



December 10, 2019

**Addendum No. 01
TO THE CONTRACT DOCUMENTS FOR:**

MANSFIELD FIRE STATION NO. 4

Mansfield, Texas

KAI Project No. 2016.166

This addendum forms a part of the Contract Documents and modifies the drawings and project manual dated November 7, 2019 as noted herein. Respondent shall acknowledge receipt of this addendum.

PERMIT COMMENTS AND RESPONSE

Landscaping

- We'd like to replace the Lacebark trees with something else - City has had issues with those in many of our medians (disease). Maybe replace with cedar elm, etc. **REVISED AS PER REQUEST**
- Would like to see a mix of red oak, etc. rather than the abundance of live oaks shown. **REVISED AS REQUESTED**
- Need to remove the reference to steel edging, as we would like concrete curb in lieu of. **REVISED AS PER REQUEST**
- Any alternative to the roses shown for something potentially not as high maintenance or disease prone **KEEPING DRIFT ROSES AS PER EMAIL FROM WADE McLAURIN DATED 11.14.19**

Irrigation

- Irrigation will be reviewed and separate permit approved by the Utilities department **UNDERSTOOD**
- Possible 3" main line rather than 2" **INCREASED MAIN LINE TO 2.5"**
- Would like installation of isolation ball valves off of the main line for future maintenance issues **ADDED AS REQUESTED**
- Back flow will have to be above ground (not in vault) to meet city requirements (and manufacturer's) **REVISED AS NOTED**



CIVCAST COMMENTS AND RESPONSE

1. See <https://www.civcastusa.com/project/5dcdb34a54b2ed173084c5d4/summary>
For shared RFI information.

REFER TO THE PROJECT MANUAL FOR THE FOLLOWING ITEMS:

1. Bid Submittal Checklist
Item No. 8 Firm Information: add '(4 binders and one thumb drive)'
2. Instructions to Bidders
Paragraph 7.1: Revise 'working' to 'calendar' days
Paragraph 17.5: Revise 'forty-five (45)' to 'sixty (60)' days
3. Proposal
Omit and replace with attached

Instructions to bidders

22. WAGES: Add the following sentence 'Prevailing wage rates for Tarrant County can be found at https://beta.sam.gov/wage-determination/TX20190270/3?index=wd&date_filter_index=0&date_rad_selection=date&wdType=dbra&construction_type=Building&page=1&sort=-relevance&keywords=Tarrant%20County&inactive_filter_values=false '

Supplementary Conditions EJCDC

- 13.03 TESTING ORGANIZATION: Revise the added sentence to read 'All inspections, tests or approvals required by the specifications shall be performed by organizations acceptable to OWNER. First test will be paid under separate contract with the OWNER, failed tests requiring retest will be paid by the CONTRACTOR.'
4. Building permit, meters, tap fees, impact fees are handled by the owner.
5. This is not a LEED certified project.
6. 072600 – UNDER SLAB VAPOR BARRIER – CSI Under slab vapor barrier is an acceptable manufacturer.
7. 079200 – JOINT SEALANTS – USG and Tremco Securock ExoAir 430 System is an acceptable manufacturer product.
8. 072726 – FLUID-APPLIED MEMBRANE AIR BARRIER – TK Products TK-Airmax 2104 is an acceptable manufacturer and product.



9. 263213 – ENGINE GENERATORS – Revised.

10. 283111 – DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM – Added section.

REFER TO THE CONTRACT DRAWINGS FOR THE FOLLOWING ITEMS:

1. Sheet G0.02 – Clarification: In the first code column from the left of the sheet revise the Occupant Load from 100 to 150
2. Sheet C1.0 – See revised sheet for added fire lane notes. Added some additional conduits to the north side for future use.
3. Sheet C4.1 – STC Stormceptor detail changed to a cascade separator detail.
4. Sheet C4.5 – STC Stormceptor detail changed to a cascade separator detail and accompanying calculations.
5. Sheet C6.0 – Added sheet to set showing gas lines
6. Sheet C9.0 – See revised sheet for revised paving area around the building
7. Sheet L.01 – See revised sheet to show drive revision to Holland Lane
8. Sheet A0.01 – See revised sheet to show drive revision to Holland Lane
9. Sheet A0.02 – See revised sheet for added dimension to 1/A1.02.
10. Sheet A1.01 – Windows type D in Kitchen 121 are to be type E.
11. Sheet A1.02 – Clarification:
 - a. Add Numbered Note 6: Function of Mezzanine 147 is to be an equipment mezzanine for mechanical, electrical, plumbing and technology equipment
 - b. Revised plan 2 to show window type G.
12. Sheet A2.01/A2.02 –
 - a. FINISH LEGEND F-5 Tubelight Slate Gray to be Clear Anodized. Added F-8 – PPG RAL 3011 BROWN RED.
 - b. NOTE BY SYMBOL – Note 8 finish revised to F-8.
12. Sheet A4.07 – Detail 5 - Clarification, solid hatch to the right of the CMU wall should not be there.
13. Sheet A5.02 – Plan 4 – Revised Electric Water Heater alcove size.
14. Sheet A5.05 – Elevation 5 - Center wall mounted light fixture over mirror.
Elevation 17 – Revised Electric water heater arrangement.
15. Sheet A6.01
 - a. DOOR TYPES - Revised type doors H and J to show solid metal panels. Glass to be tinted to match Vitro Solarban Optigray.
 - b. DOOR SCHEDULE – Clarified door types and materials.
16. Sheet A6.02 – Window Type F to have G1 type glass.
17. Sheet S2.10 – GRADE BEAM SCHEDULE – Clarified grade beam stirrup reinforcing.
18. Sheet S2.11 – Plans 1 and 2 - Clarified pier sizes at dumpster and generator enclosure.



