to independently monitor and control connected equipment through its own microcomputer.

2.3 COMMUNICATIONS PROCESSING

- A. The BMCS shall operate as a true token-pass peer-to-peer communication network. Resident processors in each DDCP shall provide for full exchange of system data between other DDCP's on the network trunk. Systems that limit data exchange to a defined number of system points are not acceptable.
- B. Systems that operate via polled response or other types of protocols that rely on a central processor or similar device to manage DDCP to DDCP communications may be considered only if a similar device is provided as a stand-by. Upon a failure or malfunction of the primary device, the stand-by shall automatically, without any operator intervention, assume all BMCS network management activities.
- C. The failure of any DDCP on the network shall not affect the operation of other DDCP's. All DDCP failure shall be annunciated at the specified alarm printers and terminals.
- D. Network shall support a minimum communications speed of 115.2 Kbps.
- E. The network shall support a minimum of 100 DDC controllers and PC workstations.
- F. Each PC workstation shall support a minimum of 4 peer-to-peer networks, either by hardwired

connection or dial up.

- G. The system shall support integration of third-party systems (fire alarm, security, lighting, PCL, chiller, boiler) via panel mounted open protocol processor. This processor shall exchange data between the two systems for inter-process control. All exchange points shall have full system functionality as specified herein for hardwired points. Provide examples of 5 reference projects utilizing gateways required for this project.

2.4 DDCP HARDWARE

- A. Each DDCP shall consist of a 32-bit microprocessor and controller, power supply, input / output boards and communication board. All program and point databases shall be stored in battery-backed RAM. Provide a minimum of 1.2 MEG RAM in each DDCP to allow for point expansion and trend data storage.
- B. Each DDCP shall incorporate a real-time clock.
- C. Each DDCP shall be provided with two RS232 communications port. Connecting an operator terminal, whether portable or stationery, shall allow the user to communicate with the entire network.
- D. Each DDCP shall provide for input / output connections to field equipment. The following point types shall be supported:
 - 1. Analog inputs - for measuring sensed variables. Inputs shall be capable of accepting voltage, resistance, current or pressure signals.
 - 2. Analog outputs - for controlling end devices. Outputs shall be capable of producing voltage, resistance, current or pressure signals.
 - 3. Digital inputs - for monitoring dry contacts such as relays, switches, pulses, etc.
 - 4. Digital outputs - to control two position devices such as starters, actuators, relays, etc.
- E. Each DDCP shall be listed under UL916 (Energy Management Systems) and shall be tested to comply with sub-part J of Part 15 FCC rules for Class A computing equipment.
- F. Each DDC Controller shall have sufficient memory to support its own operating system and databases, including:
 - 1. Control processes
 - 2. Energy management applications
 - 3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
 - 4. Historical/trend data for points specified
 - 5. Maintenance support applications
 - 6. Custom processes
 - 7. Operator I/O
 - 8. Dial-up communications
 - 9. Manual override monitoring
- G. Operator shall have the ability to manually override automatic or centrally executed commands at the DDC Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.
 - 1. Switches shall be mounted either within the DDC Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.
 - 2. DDC Controllers shall monitor the status of all overrides and inform the operator that automatic control has been inhibited. DDC Controllers shall also collect override activity information for reports.
- H. DDC Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value shall also be provided for each analog output. Status indication shall be visible without opening the panel door.
- I. In the event of the loss of normal power, there shall be an orderly shutdown of all DDC Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be

incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.

1. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.
2. Should DDC Controller memory be lost for any reason, the user shall have the capability of reloading the DDC Controller via a network workstation PC.
3. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.

2.5 PROGRAMMING FUNCTIONS

- A. Resident software in each DDCP shall provide custom programming of control strategies.
 1. Point database
 2. Operator interface
 3. Network communications
 4. Facilities and energy management functions
- B. Programming of control and energy management strategies shall be accomplished via a high-level computer language such as BASIC, JC BASIC, C, or Powers Process Control Language. A standard math processor shall be part of the programming language. All analog loops shall be capable of proportional, integral, and derivative control.
- C. Each DDCP shall incorporate an operator interface program (OIP) that provides an English language user interface. The OIP shall allow the user to program, interrogate, command, and edit the BMCS via a self-prompting method. Operator terminals, whether textual or graphical, shall be able to access the entire network from any DDCP. Access shall be accomplished in a transparent fashion; that is, the operator shall not be required to address specific DDCP's in order to display or command system points.

2.6 FACILITY MANAGEMENT SOFTWARE

- A. The BMCS shall be provided with standard and custom report generation functions that include:
 1. Alarm summaries
 2. Motor status summaries
 3. Point displays by type, system, status, overrides, failures, location, equipment and enabled/disabled.
 4. Program listings
- B. All reports shall be either displayed or printed by:
 1. Operator request.
 2. Time of day.
 3. Event conditions (such as in response to an alarm, interlock, etc.).
- C. All reports shall be time and date stamped.
- D. An alarm-processing program shall be provided to annunciate those points designated as alarmable. Alarm points shall, upon alarm occurrence, be displayed or printed at designated terminals.
- E. Historical trend data shall be collected and stored at each DDCP for later retrieval. Retrieval shall be manual or automatic. Any point, physical or calculated, may be designated for trending. The system shall allow for two methods of trend collection: Either by a pre-defined time interval sample or upon a pre-defined change of value. Trend data shall be presented in a columnar format. Each sample shall be timed stamped. Trend reports may be a single point or may be a group of points, up to a maximum of (8) points in any single group. Any point, regardless of physical location in the system may become part of a multiple point group.
- F. Each BMCS network shall provide a point-monitoring function that can display single or multiple points in a continuous updated fashion for dynamic displays of point values.
- G. A database and configuration report program shall be provided that allows the user to interrogate BMCS status. As a minimum, the user shall be able to: Verify available RAM at each DDCP, verify

DDCP status (on-line, off-line, and failed) and set the system clock.

- H. Any invalid operator entry shall result in an error message.
- I. DDCP's shall contain a password access routine that will assign an operator to one of three level of access. Level 1 shall permit display function only; level 2 shall additionally permit commanding of system points and level 3 shall additionally permit full program and database editing.
- J. DDCP's shall provide for the accumulation of totalized values for the purposes of run-time or energy totalization. Totalized values may be displayed or printed automatically or by operator request.

2.7 ENERGY MANAGEMENT SOFTWARE

- A. The BMCS shall be provided with an optimal start program such that the building may be divided into ten zones for optimum start. Warm-up and cool-down shall occur in sequence with succeeding zones starting only after the preceding zone has completed its warm-up or cool-down.
 - 1. The optimum start-up time of assigned equipment shall be determined based on a software calculation that takes into consideration outdoor air conditions, space conditions, and building thermal characteristics ("U" factor).
 - 2. The optimum start program shall control start-up of the cooling and heating equipment to achieve the target occupancy space temperature at the precise time of building occupancy.
 - 3. A built-in "learning" technique shall cause the BMCS to automatically adjust itself to the most affective time to start equipment based on historical data.
- B. The BMCS shall be provided with an operator interactive time of day (TOD) program. TOD programming and modifying shall be accomplished in a calendar-like format that prompts the user in English language to specify month, year, day and time and associated point commands. It shall be possible to assign single points or groups of points to any on or off time. Appropriate time delays shall be provided to "stagger" on times.
 - 1. TOD shall incorporate a holiday and special day schedule capability, which will automatically bring up a pre-defined holiday or special day schedule of operation. Holidays or special days can be scheduled up to one year in advance.
 - 2. In addition to the time dependent two-state control, TOD also provides time dependent setpoint control. This control provides the capability to output assignable, proportional setpoint values in accordance with the time of day and day of week. This program shall be used to accomplish night setback, morning warm-up and normal daily operating setpoints of all control system loops controlled by the BMCS. As with the two-state control, time dependent setpoint control shall be subject to the holiday schedule. The setpoints desired shall be user definable at any operator terminal.
 - 3. The operator shall be capable of reading and/or altering all sorted data pertaining to time of day, day of week, on/off times, setpoint values, and holiday designation.
 - 4. The TOD program shall also provide an override function that allows the user to conveniently change a start or stop time for any point up to one week in advance. The override command shall be temporary. Once executed the TOD program shall revert to its original schedule.
 - 5. The TOD program shall interface with the optimal start program (OSP) such that stop times may be assigned by OSP.
- C. Additional Program functions required are to be installed and programmed as requested by end user at no additional cost:
 - 1. Enthalpy optimization.
 - 2. Supply air reset.
 - 3. Hot water reset.
 - 4. Chilled water reset.
 - 5. Volumetric control.
 - 6. Dead band control. Install dual set points as requested by user.
 - 7. All specified energy management programs, whether or not applicable to this project, shall be provided such that the owner may enable the program at a future date without the need to purchase additional software or modify existing software.

2.8 WEB SERVER ACCESSIBILITY

- A. Industry leading encryption technology to provide accessibility through a web browser.
- B. Building Manager's ability to access, view and command critical building information in real time over the intranet or internet.
 - 1. Alarm Display
 - 2. Point Commanding
 - 3. Graphic Display
 - 4. Scheduling
 - 5. Running Reports
 - 6. Point Details

2.9 REMOTE NOTIFICATION

- A. Remote notification sends Alarm and System Event information to various notification devices as indicated below but not limited to. Operators can receive their building automation system alarms without restricting them to dedicated workstations.
 - 1. Alphanumeric pagers
 - 2. Numeric pagers
 - 3. Email
 - 4. Phones via voice or short message service (SMS)

2.10 POINT EXPANSION MODULES

- A. Capable of extending its input/output capabilities via special purpose modules.
 - 1. Modules may be mounted remote from the DDCP.
 - 2. Shall communicate with the DDCP over a pair of twisted cables.

2.11 TERMINAL EQUIPMENT CONTROLLERS

- A. Provide for control of each piece of equipment, including, but not limited to, the following:
 - 1. Variable Air Volume (VAV) boxes
 - 2. Constant Air Volume (CAV) boxes
 - 3. Dual Duct Terminal Boxes
 - 4. Unit Conditioners
 - 5. Heat Pumps
 - 6. Unit Ventilators
 - 7. Room Pressurization
 - 8. Fan Coil Units
- B. Include the following items:
 - 1. All input and outputs necessary to perform the specified control sequences.
 - a. Analog outputs shall be industry standard signals such as 24V floating control.
 - 2. Sufficient memory to accommodate point database, operating programs, local alarming, and local trending.
 - 3. All databases and programs shall be stored in non-volatile EEPROM, EPROM and PROM, or minimum of 100-hour battery backup shall be provided.
 - 4. Return to full normal operation without user intervention after a power outage of unlimited duration.
 - 5. Operation programs shall be field selectable for specific applications.
 - 6. Specific control strategy requirements, allowing for additional system flexibility.
 - 7. Controllers that require factory changes of all applications are not acceptable.

2.12 ELECTRONIC DAMPER ACTUATORS

- A. Modulating damper operators:
 - 1. Non-spring return. All actuators shall be 0-10 V DC operation.
 - 2. Sized with sufficient reserve power to provide smooth modulating action and tight close off against the system pressure.
 - 3. Select the operator with available torque to exceed the maximum required operating torque by not less than 100%. All actuators shall be mounted exterior of the damper on

- damper stem. Stem shall have position indicator cut into the end of the stem.
- 4. Built in auxiliary position indication feedback to be connected to the BMCS.
- 5. Minimum torque 100 in-lb.

2.13 ETHERNET CARD

- A. Ethernet Card:
 - 1. Local area network connection interface card.

2.14 CONTROL CABINETS

- A. Fully enclosed NEMA 1 for indoors, NEMA 4 for outdoors.
 - 1. Powder coat painted on all sides
 - 2. Cabinet with continuously piano type hinged door
 - 3. Locking latch
 - 4. All locks shall use a common key
 - 5. Devices on the panel face must be identified with engraved nameplates.
 - 6. Panels or termination panels must be identified with engraved nameplates.
 - 7. Provide enamel beige finish and extruded aluminum alloy frame UL 50 certified.

2.15 AUTOMATIC CONTROL VALVES

- A. Pressure ratings: Minimum 125 psig or 1.25 times maximum system operating pressure.
- B. Construction:
 - 1. 2" and smaller:
 - a. Screwed.
 - b. Bodies and internal parts: Bronze, stainless steel, or other approved corrosion-resistant metal.
 - 2. 2-1/2" and larger:
 - a. Flanged.
 - b. Bodies: Cast iron or cast steel.
 - c. Seats and parts exposed to fluid: Bronze, stainless steel, or other approved corrosion-resistant metal.
 - 3. Characterized port ball valves are acceptable for VAV terminal units only.
- C. Modulating straight through water valves: Equal percentage contoured throttling plugs.
- D. Three Way Mixing Valves: Linear throttling plugs allowing total flow through valve to remain constant regardless of position.
- E. Sizes: By Automatic Control System Manufacturer for fully modulating operation.
 - 1. Minimum pressure drop: Equal to pressure drop of coil or exchanger.
 - 2. Maximum pressure drop: 5.5 psi.
 - 3. Relief and bypass valves: Sized according to pressure available.
 - 4. 2-position valves: Line size.
 - 5. Manual by-pass operator.
- F. Electronic Actuator:
 - 1. Direct coupled installation
 - 2. Visual and electronic stroke indicator
 - 3. Die-cast aluminum housing
 - 4. Manual override
 - 5. Self-lubricating bearing and gear train
 - 6. Automatic calibration
 - 7. Automatic duty cycle protection
 - 8. Overload and stall protection
 - 9. Non-spring return
 - 10. Floating /0-10 VAC / 4-20mA operation
 - 11. UL approved
 - 12. Provide smooth modulating action and tight close off against the system pressure.
 - 13. Torque to exceed the maximum required operating torque by not less than 150%.

14. Actuator input signal shall be compatible with output DDC controller.
15. Provide weatherproof enclosure (exterior use).
16. Damper actuators not acceptable for valves.

2.16 TEMPERATURE LOW LIMIT SWITCH

- A. Responsive to the coldest 1' section of its length.
 1. Double pole single throw switch
 2. 20' capillary
 3. Line voltage with bellows actuated switch
 4. Auto reset for outdoor installation
 5. Manual reset for indoor installation

2.17 TEMPERATURE AND HUMIDITY SENSORS

- A. Combination space temperature, humidity, CO2 and motion sensor
 1. Thermister with resistance of 10,000 ohms at 77°F.
 2. Accuracy shall be as follows:
 - a. Temperature – +/-1/2°F
 - b. Humidity – +/-1/8% R.H.
 - c. CO2 – +/-30 PPM or +/-3% (greater of two)
 3. Range shall be as follows:
 - a. Temperature – 50° to 104° F.
 - b. Humidity – 10% to 90%
 - c. CO2 – 400 to 1250 PPM
 4. Surface Mounted
 - a. No display
 - b. Setpoint slide adjustment
 - c. Override button
 - d. Occupancy status indicator
 4. ALC Model #ZS2P-HCM-ALC
 5. Provide impact resistant Polycarbonate equal to BAPI-Guard guards in the following locations:
 - a. Corridors
 - b. Cafeteria
 - c. Kitchen.
 - d. Gymnasium.
 - e. Dressing Rooms.
 - f. Industrial Labs.
- B. Space / Duct Humidity Sensor
 1. Capacitance element in the space or duct as required and output a 4 to 20 MA signal proportional to 0 to 100% RH to the DDC.
 2. Capacitance element shall be field replaceable and not require calibration.
 3. Accuracy shall be +/-2% in the range from 20 to 95% RH.
 4. Relative humidity sensors shall have the sensing element of inorganic resistance media.
 5. Provide impact resistant Polycarbonate equal to BAPI-Guard covers suitable for institutional use. Submit sample for review.
 6. Provide manufacturers calibration certificate.
 7. Provide impact resistant Polycarbonate equal to BAPI-Guard guards in the following locations:
 - a. Corridors
 - b. Cafeteria
 - c. Kitchen.
 - d. Gymnasium.
 - e. Dressing Rooms.
 - f. Industrial Labs.
- C. Duct Temperature Sensors
 1. Range of 20° to 120°F.
 2. Single point sensing of temperature.
 3. Averaging elements of sufficient length to sense temperature across 2/3 duct width.

4. Averaging elements of sufficient length to provide accurate, representative indication and control.
 5. Averaging elements of sufficient length to prevent variances in temperature or stratification.
- D. Liquid Immersion Temperature Sensors
1. Platinum type resistance temperature detector (RTD).
 2. Match sensor range to medium being monitored.
 - a. Hot water range 30° to 250°F.
 - b. Chilled Water 20° to 70°F.
 3. Furnish stainless steel wells for installation by Mechanical Contractor.
 4. Locate all sensors in field with Owner/Engineer present.
 5. System accuracy for liquid temperature sensing shall be $\pm 1/2^\circ$.
 6. Sensors must be removable from wells.
- E. Outside Air / Freezer / Cooler Sensors
1. Range of -58° to 122°F .
 2. Weatherproof sun shield.
 3. External trim material corrosion resistant with all parts assembled into watertight, vibration-proof, heat resistant assembly.
 4. Minimum of 8' long leads.
 5. Encapsulated into Type 304 stainless steel tubes with low conductivity moisture proofing material and lag extension for thickness of insulation.

2.18 CURRENT SENSITIVE RELAYS

- A. Ensure compatibility with VFD applications for variable speed motor status.
1. Provide with adjustable set point.
 2. Relays must be mounted and not hung by power wires thru CT.
 3. Provide split-core type current sensors.
 4. Loop powered.
 5. LED Status.
 6. Acceptable Manufacturer: Veris Industries / Hawkeye
 7. Relays shall close status contacts in response to current flow in power leads to the equipment being monitored.

2.19 ELECTRIC REMOTE BULB THERMOSTAT

- A. Two position remote bulb thermostat:
1. Bimetal controlled.
 2. Sealed mercury switches.
 3. Provide specified control action.
 4. Adjustment can be made by removing unit cover.
 5. Element with capillary length as required for the location.

2.20 ELECTRIC SPACE THERMOSTAT

- A. Two position space thermostat.
1. Single Pole switch actuated by bi-metal sensing element.
 2. Range shall be 60°F to 90°F .
 3. Removable external knob adjustment means.

2.21 HIGH STATIC PRESSURE SWITCH

- A. With manual reset switch
1. Approved manufacturer: Cleveland AFS-460.

2.22 INSERTION FLOW SENSORS

- A. Turbine Flow Meter
1. Retractable hot tap flow sensor
 2. Accuracy: $\pm 1\%$ of full scale

3. Dual Turbine
4. Custom thread-o-let 400 psi / 250°F rated
5. Line size from 2-1/2 to 72 inch
6. Metering ranges from 0.3 to 15 f/sec.
7. Remote NEMA 4 wall mounted LCD display
8. Field Pro Software & Communicator
9. Warranty two years
10. Approved Manufacturer: Onicon Flow Meter F1200 Series

- B. Electromagnetic Flow Meter
1. Retractable hot tap flow sensor
 2. Accuracy: +/- 1% of full scale
 3. Electromagnetic
 4. Custom thread-o-let 400 psi / 250-degree F rated.
 5. Line size from 1-1/4 to 72 inch
 6. Metering ranges from 0.3 to 15 f/sec.
 7. Remote NEMA 4 wall mounted LCD display
 8. Field Pro Software & Communicator
 9. Warranty two years
 10. Approved Manufacturer Onicon Flow Meter F3500

2.23 CONTROL DAMPERS

- A. Opposed blade dampers.
1. Frames fully constructed from epoxy coated galvanized steel, aluminum or 304 stainless steel.
 2. Provisions for duct mounting.
 3. Damper blades not exceeding 8" in width.
 4. Blades of two sheets of stainless steel sheet metal.
 5. Blades suitable for high velocity performance.
 6. Bearings of nylon or oil-impregnated, sintered bronze.
 7. Shafts of 1/2" zinc-plated steel
 8. Leakage does not exceed 1/2% based on 2000 fpm and 4" static pressure.
 9. Replaceable resilient seals along top, bottom and sides of frame and blade edge.
 10. Submit leakage and flow characteristics data with shop drawings.
 11. Linkage shall be concealed out of the air stream within damper frame.
 12. Acceptable Model is Ruskin Model CD60

2.24 DRAIN PAN FLOAT SWITCH

- A. Rated at 10 Amps.
1. Shuts off equipment if water level becomes too high.
 2. DPDT Contacts.

2.25 BY-PASS AUTOMATIC SHUT-OFF TIMERS

- A. Rated at 10 Amps, 125 VAC
1. Shuts off equipment with timed switch
 2. White decorated timer
 3. Without hold feature
 4. Time Cycle 60 minutes

2.26 CO₂ SENSOR

- A. Veris CDLSXX with display.
1. Local visual indication of CO₂ levels in enclosed spaces.
 2. Pre-calibrated with factory default settings of 1000 ppm and 1500 ppm CO₂ levels
 3. Bright LED indicator transitions between green, yellow, and red as the CO₂ threshold is exceeded.
 - a. Accuracy: +/- 30 ppm @ 72°F
 - b. Output: 0-10 V (100Ω output impedance) and NTC 20k Thermister

2.27 AIR FLOW SENSING SWITCH

- A. The pressure sensing element shall be of the convoluted diaphragm type for sensitivity to system positive, negative, or differential pressure.
 - 1. Select the pressure range based on the sensed differential pressure.
 - 2. The unit shall be protected against overpressure to the full static pressure rating.
 - 3. Accuracy: +/- 2% of full scale
- B. Switch assembly:
 - 1. Reed switch
 - 2. Field adjustable setpoint
 - 3. Threaded boss conduit entrance
 - 4. SPST Action
 - 5. Voltage and rating as required for the control circuit

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The control system shall be installed, and final adjustments made by full-time employees of the factory approved BMCS Building Management Control Subcontractor.
- B. The contractor shall collaborate through Architect / Engineer and Owner to determine the Owner's preference for naming conventions, etc. before entering the data into the system.
- C. Due to actual operational or space conditions, it may be necessary for the Contractor to make sequence of operation modifications and/or controller adjustments, change the location or type of sensor to obtain proper operation and coverage of the system in each room or space. These change, if requested by the Owner or Engineer, shall be performed at no additional cost to the Owner. Therefore, labor allowances should be made for such changes and adjustments if requested.
- D. Points listed within this section are to be connected to the BMCS system as hard-wired points to cards and not connected through BacNet integration. The BacNet interface is for read only points not included within sequences of this specification.
- E. All programs are required to have the UES Library format for Logic Page and Property Page. Approved library years are 2005 and 2009.
- F. All inputs and outputs are required to include sleeve type labels. Reference 2005/2009 install standards.

3.2 INTERLOCK AND SAFETY CIRCUITS

- A. Close the outdoor air dampers when the related HVAC unit supply or exhaust fan is de-energized:
 - 1. The damper and actuators are specified in this section.
 - 2. Outdoor air damper shall be fully opened before related air handling unit fan is energized for 100% outside air use.
 - 3. Provide motorized outside air dampers for the following:
 - a. Supply fans
 - b. AHUs
 - c. Exhaust fans (except kitchen exhaust)
- B. Close the chilled and hot water valves to the coil when the related unit is de-energized.
- C. Outside Air Handling Unit chilled water coil shall only be operational when associated Air Handling Unit being served by Outside Air Handling Unit is operating. Outside Air Handling Unit shall not operate when chilled and hot water temperature is not proven. (plant failure)

- C. Exhaust/Supply Fans:
 - 1. Interlock the related exhaust and supply fans and the related outside air damper.
 - 2. Interlock the exhaust fans with the related air-handling unit through software.
 - 3. Interlock related exhaust fan for dishwasher with time delay off relay.
 - 4. Interlock related exhaust fan for kiln with time delay off relay
 - 5. Interlock kitchen hood related supply and exhaust fans.
 - 6. Provide additional interlocks as indicated on fan schedule and on drawings.
 - 7. Interlock electrical and mechanical room exhaust fans with thermostat.
 - 8. Interlock refrigerant monitor with mechanical room purge system.
 - 9. Interlock science room related supply and exhaust fans.
 - 10. Interlock outside air supply fans for VAV air-handling unit with air-handling unit status point. Supply fans shall not be allowed to operate when chilled and hot water temperature are not proven. (Plant failure)
- D. Freeze Protection:
 - 1. Provide a freeze protection sequence to ensure proper operation of equipment during a freeze condition not limited to the following:
 - a. Outside Air Handling Units & Supply Fans with heating and cooling coils: If unit is in occupied or unoccupied mode, upon the triggering of software point indicating a freeze condition or the low temperature sensor (freeze stat) indicates a freeze condition, the system will be disabled, close the outside air damper, open both heating and cooling valves to enable full flow condition. If heating coil discharge air sensor indicates a failure to control and is below setpoint then enable software point indicating a freeze condition, disable unit, close outside air damper, and open both heating and cooling valves to enable full flow condition. Ensure HW & CHW pumps are operational.
 - b. Boilers - Enable during a freeze condition.
 - c. Chillers – Open isolation valves then command by-pass valve to dump water into basin or by-pass tower. Enable condenser water pumps during a freeze condition.
 - d. Air Cooled Chillers – Open isolation valves, then enable pumps, run cycle for 15 minutes per hour, open all chilled water valves.
 - e. Protect coils downstream of DX cooling coil with freeze protection. If unit is in occupied or unoccupied mode, upon the triggering of software point indicating a freeze condition or the low temperature sensor (freeze stat) indicates a freeze condition, the system will be disabled, close the outside air damper, disable the DX cooling coil. If coil discharge air sensor indicates a failure to control and is below setpoint then enable software point indicating a freeze condition.
 - 2. Temperature low limit switch wired with double pole single throw switch with one switch leg hard-wired to de-energize fan and one switch leg to signal BMCS.
- E. Drain Pan Float Protection:
 - 1. Interlock to shut down unit and close valves.
 - 2. Cooling Coils mounted above ceiling and in roof mounted units.
 - 3. Provide for each cooling coil location.
 - 4. Signal BMCS alarm point

3.3 GRAPHICS

- A. Furnish as-built drawings indicating finally corrected "as installed" diagram(s) of the complete Building Management Control System.
 - 1. Modification of existing control systems shall be included.
 - 2. These must be as-built and any changes during the warranty period drawings must be revised and updated.
 - 3. Provide final sequence of operation in written format.
 - 4. Graphic Resolution as minimum as possible. Large resolution should only be used for Main building page.
- B. Provide a set of the "as installed" diagram(s) of the complete control system laminated in plastic and hung in the main mechanical room or as directed by Owner.
- C. Provide a color-coded floor plan of the building showing the location of each system, and the area

served by each AHU or related zone. These must be of professional quality. Floor plan is to hang in main mechanical room near central control panel.

- D. Provide computer graphics for each system.
- E. Provide final graphic room numbers as selected by Owner / Architect.. Obtain a graphic submittal package for review. Construction Drawing room numbers are not to be used unless approved in writing.
- F. All graphics to match existing format and architecture of previous schools.
- G. Update all district level and campus level summary pages.
- H. Campus level Summary page for Occupancy Status for Grey/White for motion sensors.

3.4 IDENTIFICATION

- A. Provide a laminated engraved nameplate on all control panels and devices shown on the "as installed" control diagrams. Coordinate engraving with nomenclature used on the diagrams.
- B. A black-white-black laminated plastic engraved identifying nameplate shall be secured to each terminal cabinet, and control panels. Identifying nameplates shall have ½ inch high, engraved letters.

3.5 WIRING FOR BUILDING MANAGEMENT AND CONTROL SYSTEMS

- A. Furnish and install all wire, conduit, raceways, and cable systems required for the complete operation of the Building Management and Control System.
- B. All wiring for the Building Management and Control System is specified in this section and includes, but is not limited to:
 - 1. Wiring of interlock system.
 - 2. Wiring of control instruments.
 - 3. Wiring of control panels.
 - 4. Wiring of related power supplies, i.e., transformers.
 - 5. Wiring of 120 VAC power circuits for control panels and devices.
- C. All materials and methods specified in this section shall comply with the requirements specified in Division 26 of this specification.
- D. All power supply requirements shall be connected to the building electrical distribution system in an approved manner. Do not connect control equipment of circuits common with other building loads or devices.
- E. Temperature control wiring shall be jacketed cables installed with or without conduit as specified below or single conductors installed in conduit. Control wiring shall have minimum 300V insulation for low voltage wiring and 600V insulation for line voltage wiring.
- F. All line voltage control wiring, all low voltage control wiring which is exposed in the central plant, penthouse, and other similar spaces; all low voltage control wiring which is routed through concealed inaccessible locations shall be installed in conduit.
- G. All low voltage control wiring which is routed through concealed accessible locations may be run without conduit provided that the wiring run without conduit is properly supported from the building structure on maximum 5' centers and does not depend upon the ceiling grid or the ceiling support system for support. Wiring run in plenum spaces shall be plenum rated. Support all plenum wiring in accessible locations in bridge rings, J-hooks, D rings. Plenum wiring is not to be supported within building structure or attached to conduit raceways. All low voltage wiring must be installed through supports. Wires shall be supported on 5' centers and identified at each termination point and at 50' centers minimum. Install wire parallel or perpendicular to the structural features of the building.
- H. Line and low voltage control wiring shall not be installed in the same conduit with control wiring and

BUILDING MANAGEMENT AND CONTROL SYSTEM

shall not be installed in the same conduit with power wiring.

- I. All wiring associated with building management and control system cover shall be as follows:
 - 1. Sensor jacket color, Yellow
 - 2. LAN communications, Yellow with red stripe.
 - 3. All THHN wiring shall comply with Division 26 insulation color identification
- J. All main control panels including Air Handling Unit panels, shall be provided with 120V outlet for computer power.

3.6 EXHAUST AND SUPPLY FANS

- A. Provide interlocks as scheduled on the plans unless shown on the electrical drawings.
- B. Provide BMCS override to disable operation of all exhaust and supply fans interlocked and/or specified throughout project.
- C. Where indicated on drawings BMCS shall provide a local low voltage switch to enable fan operation for a period of 60 minutes (adjustable).
- D. Exhaust fans to be controlled by schedule and logic tied to "Exhaust Fans" schedule.
- E. Exhaust fans are required to have status signal on them.

POINT DESCRIPTION	TYPE	DEVICE
Start/stop	DO	Control Relay
Exhaust Air Damper	DO	Electronic Operator
Fan Status	DI	Current Sensitive Relay
Momentary Control Switch	DI	Push Button Switch (Where indicated)
Damper Status	DI	Damper End Switch

3.7 SINGLE ZONE AIR HANDLING UNITS WITH HUMIDITY CONTROL

- A. These units are furnished with a chilled water-cooling coil and a hot water coil in the reheat coil position. Controls shall be as follows:
 - 1. A space temperature sensor (in each room) shall average space temperatures, acting through the DDC panel, modulate the valves on the chilled water cooling coil and hot water reheat coil, in sequence, to maintain the desired space temperatures.
 - 2. A humidity sensor, located in each room shall average room humidity, acting through the DDC panel, modulate the valve in the chilled water coil to maintain 55 degree discharge air when space is above its humidity setpoint and in dehumidification.
 - a. The space temperature sensor shall modulate the valve on the hot water reheat coil to maintain space temperature.
 - 3. The Space Humidity Sensor shall monitor the space relative humidity at all times. If the space relative humidity rises above the setpoint when the system is de-energized, override the BMCS. Option to disable this feature.
 - a. Energize Air Handling Unit and Central Plant Equipment.
 - b. Outside air damper shall remain closed and related exhaust fans de-energized.
 - 4. An outside air unit provides the outside air for single-zone air handling unit, the outside air unit shall be activated during the occupied periods. Outside air handler unit to be on separate schedule and tied to "OAHU Schedule"
 - 5. A float switch located in the overflow drain pan shall disable unit and send alarm through BMCS.
 - 6. AHU Speed control to be tied to Building Chill Water Supply Temp with reset 47 deg or higher require unit to be at minimum speed and increase as the supply temp gets to 44 deg.F. 44-42 Deg Unit is allowed to regulate its own speed based on static pressure or room temperature needs.
 - 7. AHU Speed control to be tied to Building Hot Water Supply Temp with reset 100 deg or

Lower require unit to be at minimum speed and increase as the supply temp gets to 110 deg.F. 110 -140 Deg Unit is allowed to regulate its own speed based on static pressure or room temperature needs.