19. Sheet S2.30 – Revised top of steel elevations for workout structure.
20. Sheet S3.12 – Detail 1 – Replaced Longitudinal bar schedule with Typical Stirrup detail.
21. Sheet S5.11 – Detail 6 – Revised Top of steel for workout structure.
22. Sheet S5.13 – Detail 5 – Revised T.O.S. elevation.
23. Sheet M0.02 – Revised FAN SCHEDULE
24. Sheet M0.03 – Revised LOUVER SCHEDULE and added INDIRECT-FIRED MAKE-UP AIR UNIT WITH GAS HEAT SCHEDULE.
25. Sheet M2.01 – Added duct work for GEAR 143. Revised duct alignment above Corridor 103 and 107.
26. Sheet M2.02 – Added MAU-1.
27. Sheet P0.02 – PLUMBING FIXTURE SCHEDULE – Revised Fixtures L1, L2, TD1.
28. Sheet P2.00 – Revised gas line and meter location. Revised sewer cleanout locations out of building.
29. Sheet P2.01 – Revised gas line in building and meter location.
30. Sheet P2.02 – Added gas line for MAU-1.
31. Sheet P4.03 – Added Natural Gas Meter detail
32. Sheet E0.03 – LIGHT FIXTURE SCHEDULE – Revised fixtures H13 and H14.
33. Sheet E2.01 – Added Plan 2 detailing VESTIBULE 101 lighting. Revised lighting in DINING 116.
34. Sheet E2.03 – Added power to MAU-1.
35. Sheet E3.02 – Revised lighting control schedule to be more legible.
36. Sheet E6.01 – EQUIPMENT SCHEDULE BY SYMBOL – Added MAU-1.
37. Sheet E6.03 – BRANCH PANEL: LB – Added MAU-1.



12/10/2019

END OF ADDENDUM 01

Competitive Sealed Proposal for
New Fire Station No. 5
Mansfield, Texas
Bid No. 2019-32-01
PROPOSAL

Date: _____

Pursuant to the Instruction to Bidders, the undersigned has thoroughly examined the Bidding Documents and the Site, understands the work to be done, and hereby proposes to do all the work as provided in the Bidding Documents and subject to the observation and approval of the Owner and Architect, and binds themselves on acceptance of this bid by Owner for performing and completing the said work within the time stated and to furnish all required guarantees for the following prices:

BASE BID

For the construction of the New Fire Station No. 5 and including all labor, materials, services, and necessary for the completion of the Work as indicated in the construction documents.

The Sum of _____ DOLLARS

UNIT PRICES

- A. Unit-Price No. 1: Add per additional foot of 18" diameter pier.
1. _____ Dollars (\$) _____ LF
- B. Unit-Price No. 2: Deduct per reduced foot of 18" diameter piers
1. _____ Dollars (\$) _____ LF
- C. Unit-Price No. 3: Add per LF for casing 18" diameter pier
1. _____ Dollars (\$) _____ LF
- D. Unit-Price No. 4: Add per additional foot of 24" diameter pier.
1. _____ Dollars (\$) _____ LF
- E. Unit-Price No. 5: Deduct per reduced foot of 24" diameter piers
1. _____ Dollars (\$) _____ LF
- F. Unit-Price No. 6: Add per LF for casing 24" diameter pier
1. _____ Dollars (\$) _____ LF

EXTRA WORK FEES

The undersigned agrees that for additional work added to the Contract and for extra costs resulting from changes in the work, the allowance for overhead and profit combined shall be in accordance with the following schedule, but in no case shall it

exceed a maximum of 15 percent, (Overhead shall include payroll taxes and supervision):

- A. For the Contractor, for any work provided by his own forces: 10 % of the cost.
- B. For the Contractor, for work produced by his subcontractors: 5 % of the amount due the subcontractor.
- C. The General Contractor shall not be allowed to charge the Owner for "extended overhead" charges relating to change orders or weather delays.

OTHER CONDITIONS

The undersigned agrees to the following:

- A. Will furnish all labor and materials as shown and specified.
- B. Will substantially complete the base proposal work in _____ calendar days including days lost to inclement weather. Maximum allowable construction schedule shall be 360 days.
- C. Will start work 15 days after notice of award of contract.
- D. Agrees that their Bid shall be good and may not be withdrawn for a period of 60 days after the scheduled closing time for receiving bids.
- E. Understands that the City of Mansfield reserves the right to reject any or all Bids and to waive any informalities in the Bidding and to assign the Work to the Bidder who, in the opinion of the City, serves the City's best interest.
- F. Attests that the bid is submitted without collusion of any other bidder.

BID ACKNOWLEDGMENT

The undersigned certifies that the bid prices contained in this bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all product/service upon which prices are extended at the price offered, and upon the conditions in the specifications of the Invitation for Bid.

"I hereby certify that the foregoing bid has not been prepared in collusion with any other bidder or other person or persons engaged in the same line of business prior to the official opening of this bid. Further, I certify that the bidder is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination to control the price of product/service bid on, or to influence any person or persons to bid or not to bid thereon."

Name of Bidder: _____

Address of Bidder: _____

City: _____ State: _____ Zip Code: _____

Telephone Number _____ Fax _____

E-mail address: _____

By (print name) _____

Title: _____ Federal ID#/SSN #: _____

Signature: _____

Acknowledgement of Addenda: #1 _____ #2 _____ #3 _____ #4 _____ #5 _____

SECTION 263213

ENGINE GENERATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes packaged engine-generator sets for emergency power supply with the following features:
 - 1. Diesel engine.
 - 2. Unit-mounted cooling system.
 - 3. and remote-mounted control and monitoring.
 - 4. Performance requirements for sensitive loads.
 - 5. Fuel system.
 - 6. Parallel generator sets.
 - 7. Load banks.
 - 8. Outdoor enclosure.
- B. Related Requirements:
 - 1. Section 263600 "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.
 - ~~2. Section 262313 "Paralleling Low Voltage Switchgear" for controls and paralleling equipment for large or multiple parallel engine generators.~~

1.3 DEFINITIONS

- A. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.
- B. LP: Liquid petroleum.
- C. EPS: Emergency power supply.
- D. EPSS: Emergency power supply system.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include thermal damage curve for generator.
3. Include time-current characteristic curves for generator protective device.
4. Include fuel consumption in gallons per hour at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
5. Include generator efficiency at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
6. Include air flow requirements for cooling and combustion air in cfm at 0.8 power factor, with air supply temperature of 95, 80, 70, and 50 deg F. Provide drawings showing requirements and limitations for location of air intake and exhausts.
7. Include generator characteristics, including, but not limited to kw rating, efficiency, reactances, and short-circuit current capability.