POINT DESCRIPTION	TYPES	DEVICE
Start/Stop	DO	Control Relay
AHU Status	DI	Current Sensitive Relay
Variable Speed Motor	AO	Motor Controller
Space Temperature	AI	Space Thermistor (Each Room)
Space Humidity	AI	Humidity Sensor (Each Room)
CHW Valve	AO	Electronic Operator
Chilled Water Coil Discharge Temp.	AI	Duct Thermistor
Unit Supply Air Temperature	AI	Duct Thermistor
HW Valve	AO	Electronic Operator
Hot Water Coil Discharge Temp.	AI	Duct Thermistor
Overflow Drain Pan	DI	Drain Pan Float Switch

3.8 OUTSIDE AIR HANDLING UNIT CONTROL

- A. These units are furnished with a chilled water coil and a hot water heating coil in the PREHEAT position. Control shall be as follows:
1. A unit mounted chilled water coil leaving air temperature sensor shall, acting through the Direct Digital Control Panel, modulate the valve on the cooling coil and the valve on the hot water coil, in sequence, to maintain the desired discharge air temperature as scheduled on drawings (adjustable). The air-handling unit shall be started and stopped from the BMCS System.
 2. When chilled water temperature is equal to or less than 48 degrees, allow unit to operate if associated air handler is operating. Sequence of operations. Chill water valve actuates any time the associated ahu is operating to maintain supply air temp set-point. Until CO2 readings start to rise above 800PPM Oahu damper to remain closed. Damper to be 0-10dc volts modulate from 0%<=800PPM to 100%<=1000PPM. When % OA damper is 100% open start unit fan. Unit fan will be at minimum speed 0%<=1100PPM to 100%<=1300PPM Unit shall not be enabled until damper is open. Provide damper status to ensure damper is in open in either the manual (hand) or auto position of the motor starter.
 3. A wall mounted space CO2 sensor shall monitor and average the space CO2 levels in each space associated with the OAHU and act through the Direct Digital Control Panel to modulate the fan speed to maintain the desired CO2 levels below 900 PPM (Adjustable).
 4. Provide a temperature low limit switch located on the discharge side of the hot water preheat coil or the entering side of the cooling coil to de-energize the air handling unit, close the outside air damper, open the hot water valve 100%, start the boiler and hot water pump, signal an alarm to the BMCS when the temperature drops below 32°F. Device shall be manual reset.
 5. A float switch located in the overflow drain pan shall disable unit and send alarm through BMCS.

POINT DESCRIPTION	TYPES	DEVICE
Start/Stop	DO	Control Relay
AHU Status	DI	Current Sensitive Relay
Variable Speed Motor	AO	Motor Controller
Chilled Water Coil Discharge Air Temp.	AI	Duct Thermistor
Entering Chilled Water Temp.	AI	Pipe RTD
CHW Valve	AO	Electronic Operator
Outside Air Damper	DO	Electronic Operator
Outside Air Damper Status	DI	Damper Position Indicator
Freeze Status	DI	Temperature Low Limit Switch
Hot Water Coil Discharge Air Temp.	AI	Duct Thermistor
HW Pre Heat Valve	AO	Electronic Operator
Space CO2 Concentration	AI	CO2 Sensor (Each room)
Overflow Drain Pan	DI	Drain Pan Float Switch

3.9 START-UP AND POINT VERIFICATION

- A. Final startup and point verification shall include the following information.
1. Field panel checkout:
 - a. Verify enclosure is not mounted on vibrating surface.
 - b. Verify class I and class II wiring are separated within enclosure.
 - c. Check for shorts/grounds/induced voltages/proper voltages.
 - d. Verify proper point terminations in accordance with as-builts.
 - e. Verify that all modules are in proper place and addressed.
 - f. Verify proper power voltage.
 - g. Load database and programming.
 - h. Startup the panel.
 - i. Point and device checkout.
 2. Analog input point checkout:
 - a. Verify the correct wiring terminations per the design documentation package, at the field panel. Verify that all wiring and terminations are neat and dressed.
 - b. Verify the point address by checking that the analog input instrument is wired to the correct piece of field equipment. Do this by altering the environment at the sensing element or by disconnecting one of the wires at the sensor and verifying that the reading at the field panel has reacted to this change.
 - c. Verify the point database to be correct, (i.e., alarmability, alarm limits, slope/intercept, engineering units, etc.). Verify that the correct change of value (COV) limit has been defined.
 - d. Verify the sensor has the correct range and input signal. (i.e., 20-120°F, 4 - 20 ma). Verify that the device is mounted in the correct location and is wired and installed correctly per the design documentation package.
 - e. Set-up and/or calibrate any associated equipment (i.e., panel LCD meters, loop isolators, etc.). Verify that these auxiliary devices are mounted in the correct location and are wired and installed correctly per the design documentation package.
 - f. Verify the correct reading at the field panel using appropriate MMI devices. Verify that any associated LCD panel meters indicate the correct measured value.

- g. Verify all actuators, VFDs, speed control are functioning as direct acting. 0V=0% and 10V=100%.
 - h. Verify all VFDs are configured to minimum 0% and maximum 100% on VFD.
 - 3. Digital input point checkout:
 - a. Verify the device is correctly wired and terminated as shown in the design documentation package. Verify that all wiring and terminations are neat and properly secured.
 - b. Verify the point address by verifying that the digital input is correctly terminated at the controlled piece of equipment.
 - c. Verify the point database is correct (i.e., point name, address, alarmability, etc.).
 - d. Set-up and/or calibrate the associated equipment, i.e., smoke detector, high/low temp detector, high/low static switch, end switch, current relay, pressure switch, etc. is mounted in the correct location, and is wired and installed correctly per the control system installation drawings.
 - e. With the controlled equipment running or energized as described in the digital output checkout procedures, verify the correct operation of the digital input point and associated equipment by putting the digital input monitored equipment into its two states. Verify that the proof or status point indicates the correct value at the operator's terminal and that the status led is giving the proper indication in each mode of operation (on/off).
 - 4. Digital output point checkout:
 - a. Verify that device is correctly wired and terminated as shown in the design documentation package.
 - b. Verify that the correct voltage is utilized in the circuit.
 - c. Verify the point database to be correct (i.e., point name, address, etc.).
 - d. Check and verify that the end device responds appropriately to the digital output(s).
 - e. After verifying the set-up and operation of any associated digital input/proof points, check and verify correct operation of the logical point and associated equipment by commanding the point to all possible states (i.e., off, on, fast, slow, auto, etc.). Verify that the defined proof delay is adequate for all modes of operation.
 - f. If any interlocked equipment exists that has independent hand-off-auto or auxiliary control wiring, verify correct operation of same. Also check that any interlocked equipment such as EP switches for damper operation or exhaust and return fans are wired correctly and operate correctly.
 - g. Verify that the controlled piece or pieces of equipment cannot be caused to change state via the digital output if an associated hand-off-auto switch is in the hand/on or hand/off mode of operation, unless specified as a fireman's override point etc.
 - h. Verify all relays are equipped with LED light indicators for status. 24AC/DC.
 - 5. Analog output point checkout:
 - a. Verify the correct wiring or piping terminations per the design documentation package, at the field panel. Verify that all wiring and piping terminations are neat and dressed.
 - b. Ensure that the correct output device(s) are installed per the Control System Installation Drawings. (i.e., I/P or P/I transducers, transformers, power supply, etc.). Verify that these devices are installed, wired, and piped correctly. Verify that any configuration jumpers are in the proper settings for the required application. Verify related transformers are fused in accordance with installation drawings.
 - c. Verify the point database to be correct. Verify that the correct COV limit has been defined.
 - d. Verify the point address by checking that the analog output is wired and/or piped to the correct output transducer and/or equipment.
 - e. Set-up and or calibrate any associated equipment, (i.e., panel LCD meters, loop isolators, pneumatic gauges, etc.). Also verify that these auxiliary devices are mounted in the correct location and are wired or piped and installed correctly per the design documentation package.
 - f. After verifying the set-up and operation of any associated equipment check for the correct operation of the logical point and associated equipment by commanding the analog output to the top and bottom of its range. Verify that the

- control device(s) responded appropriately as indicated by the design documentation package. Check to ensure that all network terminals, host console devices, etc. can also command these outputs.
- g. Check that all pneumatic gauges, pilot positioners and LCD panel meters indicate the correct values.
 - h. Verify all actuators, VFDs, speed control are functioning as direct acting. 0V=0% and 10V=100%.
 - i. Verify all VFDs are configured to minimum 0% and maximum 100% on VFD.
6. Terminal equipment controller checkout:
- a. Load program database
 - b. Enable programs
 - c. Verify sequence of operations
7. Programming checkout:
- a. Provide checkout for each system and sequence of operation.
 - b. The following are sample sequence of operations tests. The intent of these procedures is to provide a plan of action to verify system operations via block checks of the project specific sequence of operations. The procedures may be used in this format, or one procedure to a page should more detail be required. The procedures outlined below should be verified for accuracy and may be modified to meet your specific requirements.
 - c. Description of Test: AHU Alarm Checkout. Verify AHU-1 discharge air temperature alarming is operational and is received at the designated terminal.
 - d. Input to Trigger Test: Change discharge temperature high alarm limit through software to a value below the current discharge temperature (discharge temperature - 10°F).
 - e. Expected Outcome: A high temperature alarm will be received per the Alarm Definition Report at its designated terminal.
 - f. Provide signoff sheet with indication for test Pass, Fail, Date of test and Initials for signoff.
8. Workstation checkout:
- a. Verify the operation of all trunk interface equipment.
 - b. Verify all workstation software, including options, based upon the installation instructions for the PC.
 - c. Perform software backup (site, options, etc.)
 - d. Complete workstation configuration report for owner signoff.
 - e. Provide verification that all graphics have been created, as required by project bid documents.

3.10 TESTING AND ACCEPTANCE

- A. General:
- 1. After completion of installation and start-up procedures, commence the specified 3-phase verification and testing sequence leading to final acceptance.
 - a. Follow in the order specified.
 - b. Each testing phase shall be satisfactorily completed before entering the next phase.
 - 2. Prior to entering each phase of the sequence, submit for approval, a written agenda describing in detail the procedure to be followed to meet the requirements for each specified verification, test, or demonstration.
 - 3. Submit for approval, a sample of the form on which the test will be reported.
 - a. Identify project.
 - b. Provide a list of all points, arrange in numerical order of point addresses.
 - 1) Show point descriptor and location of each.
 - 2) Indicate DDC panel that processes each point.
 - 3) Use the list as a basis for the specified report form.
 - c. Signatures of participants and observers.
 - d. Results.
 - e. Description of adjustment or corrections of points in error.
 - f. Date.
 - 4. Provide schedule of tests. Estimate dates of significant events.
 - 5. Test, calibrate and adjust each point in the system as specified.
 - 6. Provide documentation of all tests and verifications as specified.

7. Provide trend reports indicating proper control of all points for an extended period of time.
- B. Phase 1 - Testing, Calibrating, and Adjusting:
1. Operate each analog point in the entire system.
 - a. At a point in the upper quarter of its range.
 - b. At a point in the lower quarter of its range.
 - c. At its operating point.
 2. Provide personnel and diagnostic instruments at both the central and remote locations.
 3. Provide testing stimulants for alarms.
 4. Use digital meters of double the accuracy of the instruments being calibrated.
 5. Provide an approved test device for simulating high and low temperatures.
 6. When the function is performed, read values at the central control, and observe the actual function at the field instrument.
 7. Exercise each binary point and observe indication at console and simultaneously observe operation in the field.
 8. Submit an operation report for each point in the system, in approved format, and describe any corrective or adjusting action taken.
 9. Test all power transducers with a Dranetz Power Analyzer.
- C. Phase 2 - Equipment and Point Verification:
1. Verify calibration or function of each point.
 - a. Verify analog points at operating value.
 - b. Record on specified form.
 - c. Make approved adjustments to out of tolerance points.
 - 1) Identify these points for ready reference.
 2. After verification procedure is completed:
 - a. Verify corrected points.
 - b. Record on specified form.
 - c. Points requiring correction.
 - 1) Replace sensor or actuator if electrical measurements indicated components are out of specified tolerance.
- D. Phase 3 - Software Verification:
1. Submit agenda and report format for software demonstrations.
 2. Demonstrate to the Owner and the Engineer that all software programs and automatic control sequences function as specified.
 3. Demonstrate compliance with response time specifications.
 - a. Simulate normal heavy load conditions.
 - b. Initiate at least ten successive occurrences on normal heavy load conditions as specified, and measure response time of typical alarms and status changes.
 04. Provide written documentation of demonstration, signed by representatives of the Contractor and Engineer.
- E. Provide the following reports to Engineer at final completion of all Testing:
1. List of all points.
 2. List of all points currently in alarm.
 3. List of all disabled points.
 4. List of all points in over-ride status.
 5. List of all points currently locked out.
 6. List of user accounts and access levels.
 7. List all weekly schedules.
 8. List of holiday programming schedules.
 9. List of limits and deadbands.
 10. System diagnostics reports including, list of DDC panels online and communicating, status of all DDC terminal unit's device points.
 11. List of programs.
 12. Provide trend data reports to ensure proper operation and sequence control of BMCS.
- F. Substantial Completion of the BMCS will not occur until completion and acceptance of all testing and acceptance procedures.

3.11 TRAINING

BUILDING MANAGEMENT AND CONTROL SYSTEM

- A. The contractor shall provide factory-trained instructor to give full instruction to designated personnel in the operation of the system installed. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. The contractor shall provide all students with a student binder containing product specific training modules for the system installed. All training shall be held during normal working hours of 8:00 am to 4:30 PM weekdays.
- B. Provide (3) 8 hour in person training classes for Owner's designated operating personnel. Training shall include:
 - Explanation of drawings, operations, and maintenance manuals
 - Walk-through of the job to locate control components
 - Operator workstation and peripherals
 - DDC controller and ASC operation/function
 - Operator control functions including graphic generation and field panel programming
 - Operation of portable operator's terminal
 - Explanation of adjustment, calibration, and replacement procedures
 - Student binder with training modules
- C. Since the Owner may require personnel to have more comprehensive understanding of the hardware and software, additional training must be available from the Contractor.

3.12 PROJECT MANAGEMENT

- A. Provide a designated project manager who will be responsible for the following:
 - 1. Construct and maintain project schedule.
 - 2. Authorized to accept and execute orders or instructions from General Contractor, Owner / Architect & Engineer.
 - 3. Attend project meetings as necessary to avoid conflict and delays.
 - 4. Make necessary field decisions relating to this section.
 - 5. Coordination / Single point contact.
 - 6. Have Internet access for project management.

END OF SECTION

CENTRAL MIDDLE SCHOOL RENOVATIONS GALVESTON I.S.D. GALVESTON, TX



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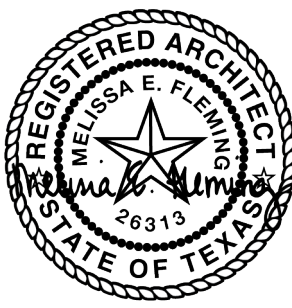
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CENTRAL MIDDLE SCHOOL RENOVATIONS



ISSUED: 03/24/2022

REVISIONS

Revision No.	Revision Date
1 ADDENDUM NO.2	04/08/2022

Director	Drawn By
MEF	KT, AG, AC
Designer	Quality Control
KT	VLK
Proj. Arch.	
MG	

PROJECT NO.

21-136.01

SHEET TITLE

INDEX TO DRAWINGS
GENERAL NOTES
ABBREVIATIONS

SHEET NO.

INDEX

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ABBREVIATIONS

A	A.F.F. ABOVE FINISH FLOOR	M (CONT.)	MOD BIT MODIFIED BITUMEN
A.C.T.	ACOUSTICAL CEILING TILE	MULL	MULLION
ADDL.	ADDITIONAL	M.E.P.	MECHAN.I.C.AL-ELECTRICAL-PLUMBING
A.B.	AIR BARRIER	M.C.M.	METAL COMPOSITE MATERIAL
A.C.M.	ALUMINUM COMPOSITE PANEL	MIN.	MINIMUM
A.D.A.	AMERICANS WITH DISABILITIES ACT	MISC.	MISCELLANEOUS
AL/ALUM.	ALUMINUM		
APPROX.	APPROXIMATE OR APPROXIMATELY	N	NOM.
ARCH.	ARCHITECT OR ARCHITECTURAL	N/A	NOT APPLICABLE
		N.I.C.	NOT IN CONTRACT
B		N.T.S.	NOT TO SCALE
BD.	BOARD	NO./#	NUMBER
B.O.W.	BOTTOM OF WALL		
B.U.R.	BUILT-UP ROOFING	O	O.C.
BLDG.	BUILDING	O.D.	ON CENTER
		O.H.	OUTSIDE DIAMETER
C		O.H.D.	OPPOSITE HAND
CL	CENTER LINE	OHD.	OVERHEAD
C.R.	CLASSROOM	O.F.C.I.	OWNER-FURNISHED,
C.F.S.	COLD-FORMED STEEL		CONTRACTOR-INSTALLED
CONC.	CONCRETE	O.F.O.I.	OWNER-FURNISHED,
CMU	CONCRETE MASONRY UNIT		OWNER INSTALLED
C.M.	CONSTRUCTION MANAGER	P / Q	
CONT.	CONTINUOUS	PR.	PAIR
C.I.	CONTINUOUS INSULATION	P.LAM.	PLASTIC LAMINATE
C.J.	CONTROL JOINT	PL	PLATE
COORD.	COORDINATE	PLUMB.	PLUMBING
CORR.	CORRIDOR	PT.	POINT
		P.C.F.	POUNDS PER CUBIC FOOT
D		P.S.F.	POUNDS PER SQUARE FOOT
DIA.	DIAMETER	P.S.I.	POUNDS PER SQUARE INCH
D.O.	DOOR OPENING	PREFAB.	PREFABRICATED
DN.	DOWN	PROJ.	PROJECTOR or PROJECTION
DS.	DOWNSPOUT	Q.T.	QUARRY TILE
E		R	R.
EA.	EACH	R.	RADIUS
E.W.	EACH WAY	REBAR	REINFORCING BAR
ELEC.	ELECTRICAL	REF.	REFERENCE or REFER TO
E.W.C.	ELECTRIC WATER COOLER	R.C.P	REFLECTED CEILING PLAN
ELEV.	ELEVATION	RE:	REGARDING
EQ.	EQUAL	REFG.	REFRIGERATOR
EQUIP.	EQUIPMENT	REINF.	REINFORCE or REINFORCING
EX	EXISTING	REOD.	REQUIRED
E.J.	EXPANSION JOINT	R.	RISER (STAIR)
EXT.	EXTERIOR	R.D.	ROOF DRAIN
EIFS	EXTERIOR INSULATION & FINISH SYSTEM	R.O.	ROUGH OPENING
F		S	SIM.
FT.	FEET or FOOT	SIM.	SIMILAR
F.R.P.	FIBERGLASS REINFORCED PLASTIC	S.C.	SOLID CORE
F.V.	FIELD-VERIFY	S.A.B.	SOUND ATTENUATION BLANKET
FIN.	FINISH	S.A.F.B.	SOUND ATTENUATION FIRE BLANKET
F.F.	FINISH FLOOR	S.T.C.	SOUND TRANSMISSION CLASS
F.E.	FIRE EXTINGUISHER	SPEC.	SPECIFICATION
F.E.C.	FIRE EXTINGUISHER & CABINET	SQ.	SQUARE
F.H.C.	FIRE HOSE CABINET	S.F.	SQUARE FOOT
F.H.C.S.	FLAT-HEAD COUNTERSUNK	S.S.	STAINLESS STEEL
FLR.	FLOOR	STRUC.	STRUCTURAL
F.D.	FLOOR DRAIN	SUSP.	SUSPENDED
FLUOR.	FLUORESCENT		
		T	T.B.
G/H		T.B.	TACKBOARD
GALV.	GALVANIZED	T.W.	TACK WALL
GA.	GAGE	T.C.	TEACHER'S CABINET
G.C.	GENERAL CONTRACTOR	T.A.S.	TEXAS ACCESSIBILITY STANDARDS
G.O.	GLAZED OPENING	T.	TREAD (STAIR)
GYP	GYPSUM	T&B	TOP & BOTTOM
HT.	HEIGHT	T.O.	TOP OF
H.P.	HIGH POINT	T.C.	TOP OF CURB
H.M.	HOLLOW METAL	T.O.D.	TOP OF DECK
HORIZ.	HORIZONTAL	T.O.J.	TOP OF JOIST
H.B.	HORIZONTAL BLINDS	T.O.S.	TOP OF STEEL
H.D.G.	HOT-DIP GALVANIZED	T.O.W.	TOP OF WALL
HR.	HOOR	TYP.	TYPICAL
I/J/K		U/V	U/C
I.D.	INSIDE DIAMETER	U/C	UNDER COUNTER
INSUL.	INSULATION	U.L.	UNDERWRITERS LABORATORY
INT.	INTERIOR	U.N.O.	UNLESS NOTED OTHERWISE
I.B.C.	INTERNATIONAL BUILDING CODE	V.I.F.	VERIFY IN FIELD
		VERT.	VERTICAL
L		V.C.T.	VINYL COMPOSITION TILE
LAV.	LAVATORY	V.W.C	VINYL WALL COVERING
L.L.H.	LONG LEG HORIZONTAL		
L.L.V.	LONG LEG VERTICAL	W/X/Y/Z	
L.P.	LOW POINT	W.C.	WATER CLOSET
L.V.T.	LUXURY VINYL TILE	W.R.B.	WATER-RESISTIVE BARRIER
		WT.	WEIGHT
M		W.	WIDE
MFR.	MANUFACTURER	W/	WITH
MFG.	MANUFACTURING	W/O	WITHOUT
M.B.	MARKER BOARD	W.P.	WORKING POINT
M.O.	MASONRY OPENING	W.W.F.	WELDED WIRE FABRIC
MAX.	MAXIMUM		
MECH.	MECHAN.I.C.AL		

MATERIAL INDICATIONS

	EARTH		CERAMIC TILE
	POROUS FILL		GLASS (LARGE SCALE)
	CONCRETE/ GROUT		INSULATION (RIGID BOARD)
	BRICK		INSULATION (BATT/ BLANKET)
	CMU (LARGE SCALE)		INSULATION (SEMI-RIGID BOARD)
	MARBLE		WOOD, ROUGH (CONT.)
	METAL (LARGE SCALE)		WOOD, ROUGH (BLOCKING)
	METAL (SMALL SCALE)		WOOD, FINISH
	RESILIENT FLOORING		PLYWOOD (LARGE SCALE)
	ACOUSTICAL TILE		METAL LATH
	TERRAZZO		GYPSUM BOARD
	PLASTER, SAND, GROUT		

PROJECT INFORMATION

PROJECT IDENTIFICATION

PROJECT NAME - CENTRAL MIDDLE SCHOOL RENOVATIONS
OWNER - GALVESTON I.S.D.
PROJECT LOCATION - 3014 SEALY AVENUE GALVESTON, TEXAS 77550
TDLR PROJECT REGISTRATION NUMBER - TABS2022012554

APPROXIMATE BUILDING AREAS

GROUND LEVEL AREA:.	123,420 S.F.
LEVEL TWO AREA:.	40,262 S.F.
LEVEL THREE AREA:.	11,656 S.F.
TOTAL BLDG AREA:.	175,338 S.F.
LEGAL DESCRIPTION:	LOT X BLOCK X

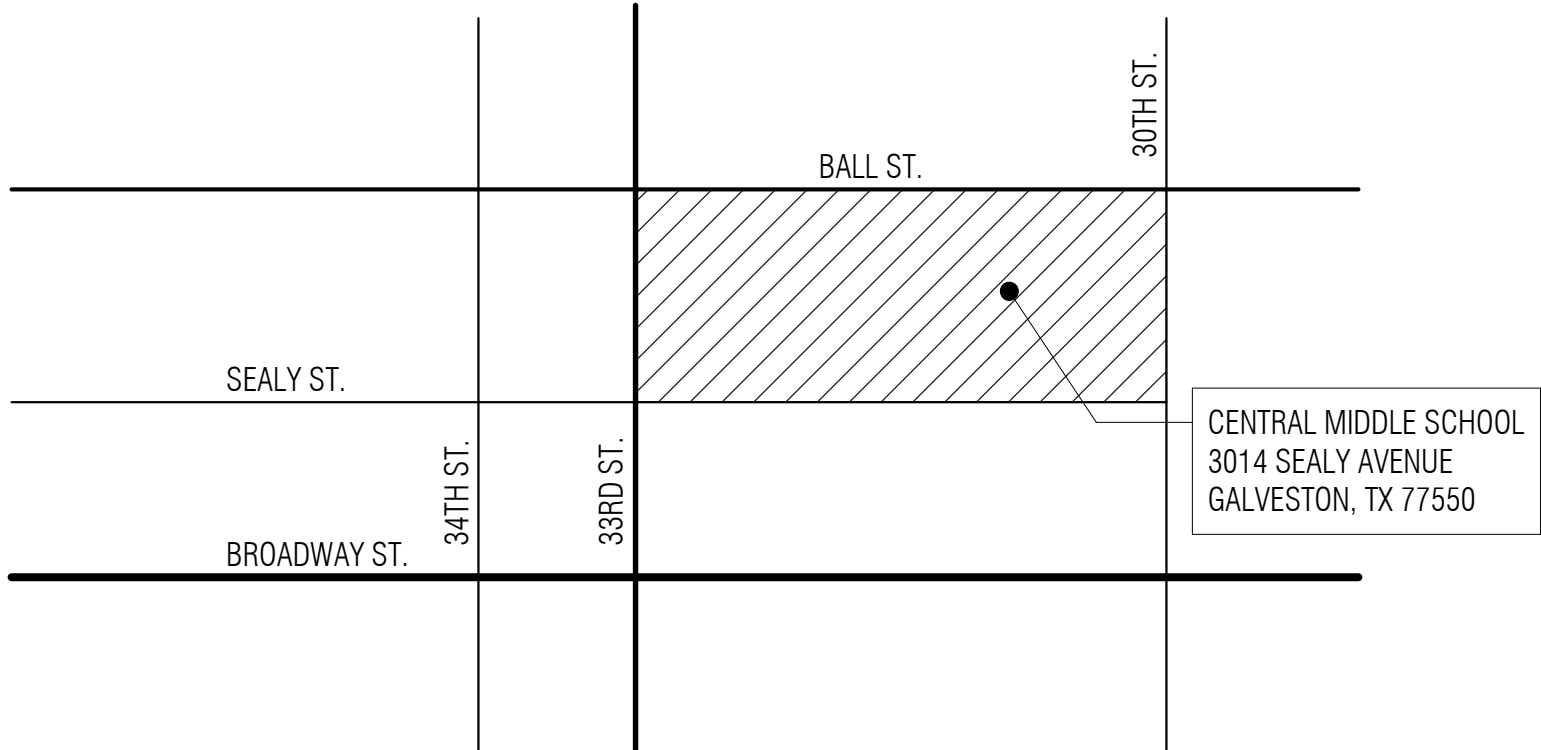
BUILDING CONSTRUCTION INFORMATION

TYPE OF CONSTRUCTION (TABLE 601 - IBC): TYPE II-B
FIRE PROTECTION SYSTEM: AUTOMATIC SPRINKLER
SYSTEM THROUGHOUT

APPLICABLE CODES

2012	INTERNATIONAL BUILDING CODE, WITH LOCAL AMENDMENTS
2015	INTERNATIONAL ENERGY CODE
2012	INTERNATIONAL FUEL AND GAS CODE
2012	MECHAN.I.C.AL CODE, WITH LOCAL AMENDMENTS
2012	INTERNATIONAL FIRE CODE NATIONAL ELECTRICAL CODE.
2017	FLOOD ORDINANCE NO. 02-085
2015	LAND DEVELOPMENT REGULATIONS*

SITE LOCATION MAP



SYMBOLS LEGEND

CLASSROOM A201	ROOM NAME & NUMBER		LOUVER
A203	DOOR NUMBER		KEYED NOTE
A	ALUMINUM-FRAMED GLAZED OPENING SYSTEM		NORTH ARROW
60	HOLLOW METAL-FRAMED GLAZED OPENING SYSTEM		HORIZONTAL BLINDS
P1	PARTITION TYPE		INTERIOR ELEVATION
ABC-01	BUILDING ASSEMBLY TYPE		SECTION DETAIL
SHEET NO. DWG. NO.	BUILDING ELEVATION		ACCESS CONTROL
SHEET NO. DWG. NO.	BUILDING SECTION		DATUM ELEVATION
SHEET NO. DWG. NO.	WALL SECTION		

GENERAL NOTES

- Refer to the CODE-series sheets for Code Information, Design Criteria and Fire Protection Requirements.
- Verify and document existing dimensions and conditions at the site before beginning construction. Notify the Architect of conflicts or variations prior to commencement of construction.
- Based on the applicable design criteria, submit Shop Drawings of the proposed pattern of control joints in masonry veneer, CMU, gypsum board, plaster and stucco to the Architect for review and approval prior to construction.
- In case of discrepancies in or between the Contract Documents, the greater quantity or better quality shall be bid. Clarifications regarding the discrepancies shall be requested from the Architect prior to construction, and the resulting interpretations implemented in accordance with the Contract Documents.

INDEX TO DRAWINGS

COVER	COVER
INDEX	INDEX TO DRAWINGS GENERAL NOTES ABBREVIATIONS

ARCHITECTURAL

A0.21	PHASING PLAN
A0.31	TEXAS ACCESSIBILITY STANDARDS REQUIREMENTS
A2.00	ORIENTATION PLAN - LEVEL ONE
A2.01A	DEMOLITION FLOOR PLAN - LEVEL ONE - UNIT A
A2.01B	DEMOLITION FLOOR PLAN - LEVEL ONE - UNIT B
A2.11A	FLOOR PLAN - LEVEL ONE - UNIT A
A2.11B	FLOOR PLAN - LEVEL ONE - UNIT B
A2.14	FLOOR PLAN - ALTERNATE STEM LAB
A2.20	PARTITION DETAILS
A2.30	TYPICAL TOILET ROOM DETAILS, TOILET ACCESSORY LEGEND
A2.50	PROJECT SCHEDULES
A4.10	WALL SECTIONS AND SECTION DETAILS
A5.01	ROOF PLAN AND DETAILS
A6.11A	REFLECTED CEILING PLAN - LEVEL ONE - UNIT A
A6.11B	REFLECTED CEILING PLANS
A7.21	GLAZING ASSEMBLY ELEVATIONS
A8.01	CASEWORK

STRUCTURAL

S1.01	GENERAL NOTES
S1.02	ABBREVIATIONS, SYMBOLS, AND SHEET INDEX
S2.01	OVERALL AND ENLARGED PLANS
S2.01A	ALTERNATE ENLARGED PLAN AND DETAILS
S3.01	DETAILS

MECHANICAL

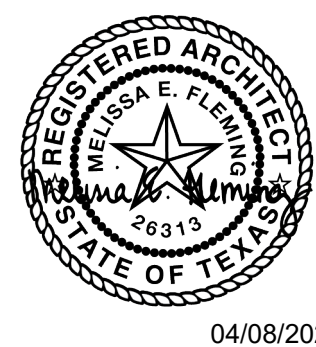
M2.01A	MECHANICAL DEMOLITION FLOOR PLAN - LEVEL ONE
M2.01B	MECHANICAL DEMOLITION FLOOR PLAN - LEVEL ONE
M3.11A	MECHANICAL FLOOR PLAN - LEVEL ONE
M3.11B	MECHANICAL FLOOR PLAN - LEVEL ONE
M4.01	MECHANICAL DETAILS
M5.01	MECHANICAL LEGENDS AND SCHEDULES
M6.01	MECHANICAL ENLARGED PLANS - ALTERNATE

ELECTRICAL

E1.01	ELECTRICAL DEMOLITION COMPOSITE PLANS
E1.02	ELECTRICAL COMPOSITE PLANS
E2.01A	ELECTRICAL/TECHNOLOGY DEMOLITION FLOOR PLAN - LEVEL ONE
E2.01B	ELECTRICAL/TECHNOLOGY DEMOLITION FLOOR PLAN - LEVEL ONE
E2.11A	ELECTRICAL LIGHTING FLOOR PLAN
E3.11A	ELECTRICAL POWER/TECHNOLOGY FLOOR PLAN - LEVEL ONE
E3.11B	ELECTRICAL POWER/TECHNOLOGY FLOOR PLAN - LEVEL ONE
E4.01	ELECTRICAL LEGEND AND DETAILS
E5.01	ELECTRICAL STEM LAB PLANS - ALTERNATE
FAS1.10	FIRE ALARM AND SPRINKLER FLOOR PLANS

PLUMBING

P1.01	PLUMBING DEMOLITION COMPOSITE PLAN
P1.02	PLUMBING COMPOSITE PLAN
P2.01A	PLUMBING DEMOLITION FLOOR PLAN - LEVEL ONE
P3.11A	PLUMBING FLOOR PLAN - LEVEL ONE
P3.12A	PLUMBING FLOOR PLAN - LEVEL TWO (ALTERNATE)
P4.01	PLUMBING DETAILS AND SCHEDULES



ISSUED: 03/24/2022

REVISIONS

Revision No.	Revision Date
1 ADDENDUM NO.2	04/08/2022

Director MEF	Drawn By AC
Designer KT	Quality Control VLK
Proj. Arch. MG	

PROJECT NO.