B. Shop Drawings:

1. Include plans and elevations for engine-generator set and other components specified. Indicate access requirements affected by height of subbase fuel tank.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports and clearance requirements for proper fluid drain.
4. Design calculations for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
5. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include base weights.
6. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams showing terminal markings for EPS equipment and functional relationship between all electrical components.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer and testing agency.

B. Seismic Qualification Certificates: For engine-generator set, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: With engine and generator mounted on rails identify center of gravity and total weight including full fuel tank, supplied enclosure, external silencer, subbase-mounted fuel tank, and each piece of equipment not integral to the engine-generator set, and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Source quality-control reports, including, but not limited to the following:

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.

4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
5. Report of sound generation.
6. Report of exhaust emissions showing compliance with applicable regulations.
7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

D. Field quality-control reports.

E. Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
 - b. Operating instructions laminated and mounted adjacent to generator location.
 - c. Training plan.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: One for every 10 of each type and rating but no fewer than one of each.
2. Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.
4. Tools: Each tool listed by part number in operations and maintenance manual.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved by manufacturer.

B. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Engine-generator set housing, subbase fuel tank, engine-generator set, batteries, battery racks, silencers, and sound attenuating equipment, accessories, and components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - 2. Component Importance Factor: 1.5.
- B. ASME Compliance: Comply with ASME B15.1.
- C. NFPA Compliance:
 - 1. Comply with NFPA 37.
 - 2. Comply with NFPA 70.
 - 3. Comply with NFPA 99.
 - 4. Comply with NFPA 110 requirements for Level 1 emergency power supply system.
- D. UL Compliance: Comply with UL 2200.
- E. Engine Exhaust Emissions: Comply with current EPA Tier requirements and applicable state and local government requirements.
- F. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.
- G. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
 - 1. Ambient Temperature: Minus 15 to plus 40 deg C.
 - 2. Relative Humidity: Zero to 95 percent.
 - 3. Altitude: Sea level to 1000 feet (300 m).
- H. Unusual Service Conditions: Engine-generator equipment and installation are required to operate under the following conditions:

2.3 ASSEMBLY DESCRIPTION

- A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
- C. EPSS Class: Engine-generator set shall be classified as a required by EPA in accordance with NFPA 110.
- D. Induction Method: Naturally aspirated or Turbocharged.
- E. Governor: Adjustable isochronous, with speed sensing.
- F. Emissions: Comply with EPA Tier requirements in accordance with current regulations.
- G. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.
 - 1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.
- H. Capacities and Characteristics:
 - 1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries.
 - 2. Output Connections: Three-phase, four wire.
 - 3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.
- I. Generator-Set Performance:
 - 1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
 - 2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
 - 3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
 - 4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
 - 5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
 - 6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
 - 7. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
 - 8. Start Time: Comply with NFPA 110, Type 10, system requirements.
- J. Generator-Set Performance for Sensitive Loads:

1. Oversizing generator compared with the rated power output of the engine is permissible to meet specified performance.
 - a. Nameplate Data for Oversized Generator: Show ratings required by the Contract Documents rather than ratings that would normally be applied to generator size installed.
2. Steady-State Voltage Operational Bandwidth: 1 percent of rated output voltage from no load to full load.
3. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 0.5 second.
4. Steady-State Frequency Operational Bandwidth: Plus or minus 0.25 percent of rated frequency from no load to full load.
5. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
6. Transient Frequency Performance: Less than 2-Hz variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within three seconds.
7. Output Waveform: At no load, harmonic content measured line to neutral shall not exceed 2 percent total with no slot ripple. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
8. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to winding insulation or other generator system components.
9. Excitation System: Performance shall be unaffected by voltage distortion caused by nonlinear load.
 - a. Provide permanent magnet excitation for power source to voltage regulator.
10. Start Time: Comply with NFPA 110, Type 10, system requirements.

~~K. Parallel Engine Generators:~~

- ~~1. Automatic reactive output power control and load sharing between generator sets operated in parallel.~~
- ~~2. Automatic regulation, automatic connection to a common bus, and automatic synchronization, with manual controls and instruments to monitor and control paralleling functions.~~
- ~~3. Protective relays required for equipment and personnel safety.~~
- ~~4. Paralleling suppressors to protect excitation systems.~~
- ~~5. Reverse power protection.~~
- ~~6. Loss of field protection.~~

2.4 ENGINE

- A. Fuel: Fuel oil, Grade DF-2.
- B. Rated Engine Speed: 1800 rpm.
- C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