21-136.01

SHEET TITLE

PHASING PLAN

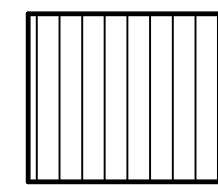
SHEET NO.

A0.21

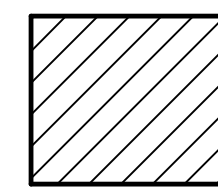
GENERAL PHASING NOTES

1. DIAGRAMS ARE FOR GENERAL PHASING DESCRIPTIONS. GENERAL CONTRACTOR TO COORDINATE ALL PHASING WITH GISD REQUIREMENTS, CONSTRUCTIBILITY AND LIFE SAFETY REQUIREMENTS.
2. DURING EACH PHASE, ALL SYSTEMS SHALL REMAIN FUNCTIONAL & TIED IN, INCLUDING BUT NOT LIMITED TO: FIRE ALARM, BUILDING AUTOMATION SYSTEM, DATA, INTERCOM.
3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MOVING FURNITURE TO ACCOMPLISH THE RENOVATION WORK.

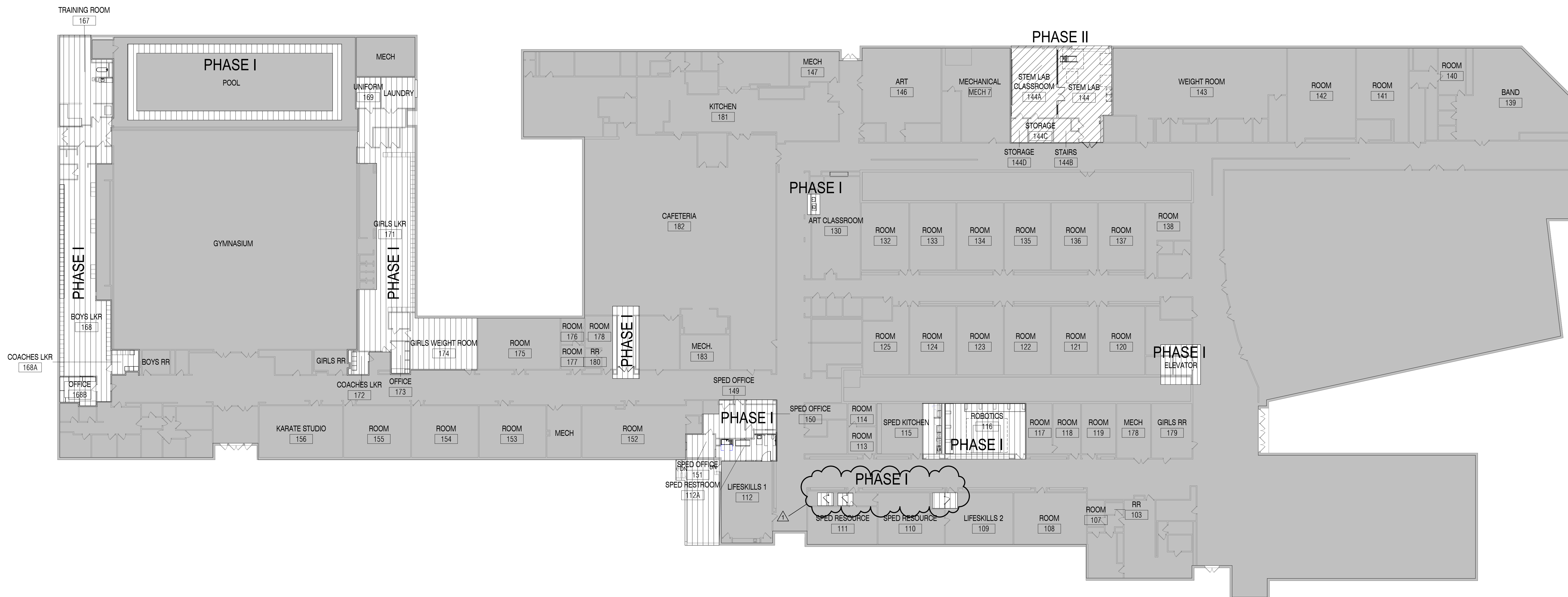
PHASING LEGEND



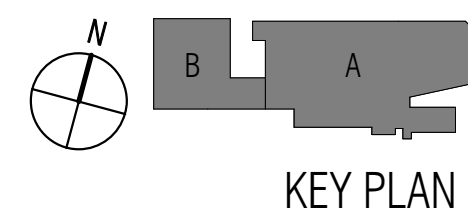
PHASE I - Life Skills & General Renovations
Renovation of interior spaces to include, but not limited to, an ADA restroom, kitchen, and finish updates to existing offices. This phase also includes exterior patio renovations. Renovations that encompass the remaining scope of work identified for the campus including, but not limited to, finishes in locker rooms, offices, elevator, girls' weight room, pool tile replacements, relocation of cafeteria doors, and vision panels added to existing doors.



PHASE II - STEM suite
Renovations to create a STEM suite (STEM lab and classroom). Scope includes, but is not limited to, mechanical, electrical and structural updates, interior and exterior glazing and finish upgrades throughout.



1 PHASING FLOOR PLAN - LEVEL ONE
SCALE: 1" = 20'-0"





ISSUED: 03/24/2022

REVISIONS

Revision No.	Revision Date
1 ADDENDUM NO.2	04/08/2022

Director
MEF
Designer
KT
Proj. Arch.
MG

Drawn By
KT, AG, AC
Quality Control
STAFF

PROJECT NO.

21-136.01

SHEET TITLE

DEMOLITION FLOOR PLAN -
LEVEL ONE - UNIT A

SHEET NO.

A2.01A

DEMOLITION KEYED NOTES

NOTE: NOT ALL NOTES MAY APPEAR ON THE SHEET

CEILING

- (C1) REMOVE EXISTING CEILING SYSTEM, LIGHTS AND DEVICES. REF ELECTRICAL SHEETS FOR RELOCATED FIXTURES.
- (C2) VERIFY HARDWARE COMPONENTS AND REPLACE AS NEEDED.
- (C3) REMOVE AND DISCARD STAGE LIGHTING. REFERENCE ELECTRICAL DEMO SHEET.
- (C4) REMOVE LIGHTING DEVICES (REF: ELECTRICAL SHEETS)

FLOORS

- (F1) REMOVE EXISTING FLOOR FINISH & BASE, CLEAN & PREPARE FOR INSTALLATION OF NEW FINISH AS SCHEDULED.
- (F2) REMOVE EXISTING EXTERIOR QUARRY TILES, AND SAND BED PREP SLAB FOR TOPPING SLAB. REF STRUCTURAL.
- (F3) PREPARE FLOOR FOR NEW FINISHES AS SCHEDULED.
- (F4) EXISTING VCT FLOORING TO REMAIN, PATCH MISSING TILES WITH MATCHING TILE APPROVED BY ARCHITECT. CLEAN & WAX FLOORING.
- (F5) REMOVE EXISTING CARTHAGE STONE STEP & ASSOCIATED STEEL
- (F6) REMOVE AND STORE BENCHES FOR REINSTALLATION FOLLOWING EPOXY FLOORING

REMOVE ANY BROKEN OR CRACKED THRESHOLD 2x2 TILES. CLEAN AND PREP AREA FOR INSTALLATION OF 2x2 TILES AT THRESHOLD.

WALLS

- (W1) REMOVE INTERIOR WALL PARTITIONS
- (W2) PARTIALLY REMOVE EXISTING INTERIOR PARTITION, PATCH TO MATCH EXISTING SUBSTRATE
- (W3) REMOVE EXISTING CHAIN LINK CAGES AND STRUCTURAL SUPPORTS
- (W4) REMOVE EXISTING ELEVATOR WALL PANELING AND PREP WALL SURFACE FOR NEW
- (W5) CLEAN AND REMOVE CHIPPED PAINT FROM CMU WALLS. PREP FOR PAINT.
- (W6) CLEAN AND PREP AREA FOR INSTALLATION OF RELOCATED GLAZED BLOCKING. GC TO REMOVE/CLEAN GLAZED BLOCKING IN MEZZANINE AREA ABOVE STEM LAB TO RELOCATE TO LOCKER ROOM.
- (W7) CLEAN AND PREP AREA FOR TOOTH IN CMU INSTALLATION TO MATCH EXISTING AT WALL OPENING. PAINT WALL TO MATCH EXISTING.
- (W8) REMOVE EXISTING WINDOW SYSTEM AND PREP FOR NEW.

DOORS & WINDOWS

- (D1) REMOVE EXISTING DOOR AND FRAME, SALVAGE DOORS FOR REINSTALLATION AT NEW LOCATION. REF. DOOR SCHEDULE A2.60
- (D2) REMOVE EXISTING DOOR, FRAME TO REMAIN
- (D3) CUT ROUGH OPENING IN EXISTING DOOR AND PREP FOR INSTALLATION OF VISION PANEL. REF A2.60
- (D4) REMOVE EXISTING WINDOWS, FRAME, ASSOCIATED HARDWARE & A/C UNITS.
- (D5) SAW CUT EXISTING MASONRY WALL, SALVAGE BRICK FOR REINSTALLATION AT NOTED LOCATIONS.
- (D6) REMOVE EXISTING DOOR, SALVAGE DOOR FOR REINSTALLATION AT NEW LOCATION, FRAME TO REMAIN INSTALLED. REF DOOR SCHEDULE A2.60
- (D7) REMOVE AND DISCARD DOOR FRAME; REMOVE AND RETURN DOOR AND HARDWARE TO OWNER

PLUMBING

- (P1) REMOVE EXISTING PLUMBING FIXTURES, BRACKETS, CONNECTIONS, ETC. REF: PLUMBING DEMOLITION PLANS FOR ADDITIONAL INFO.

MISCELLANEOUS

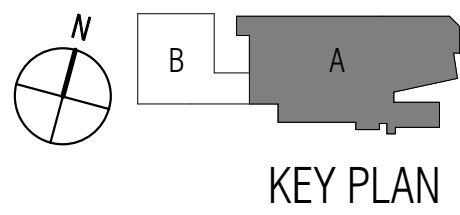
- (M1) REMOVE EXISTING MILLWORK CABINETS & BRACKETS
- (M2) REMOVE EXISTING PROJECTION SCREEN AND RETURN TO OWNER
- (M3) REMOVE & SALVAGE (4) LOCKERS FOR REINSTALLATION IN BOYS COACHES LKR 168A. RETURN REMAINING LOCKERS TO OWNER. REPAIR AND PATCH WALLS AS NEEDED.
- (M4) REMOVE EXISTING BOARDS, CLOCKS, PROJECTOR SCREEN, & WALL MOUNTED DEVICES AND RETURN TO OWNER
- (M5) REMOVE & RELOCATE EXISTING ELEC. SWITCHES, REF. ELEC DWGS
- (M6) REMOVE EXISTING THREE TIER LOCKERS, PREP WALLS FOR NEW LOCKERS; RETURN LOCKERS TO OWNER.
- (M7) REMOVE BROKEN POOL COVE TILES & PREP AREA FOR NEW
- (M8) REMOVE & DISCARD MISC. WALL MOUNTED ACCESSORIES
- (M9) CONTRACTOR TO DISCONNECT EXISTING ICE MACHINE AND RETURN TO OWNER.
- (M10) REMOVE EXISTING MARKER BOARD, PATCH AND PAINT AS NEEDED. RELOCATE MARKERBOARD TO STEM LAB ROOM 144A
- (M11) REMOVE EXISTING CASEWORK; PREP AREA FOR INSTALLATION OF NEW CASEWORK
- (M12) REMOVE AND SALVAGE LOCKERS FOR REINSTALLATION IN GIRLS COACHES LKR 172. REPAIR AND PATCH WALLS.
- (M13) EXISTING LOCKERS TO REMAIN.

DEMOLITION NOTES

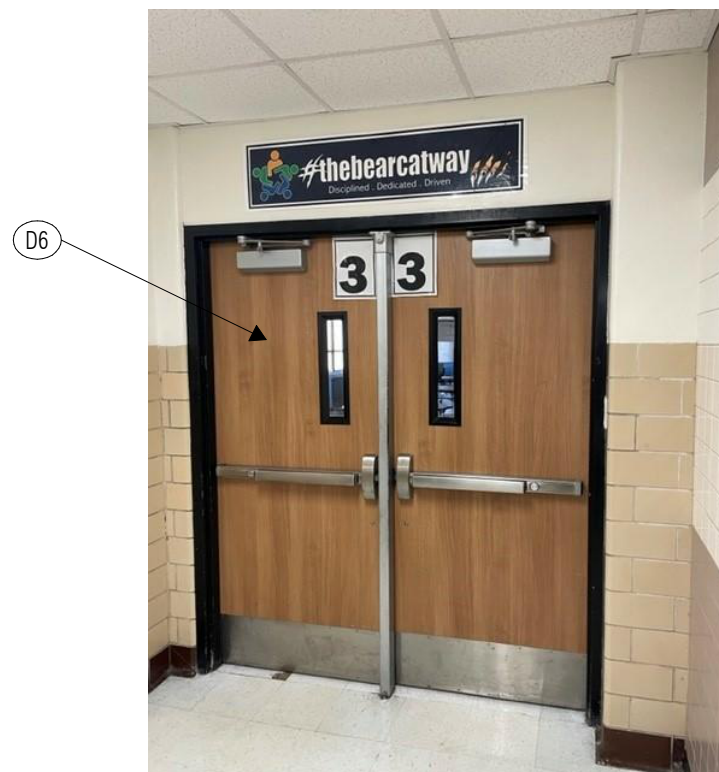
- Drawings show the general extent of demolition work, however it is impractical to indicate or note every item of demolition. Any items shown dashed are to be removed to make way for new construction, unless noted otherwise.
- Existing materials containing asbestos to be removed under separate contract prior to construction by owner's asbestos abatement contractor.
- Contact the owner prior to the start of demolition to determine items to be salvaged and returned to owner.
- Protect items to remain from damage during demolition.
- Refer to electrical and mechanical demolition plan for additional information.
- Repair at no cost to the owner any damages they incur on the existing building and site as a result of their activities not schedules for alteration.
- Patch/repair flooring to match existing at all removed or demolished doors, windows, millwork or partition unless otherwise noted.

DEMOLITION LEGEND

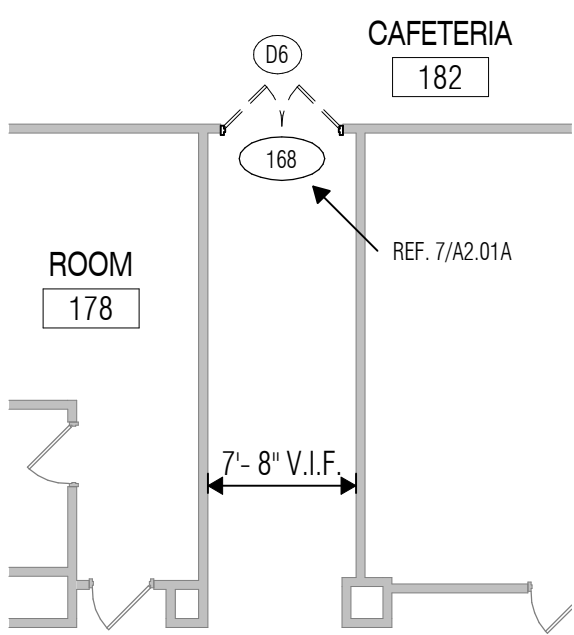
- EXISTING WALL TO REMAIN
- EXISTING WALL TO BE REMOVED
- EXISTING TO BE REMOVED
- EXISTING DOOR TO REMAIN
- EXISTING DOOR TO BE REMOVED & RELOCATED. REF: DOOR SCHEDULE
- EXISTING DOOR & FRAME TO BE REMOVED. DOOR AND HARDWARE TO BE RETURNED TO OWNER.



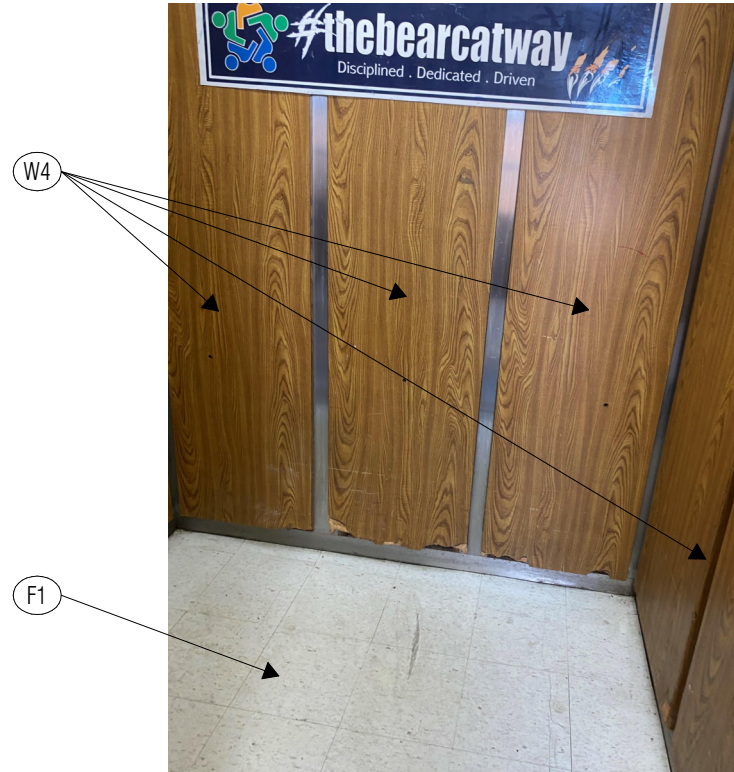
KEY PLAN



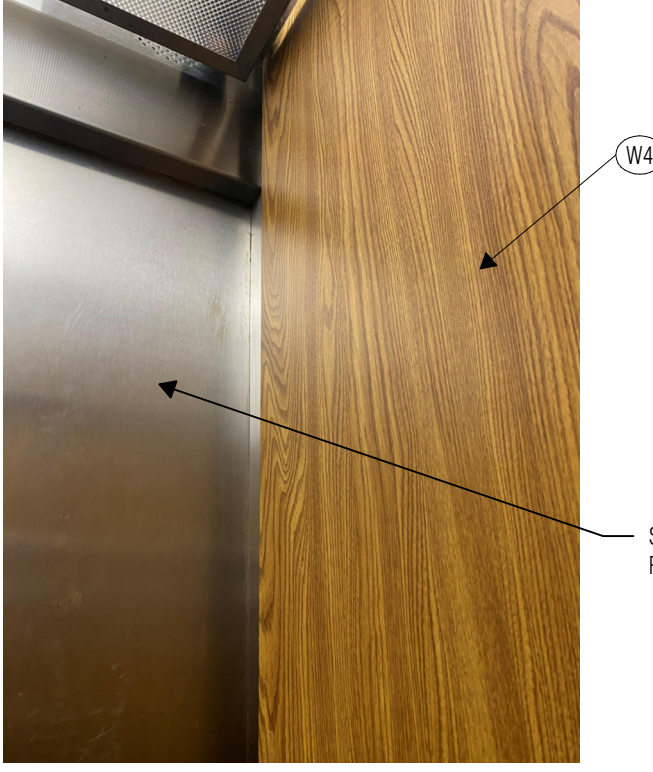
7 EXISTING CAFETERIA DOORS
SCALE: 3" = 1'-0"



5 DEMOLITION FLOOR PLAN - CAFETERIA DOORS
SCALE: 1" = 10'-0"



PLAN WEST

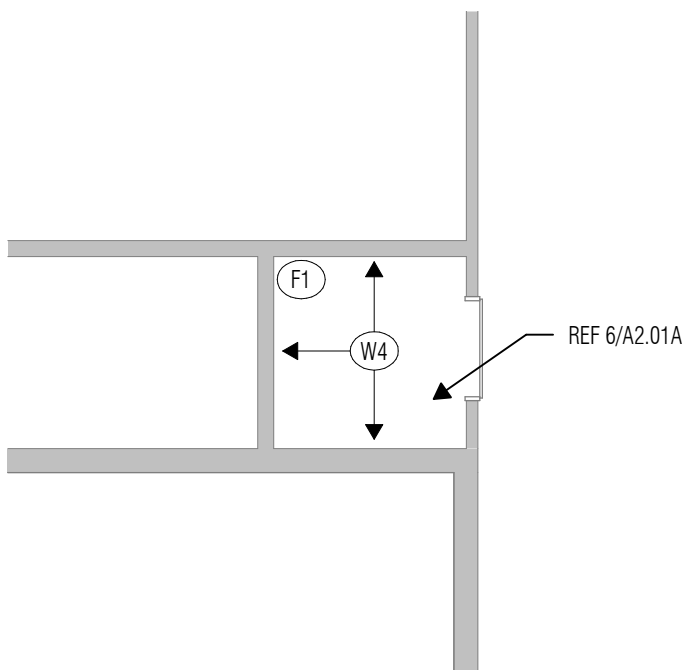


PLAN SOUTHWEST



PLAN NORTHWEST

6 EXISTING ELEVATOR
SCALE: 3" = 1'-0"



4 DEMOLITION FLOOR PLAN - ELEVATOR
SCALE: 1/8" = 1'-0"



1 DEMOLITION FLOOR PLAN - SPED WING
SCALE: 1/8" = 1'-0"



ISSUED: 03/24/2022

REVISIONS

Revision No.	Revision Date
1 ADDENDUM NO.2	04/08/2022

Director
MEF
Designer
KT
Proj. Arch.
MG

Drawn By
KT, AG, AC
Quality Control
CJ

PROJECT NO.

21-136.01

SHEET TITLE

FLOOR PLAN - LEVEL ONE -
UNIT A

SHEET NO.

A2.11A

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FLOOR PLAN NOTES

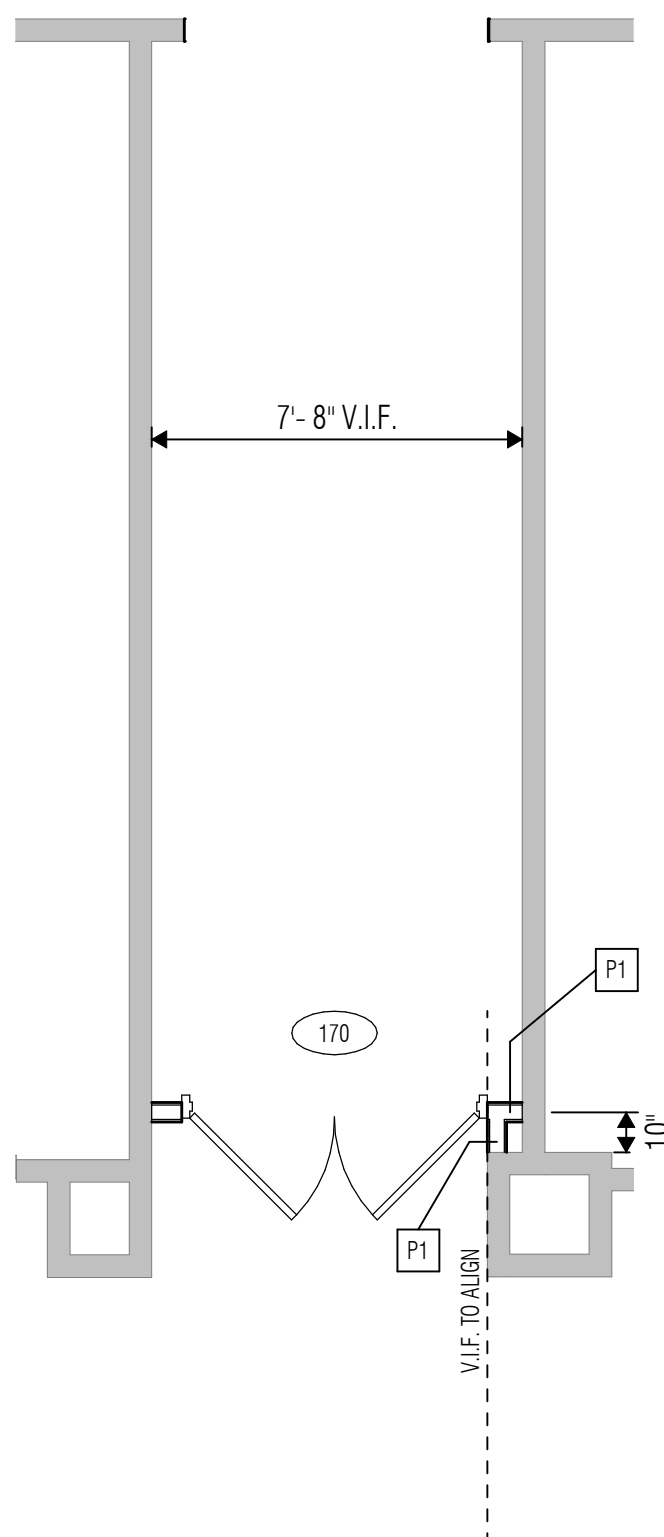
- Dimensions on Floor Plans are to face of stud or CMU unless noted otherwise.
- Coordinate the location of electrical devices with casework, millwork, lockers, etc. Any electrical device that is not properly coordinated shall be relocated at no additional cost.
- Refer to Sheet A2.21 for Partition Types.
- Interior partitions are Type "P1" unless noted otherwise.
- Refer to Detail 4/A0.31 for Typical Door Maneuvering Clearances. All new doors shall meet the requirements of that detail. If any door is found that does not comply with these requirements, request clarification from the Architect prior to construction.
- Refer to Sheet A2.20 for Typical Gypsum Board Control Joint Details at all CFS and light-gage steel stud partition openings.
- Refer to Sheet A2.20 for Typical Partition Penetration Details, including pipe, conduit and ductwork penetrations.
- Refer to Sheet A2.20 for Typical Bracing at Non-Loadbearing CMU Partitions.
- Provide factory bullnose units at all interior exposed vertical edges of CMU, except at starter course with applied base material where square-edge units shall be provided in lieu of bullnose units.
- Provide steel or masonry lintels over all openings in CMU walls, including those required for mechanical ductwork and dampers, whether specifically indicated on the drawings or not.
- Provide minimum 20 gage light-gage steel studs at all interior partitions scheduled to receive ceramic tile or plaster.
- At light-gage steel stud partitions that extend above the ceiling, provide diagonal 20 gage stud braces at 4'-0" o.c. to structure above (not to steel deck) as required to provide rigid anchorage and support of partitions.
- Provide minimum 2 X 6 fire-retardant treated wood blocking in both new and existing stud walls and partitions, at mounting locations for wall-mounted accessories, handrails, casework, markerboards, tackboards, folding partitions, toilet partitions, and all other wall-mounted items. Refer to Sheet A2.20 for typical blocking requirements at various conditions.
- Provide sealant and/or fire safing at all floor penetrations, as applicable.

FLOOR PLAN LEGEND

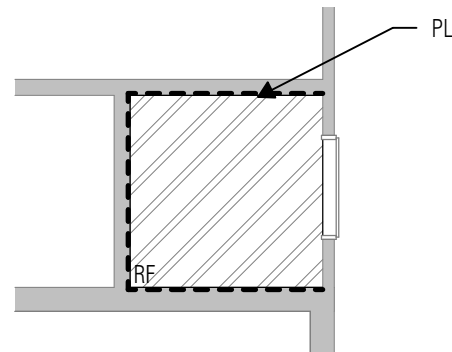
- METAL STUD PARTITION. Extend 4" above highest ceiling plane and brace to structure above as noted in Floor Plan Notes. Refer to Reflected Ceiling Plan for fire, smoke and sound-conditioned partitions that extend to deck above.
- CMU PARTITION. Extend 4" above highest ceiling plane and brace to structure above as detailed. Refer to Reflected Ceiling Plan for fire, smoke and sound-conditioned partitions that extend to deck above.
- LOCKER TYPE
For locker types, ref. A2.30
- LOCKER QUANTITY
- FURNITURE, FIXTURE OR EQUIPMENT BY OWNER. Coordinate with adjacent electrical devices, casework, etc.
- EXISTING DOOR
- RELOCATED EXISTING DOOR
- NEW DOOR
- EXISTING WALL
- FURNITURE, FIXTURE OR EQUIPMENT BY OWNER. Coordinate with adjacent electrical devices, casework, etc.

INTERIOR FINISH LEGEND

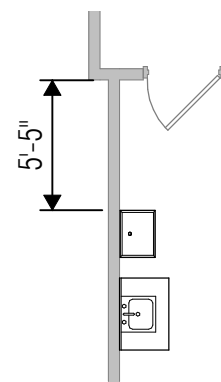
- C0-01 CONCRETE, SEALED
- RF RESILIENT FLOOR
- RU RESILIENT MODULAR ATHLETIC FLOORING
- PF RESINOUS FLOORING
- PT PAINTED
- BC COVED BASE
- PL PLASTIC LAMINATE WALL PANELS
- CT CERAMIC TILE
- FRP FIBERGLASS REINFORCED PLASTIC



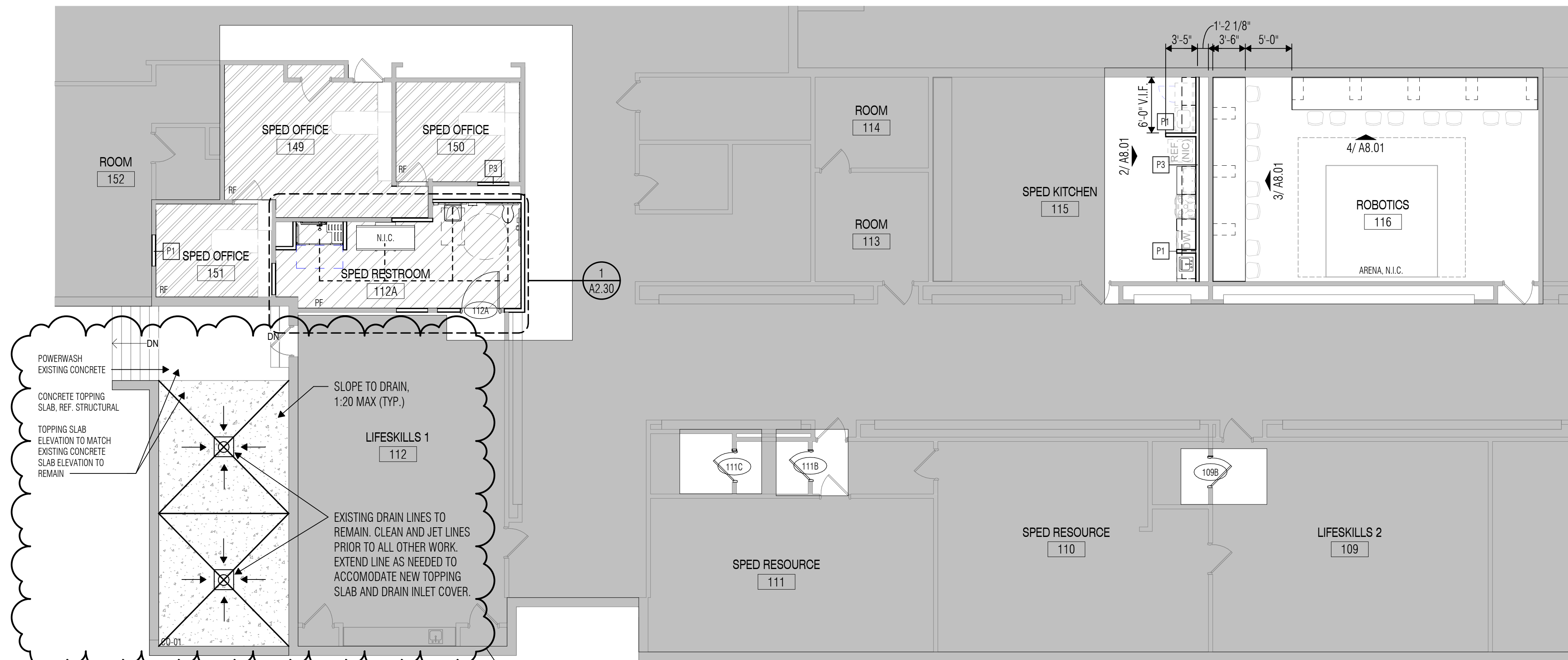
4 FLOOR PLAN - CAFETERIA DOORS
SCALE: 1/4" = 1'-0"



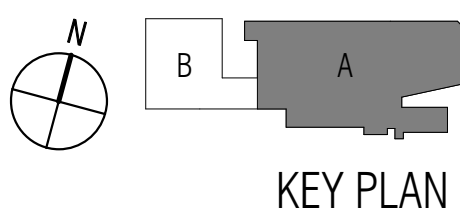
3 FLOOR PLAN - ELEVATOR
SCALE: 1/8" = 1'-0"



2 FLOOR PLAN - ART ROOM
SCALE: 1/8" = 1'-0"



1 FLOOR PLAN - SPED WING
SCALE: 1/8" = 1'-0"





ISSUED: 03/24/2022

REVISIONS	
Revision No.	Revision Date
1 ADDENDUM NO.2	04/08/2022

Director
MEF
Designer
KT
Proj. Arch.
MG

Drawn By
AC
Quality Control
VLK

PROJECT NO.