- D. Lubrication System: The following items are mounted on engine or skid:
1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- E. Jacket Coolant Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.
- F. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.
1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
 2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
 3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
 4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
 5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.
 - a. Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.
 - b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.
- G. Cooling System: Closed loop, liquid cooled, with remote radiator and integral engine-driven coolant pump. Comply with requirements in Section 232113 "Hydronic Piping" for coolant piping.
1. Configuration: Vertical air discharge.
 2. Radiator Core Tubes: Aluminum.
 3. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
 4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
 5. Fan: Driven by totally enclosed electric motor with sealed bearings.
 6. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
 7. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
- H. Muffler/Silencer: Semicritical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 18 dB at 500 Hz.
 2. Sound level measured at a distance of 25 feet (8 m) from exhaust discharge after installation is complete shall be 85 dBA or less.
- I. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.
- J. Starting System: 24-V electric, with negative ground.
1. Components: Sized so they are not damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Performance Requirements" Article.
 2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
 3. Cranking Cycle: As required by NFPA 110 for system level specified.
 4. Battery: Lead acid, with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle at least three times without recharging.
 5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
 6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in "Performance Requirements" Article. Include accessories required to support and fasten batteries in place. Provide ventilation to exhaust battery gases.
 7. Battery Stand: Factory-fabricated, two-tier metal with acid-resistant finish designed to hold the quantity of battery cells required and to maintain the arrangement to minimize lengths of battery interconnections.
 8. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35 A minimum continuous rating.
 9. Battery Charger: Current-limiting, automatic-equalizing and float-charging type designed for lead-acid batteries. Unit shall comply with UL 1236 and include the following features:
 - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg F (minus 40 deg C) to 140 deg F (plus 60 deg C) to prevent overcharging at high temperatures and undercharging at low temperatures.
 - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
 - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
 - e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
 - f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

2.5 DIESEL FUEL-OIL SYSTEM

- A. Comply with NFPA 30.

- B. Piping: Fuel-oil piping shall be Schedule 40 black steel, complying with requirements in Section 231113 "Facility Fuel-Oil Piping." Cast iron, aluminum, copper, and galvanizing shall not be used in the fuel-oil system.
- C. Main Fuel Pump: Mounted on engine to provide primary fuel flow under starting and load conditions.
- D. Fuel Filtering: Remove water and contaminants larger than 1 micron.
- E. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
- ~~F. Fuel Oil Storage Tank: Comply with requirements in Section 231313 "Facility Underground Fuel Oil Storage Tanks" or Section 231323 "Facility Aboveground Fuel Oil Storage Tanks."~~
 - ~~1. Fuel Tank Capacity: Minimum 133 percent of total fuel required for periodic maintenance operations between fuel refills plus fuel for the hours of continuous operation required for the indicated EPSS Class.~~
 - ~~2. Duplex Fuel Oil Transfer Pump: Comply with requirements in Section 231213 "Facility Fuel Oil Pumps."~~
- ~~G. Day Tank: Comply with UL 142, freestanding, factory-fabricated fuel tank assembly, with integral, float-controlled transfer pump and the following features:~~
 - ~~1. Containment: Integral rupture basin with a capacity of 150 percent of nominal capacity of day tank.
 - ~~a. Leak Detector: Locate in rupture basin and connect to provide audible and visual alarm in the event of day tank leak.~~~~
 - ~~2. Tank Capacity: As recommended by engine manufacturer for an uninterrupted period of 24 hours' operation at 100 percent of rated power output of engine-generator system without being refilled.~~
 - ~~3. Pump Capacity: Exceeds maximum flow of fuel drawn by engine-mounted fuel supply pump at 110 percent of rated capacity, including fuel returned from engine.~~
 - ~~4. Low-Level Alarm Sensor: Liquid-level device operates alarm contacts at 25 percent of normal fuel level.~~
 - ~~5. High-Level Alarm Sensor: Liquid-level device operates alarm and redundant fuel shutoff contacts at midpoint between overflow level and 100 percent of normal fuel level.~~
 - ~~6. Piping Connections: Factory installed fuel supply and return lines from tank to engine; local fuel fill, vent line, overflow line; and tank drain line with shutoff valve.~~
 - ~~7. Redundant High-Level Fuel Shutoff: Actuated by high-level alarm sensor in day tank to operate a separate motor control device that disconnects day tank pump motor. Sensor shall signal solenoid valve, located in fuel suction line between fuel storage tank and day tank, to close. Both actions shall remain in shutoff state until manually reset. Shutoff action shall initiate an alarm signal to control panel but shall not shut down engine-generator set.~~
- H. Subbase-Mounted, Double-Wall, Fuel-Oil Tank: Factory installed and piped, complying with UL 142 fuel-oil tank. Features include the following:
 - 1. Tank level indicator.
 - 2. Fuel-Tank Capacity: Minimum 133 percent of total fuel required for periodic maintenance operations between fuel refills, plus fuel for ~~the~~ 24 hours of continuous operation for indicated EPSS class.

3. Leak detection in interstitial space.
4. Vandal-resistant fill cap.
5. Containment Provisions: Comply with requirements of authorities having jurisdiction.

2.6 CONTROL AND MONITORING

- A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.
- B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.
- C. Comply with UL 508A.
- D. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration. Panel shall be powered from the engine-generator set battery.
- E. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common wall-mounted control and monitoring panel. Panel shall be powered from the engine-generator set battery.
- F. Configuration: Operating and safety indications, protective devices, basic system controls, engine gages, instrument transformers, generator disconnect switch or circuit breaker, and other indicated components shall be grouped in a combination control and power panel. Control and monitoring section of panel shall be isolated from power sections by steel barriers. Panel shall be powered from the engine-generator set battery. Panel features shall include the following:
 1. Wall-Mounting Cabinet Construction: Rigid, self-supporting steel unit complying with NEMA ICS 6. Power bus shall be copper. Bus, bus supports, control wiring, and temperature rise shall comply with UL 891.
 2. Switchboard Construction: Freestanding unit complying with Section 262413 "Switchboards."
 3. Switchgear Construction: Freestanding unit complying with Section 262300 "Low-Voltage Switchgear."
- G. Indicating Devices : As required by NFPA 110 for Level 1 system, including the following:
 1. AC voltmeter.
 2. AC ammeter.
 3. AC frequency meter.
 4. EPS supplying load indicator.
 5. Ammeter and voltmeter phase-selector switches.
 6. DC voltmeter (alternator battery charging).
 7. Engine-coolant temperature gage.

8. Engine lubricating-oil pressure gage.
 9. Running-time meter.
 10. Current and Potential Transformers: Instrument accuracy class.
- H. Protective Devices and Controls in Local Control Panel: Shutdown devices and common visual alarm indication as required by NFPA 110 for Level 1 system, including the following:
1. Start-stop switch.
 2. Overcrank shutdown device.
 3. Overspeed shutdown device.
 4. Coolant high-temperature shutdown device.
 5. Coolant low-level shutdown device.
 6. Low lube oil pressure shutdown device.
 7. Air shutdown damper shutdown device when used.
 8. Overcrank alarm.
 9. Overspeed alarm.
 10. Coolant high-temperature alarm.
 11. Coolant low-temperature alarm.
 12. Coolant low-level alarm.
 13. Low lube oil pressure alarm.
 14. Air shutdown damper alarm when used.
 15. Lamp test.
 16. Contacts for local and remote common alarm.
 17. Coolant high-temperature prealarm.
 18. Generator-voltage adjusting rheostat.
 19. Main fuel tank low-level alarm.
 - a. Low fuel level alarm shall be initiated when the level falls below that required for operation for the duration required in "Fuel Tank Capacity" Paragraph in "Diesel Fuel-Oil System" Article.
 20. Run-Off-Auto switch.
 21. Control switch not in automatic position alarm.
 22. Low-starting air pressure alarm.
 23. Low-starting hydraulic pressure alarm.
 24. Low cranking voltage alarm.
 25. Battery-charger malfunction alarm.
 26. Battery low-voltage alarm.
 27. Battery high-voltage alarm.
 28. Generator overcurrent protective device not closed alarm.
- I. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.
- J. Common Remote Panel with Common Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel. Remote panel shall be powered from the engine-generator set battery.
- K. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event, and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

1. Overcrank alarm.
 2. Coolant low-temperature alarm.
 3. High engine temperature prealarm.
 4. High engine temperature alarm.
 5. Low lube oil pressure alarm.
 6. Overspeed alarm.
 7. Low fuel main tank alarm.
 8. Low coolant level alarm.
 9. Low cranking voltage alarm.
 10. Contacts for local and remote common alarm.
 11. Audible-alarm silencing switch.
 12. Air shutdown damper when used.
 13. Run-Off-Auto switch.
 14. Control switch not in automatic position alarm.
 15. Fuel tank derangement alarm.
 16. Fuel tank high-level shutdown of fuel supply alarm.
 17. Lamp test.
 18. Low cranking voltage alarm.
 19. Generator overcurrent protective device not closed.
- L. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.
- M. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

- A. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices shall consider both utility and EPSS as the voltage source.
1. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.
- B. Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying with UL 489.
1. Tripping Characteristic: Designed specifically for generator protection.
 2. Trip Rating: Matched to generator output rating.
 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 4. Mounting: Adjacent to or integrated with control and monitoring panel.
- C. Generator Circuit Breaker: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489.
1. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
 2. Trip Settings: Selected to coordinate with generator thermal damage curve.
 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 4. Mounting: Adjacent to or integrated with control and monitoring panel.

- D. Generator Circuit Breaker: Insulated-case, electronic-trip type; 100 percent rated; complying with UL 489.
 - 1. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
 - 2. Trip Settings: Selected to coordinate with generator thermal damage curve.
 - 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 - 4. Mounting: Adjacent to or integrated with control and monitoring panel.
- E. Generator Disconnect Switch: Molded-case type, 100 percent rated.
 - 1. Trip Rating: Matched to generator output rating.
 - 2. Shunt Trip: Connected to trip switch when signaled by generator protector or by other protective devices.
- F. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. When signaled by generator protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits. Protector performs the following functions:
 - 1. Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms. Contacts shall be available for load shed functions.
 - 2. Under single or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
 - 3. As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the generator set.
 - 4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.
- G. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground fault.
 - 1. Indicate ground fault with other generator-set alarm indications.
 - 2. Trip generator protective device on ground fault.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Range: Provide extended range of output voltage by adjusting the excitation level.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

- F. Enclosure: Dripproof.
- G. Instrument Transformers: Mounted within generator enclosure.
- H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified and as required by NFPA 110.
 - 1. Adjusting Rheostat on Control and Monitoring Panel: Provide plus or minus 5 percent adjustment of output-voltage operating band.
 - 2. Maintain voltage within 15 percent on one step, full load.
 - 3. Provide anti-hunt provision to stabilize voltage.
 - 4. Maintain frequency within 5 percent and stabilize at rated frequency within 2 seconds.
- I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.
- K. Subtransient Reactance: 12 percent, maximum.

2.9 OUTDOOR GENERATOR-SET ENCLOSURE

- A. Description: Vandal-resistant, sound-attenuating, weatherproof steel housing, wind resistant up to 100 mph (160 km/h). Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.
- B. Description: Prefabricated or pre-engineered galvanized-steel-clad, integral structural-steel-framed, walk-in enclosure, erected on concrete foundation.
 - 1. Structural Design and Anchorage: Comply with ASCE 7 for wind loads up to 100 mph (160 km/h).
 - 2. Seismic Design: Comply with seismic requirements in Section 260548.16 "Seismic Controls for Electrical Systems."
 - 3. Hinged Doors: With padlocking provisions.
 - 4. Space Heater: Thermostatically controlled and sized to prevent condensation.
 - 5. Lighting: Provide weather resistant LED lighting with 30 footcandles ((330 LUX)) average maintained.
 - 6. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits required by engine-generator-set components.
 - 7. Muffler Location: Within enclosure.
- C. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
 - 1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
 - 2. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.
 - 3. Ventilation: Provide temperature-controlled exhaust fan interlocked to prevent operation when engine is running.