21-136.01

SHEET TITLE

FLOOR PLAN - ALTERNATE
STEM LAB

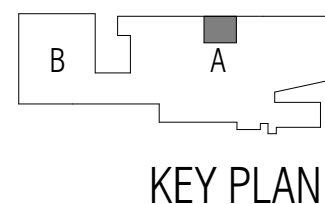
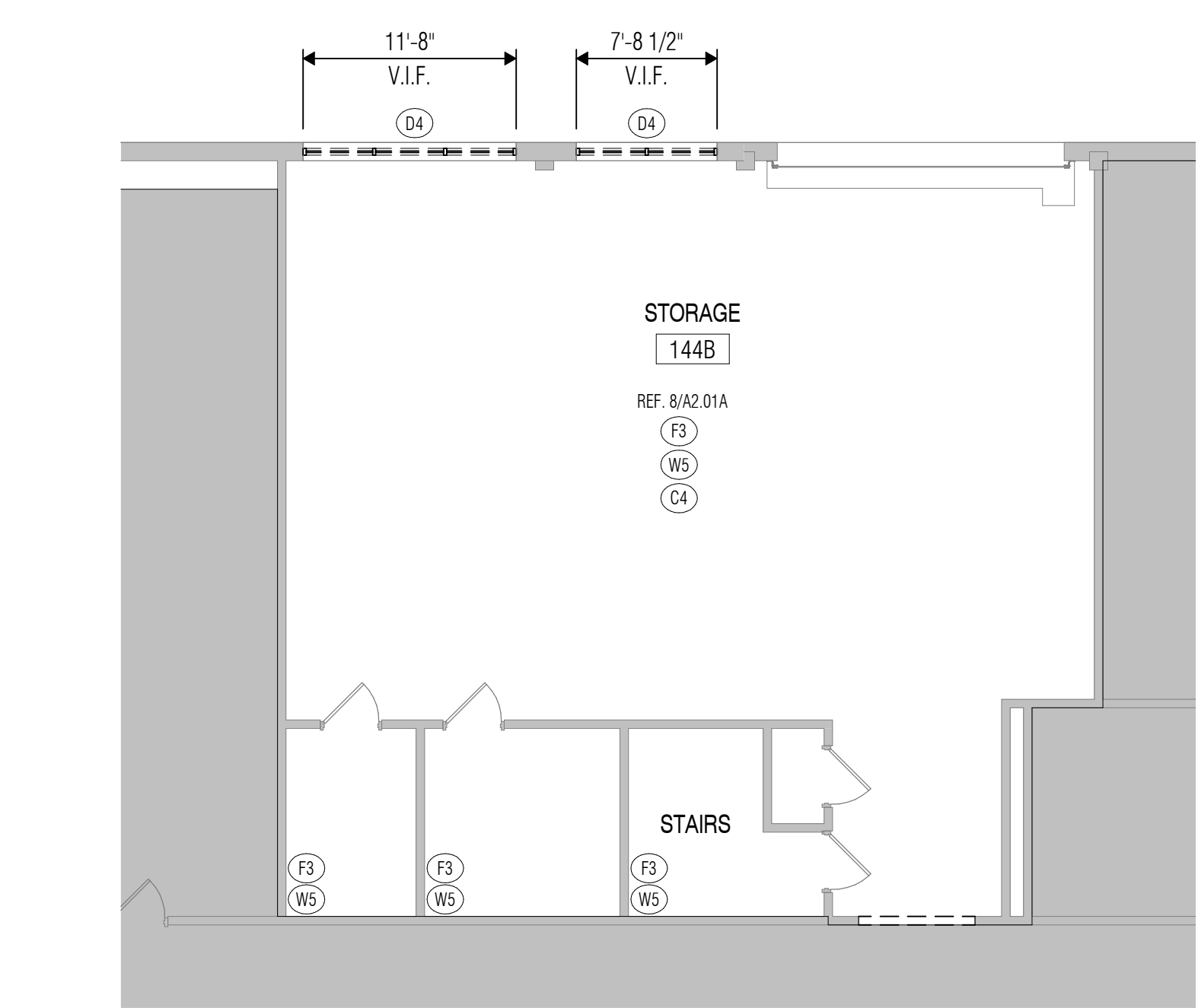
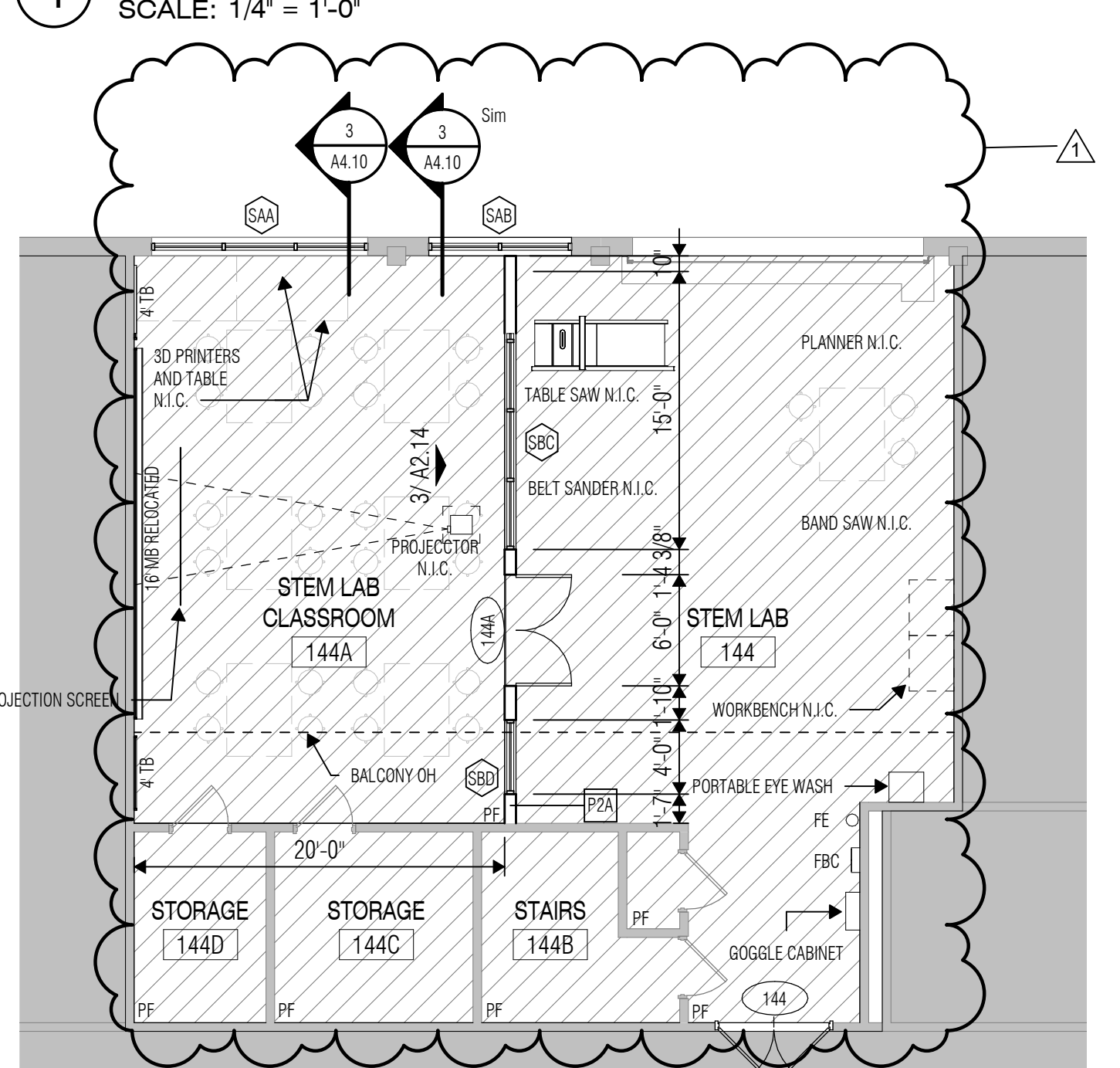
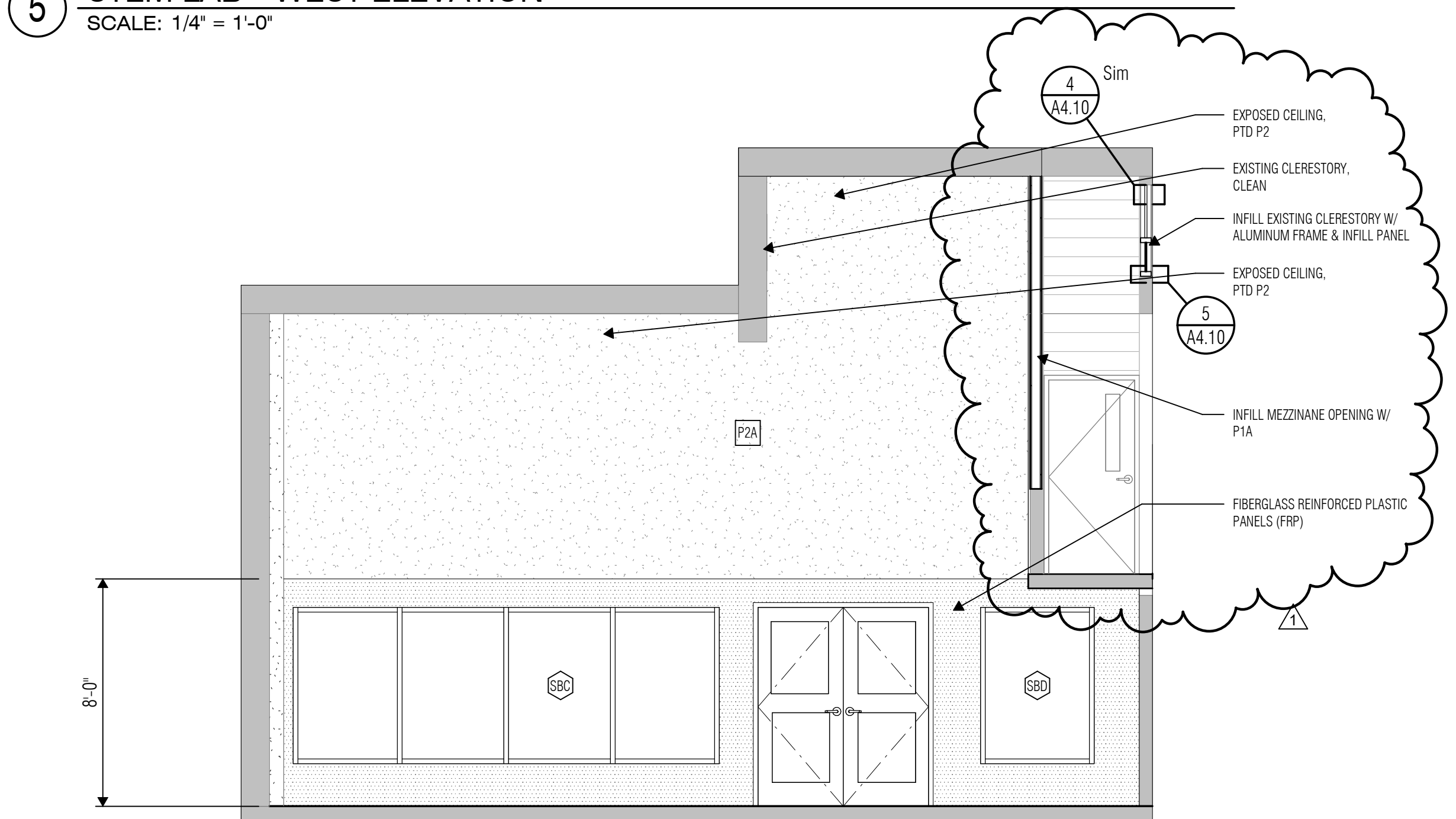
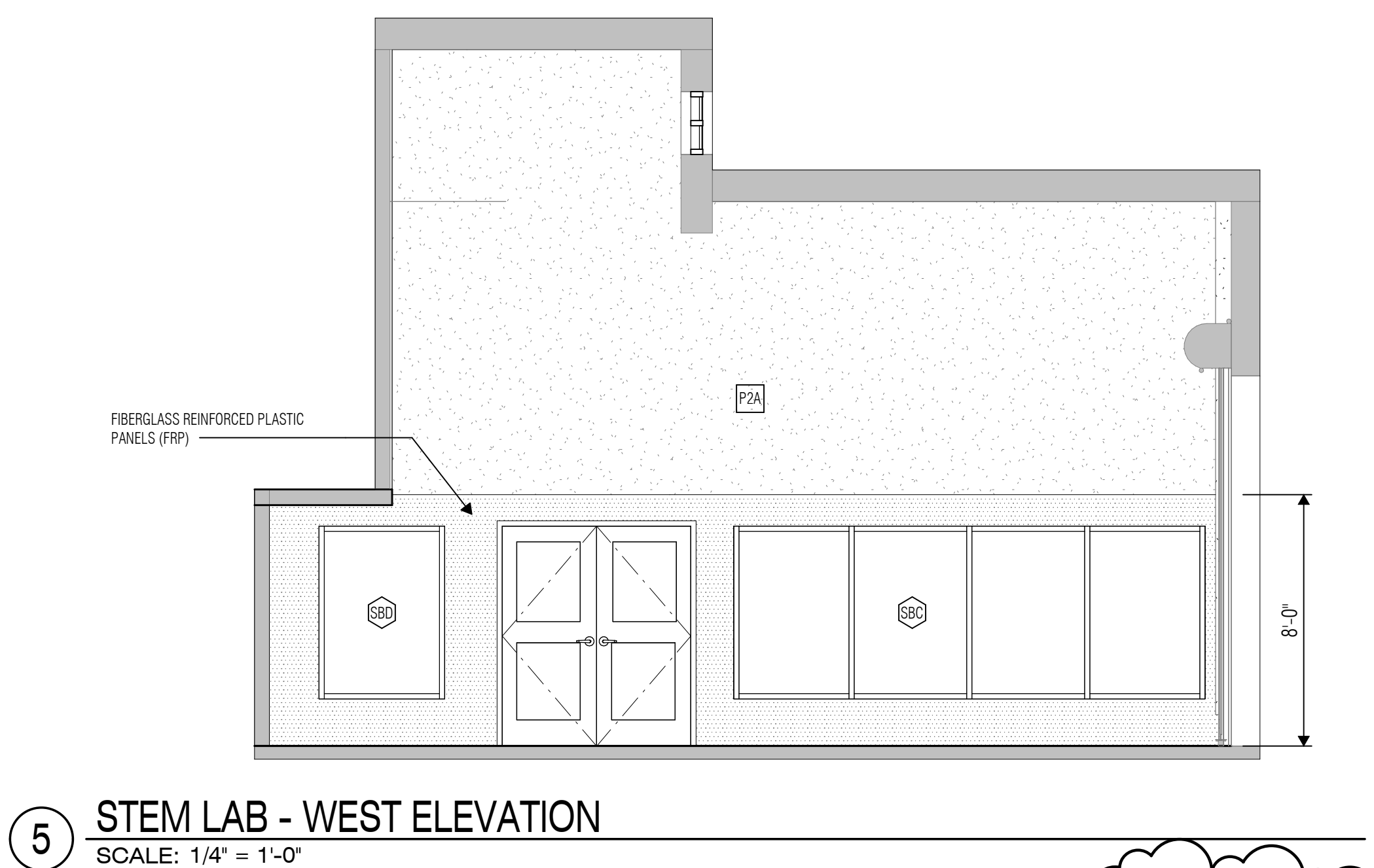
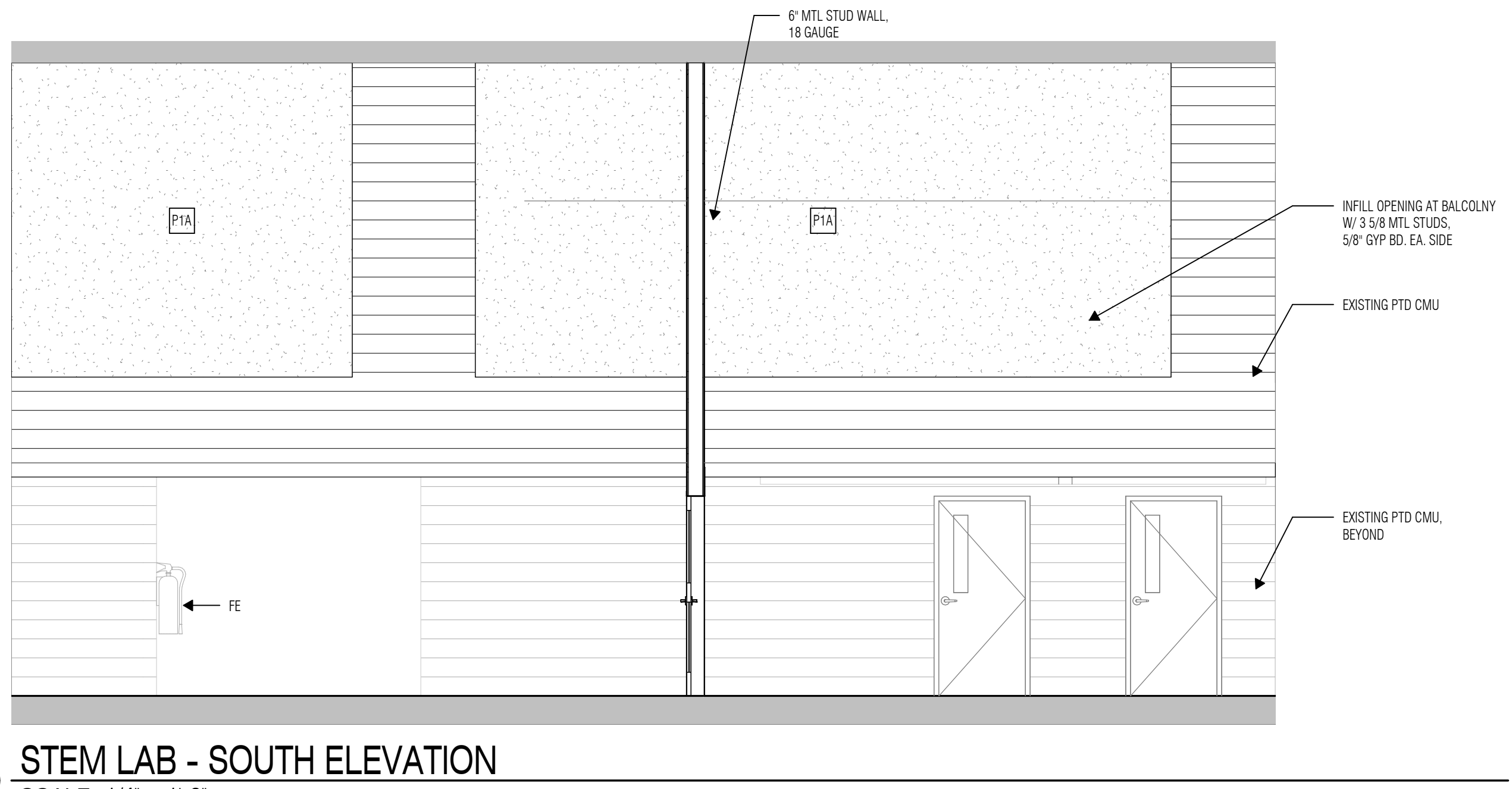
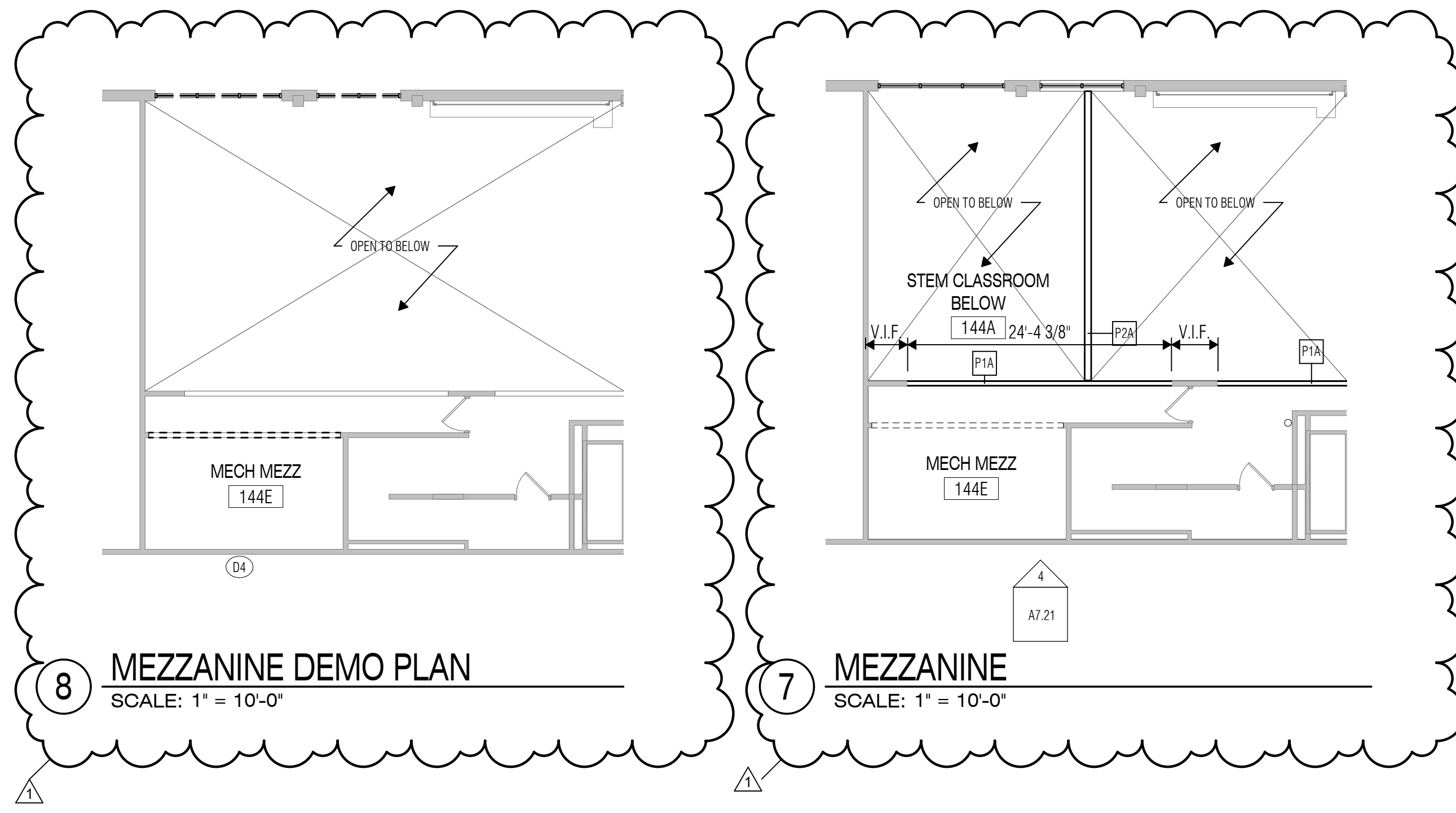
SHEET NO.

A2.14

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INTERIOR FINISH LEGEND		
	CO-01	CONCRETE, SEALED
	RF	RESILIENT FLOOR
	RU	RESILIENT MODULAR ATHLETIC FLOORING
	PF	RESINOUS FLOORING
	PT	PAINTED
	BC	COVED BASE
	PL	PLASTIC LAMINATE WALL PANELS
	CT	CERAMIC TILE
	FRP	FIBERGLASS REINFORCED PLASTIC

DEMOLITION KEYED NOTES	
NOTE: NOT ALL NOTES MAY APPEAR ON THE SHEET	
CEILING	
(C1)	REMOVE EXISTING CEILING SYSTEM, LIGHTS AND DEVICES. REF ELECTRICAL SHEETS FOR RELOCATED FIXTURES.
(C2)	VERIFY HARDWARE COMPONENTS AND REPLACE AS NEEDED.
(C3)	REMOVE AND DISCARD STAGE LIGHTING. REFERENCE ELECTRICAL DEMO SHEET.
(C4)	REMOVE LIGHTING DEVICES (REF. ELECTRICAL SHEETS)
FLOORS	
(F1)	REMOVE EXISTING FLOOR FINISH & BASE. CLEAN & PREPARE FOR INSTALLATION OF NEW FINISH AS SCHEDULED.
(F2)	REMOVE EXISTING EXTERIOR QUARRY TILES, AND SAND BED PREP SLAB FOR TOPPING SLAB. REF STRUCTURAL.
(F3)	PREPARE FLOOR FOR NEW FINISHES AS SCHEDULED.
(F4)	EXISTING VCT FLOORING TO REMAIN, PATCH MISSING TILES WITH MATCHING TILE APPROVED BY ARCHITECT. CLEAN & WAX FLOORING.
(F5)	REMOVE EXISTING CARTHAGE STONE STEP & ASSOCIATED STEEL
(F6)	REMOVE AND STORE BENCHES FOR REINSTALLATION FOLLOWING EPOXY FLOORING
REMOVE ANY BROKEN OR CRACKED THRESHOLD 2x2 TILES. CLEAN AND PREP AREA FOR INSTALLATION OF 2x2 TILES AT THRESHOLD.	
WALLS	
(W1)	REMOVE INTERIOR WALL PARTITIONS
(W2)	PARTIALLY REMOVE EXISTING INTERIOR PARTITION. PATCH TO MATCH EXISTING SUBSTRATE
(W3)	REMOVE EXISTING CHAIN LINK CAGES AND STRUCTURAL SUPPORTS
(W4)	REMOVE EXISTING ELEVATOR WALL PANELING AND PREP WALL SURFACE FOR NEW
(W5)	CLEAN AND REMOVE CHIPPED PAINT FROM CMU WALLS. PREP FOR PAINT.
(W6)	CLEAN AND PREP AREA FOR INSTALLATION OF RELOCATED GLAZED BLOCKING. GC TO REMOVE/CLEAN GLAZED BLOCKING IN MEZZANINE AREA ABOVE STEM LAB TO RELOCATE TO LOCKER ROOM.
(W7)	CLEAN AND PREP AREA FOR TOOTH IN CMU INSTALLATION TO MATCH EXISTING AT WALL OPENING. PAINT WALL TO MATCH EXISTING.
(W8)	REMOVE EXISTING WINDOW SYSTEM AND PREP FOR NEW.
DOORS & WINDOWS	
(D1)	REMOVE EXISTING DOOR AND FRAME. SALVAGE DOORS FOR REINSTALLATION AT NEW LOCATION. REF. DOOR SCHEDULE A2.60
(D2)	REMOVE EXISTING DOOR, FRAME TO REMAIN
(D3)	CUT ROUGH OPENING IN EXISTING DOOR AND PREP FOR INSTALLATION OF VISION PANEL. REF A2.60
(D4)	REMOVE EXISTING WINDOWS, FRAME, ASSOCIATED HARDWARE & A/C UNITS.
(D5)	SAW CUT EXISTING MASONRY WALL, SALVAGE BRICK FOR REINSTALLATION AT NOTED LOCATIONS.
(D6)	REMOVE EXISTING DOOR, SALVAGE DOOR FOR REINSTALLATION AT NEW LOCATION, FRAME TO REMAIN INSTALLED. REF DOOR SCHEDULE A2.60
(D7)	REMOVE AND DISCARD DOOR FRAME; REMOVE AND RETURN DOOR AND HARDWARE TO OWNER
PLUMBING	
(P1)	REMOVE EXISTING PLUMBING FIXTURES, BRACKETS, CONNECTIONS, ETC. REF: PLUMBING DEMOLITION PLANS FOR ADDITIONAL INFO.
MISCELLANEOUS	
(M1)	REMOVE EXISTING MILLWORK CABINETS & BRACKETS
(M2)	REMOVE EXISTING PROJECTION SCREEN AND RETURN TO OWNER
(M3)	REMOVE & SALVAGE (4) LOCKERS FOR REINSTALLATION IN BOYS COACHES LKR 168A. RETURN REMAINING LOCKERS TO OWNER. REPAIR AND PATCH WALLS AS NEEDED.
(M4)	REMOVE EXISTING BOARDS, CLOCKS, PROJECTOR SCREEN, & WALL MOUNTED DEVICES AND RETURN TO OWNER
(M5)	REMOVE & RELOCATE EXISTING ELEC. SWITCHES, REF. ELEC DWGS
(M6)	REMOVE EXISTING THREE TIER LOCKERS, PREP WALLS FOR NEW LOCKERS; RETURN LOCKERS TO OWNER.
(M7)	REMOVE BROKEN POOL COVE TILES & PREP AREA FOR NEW
(M8)	REMOVE & DISCARD MISC. WALL MOUNTED ACCESSORIES
(M9)	CONTRACTOR TO DISCONNECT EXISTING ICE MACHINE AND RETURN TO OWNER.
(M10)	REMOVE EXISTING MARKER BOARD, PATCH AND PAINT AS NEEDED. RELOCATE MARKERBOARD TO STEM LAB ROOM 144A
(M11)	REMOVE EXISTING CASEWORK; PREP AREA FOR INSTALLATION OF NEW CASEWORK
(M12)	REMOVE AND SALVAGE LOCKERS FOR REINSTALLATION IN GIRLS COACHES LKR 172. REPAIR AND PATCH WALLS.
(M13)	EXISTING LOCKERS TO REMAIN.





ISSUED: 04/08/2022

REVISIONS	
Revision No.	Revision Date

Director
MEF
Designer
KT
Proj. Arch.
MG

Drawn By
AC
Quality Control
VLK

PROJECT NO.

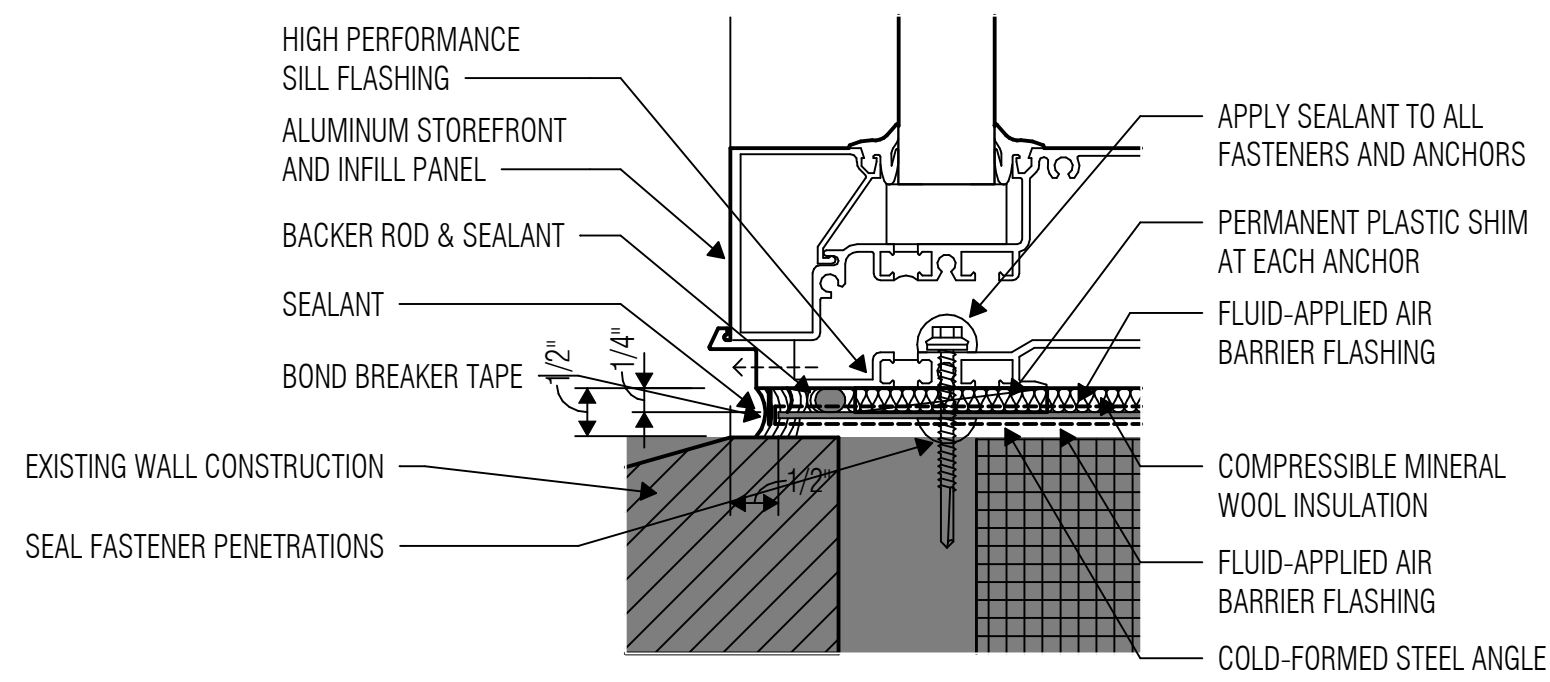
21-136.01

SHEET TITLE

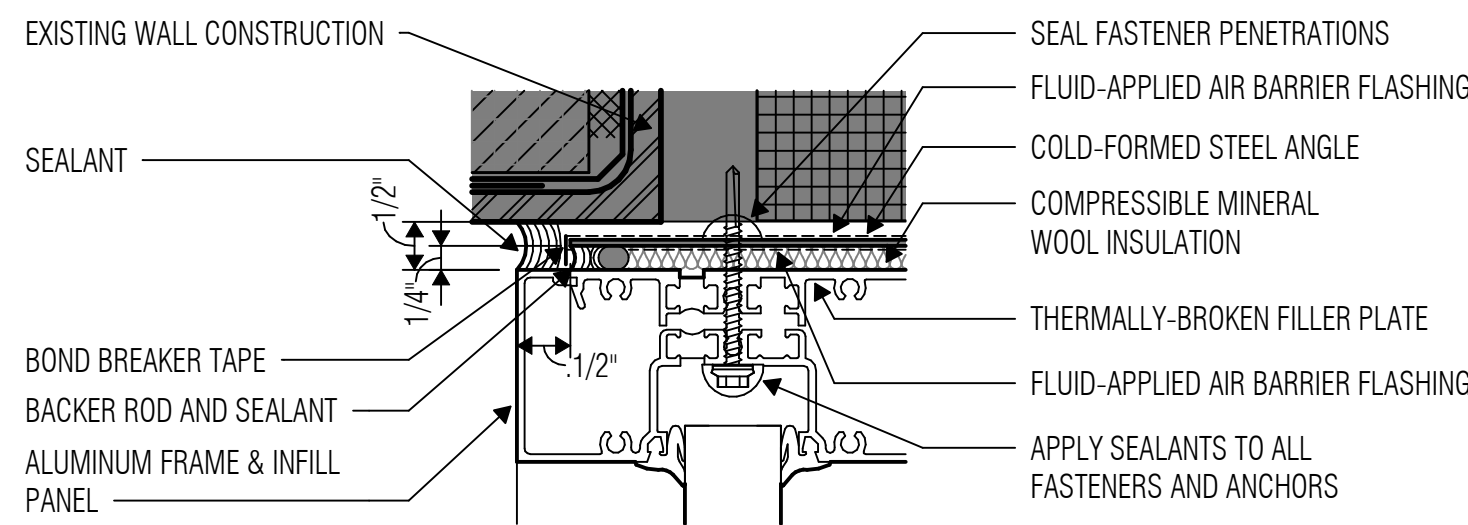
WALL SECTIONS AND
SECTION DETAILS

SHEET NO.

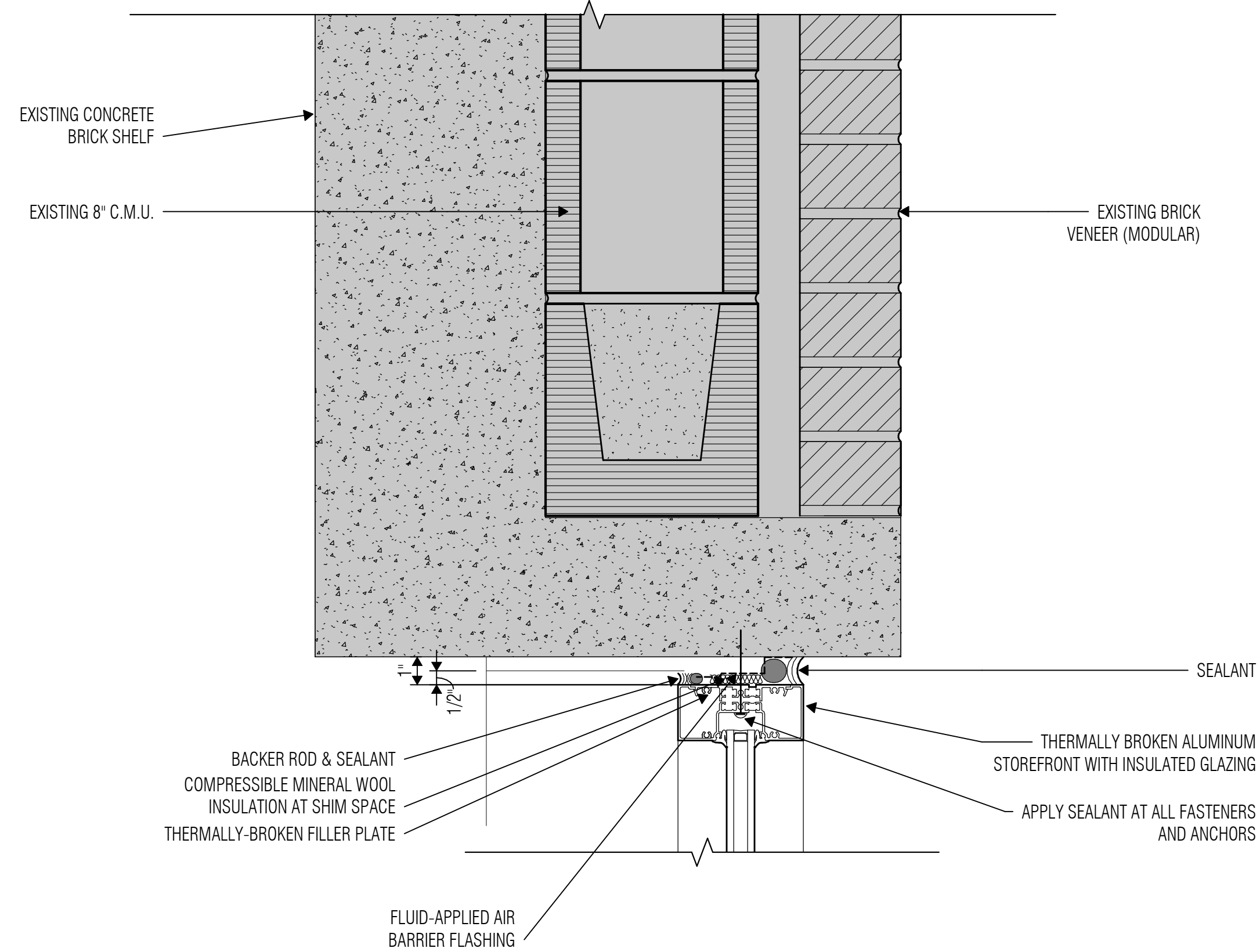
A4.10



5 SILL DETAIL AT INFILL PANEL
SCALE: 6" = 1'-0"

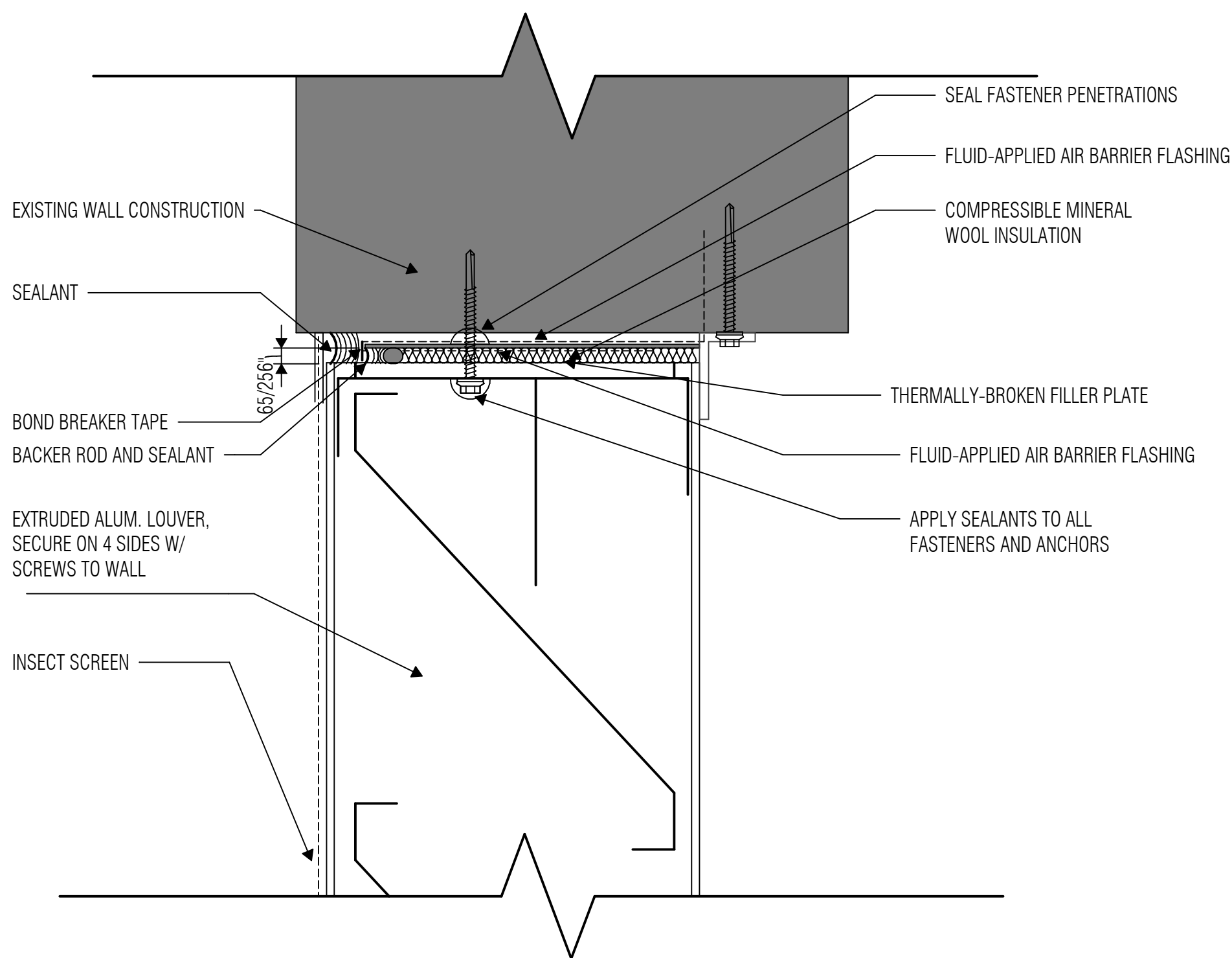


4 DETAIL at INFILL PANEL HEADER
SCALE: 6" = 1'-0"

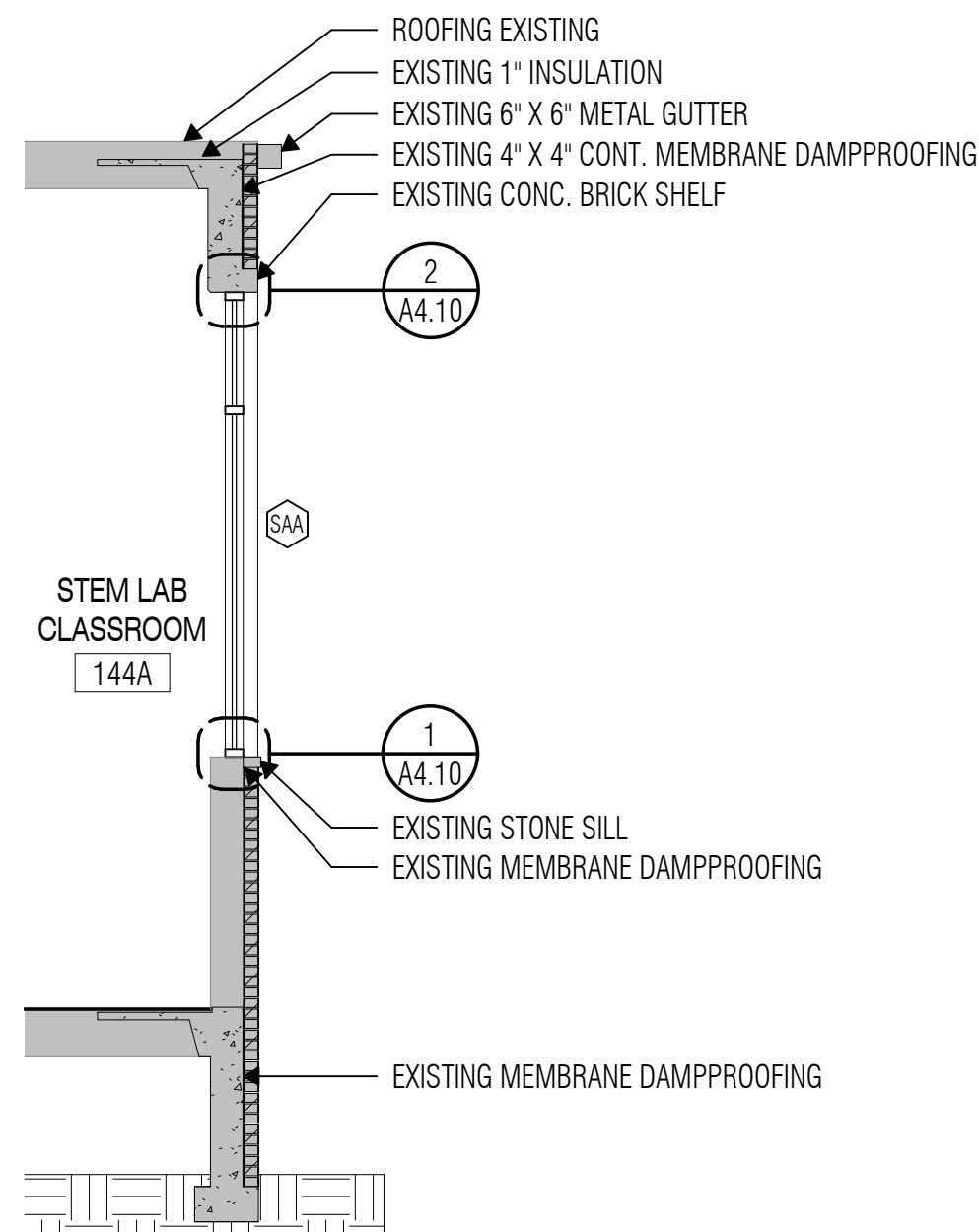


2 MODULAR BRICK/ CMU WALL AT STOREFRONT HEAD -
LOOSE LINTEL
SCALE: 3" = 1'-0"

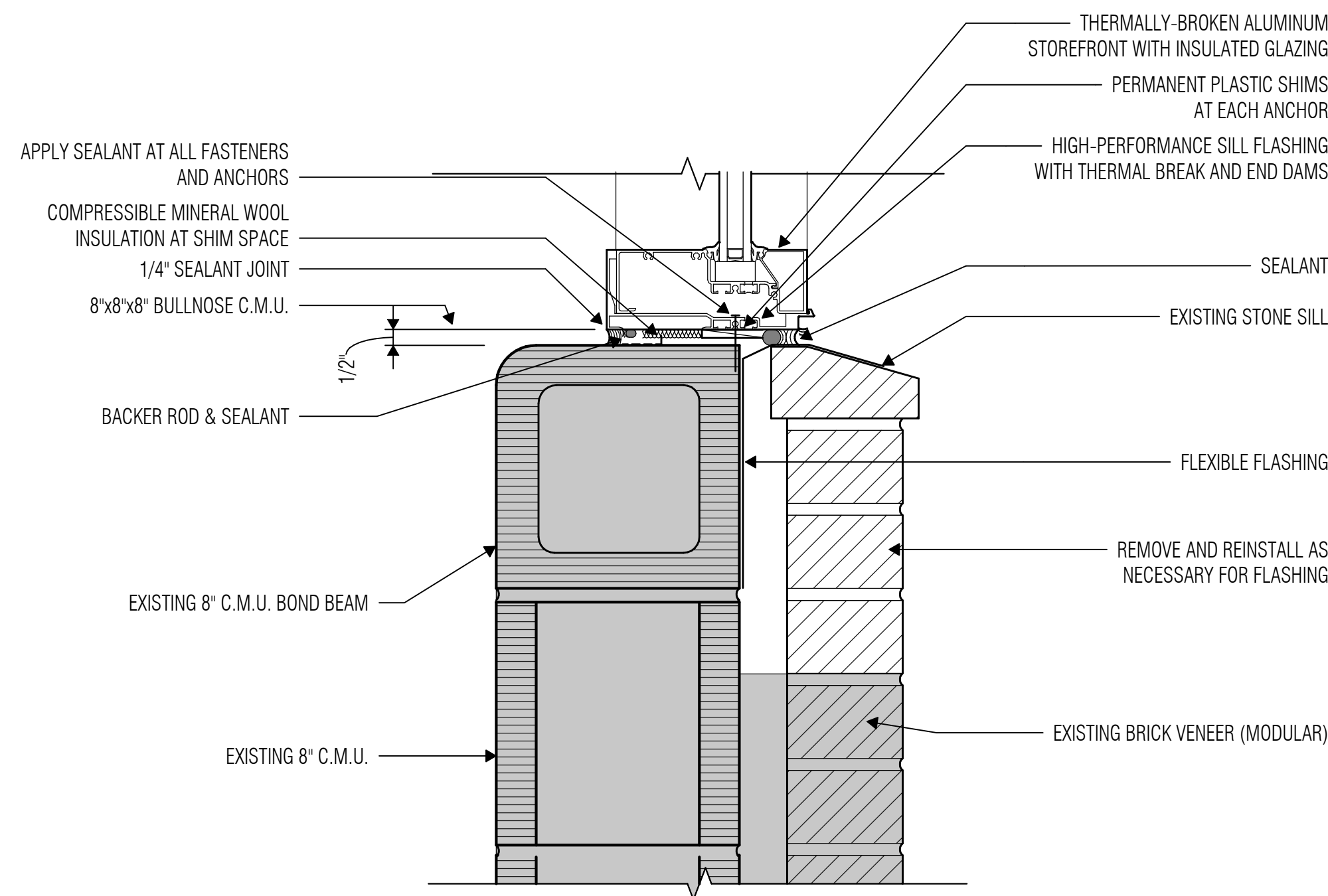
*BMC-31.H.60SF.LL



6 HEAD DETAIL AT LOUVER
SCALE: 6" = 1'-0"



3 WALL SECTION - ALTERNATE STEM LAB
SCALE: 1/4" = 1'-0"



1 MODULAR BRICK/ CMU WALL AT STOREFRONT SILL - BRICK
SILL
SCALE: 3" = 1'-0"

*BMC-31.S.60SF.SB

DEMOLITION LEGEND

- FASTENERS SHALL UNSCREWED FROM STRUCTURAL COMPONENTS FOR REMOVAL.
- EXTENTS OF DEMOLITION SHALL BE COORDINATED WITH NEW WORK.
- REMOVED FLASHING MAY NOT BE REUSED.
- CONTRACTOR TO COORDINATE / PROVIDE TEMPORARY STRUCTURAL BRACING AS REQUIRED.
- CONTRACTOR TO COORDINATE PHASING OF WORK.
- CONTRACTOR TO ENSURE WEATHERTIGHT TEMPORARY ENCLOSURE DURING WORK STOPPAGE.
- CONTRACTOR TO PROTECT AND REINSTALL DISLODGED INSULATION OR REPLACE DAMAGED ROOF INSULATION.
- CONTRACTOR TO PROTECT CEILING, LIGHTING, CONDUIT / WIRING, DUCTWORK AND ALL INTERSTITIAL ELEMENTS / INTERIOR SPACE, FURNISHINGS AND FINISHES DURING DEMOLITION AND INSTALLATION OF NEW ROOF SYSTEM.
- CONTRACTOR IS RESPONSIBLE FOR THE REPAIR / REPLACEMENT OF EQUIPMENT / FINISHES / INTERIOR ELEMENTS DAMAGED DURING THE WORK PHASE.
- ALL LOOSE FASTENERS AND DEBRIS SHALL BE RETRIEVED BOTH FROM INTERIOR AND EXTERIOR DAILY. ALL CONSTRUCTION DEBRIS MUST BE REMOVED DAILY FROM AREAS OUTSIDE THE CONSTRUCTION ENCLOSURE. ALL AREAS MUST BE FULLY CLEAN OF ALL CONSTRUCTION DEBRIS PRIOR TO REMOVAL OF CONSYTRUCTION ENCLOSURE.
- CONTRACTOR TO COORDINATE DAILY WORK SCHEDULE WITH GISD TO ENSURE SPACES BELOW THE WORK ARE NOT OCCUPIED. CONTRACTOR RESPONSIBLE TO SECURE ALL OCCUPIED AREAS BELOW THE WORK.
- REFER TO DEMOLITION SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
- NOTIFY ARCHITECT / ENGINEER PRIOR TO PROCEEDING IF ACTUAL CONDITIONS VARY FROM DOCUMENTED CONDITIONS.

DEMOLITION LEGEND

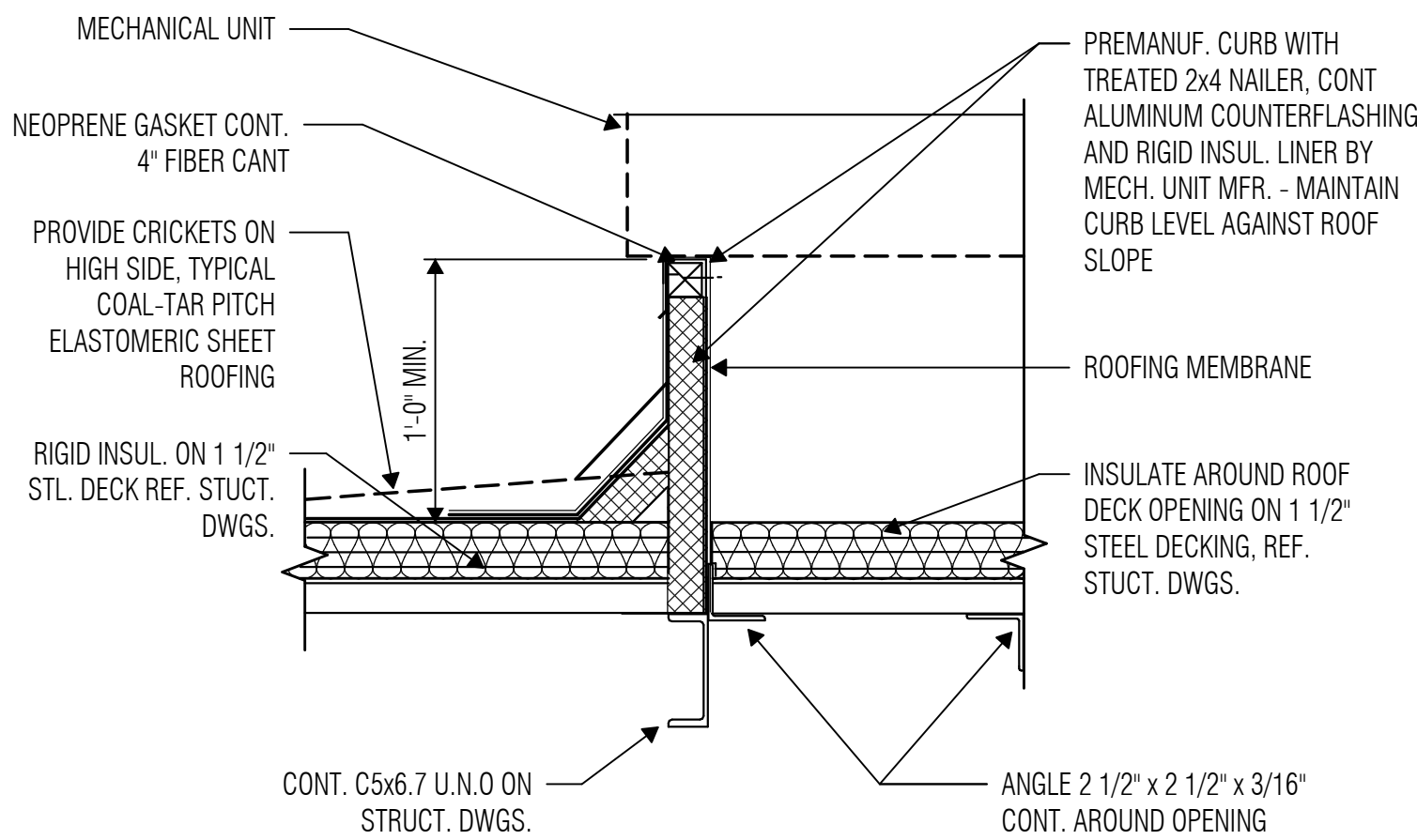
 ROOF TO BE DEMOLISHED

ROOF PLAN NOTES

- Provide tapered insulation crickets at the high side of all rooftop curbs, mounting rails, and other miscellaneous roof penetrations as required to shed water around them and to ensure positive roof drainage, whether indicated on the drawings or not.
- Crickets shall slope 1/2" per foot, unless noted otherwise.
- Provide metal end closure at the ends of expansion joints, flashings and counterflashings.
- Paint all exposed galvanized metal flashings, miscellaneous steel, piping, conduits, etc. that are not prefinished.

ROOF PLAN LEGEND

EF EXHAUST FAN, REF. M.E.P.



FASTENER TABLE		
UNIT SIZE	MINIMUM NUMBER OF FASTENERS PER SIDE TO ATTACH UNIT TO CURB	MINIMUM NUMBER OF FASTENERS PER SIDE TO ATTACH CURB TO ROOF STRUCTURE
60	5	5
70	5	5
80	5	5
90	5	5
100	5	5
120	5	6
135	5	6
150	6	7
165	6	7
180	8	8
195	8	8
210	8	9
225	8	9
245	8	10
270	9	10
300	9	14

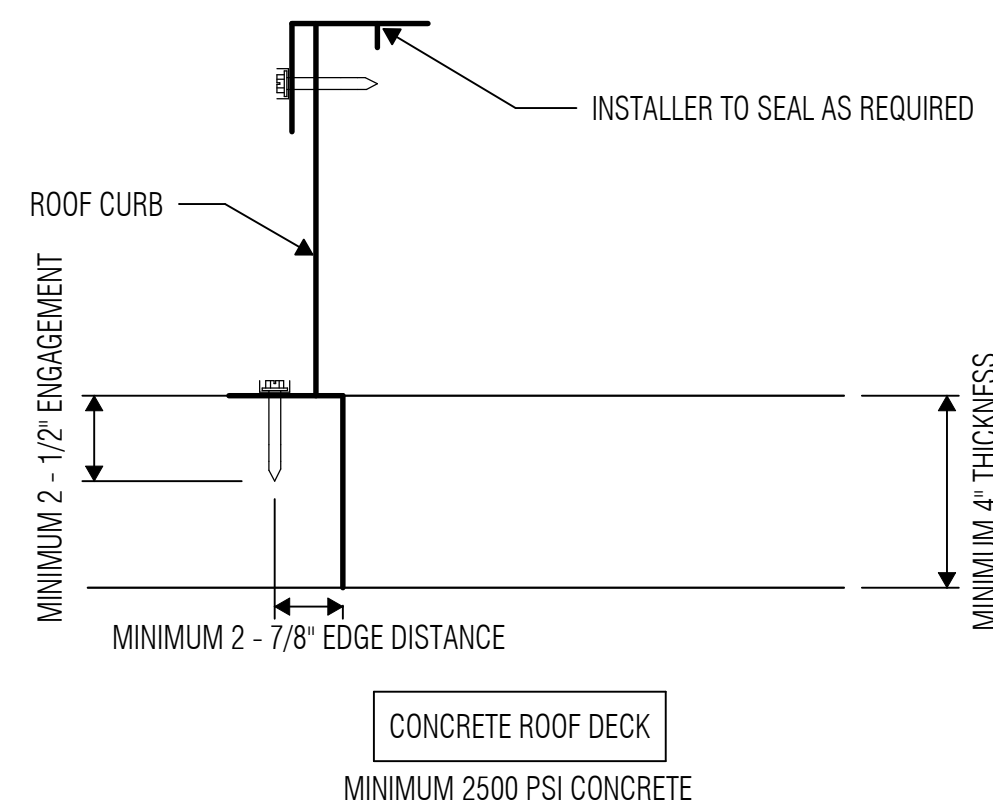
NOTE

UNIT IS TO INCLUDE A CURB CAP BASE TO FACILITATE MOUNTING OF THE UNIT TO A CURB. THE CURB WILL BE ADEQUATELY ATTACHED TO THE BUILDING STRUCTURE TO SUSTAIN ALL FORCES WHICH MAY BE PRODUCED BY THE PRESCRIBED ENVIRONMENTAL FORCES EXERTED ON THE FAN AND CURB. THE CURB MUST BE ATTACHED TO A STRUCTURAL MEMBER OF THE BUILDING.

CONCRETE DECK: CURB IS TO BE ATTACHED WITH WEDGE TYPE CONCRETE ANCHOR - MINIMUM 3/8" DIAMETER CARBON STEEL - HILTI KWIK BOLT 3 OR EQUAL. MINIMUM 2-1/2" OF ENGAGEMENT IN 2000 PSI MINIMUM CONCRETE. MINIMUM DECK THICKNESS IS 4". ANCHORS ARE TO BE EQUALLY SPACED. SEE TABLE FOR MINIMUM QUANTITY OF ANCHORS REQUIRED PER CURB SIDE.

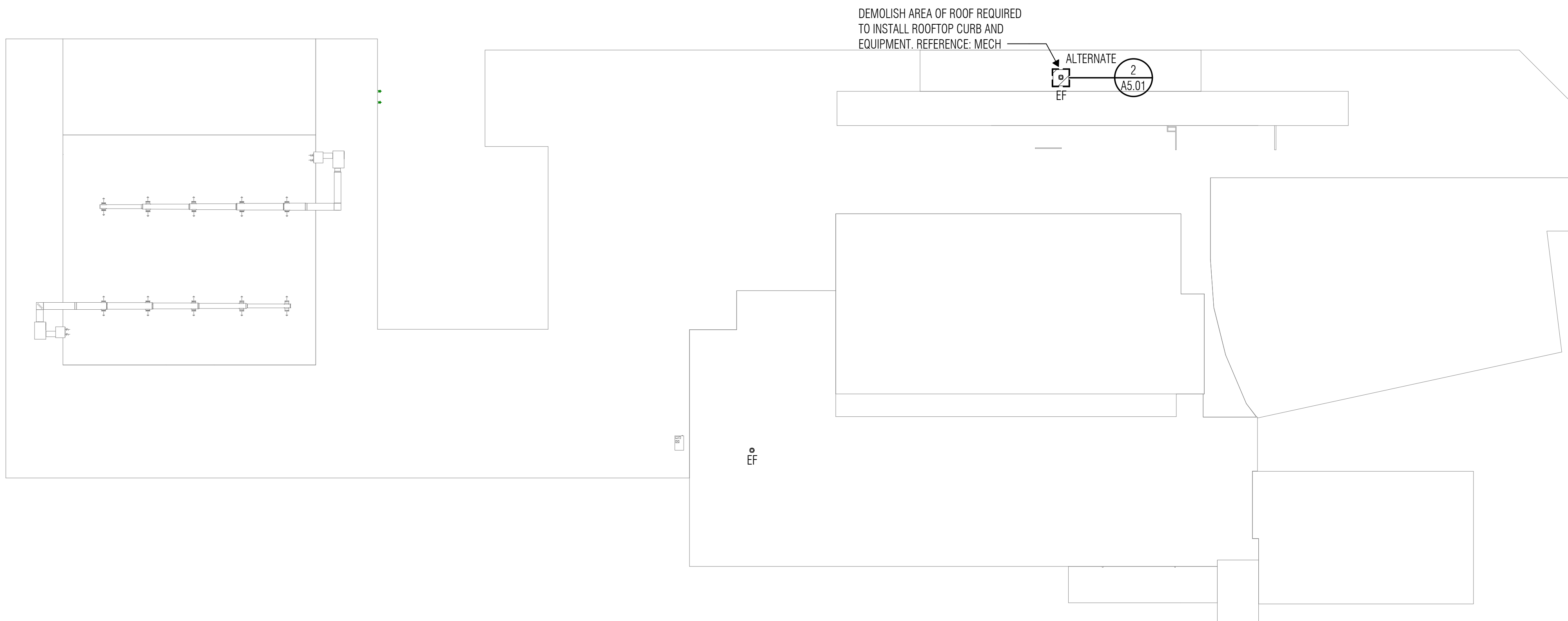
STEEL ROOF STRUCTURE: CURB IS TO BE ATTACHED WITH SELF-DRILLING STEEL SCREW OF MINIMUM NOMINAL SIZE OF #12, AND SCREW SHALL PASS THROUGH STEEL STRUCTURE AT LEAST 1/2". THE SCREW MUST BE AT LEAST 1/2" FROM MATERIAL EDGE. SEE TABLE FOR MINIMUM QUANTITY OF SCREWS REQUIRED PER CURB SIDE.