- D. Interior Lights with Switch: Factory-wired, vapor-proof fixtures within housing; arranged to illuminate controls and accessible interior. Arrange for external electrical connection.
 - 1. AC lighting system and connection point for operation when remote source is available.
 - 2. DC lighting system for operation when remote source and generator are both unavailable.
- E. Convenience Outlets: Factory wired, GFCI. Arrange for external electrical connection.

2.10 MOTORS

- A. Description: NEMA MG 1, Design B, medium induction random-wound, squirrel cage motor.
- B. Efficiency: Energy efficient, as defined in NEMA MG 1.
- C. Service Factor: 1.15.
- D. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- E. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
- F. Temperature Rise: Match insulation rating.
- G. Code Letter Designation:
 - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
 - 2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- H. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.
- I. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in electrical Sections.

2.11 VIBRATION ISOLATION DEVICES

- A. Elastomeric Isolator Pads: Oil- and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.
 - 1. Material: Standard neoprene separated by steel shims.
- B. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.
 - 1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to ~~1/4-inch-~~ (6-mm-) thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 - 2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
 - 3. Minimum Additional Travel: 50 percent of required deflection at rated load.

4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
- C. Comply with requirements in Section 232116 Hydronic Piping Specialties" for vibration isolation and flexible connectors materials for steel piping.
- D. Comply with requirements in Section 233113 "Metal Ducts" for vibration isolation and flexible connector materials for exhaust shroud and ductwork.
- E. Vibration isolation devices shall not be used to accommodate misalignments or to make bends.
- 2.12 FINISHES
- A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.
- 2.13 SOURCE QUALITY CONTROL
- A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.
- B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:
1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
 2. Test generator, exciter, and voltage regulator as a unit.
 3. Full load run.
 4. Maximum power.
 5. Voltage regulation.
 6. Transient and steady-state governing.
 7. Single-step load pickup.
 8. Safety shutdown.
 9. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
 10. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in for piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.
- B. Equipment Mounting:
 - 1. Install packaged engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 2. Coordinate size and location of concrete bases for packaged engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
 - 3. Coordinate size and location of roof curbs, equipment supports, and roof penetrations for remote radiators. These items are specified in Section 077200 "Roof Accessories."
- C. Install packaged engine-generator to provide access, without removing connections or accessories, for periodic maintenance.
- D. Install packaged engine-generator with restrained spring isolators having a minimum deflection of 1 inch (25 mm) on 4-inch- (100-mm-) high concrete base. Secure enclosure to anchor bolts installed in concrete bases. Concrete base construction is specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- E. Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping shall be same diameter as muffler outlet.
 - 1. Install flexible connectors and steel piping materials according to requirements in Section 232116 Hydronic Piping Specialties."
 - 2. Insulate muffler/silencer and exhaust system components according to requirements in Section 230719 "HVAC Piping Insulation."
 - 3. Install isolating thimbles where exhaust piping penetrates combustible surfaces with a minimum of 9 inches (225 mm) clearance from combustibles.
- F. Install condensate drain piping to muffler drain outlet full size of drain connection with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe with welded joints.
- G. Installation requirements for piping materials and flexible connectors are specified in Section 232116 "Hydronic Piping Specialties." Copper and galvanized steel shall not be used in the fuel-oil piping system.
- H. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping and specialties.
- B. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine-generator to allow service and maintenance.

- C. Connect engine exhaust pipe to engine with flexible connector.
- D. Connect fuel piping to engines with a gate valve and union and flexible connector.
 - 1. Diesel storage tanks, tank accessories, piping, valves, and specialties for fuel systems are specified in Section 231113 "Facility Fuel-Oil Piping."
- E. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- F. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Provide a minimum of one 90 degree bend in flexible conduit routed to the generator set from a stationary element.
- G. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.4 IDENTIFICATION

- A. Identify system components according to Section 230553 "Identification for HVAC Piping and Equipment" and Section 260553 "Identification for Electrical Systems."
- B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections.
- D. Tests and Inspections:
 - 1. Perform tests recommended by manufacturer and each visual and mechanical inspection and electrical and mechanical test listed in the first two subparagraphs as specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - a. Visual and Mechanical Inspection
 - 1) Compare equipment nameplate data with drawings and specifications.
 - 2) Inspect physical and mechanical condition.
 - 3) Inspect anchorage, alignment, and grounding.
 - 4) Verify the unit is clean.
 - b. Electrical and Mechanical Tests
 - 1) Perform insulation-resistance tests in accordance with IEEE 43.

- a) Machines larger than 200 horsepower (150 kilowatts). Test duration shall be 10 minutes. Calculate polarization index.
 - b) Machines 200 horsepower (150 kilowatts) or less. Test duration shall be one minute. Calculate the dielectric-absorption ratio.
 - 2) Test protective relay devices.
 - 3) Verify phase rotation, phasing, and synchronized operation as required by the application.
 - 4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
 - 5) Conduct performance test in accordance with NFPA 110.
 - 6) Verify correct functioning of the governor and regulator.
2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
 3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
 - a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
 - b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
 - c. Verify acceptance of charge for each element of the battery after discharge.
 - d. Verify that measurements are within manufacturer's specifications.
 4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
 5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
 6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg (120 kPa). Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
 7. Exhaust Emissions Test: Comply with applicable government test criteria.
 8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
 9. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and 100 percent of rated linear load. Verify that harmonic content is within specified limits.
 10. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line, and compare measured levels with required values.
- E. Coordinate tests with tests for transfer switches and run them concurrently.
 - F. Test instruments shall have been calibrated within the last 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.
 - G. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.
 - H. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

- I. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- J. Remove and replace malfunctioning units and retest as specified above.
- K. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
- L. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- M. Infrared Scanning: After Substantial Completion, but not more than 60 days after final acceptance, perform an infrared scan of each power wiring termination and each bus connection while running with maximum load. Remove all access panels so terminations and connections are accessible to portable scanner.
 - 1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.
 - 2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 3. Record of Infrared Scanning: Prepare a certified report that identifies terminations and connections checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

END OF SECTION

SECTION 283111

DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Air-sampling smoke detectors.
5. Nonsystem smoke detectors.
6. Heat detectors.
7. Notification appliances.
8. Device guards.
9. Firefighters' two-way telephone communication service.
10. Firefighters' smoke-control station.
- ~~11. Magnetic door holders.~~
12. Remote annunciator.
13. Network communications.