WOOD ROOF STRUCTURE: CURB IS TO BE ATTACHED WITH STEEL LAG BOLTS NOMINAL SIZE OF 5/16" DIAMETER OR LARGER. WOOD IS TO BE 4" NOMINAL SIZE OR GREATER. THE BOLT SHALL HAVE A MINIMUM OF 3" OF THREAD ENGAGEMENT AND SHALL BE AT LEAST 1-1/2" FROM MATERIAL EDGE. SEE TABLE FOR MINIMUM QUANTITY OF BOLTS REQUIRED PER CURB SIDE.



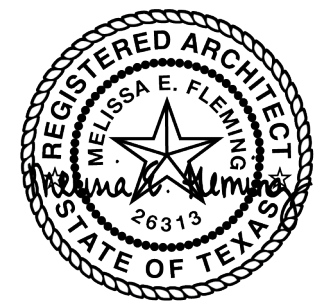
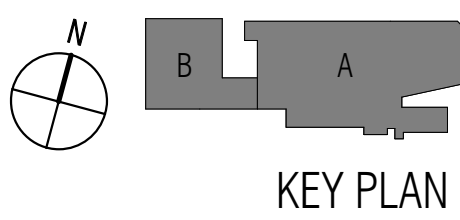
2 ROOF EQUIPMENT DETAIL - ALTERNATE

SCALE: 1 1/2" = 1'-0"



1 OVERALL ROOF PLAN

SCALE: 1/32" = 1'-0"



04/08/2022

ISSUED: 04/08/2022

REVISIONS

Revision No. Revision Date

Director MEF
Designer KT
Proj. Arch. MG

Drawn By AC
Quality Control VLK

PROJECT NO.

21-136.01

SHEET TITLE

ROOF PLAN AND DETAILS

SHEET NO.

A5.01

GLAZING SYSTEM NOTES

- Overall dimensions of glazing system elevations reflect rough opening dimensions, inclusive of perimeter joints.
- Provide 3/16" thick heavy wall framing members at all door frames in exterior and interior aluminum Storefront systems.
- Provide 3/16" thick heavy wall door adapters at all door frame members in exterior and interior aluminum Curtain Wall systems.
- Door opening dimensions in Curtain Wall systems reflect 1" door adapters at jamb conditions, and 1-3/4" door adapters at head conditions. Adjust dimensions between Mullions at door openings in curtain wall systems as required for actual size of door adapters provided. Door sizes as identified in Door Schedule shall be maintained.
- Refer to 1/A7.01 for Typical Push/Pull Mounting Heights Detail for aluminum/glass doors.

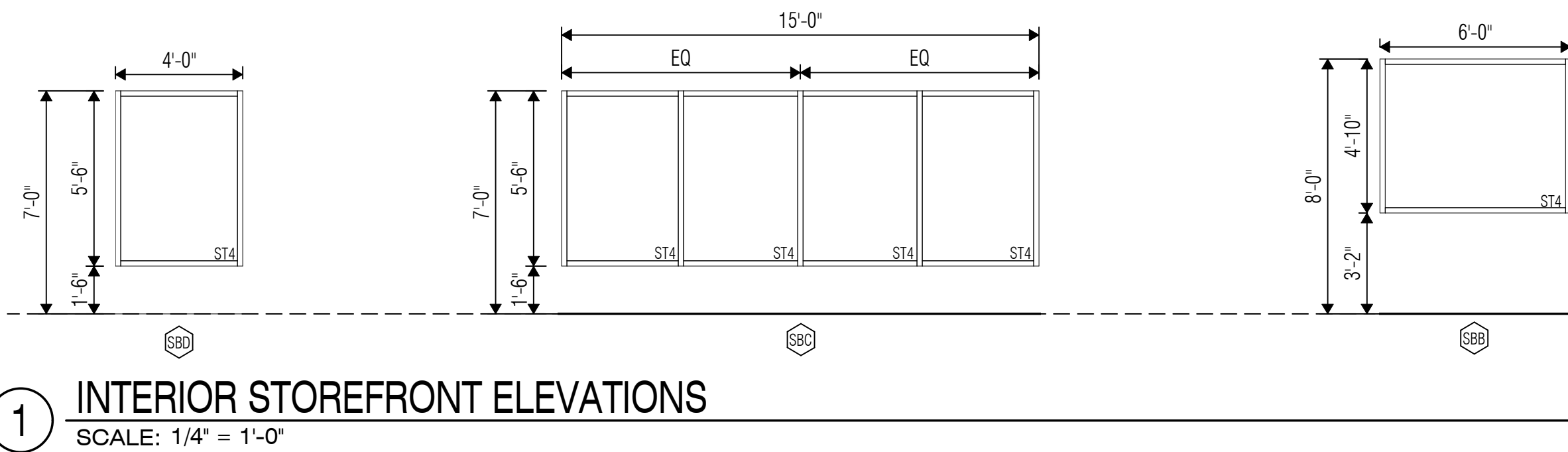
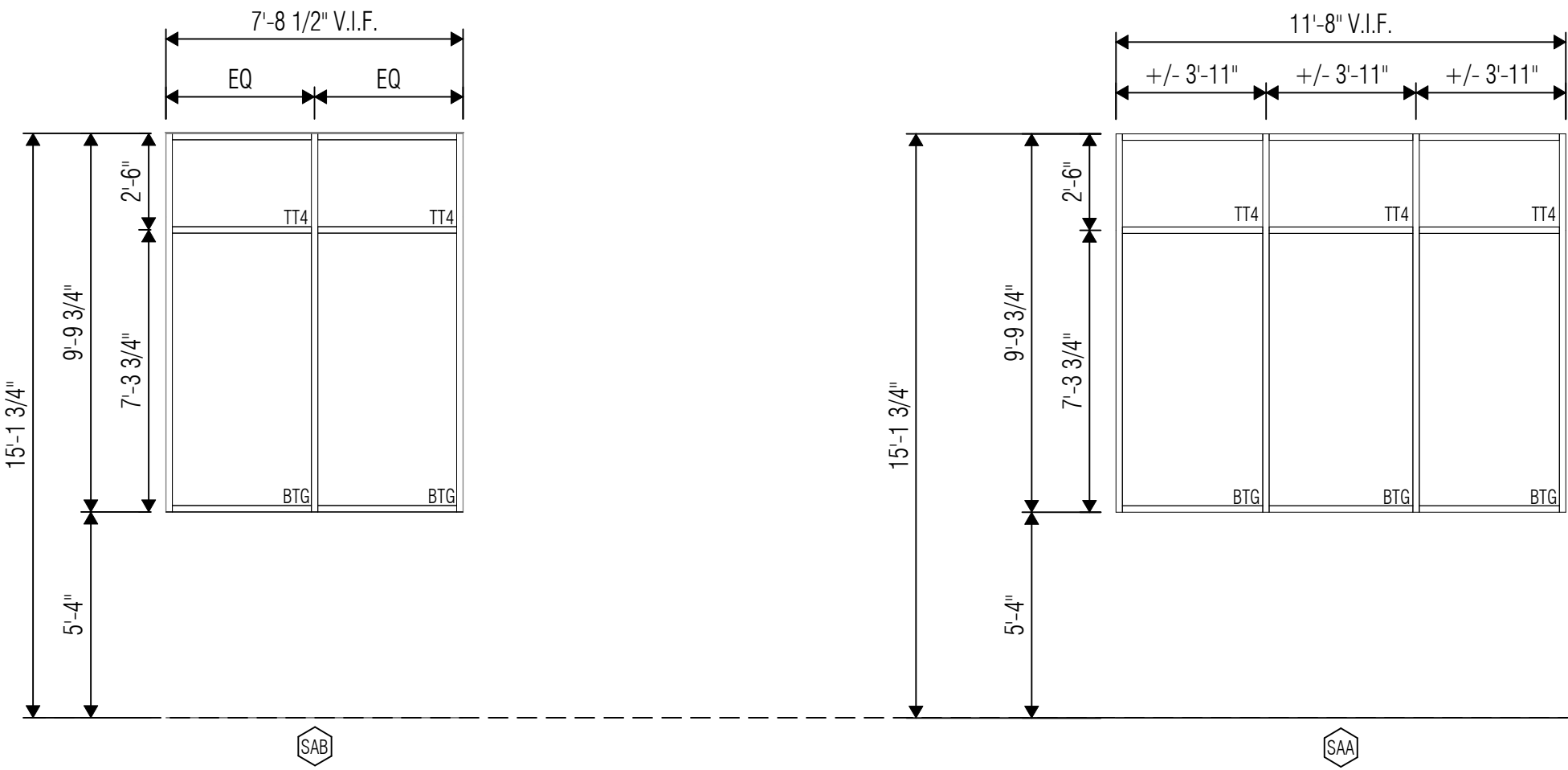
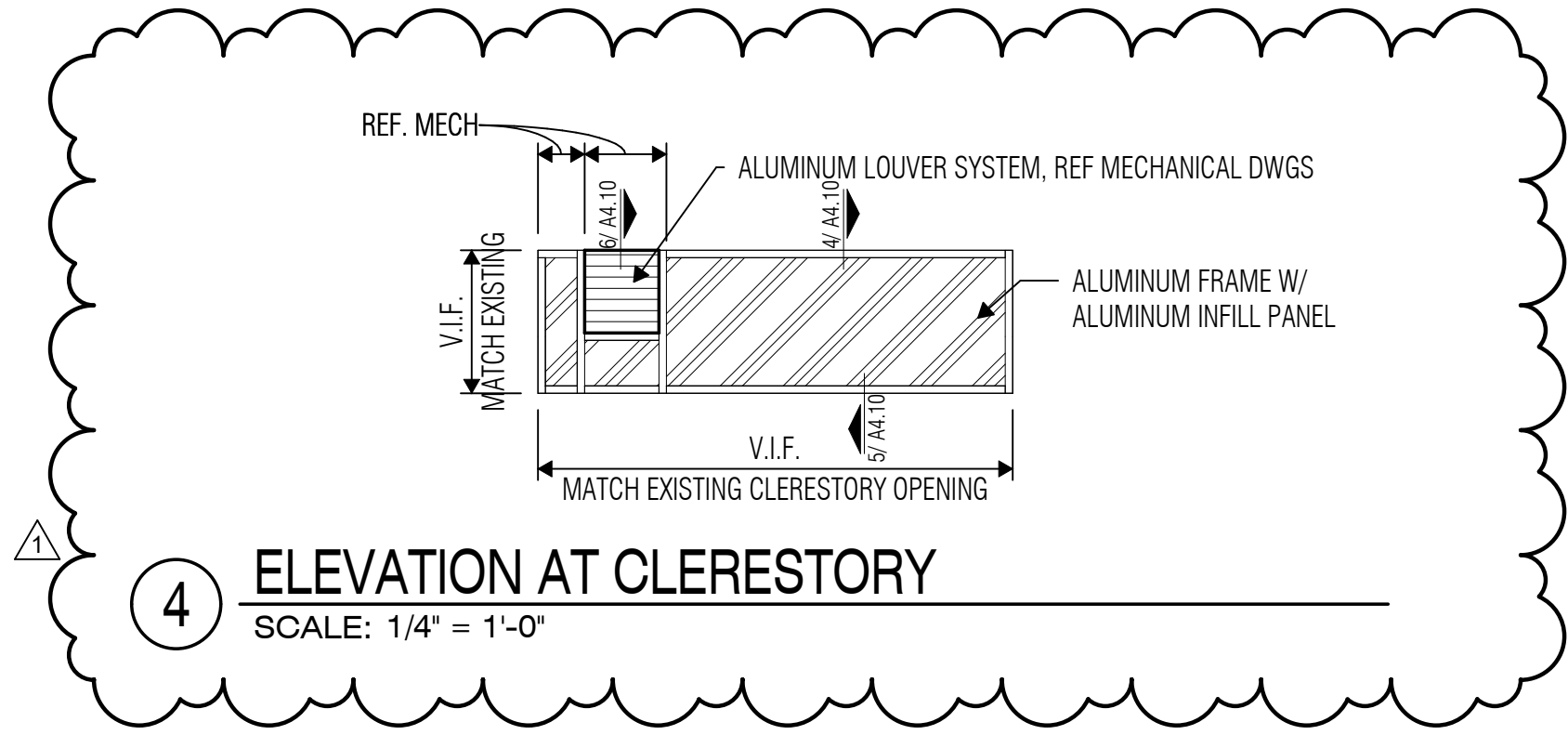
GLASS TYPE LEGEND

TT4 TINTED, LAMINATED, 1 5/16" THICK GLASS
CT4 CLEAR, TEMPERED LAMINATED GLASS, 1/4" THICK
BTG V.I.F. TO MATCH EXISTING STOREFRONT BLUE PANEL IN WEIGHT ROOM 143
ST4 CLEAR, TEMPERED SAFETY GLASS, 1/4" THICK

GLAZING SYSTEM LEGEND

STOREFRONT FRAMING WITH 3/16" THICK HEAVY WALL MATERIAL. TYPICAL AT ALL DOOR FRAME MEMBERS IN STOREFRONT GLAZING SYSTEMS.

CURTAIN WALL FRAMING WITH STEEL REINFORCING PROVIDED BY MANUFACTURER.



04/08/2022

ISSUED: 03/24/2022

REVISIONS

Revision No.	Revision Date
1	ADDENDUM NO.2 04/08/2022

Director
MEF
Designer
KT
Proj. Arch.
MG

Drawn By
KT, AG, AC
Quality Control
KT

PROJECT NO.

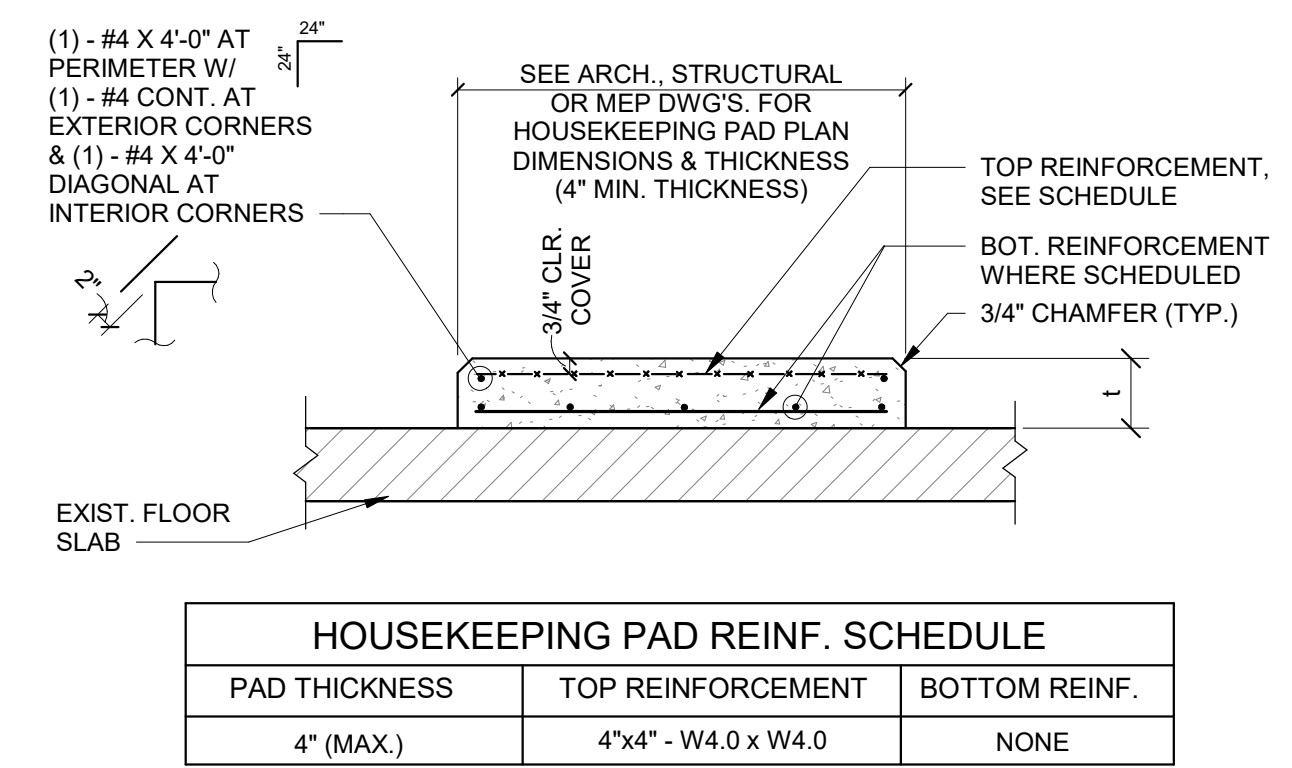
21-136.01

SHEET TITLE

GLAZING ASSEMBLY
ELEVATIONS

SHEET NO.

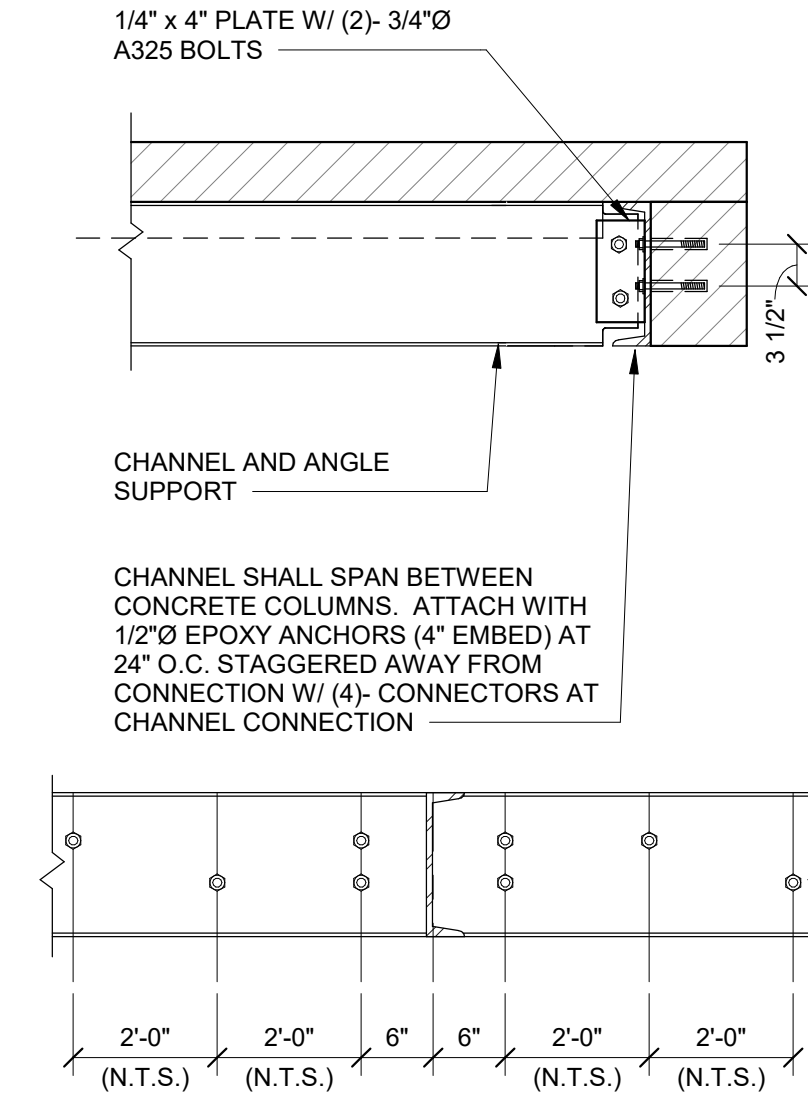
A7.21



NOTE:
1. GENERAL CONTRACTOR TO DETERMINE REQUIREMENTS FOR HOUSEKEEPING PADS OVER STRUCTURAL SLAB AND PROVIDE WHERE REQUIRED WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT. COORDINATE DIMENSIONS AND OTHER SPECIAL REQUIREMENTS WITH EQUIPMENT MANUFACTURERS AS REQUIRED.
2. PAD SHALL NOT BE POURED UNTIL AFTER SLAB HAS BEEN REINFORCED AS SHOWN IN DETAILS.
3. CONCRETE FOR HOUSEKEEPING PAD SHALL BE LIGHTWEIGHT CONCRETE W/ $F_c = 3,000$ PSI.

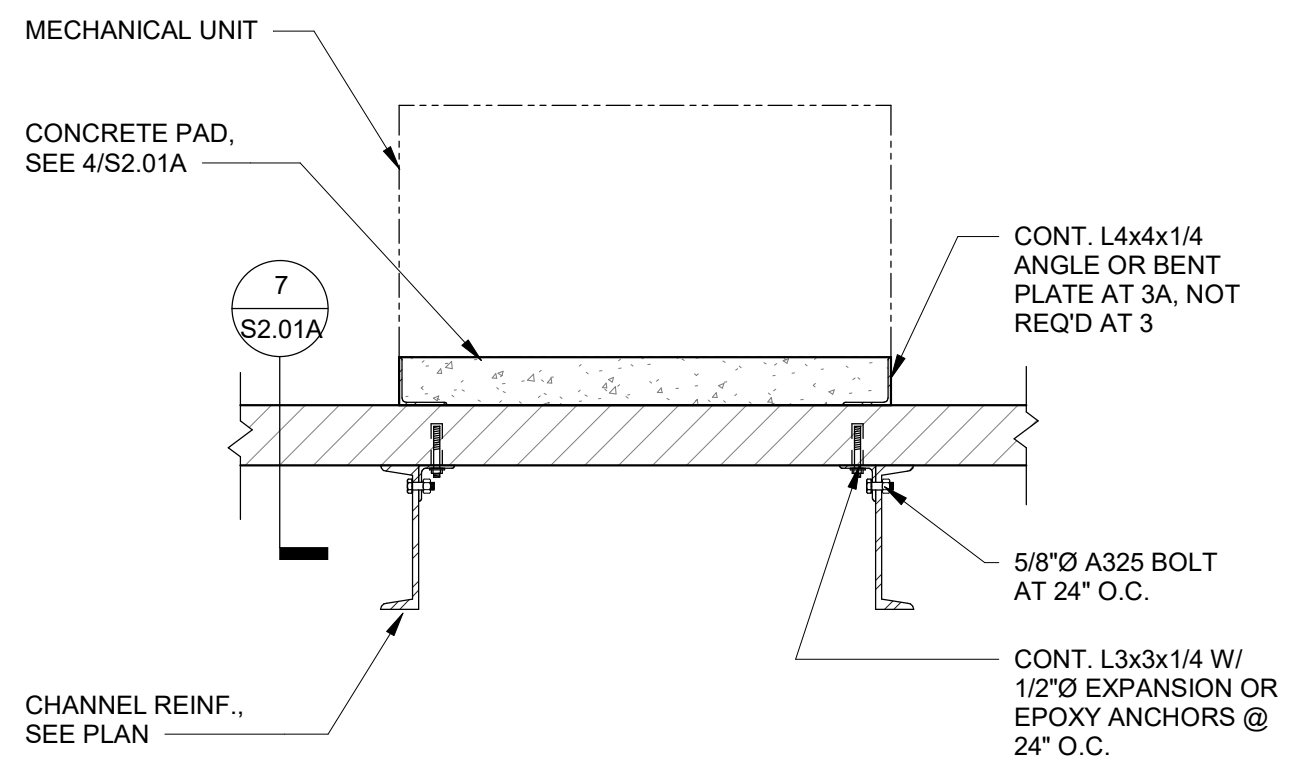
TYPICAL DETAIL
CONCRETE ISLAND OR HOUSEKEEPING PAD
ON ELEVATED FLOOR (ALTERNATE)

4 SCALE: N.T.S.



MECHANICAL UNIT SUPPORT
AT EXISTING BEAM (ALTERNATE)

7 SCALE: 3/4" = 1'-0"

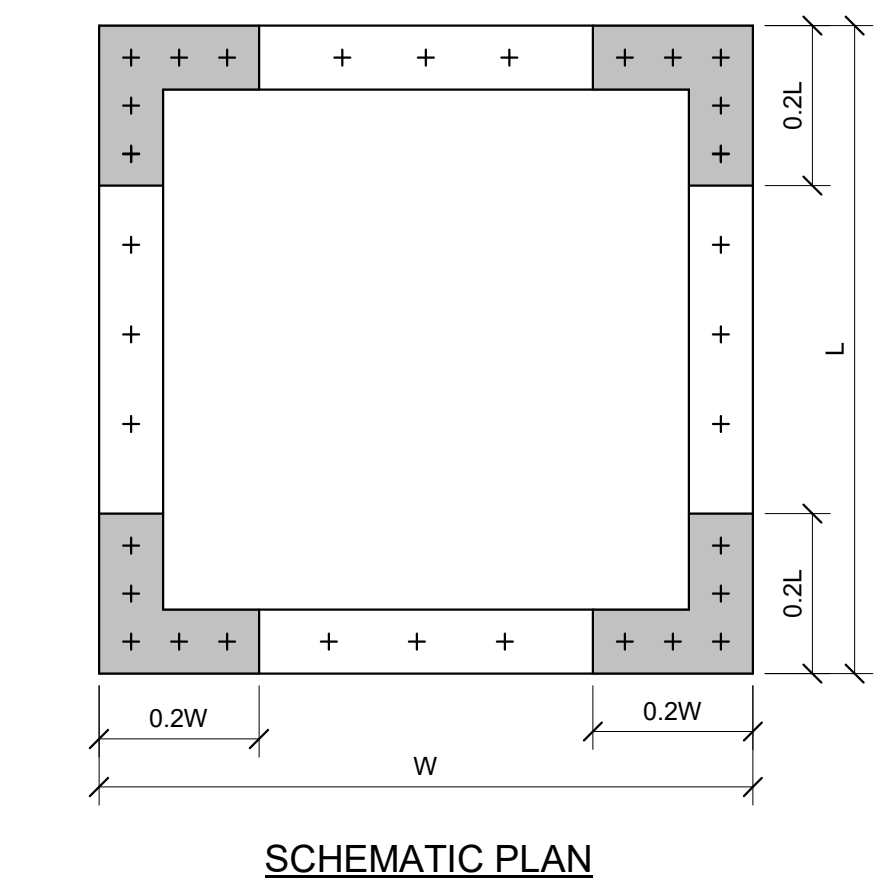


MECHANICAL UNIT SUPPORT
AT EXISTING SLAB (ALTERNATE)

3A 3 SCALE: 3/4" = 1'-0"

FASTENER SCHEDULE			
TYPE	MINIMUM FASTENER SIZE	TYPICAL SPACINGS	CORNER
1	3/8" Ø THRU-BOLT	36" O.C.	18" O.C.
2	#10 SCREW*	12" O.C.	4" O.C.
3	#10 SCREW*	12" O.C.	4" O.C.

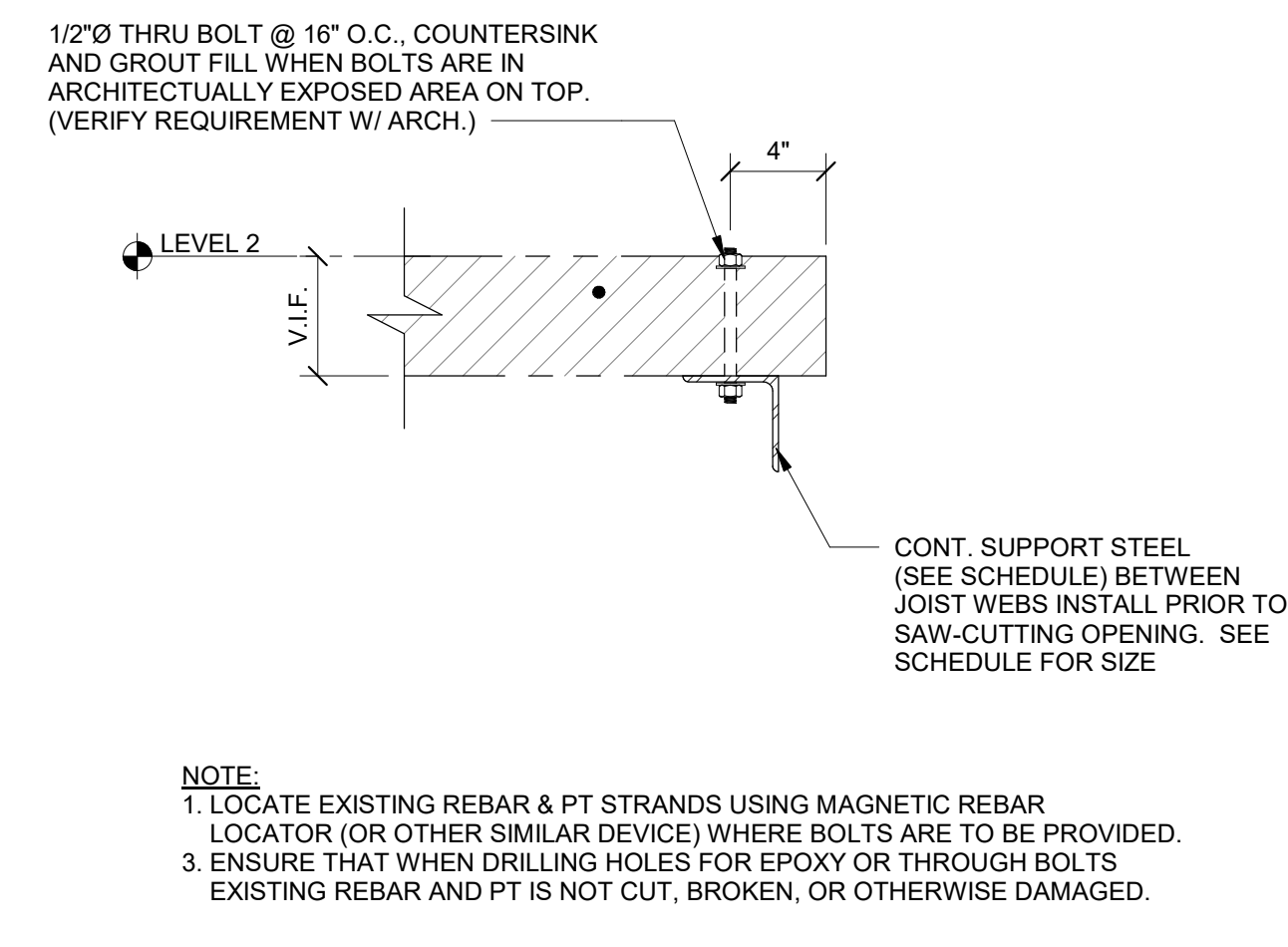
*SCREW SHALL EMBED 1" MIN. INTO WOOD BLOCKING



NOTES:
1. FASTENING SCHEDULE SHALL ONLY APPLY UNDER THE FOLLOWINGS CONDITIONS:
a. MEAN ROOF HEIGHT IS $\leq 145'$ -0"
b. MECHANICAL EQUIPMENT IS LESS THAN 6'-0" TALL
c. MECHANICAL UNIT HEIGHT TO WIDTH RATIO IS ≤ 1.5
d. WIND SPEED IS LESS THAN OR EQUAL TO 140mph (V_{ult}) OR 110mph (V_{des}). SEE GEN. NOTES FOR DESIGN WIND SPEED.
2. REFER TO MEP/MFR. FOR W & L DIMENSIONS.

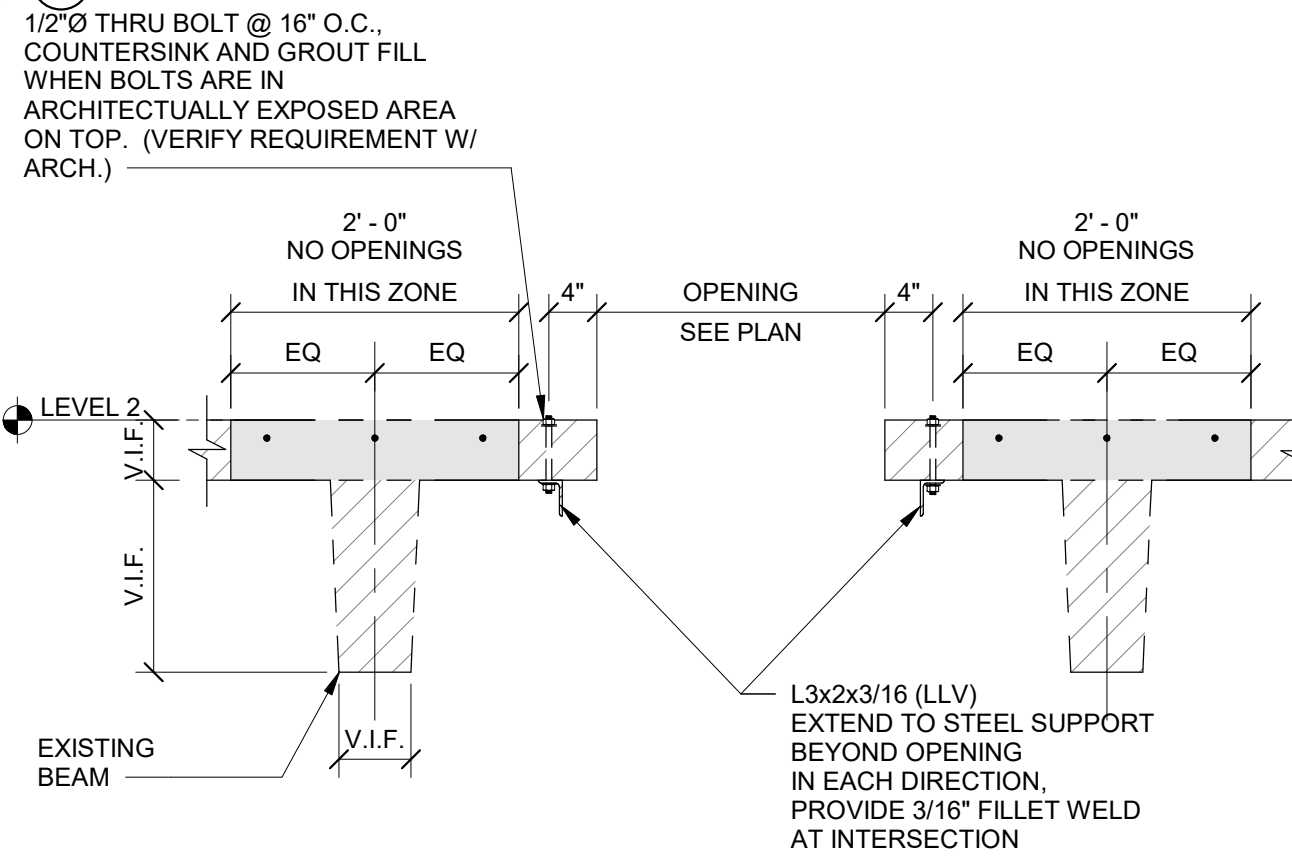
TYP. DET. FASTENER SCHED. AT
MECHANICAL UNITS

11 SCALE: 1/2" = 1'-0"



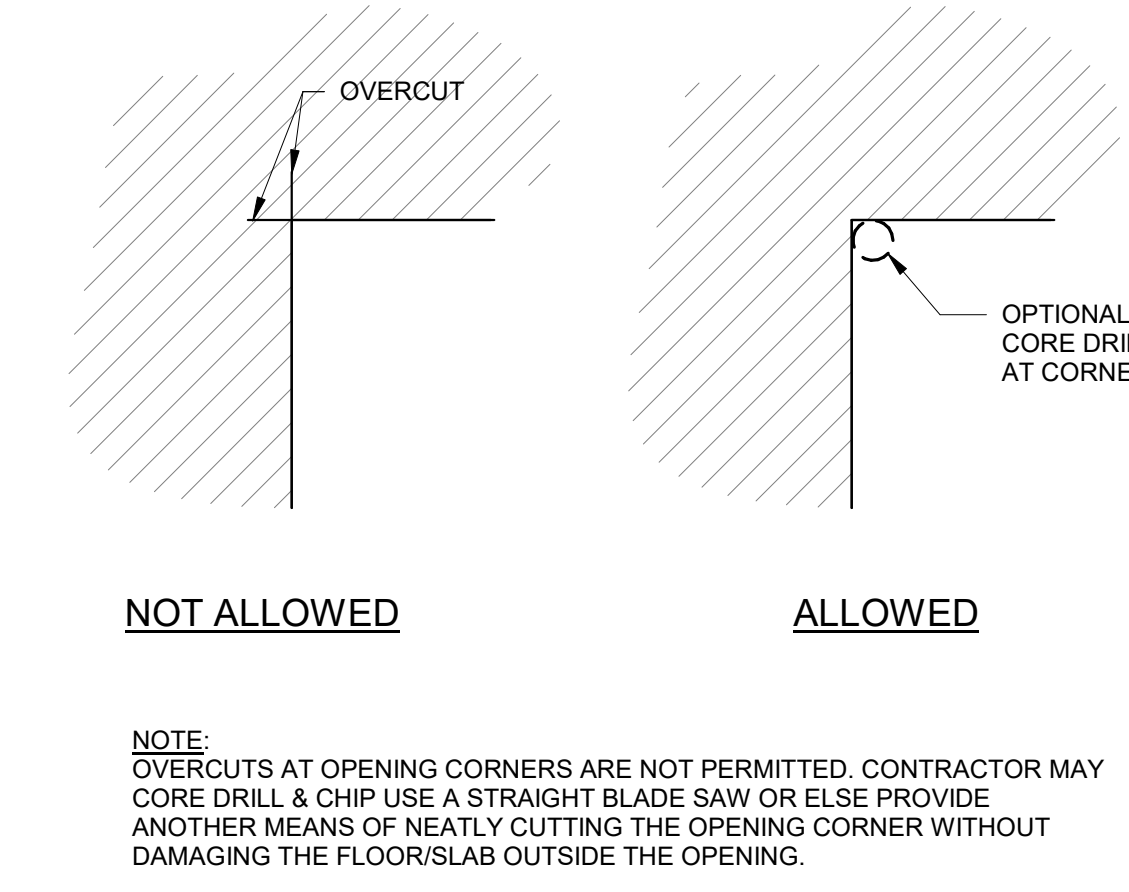
STEEL AT OPENING

15 SCALE: 1 1/2" = 1'-0"



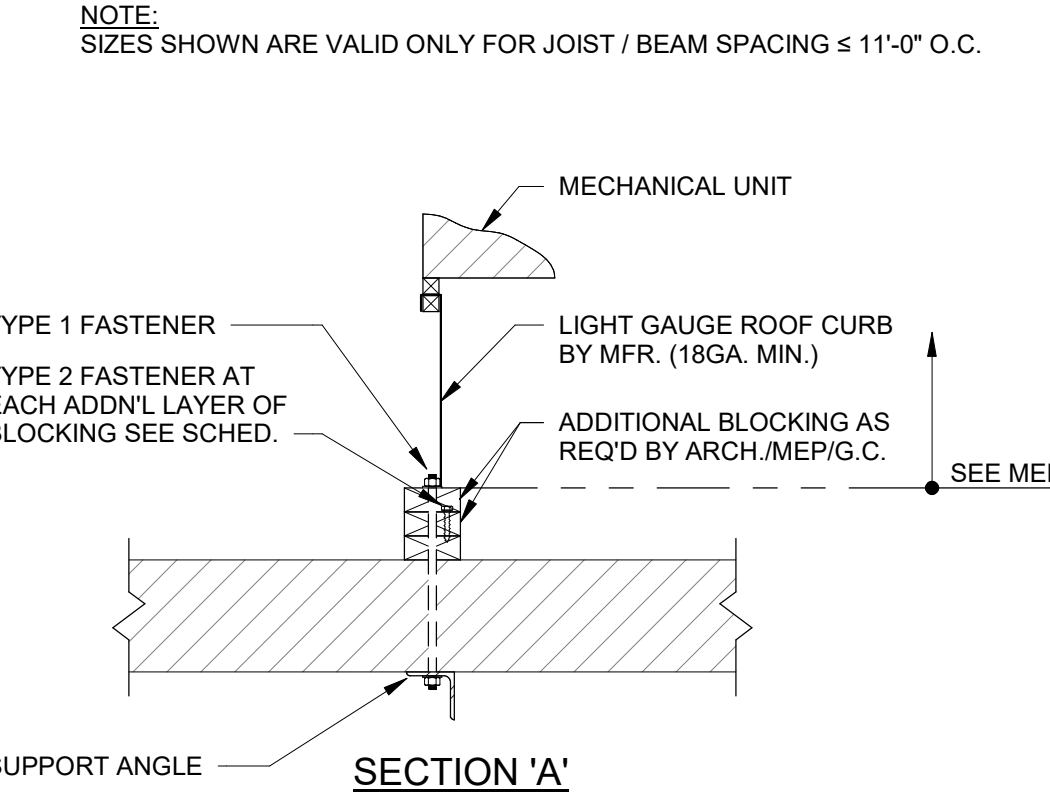
STEEL AT OPENING

14 SCALE: 3/4" = 1'-0"



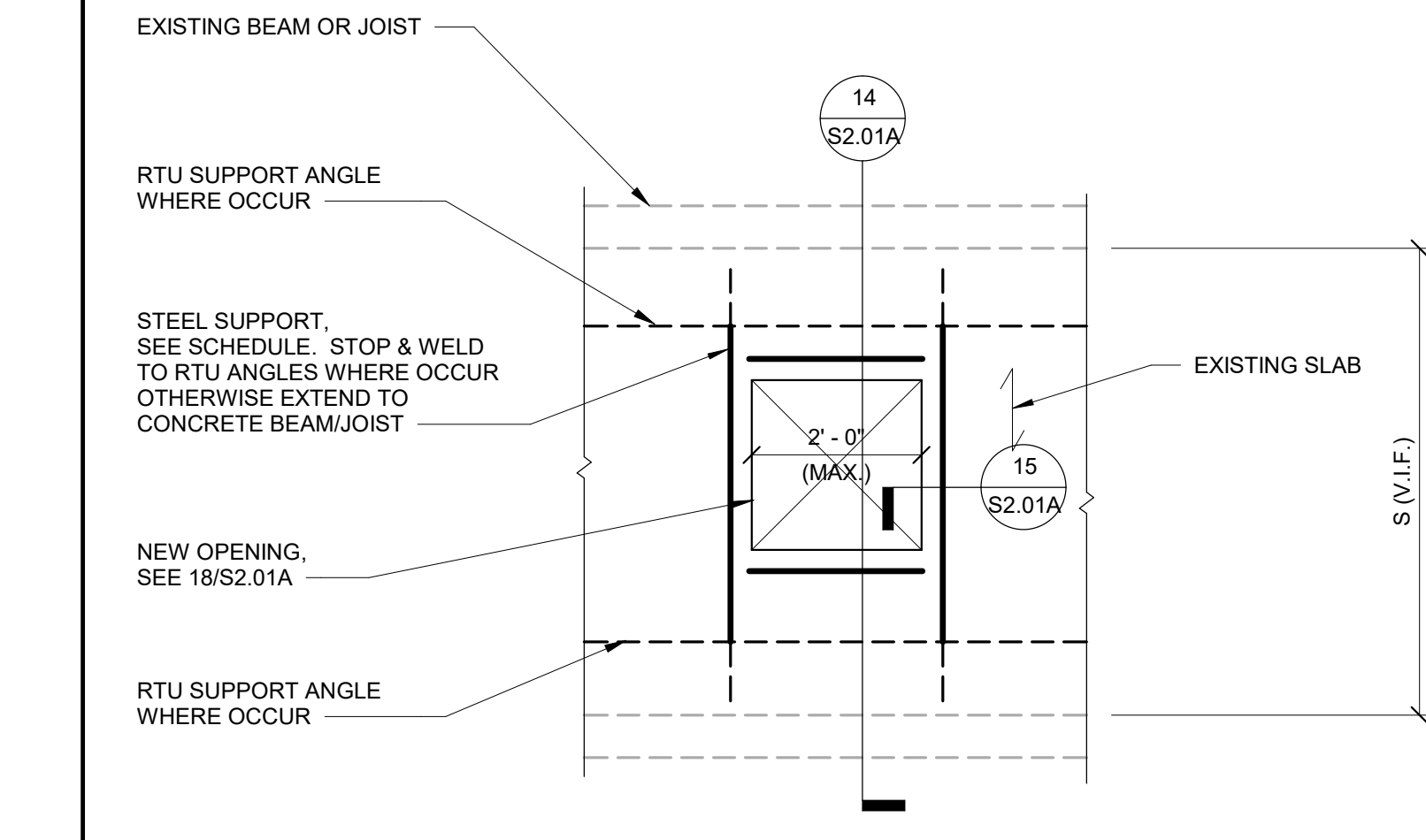
TYPICAL DETAIL
SAW CUT OPENING AT EXISTING SLAB

18 SCALE: 1" = 1'-0"



TYPICAL DETAIL ROOF CURB
AT MECHANICAL UNITS

9 SCALE: N.T.S.



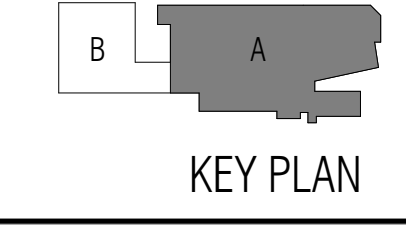
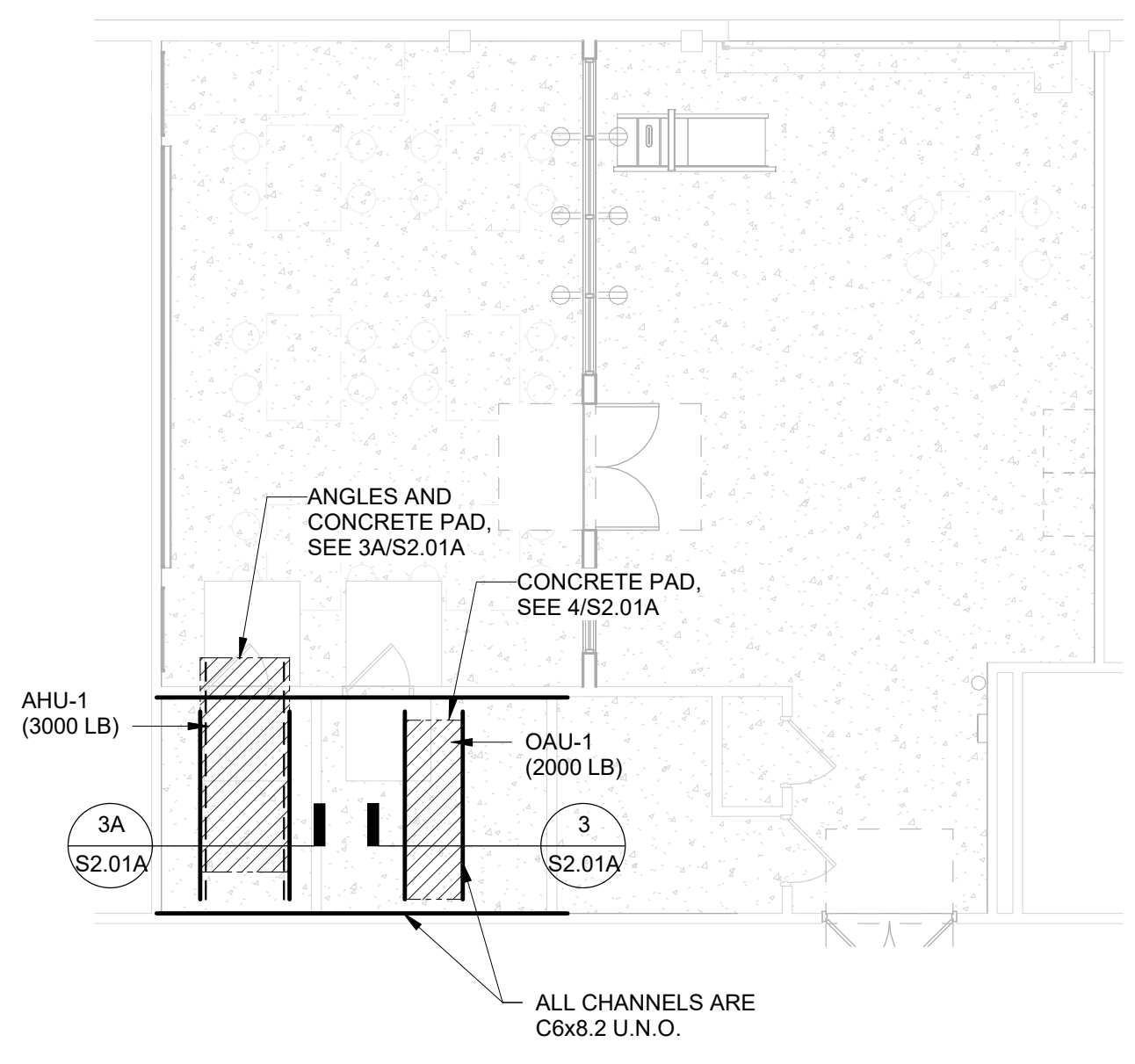
TYPICAL DETAIL NEW
OPENING IN EXISTING CONCRETE SLAB

17 SCALE: 1/2" = 1'-0"

SUPPORT SCHEDULE	
SPAN	MEMBER SIZE
<6'-0"	L3x3x1/4
6'-0"	L4x4x1/4
12'-0"	L4x4x3/8
16'-0"	L5x5x7/16

ENLARGED PLAN (ALTERNATE)

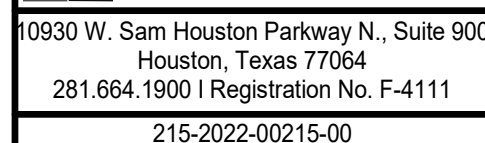
1 SCALE: 1/8" = 1'-0"





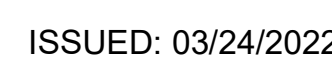
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CENTRAL MIDDLE SCHOOL RENOVATIONS

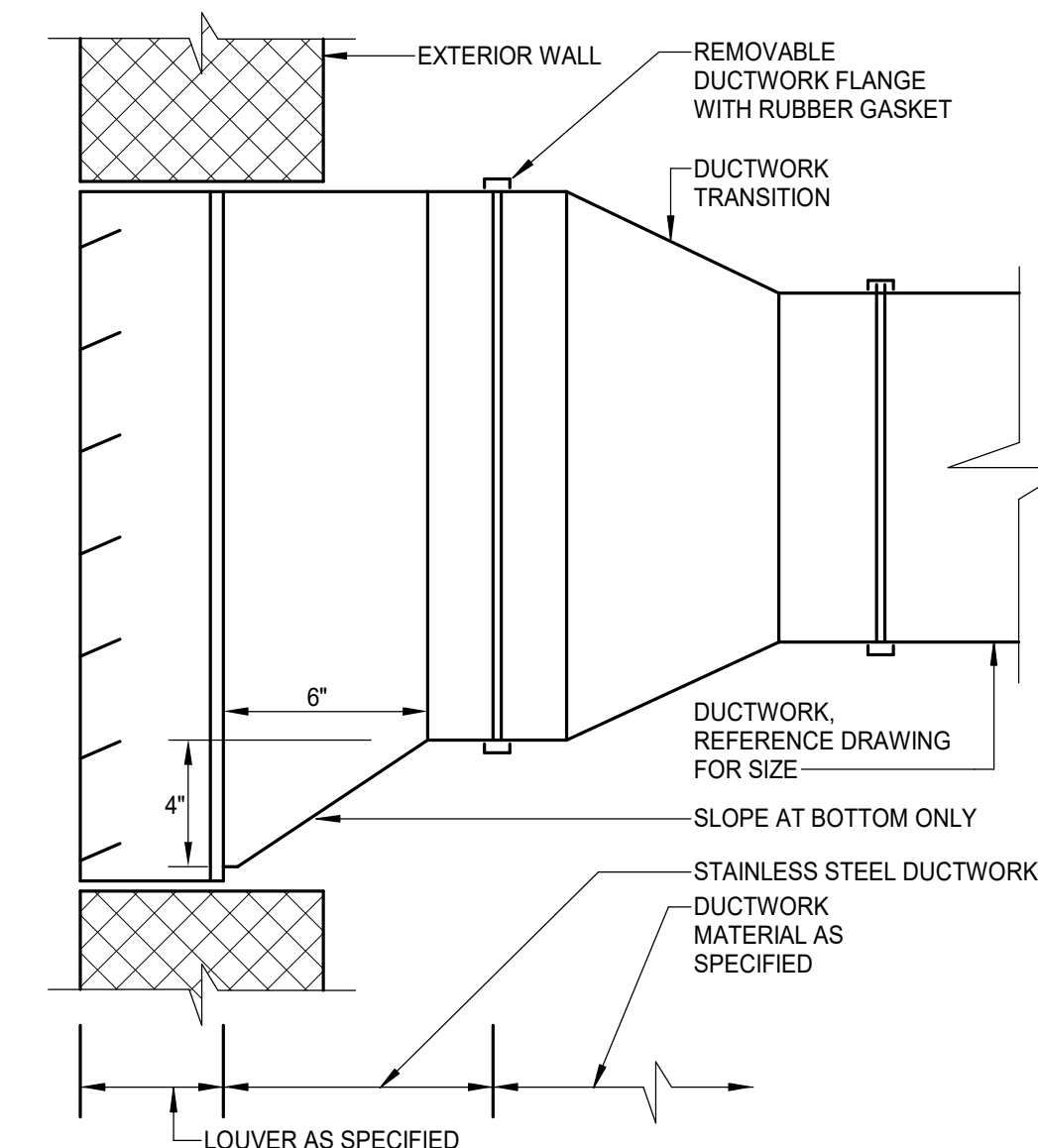


Revision No.	Revision Date
ADDENDUM 2	04-08-2

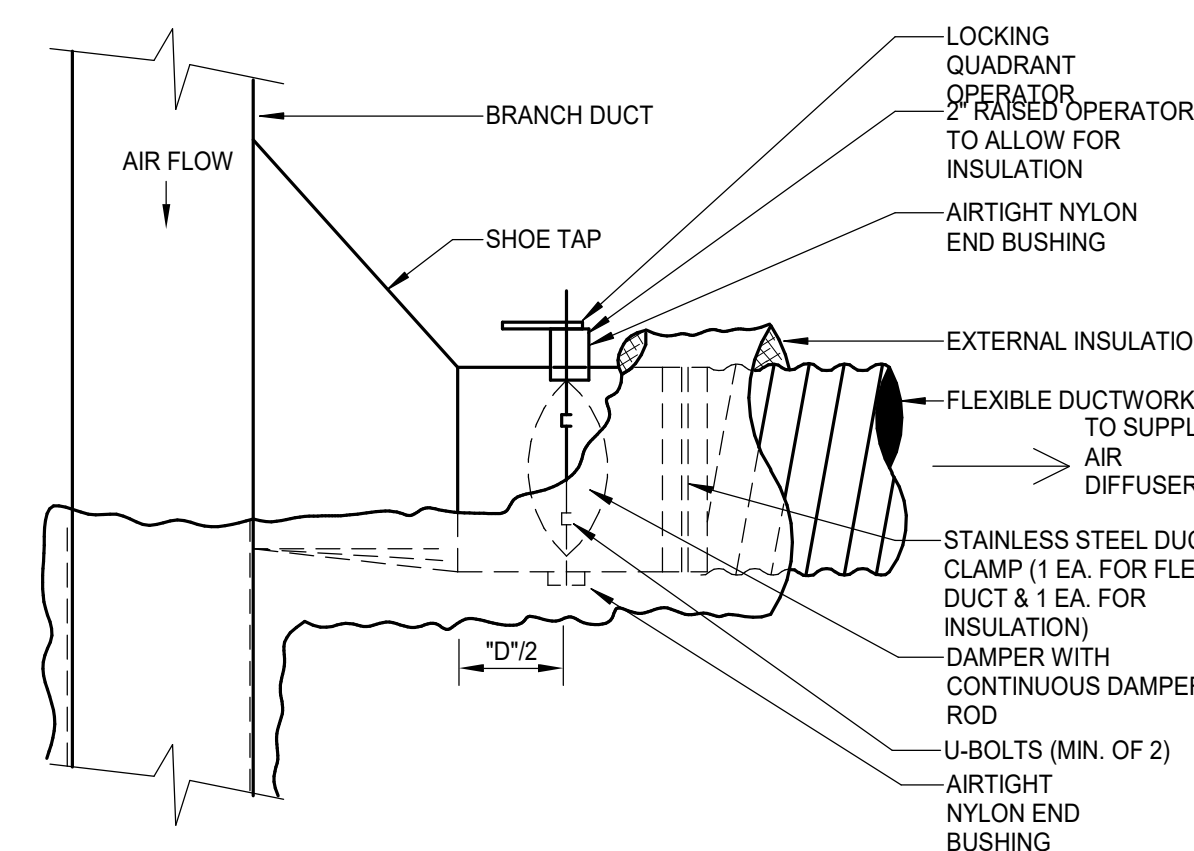
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M4.01

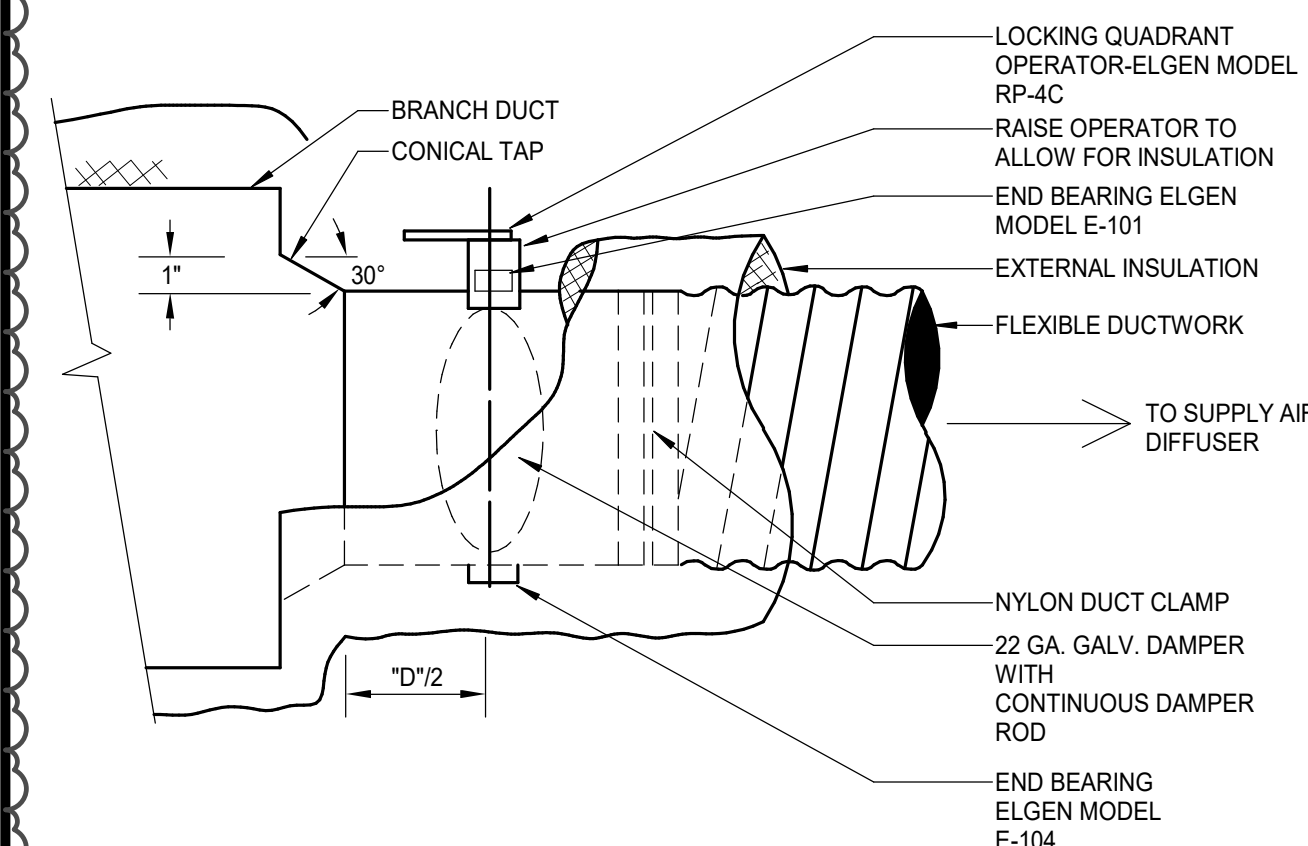
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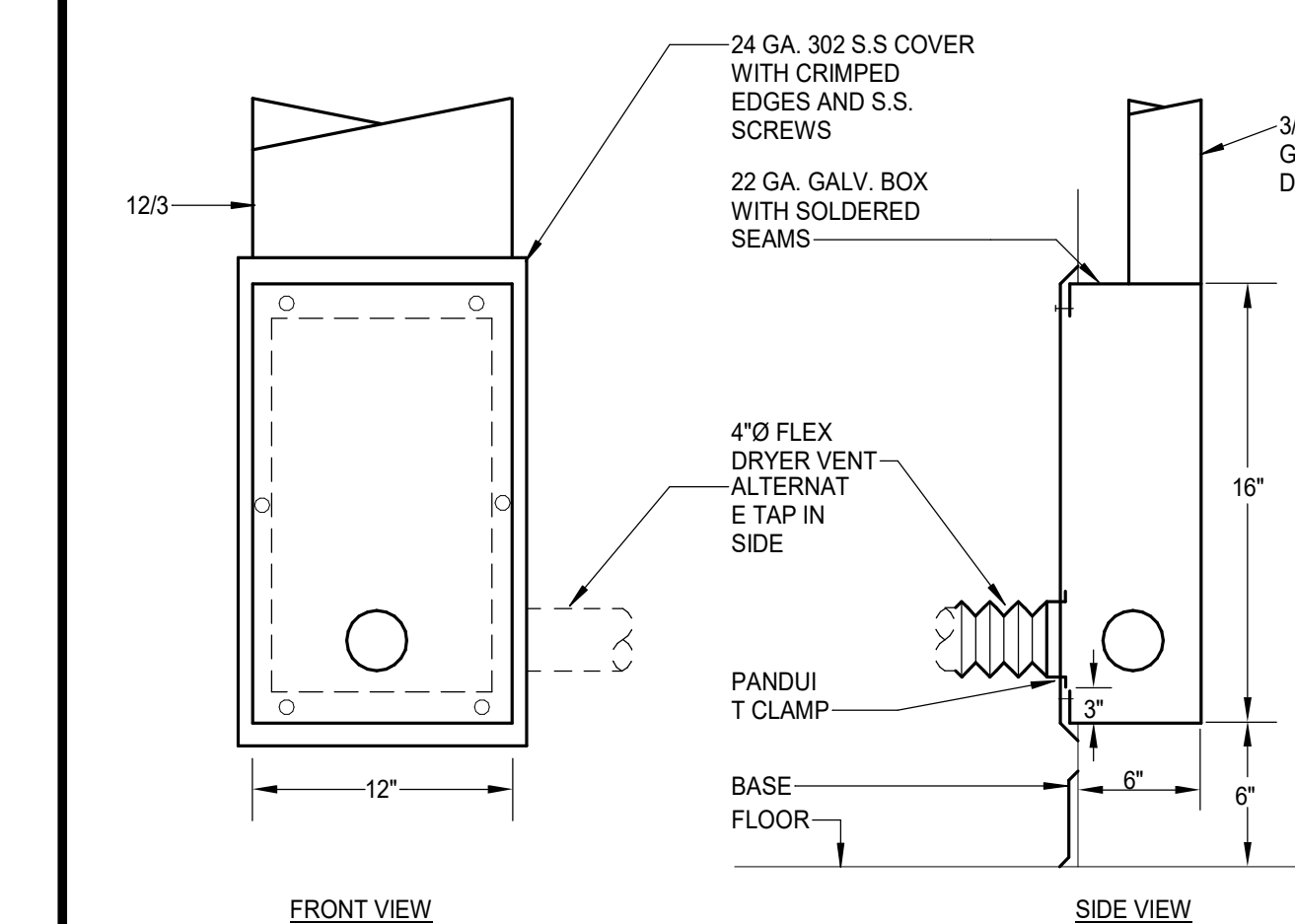
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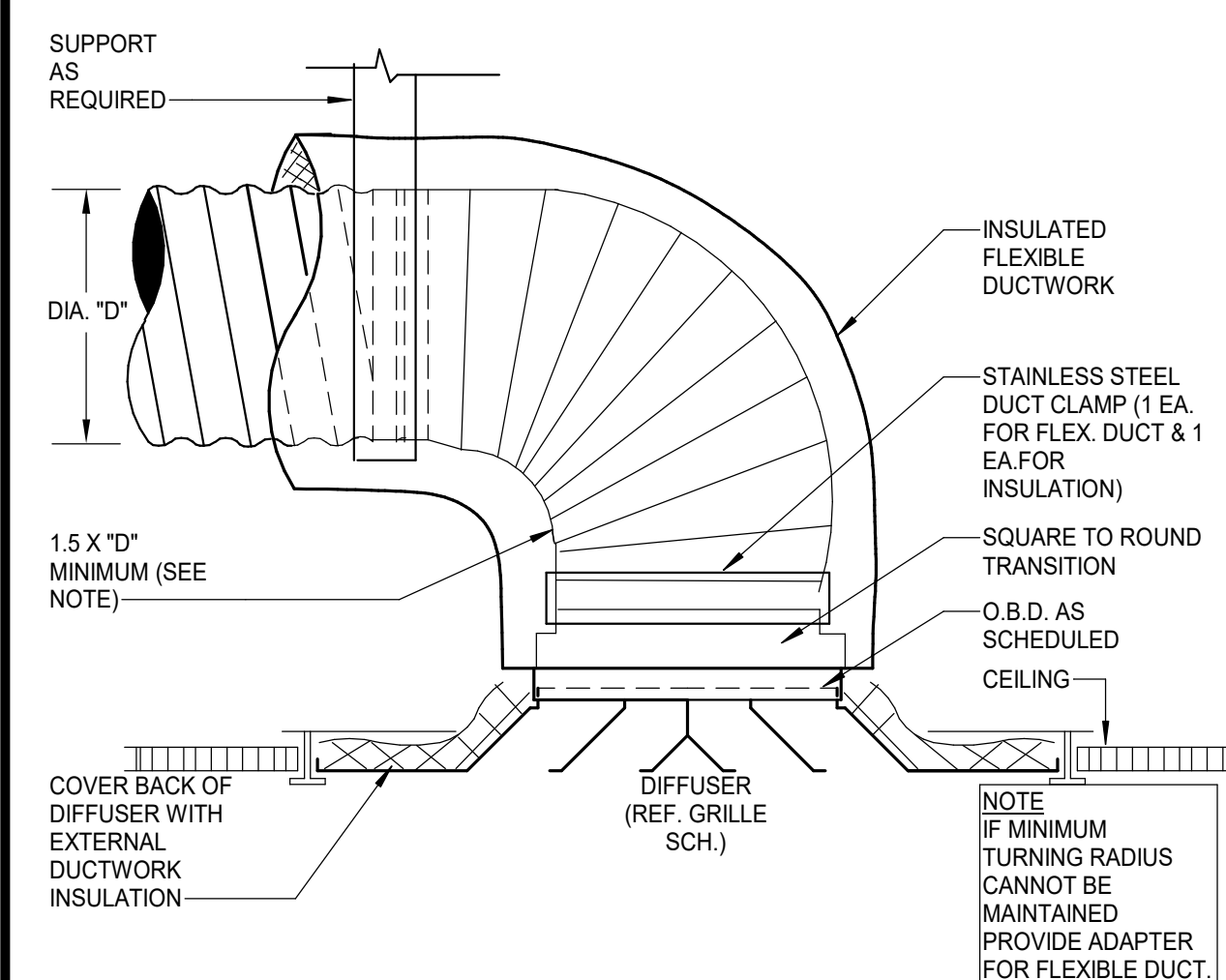
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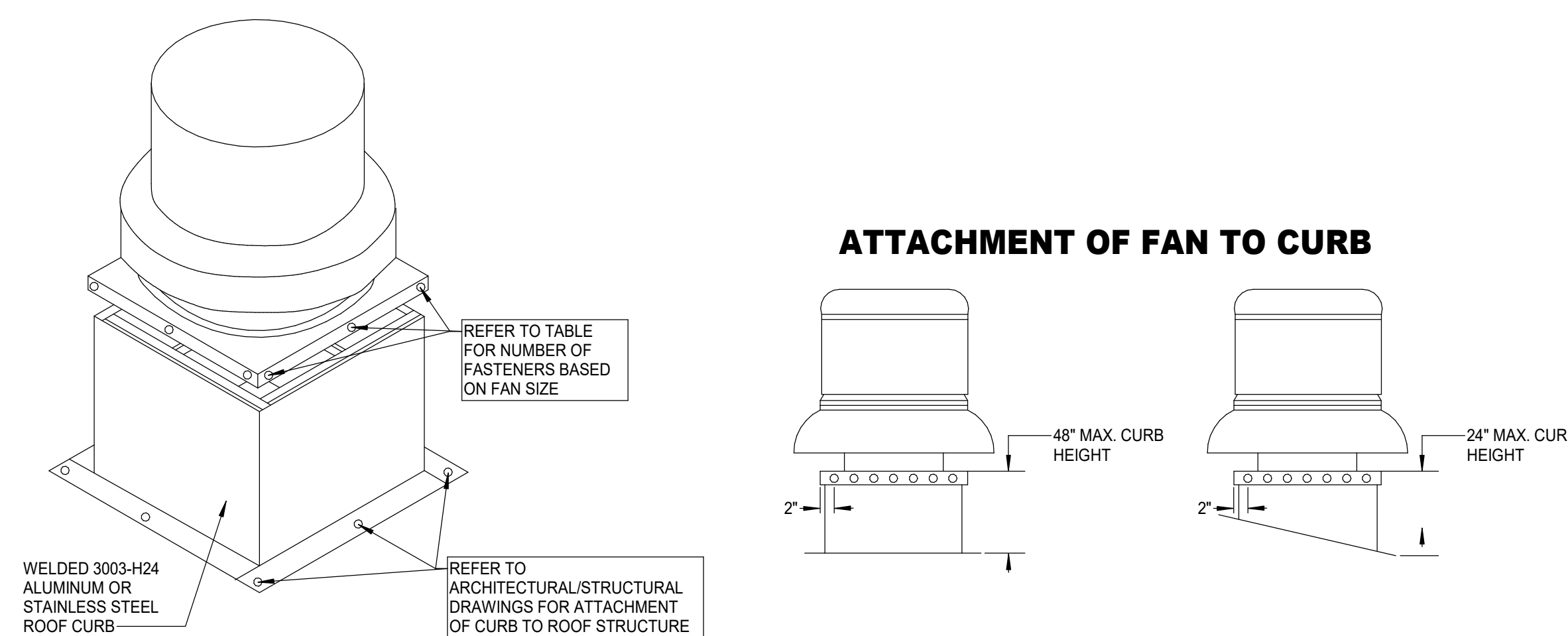
2 SCALE: NONE