B. Related Requirements:

1. Section 280513 "Conductors and Cables for Electronic Safety and Security" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
 2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 2. Include plans, elevations, sections, details, and attachments to other work.
 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
 4. Detail assembly and support requirements.
 5. Include voltage drop calculations for notification-appliance circuits.
 6. Include battery-size calculations.
 7. Include input/output matrix.
 8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
 9. Include performance parameters and installation details for each detector.
 10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
 11. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
 - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
 - b. Show field wiring required for HVAC unit shutdown on alarm.
 - c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
 - d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.
 - e. Locate detectors according to manufacturer's written recommendations.
 - f. Show air-sampling detector pipe routing.
 12. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.
- C. General Submittal Requirements:
1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
 2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; Level III minimum.
 - c. Licensed or certified by authorities having jurisdiction.
- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.

2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
3. Indicate audible appliances required to produce square wave signal per NFPA 72.

~~1.5 Sample Warranty: For special warranty.~~

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Air-sampling system sample port locations and modeling program report showing layout meets performance criteria.
 - g. Record copy of site-specific software.
 - h. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
 - i. Manufacturer's required maintenance related to system warranty requirements.
 - j. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.
- B. Software and Firmware Operational Documentation:
 1. Software operating and upgrade manuals.
 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
 3. Device address list.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level II technician.

1.8 PROJECT CONDITIONS

- A. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.
- B. Fire Alarm system shall be Potter. No other manufacturer will be acceptable per owner request.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Flame detectors.
 - 4. Smoke detectors.
 - 5. Duct smoke detectors.
 - 6. Carbon monoxide detectors.
 - 7. Automatic sprinkler system water flow.
 - ~~8. Preaction system.~~
 - 9. Fire-extinguishing system operation.
 - ~~10. Fire standpipe system.~~
 - ~~11. Dry system pressure flow switch.~~
 - ~~12. Fire pump running.~~

- B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm notification appliances.
 2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
 3. Unlock electric door locks in designated egress paths.
 - ~~4. Release fire and smoke doors held open by magnetic door holders.~~
 5. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
 6. Close smoke dampers in air ducts of designated air-conditioning duct systems.
 - ~~7. Activate preaction system.~~
 - ~~8. Recall elevators to primary or alternate recall floors.~~
 - ~~9. Activate elevator power shunt trip.~~
 - ~~10. Activate emergency lighting control.~~
 11. Activate emergency shutoffs for gas and fuel supplies.
 12. Record events in the system memory.
- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
 2. High- or low-air-pressure switch of a dry-pipe sprinkler system.
 3. Alert and Action signals of air-sampling detector system.
 - ~~4. Elevator shunt trip supervision.~~
 - ~~5. Fire pump running.~~
 - ~~6. Fire pump loss of power.~~
 - ~~7. Fire pump power phase reversal.~~
 8. Independent fire-detection and -suppression systems.
 9. User disabling of zones or individual devices.
 10. Loss of communication with any panel on the network.
- D. System trouble signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
 3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
 4. Loss of primary power at fire-alarm control unit.
 5. Ground or a single break in internal circuits of fire-alarm control unit.
 6. Abnormal ac voltage at fire-alarm control unit.
 7. Break in standby battery circuitry.
 8. Failure of battery charging.
 9. Abnormal position of any switch at fire-alarm control unit or annunciator.
 10. Hose cabinet door open.
- E. System Supervisory Signal Actions:
1. Initiate notification appliances.
 2. Identify specific device initiating the event at fire-alarm control unit and remote annunciators.
 3. Transmit system status to building management system.

2.3 FIRE-ALARM CONTROL UNIT

- A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder and printer.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. The FACP shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, two line(s) of 40 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
- D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, Class B.
- ~~E. Stairwell and Elevator Shaft Pressurization: Provide an output signal using an addressable relay to start the stairwell and elevator shaft pressurization system. Signal shall remain on until alarm conditions are cleared and fire-alarm system is reset. Signal shall not stop in response to alarm acknowledge or signal silence commands.~~
- ~~1. Pressurization starts when any alarm is received at fire-alarm control unit.~~
 - ~~2. Alarm signals from smoke detectors at pressurization air supplies have a higher priority than other alarm signals that start the system.~~
- F. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

G. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

~~H. Elevator Recall:~~

~~1. Elevator recall shall be initiated only by one of the following alarm initiating devices:~~

- ~~a. Elevator lobby detectors except the lobby detector on the designated floor.~~
- ~~b. Smoke detector in elevator machine room.~~
- ~~c. Smoke detectors in elevator hoistway.~~

~~2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.~~

~~3. Water flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.~~

- ~~a. Water flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.~~

I. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.

J. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

K. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: Sealed lead calcium.

2.4 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show

visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Single-action mechanism, breaking-glass or plastic-rod type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Double-action mechanism requiring two actions to initiate an alarm, breaking-glass or plastic-rod type; with addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
3. Station Reset: Key- or wrench-operated switch.
4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.5 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be two-wire type except where four wire type is needed for AHU shutdown or other similar functions.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).

C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.

- e. Sensor range (normal, dirty, etc.).
- 3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
- 4. Each sensor shall have multiple levels of detection sensitivity.
- 5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
- 6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 PROJECTED BEAM SMOKE DETECTORS

- A. Projected Beam Light Source and Receiver: Designed to accommodate small angular movements and continue to operate and not cause nuisance alarms.
- B. Detector Address: Accessible from fire-alarm control unit and able to identify the detector's location within the system and its sensitivity setting.
- C. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - 1. Primary status.
 - 2. Device type.
 - 3. Present average value.
 - 4. Present sensitivity selected.
 - 5. Sensor range (normal, dirty, etc.).