5 ONLY)
SCALE: NONI



1 AT SU
SCALE: NONE



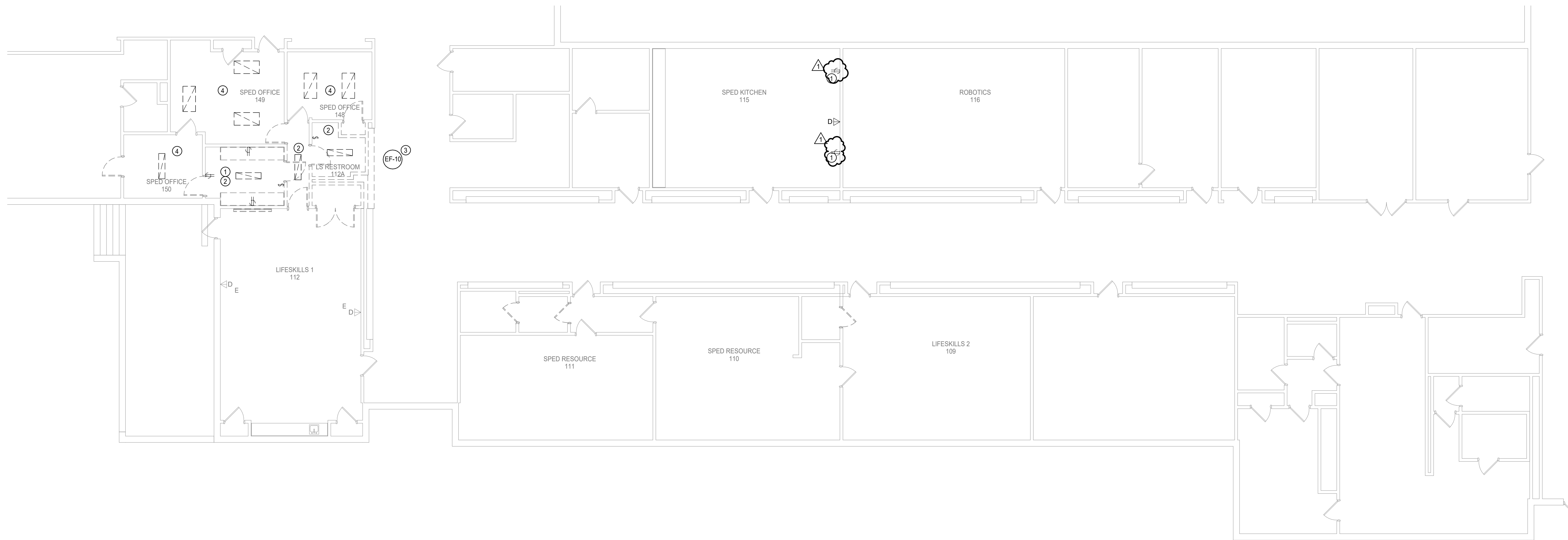
UNIT SIZE	MINIMUM NUMBER OF FASTENERS PER SIDE TO ATTACH UNIT TO CURB
60	5
70	5
80	5
90	5
100	5
120	5
135	5
150	6
165	6
180	8
195	8
210	8
225	8
245	8
270	9
300	9

GENERAL NOTES:
PROVIDE SEALANT AT ALL SCREW
PENETRATIONS.

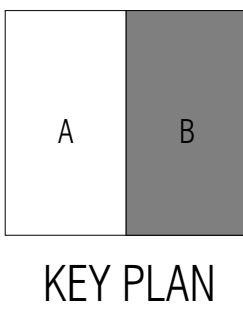
NOTES

7. ALL POWER VENTILATORS AS REQUIRED TO HEREIN REFERS TO ALL LOREN COOK MODEL: ACE POWER VENTILATORS INCLUDING BOTH DIRECT DRIVE AND BELT DRIVE UNITS WHICH ARE CONSTRUCTED WITH THE SAME OUTER HOUSING COMPOSED OF ALUMINUM OR STEEL.
8. THIS APPROVAL IS FOR THE STRUCTURAL CAPACITY OF THE EXTERIOR HOUSING ONLY, IT DOES NOT INCLUDE ANY INTERNAL MECHANISM OR ELECTRICAL PART.
9. THE CURB SHALL BE INSTALLED TO PREVENT WATER PENETRATION ACCORDING TO FLORIDA BUILDING CODE PTAS 100(A), WIND DRIVEN RAIN TEST. IT CANNOT BE INSTALLED WITH THE RIDGE AREA FR 1523.6.5.2.13.
10. THE CURB SHALL BE CONSTRUCTED OF 3003-H24 ALUMINUM OR STAINLESS STEEL. THE CURB MATERIAL THICKNESS SHALL BE 0.040 INCHES MINIMUM. THE WASHERS SHALL BE 1/2" DIA. 304 STAINLESS STEEL.
11. THE ACE POWER VENTILATOR SHALL BE ATTACHED TO THE CURB WITH ONE OF THE FOLLOWING METHODS INSTALLED ON ALL FOUR SIDES OF THE CURB CAP OR THROUGH THE USE OF THE ACCESSORY HINGED BASE. THE FASTENERS SHALL BE 1/2" DIA. 304 STAINLESS STEEL. THE DISTANCE BETWEEN FASTENERS SHALL BE 16" OR LESS. THE QUANTITY OF FASTENERS INTO EACH CURB SIDE SHALL EQUAL OR EXCEED THE QUANTITY SHOWN IN TABLE.
12. A #12 X 7/8" WASH WIDER HEAD SELF-DRILLING SCREW.
13. ALTERNATE FASTENER - 2"X 1/2" HEAD 1/4" WASH WIDER COMPANION NUT INSTALLED ON THE INTERIOR OF THE CURB.
14. ALL FASTENERS ARE TO BE STAINLESS STEEL.
15. AN AIR GASKET BETWEEN THE CURB AND CURB CAP SHALL BE SEAL W/ NEOPRENE GASKET AS SPECIFIED AND INSTALLED BY THE INSTALLING CONTRACTOR THAT ALLOWS THE FASTENERS TO BE INSTALLED WITHOUT CAUSING EXCESSIVE DISTORTION OF THE UNIT FLANGES.
16. THE INSTALLER IS RESPONSIBLE FOR CHECKING THAT ALL FASTENERS ARE PROPERLY INSTALLED AND ALL ACCESS PANELS ARE IN PLACE BEFORE PUTTING UNIT INTO SERVICE.
17. ALL FASTENERS AND ACCESS PANELS MUST BE PROPERLY INSTALLED AFTER MAINTENANCE OPERATIONS FOR UNIT TO BE RE-INSTALLED.

SCALE: NONE



1 ELECTRICAL/TECHNOLOGY DEMOLITION 1ST FLOOR PLAN - SPED WING
Scale: 1/8" = 1'-0"



DEMOLITION / EXISTING DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION, AND WHEN AVAILABLE, EXISTING RECORD DOCUMENTS. REPORT DISCREPANCIES TO ARCHITECT BEFORE DISTURBING EXISTING INSTALLATION, AND IMMEDIATELY AFTER SUCH DISCREPANCIES ARE DISCOVERED. CONTRACTOR TO VERIFY EXISTING CONDITIONS ON FIELD AND NOTIFY ENGINEER IF THERE ARE ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND DRAWINGS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL REMOVE SUCH EXISTING WORK AS CALLED FOR ON THE DRAWINGS OR AS REQUIRED TO CLEAR THE AREAS OF NEW CONSTRUCTION.

WHERE ANY NEW WALL TERMINATES AT THE SAME LOCATION AS AN EXISTING WALL MOUNTED ELECTRICAL AND TECHNOLOGY DEVICE, CONTRACTOR SHALL RELOCATE DEVICE AND EXTEND WIRING AND CONDUIT AS INSTRUCTED

ELECTRICL KEYED NOTES

- ① DISCONNECT AND REMOVE EXISTING WIRING DEVICE(S) INDICATED TO BE REMOVED. REMOVE ASSOCIATED CONDUIT, AND WIRE BACK TO NEAREST JUNCTION FOR RE-USE. PATCH WALL TO MATCH EXISTING.
- ② DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE AND STORE FOR RELOCATION. REMOVE ASSOCIATED CONDUIT/WIRE BACK TO NEAREST JUNCTION BOX FOR REUSE.
- ③ DISCONNECT EXISTING BEXHAUST FAN FOR RELOCATION. REMOVE ASSOCIATED CONDUITS AND WIRE BACK TO NEAREST JUNCTION BOX FOR REUSE.
- ④ HANG EXISTING LIGHT FIXTURES WITH CHAIN HANG KIT TO SUPPORT FROM STRUCTURE ABOVE TO FACILITATE DEMOLITION OF CEILING GRID. REFER TO ARCHITECTURAL PLANS FOR AREAS THAT THE CEILING IS BEING REPLACED. SUSPEND OR REMOVE AND STORE ALL CEILING MOUNTED ELECTRICAL DEVICES TO FACILITATE DEMOLITION OF CEILING GRID. DEVICES INCLUDE BUT ARE NOT LIMITED TO: EXIT SIGNS, FIRE ALARM DEVICES, SECURITY DEVICES, COMMUNICATION SPEAKERS, CAMERAS, AND OCCUPANCY SENSORS. REFER TO ARCHITECTURAL PLANS FOR AREAS THAT THE CEILING IS BEING REMOVED.

ELECTRICAL GENERAL NOTES:

1. DISCONNECT AND REMOVE ALL ABANDONED WIRING AND CONDUIT.
2. VERIFY ALL DEMOLITION WORK WITH ARCHITECT/OWNER PRIOR TO COMMENCEMENT OF WORK.
3. UNLESS NOTED OTHERWISE, ALL EXISTING ELECTRICAL SWITCHBOARDS, PANELBOARDS, TRANSFORMERS SHALL REMAIN.
4. UNLESS NOTED OTHERWISE, ALL EXISTING LIGHTING FIXTURES SHALL REMAIN.



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215-2022-00215-00



ISSUED: 03/24/2022

Revision No.	Revision Date
1 ADDENDUM 2	04-08-22

Director JZ
Design MA
Proj. Arch. MA

Drawn By MA
Quality Control MA

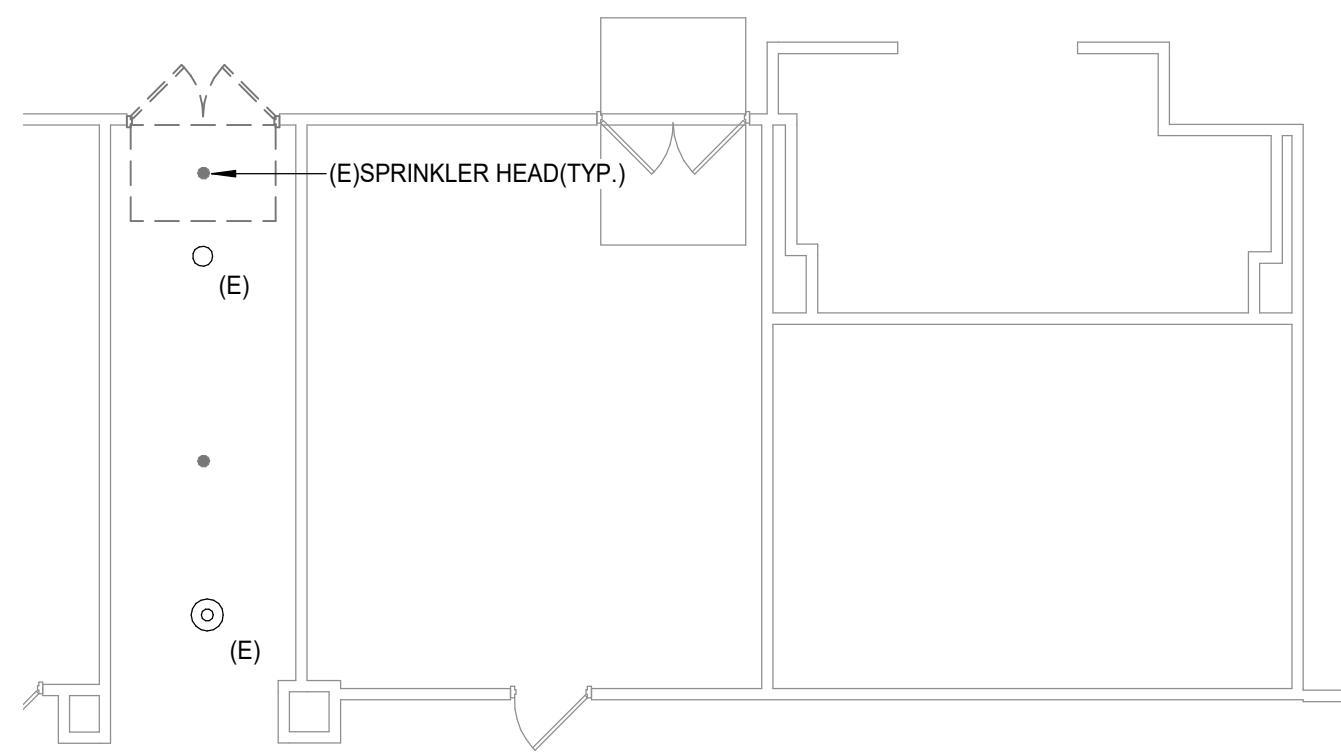
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ELECTRICAL/TECHNOLOGY
DEMOLITION FLOOR PLAN -
LEVEL ONE

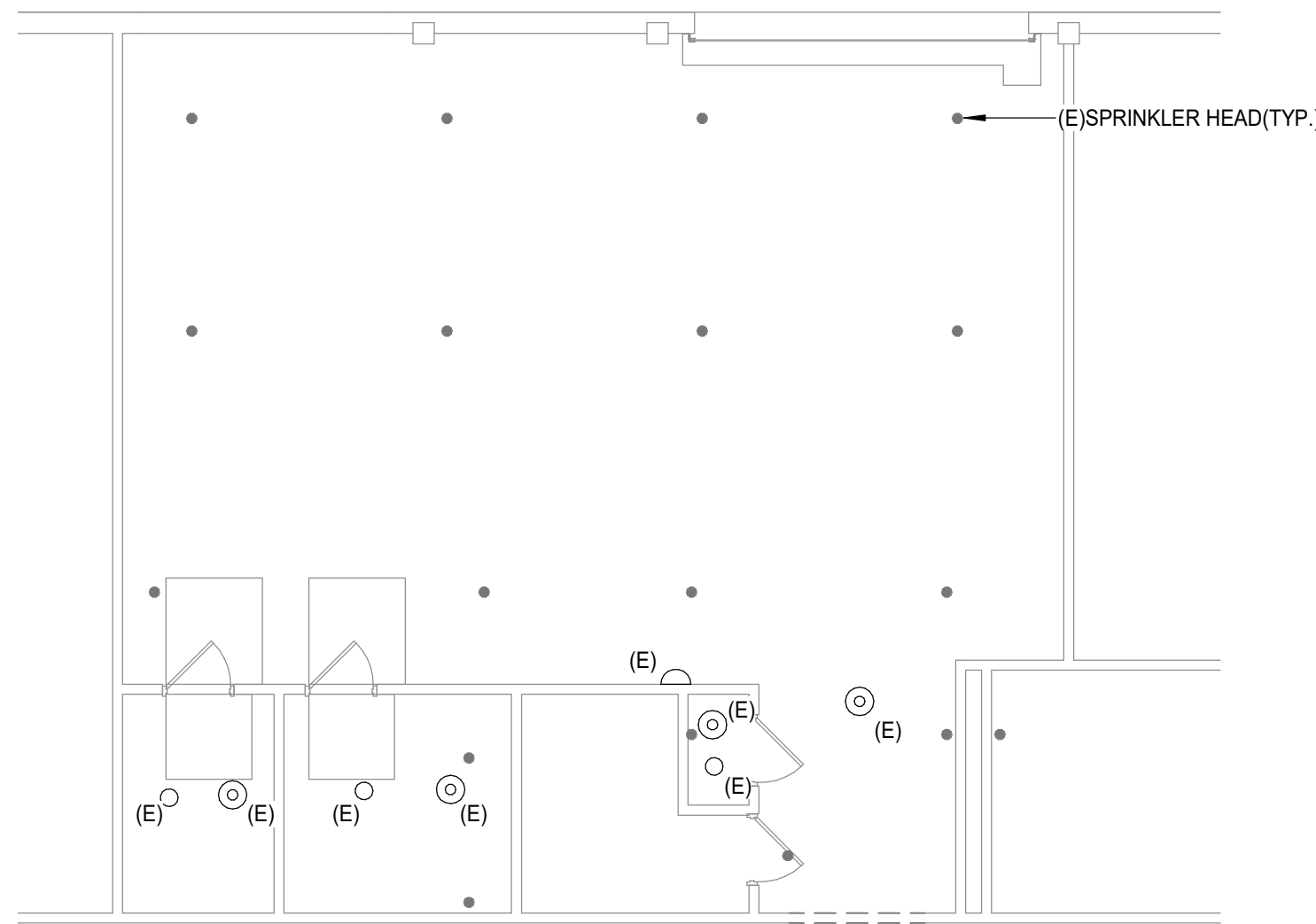
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CENTRAL MIDDLE SCHOOL RENOVATIONS

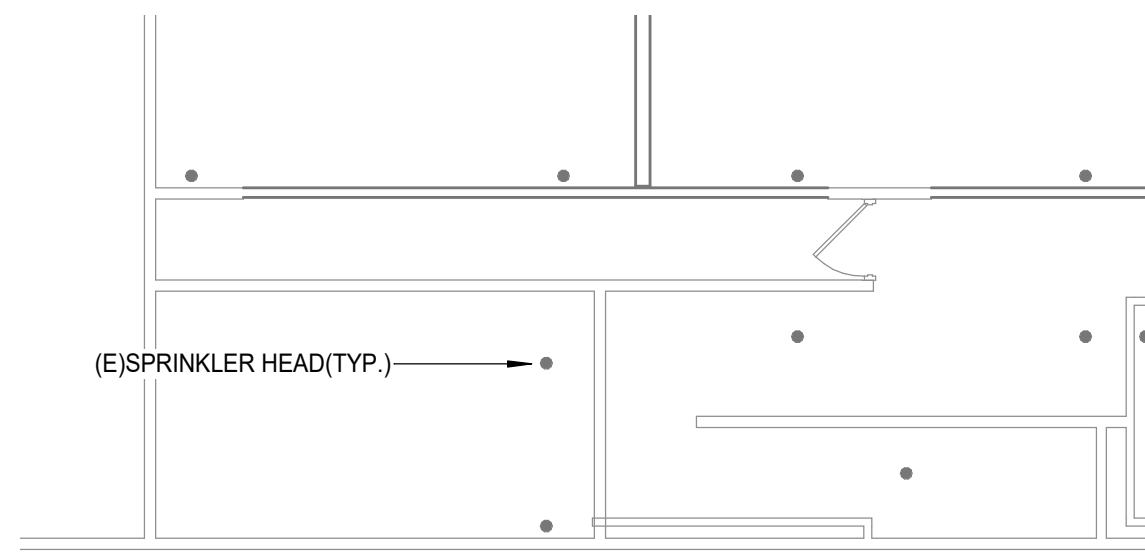
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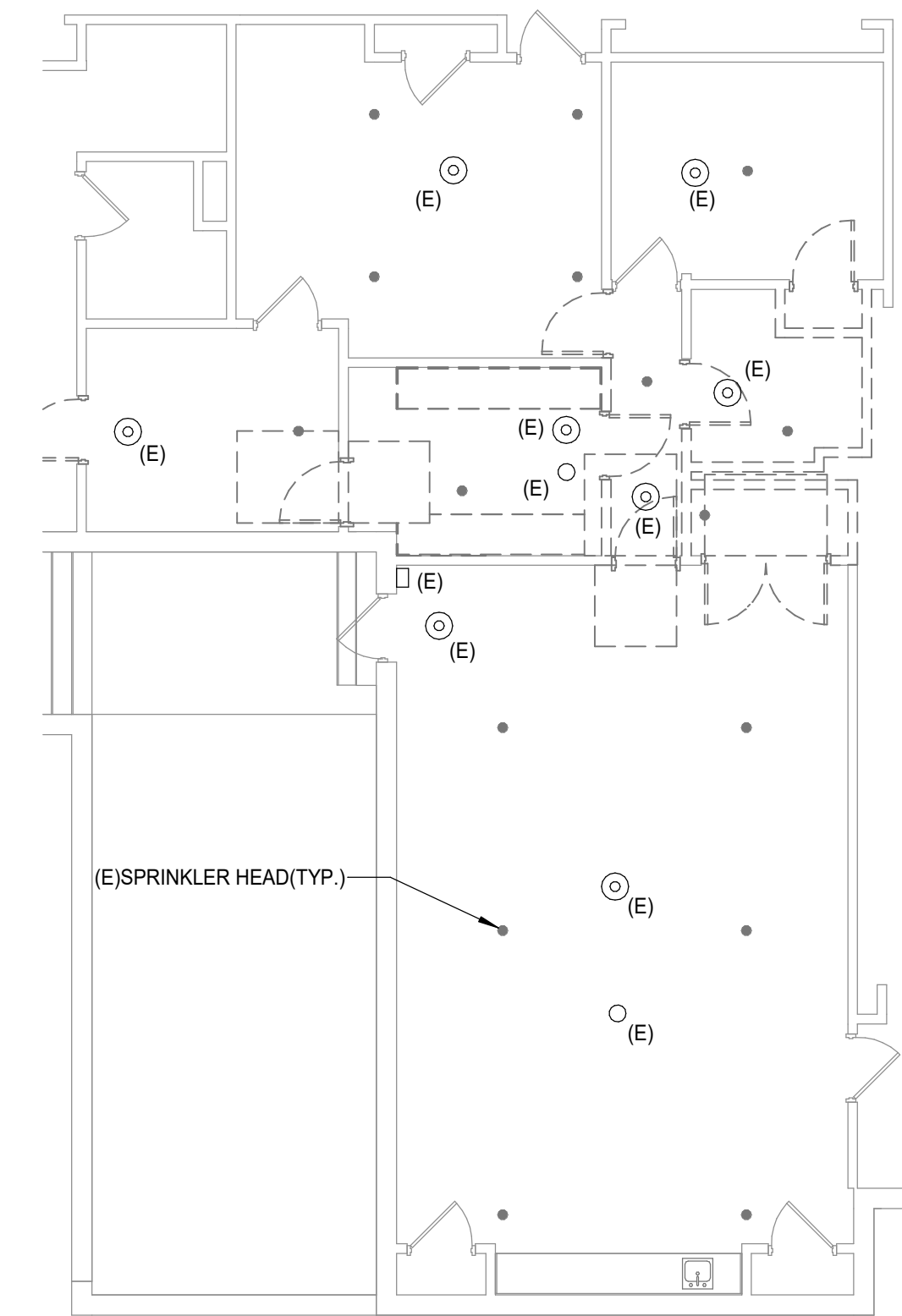
5 **PLUMBING EXISTING FIRE SPRINKLER PLAN - CAFETERIUM CORRIDOR**
Scale: 1/8" = 1'-0"



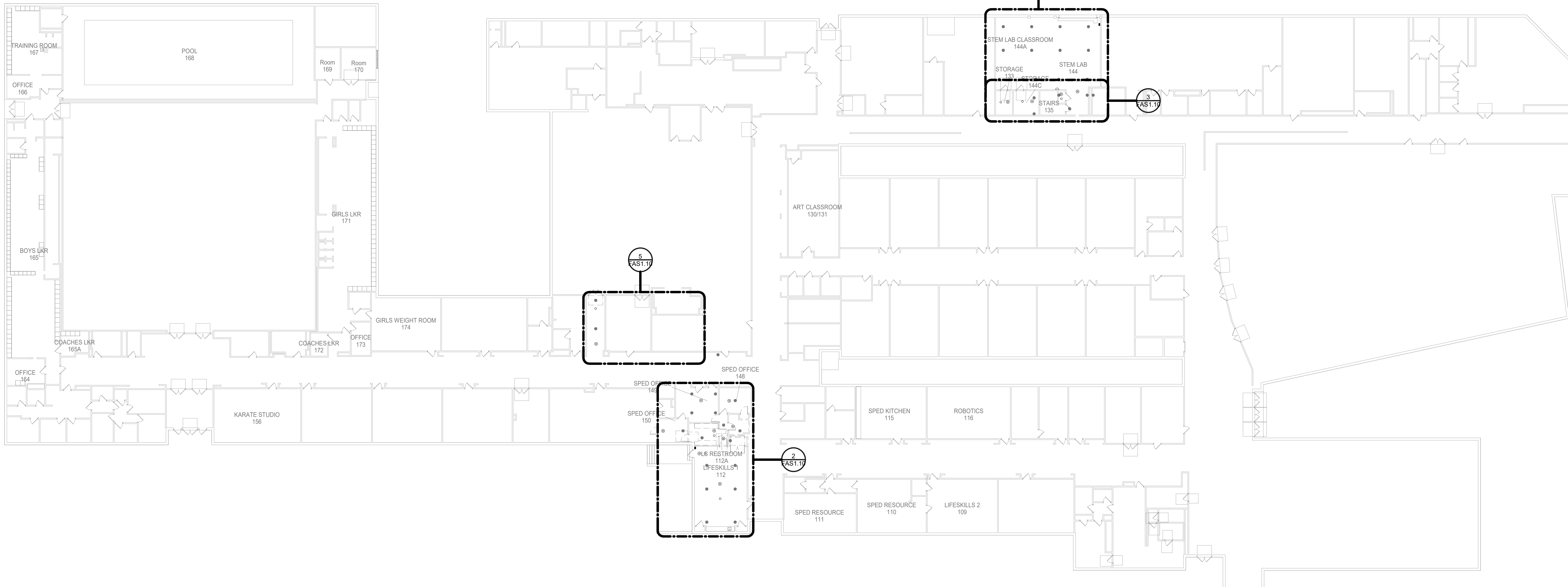
4 **PLUMBING EXISTING FIRE SPRINKLER FLOOR PLAN - STEM LAB**
Scale: 1/8" = 1'-0"



3 **PLUMBING EXISTING FIRE SPRINKLER PLAN - MEZZANINE**
Scale: 1/8" = 1'-0"



2 **PLUMBING EXISTING FIRE SPRINKLER PLAN - SPECIAL ED**
Scale: 1/8" = 1'-0"



1 **FIRE ALARM AND SPRINKLERS**
Scale: 1" = 20'-0"

THE INFORMATION INDICATED ON THIS PLAN ARE FOR INFORMATIONAL PURPOSES ONLY AND WHERE OBTAINED FROM PRELIMINARY FIELD WORK. LICENSED FA AND PS CONTRACTORS AND LICENSED FA AND PS ENGINEERS ARE RESPONSIBLE FOR PERFORMING DETAILED FIELD VERIFICATION OF EXISTING SYSTEMS PRIOR TO BID. IN ADDITION LICENSED FA AND PS CONTRACTORS AND LICENSED FA AND PS ENGINEERS SHALL PROVIDE DRAWINGS AND CALCULATIONS FOR UPDATE CHANGES TO EXISTING SYSTEM TO COMPLY WITH NEW SPACE LAYOUT AND ALL APPLICABLE CODES. EXISTING SYSTEMS SHALL BE MAINTAINED IN FULL OPERATING ORDER FOR ENTIRE CONSTRUCTION PROCESS.

- LEGEND**
- CEILING MOUNTED STROBE
 - WALL MOUNTED STROBE
 - SMOKE DETECTOR
 - PULL STATION
 - SPRINKLER HEAD