2.7 CARBON MONOXIDE DETECTORS

- A. General: Carbon monoxide detector listed for connection to fire-alarm system.
 - 1. Mounting: Adapter plate for outlet box mounting.
 - 2. Testable by introducing test carbon monoxide into the sensing cell.
 - 3. Detector shall provide alarm contacts and trouble contacts.
 - 4. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
 - 5. Comply with UL 2075.
 - 6. Locate, mount, and wire according to manufacturer's written instructions.
 - 7. Provide means for addressable connection to fire-alarm system.
 - 8. Test button simulates an alarm condition.

2.8 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
 - 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.

2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.9 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.
- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- C. Chimes, Low-Level Output: Vibrating type, 75-dBA minimum rated output.
- D. Chimes, High-Level Output: Vibrating type, 81-dBA minimum rated output.
- E. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.
- F. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens.
 1. Rated Light Output:
 - a. Candella level as required by the dimensions and conditions in each space, or 15/30/75/110 cd, selectable in the field.
 2. Mounting: Ceiling mounted where allowed by code. Wall mounted where ceiling height is too high to allow for ceiling mounted.
 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 4. Flashing shall be in a temporal pattern, synchronized with other units.
 5. Strobe Leads: Factory connected to screw terminals.
 6. Mounting Faceplate: Factory finished, white.
- G. Tone Notification Appliances:
 1. Comply with UL 1480.
 2. High-Range Units: Rated 2 to 15 W.

3. Low-Range Units: Rated 1 to 2 W.
4. Mounting: semirecessed or surface mounted and bidirectional.
5. Matching Transformers: Tap range matched to acoustical environment of speaker location.
6. Rating: 24-V ac or dc.

H. Material and Finish: Match door hardware.

~~2.10 MAGNETIC DOOR HOLDERS~~

~~A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.~~

- ~~1. Electromagnets: Require no more than 3 W to develop 25 lbf holding force.~~
- ~~2. Wall Mounted Units: Flush mounted unless otherwise indicated.~~
- ~~3. Rating: 24 V ac or dc.~~

~~B. Material and Finish: Match door hardware.~~

2.11 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.

1. Mounting: Flush cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.12 ADDRESSABLE INTERFACE DEVICE

A. General:

1. Include address-setting means on the module.
2. Store an internal identifying code for control panel use to identify the module type.
3. Listed for controlling HVAC fan motor controllers.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall.

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.
2. Operate solenoids for use in sprinkler service.

2.13 NETWORK COMMUNICATIONS

- A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.
- B. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.
- C. Provide integration gateway using for connection to building automation system. Coordinate with controls contractor to determine protocol type.

2.14 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 1. Factory fabricated and furnished by device manufacturer.
 2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
 1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.

- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
- C. Manual Fire-Alarm Boxes:
 - 1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
 - 2. Mount manual fire-alarm box on a background of a contrasting color.
 - 3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
 - 1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 - 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 - 3. Smooth ceiling spacing shall not exceed 30 feet.
 - 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.
 - 5. HVAC: Locate detectors not closer than 60 inches from air-supply diffuser or return-air opening.
 - 6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
 - 1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Air-Sampling Smoke Detectors: If using multiple pipe runs, the runs shall be pneumatically balanced.
- H. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.
- I. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- J. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- K. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- L. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
 - 1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.
- B. Where exposed below 10', fire alarm wire shall be installed in EMT. Exposed EMT shall be painted red enamel or shall be factory colored red conduit.

3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
 - ~~2. Alarm-initiating connection to stairwell and elevator shaft pressurization systems.~~
 - 3. Smoke dampers in air ducts of designated HVAC duct systems.
 - 4. Electronically locked doors and access gates.
 - 5. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 - 6. Supervisory connections at valve supervisory switches.
 - ~~7. Supervisory connections at low air pressure switch of each dry pipe sprinkler system.~~
 - 8. Data communication circuits for connection to building management system.
 - 9. Data communication circuits for connection to mass notification system.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- B. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- C. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- F. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

END OF SECTION

TDLR REGISTRATION MANSFIELD FIRE STATION #5:	TABS2020002795
APPLICABLE CODES	2018 INTERNATIONAL BUILDING CODE
TYPE OF CONSTRUCTION PRIMARY STRUCTURAL FRAME BEARING WALLS - EXTERIOR BEARING WALLS - INTERIOR INT. NONBEARING WALLS/PARTITIONS EXT. NONBEARING WALLS/PARTITIONS	TYPE II-B (TABLE 601 FOR RATINGS) 0 HOURS 0 HOURS 0 HOURS 0 HOURS (TABLE 602) 1 HOUR 1 HOUR 0 HOUR 0 HOUR
X < 5 5 ≤ X < 10 10 ≤ X < 30 X ≥ 30	1 HOUR 0 HOUR 0 HOUR 0 HOUR
FIRE SPRINKLERS	YES
ALLOWABLE SQ. FT.	92,000 SF (TABLE 506.2)
ALLOWABLE BLDG HEIGHT:	75 FT (TABLE 504.3)
ALLOWABLE STORIES:	4 STORIES (TABLE 504.4)
OCCUPANCY TYPE: TOTAL ACTUAL SQ. FT. BUSINESS (B) MEZZANINE	(B) BUSINESS 12867.87SF 11927.08 SF 940.79 SF
NUMBER OF STORIES:	1 STORY PLUS A MEZZANINE
OCCUPANT LOAD: ~~BUSINESS 150 GROSS (11927.08/150)~~	TABLE 1004.1.1 ~~119.27 = 80 OL~~

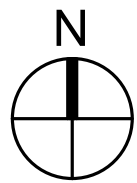
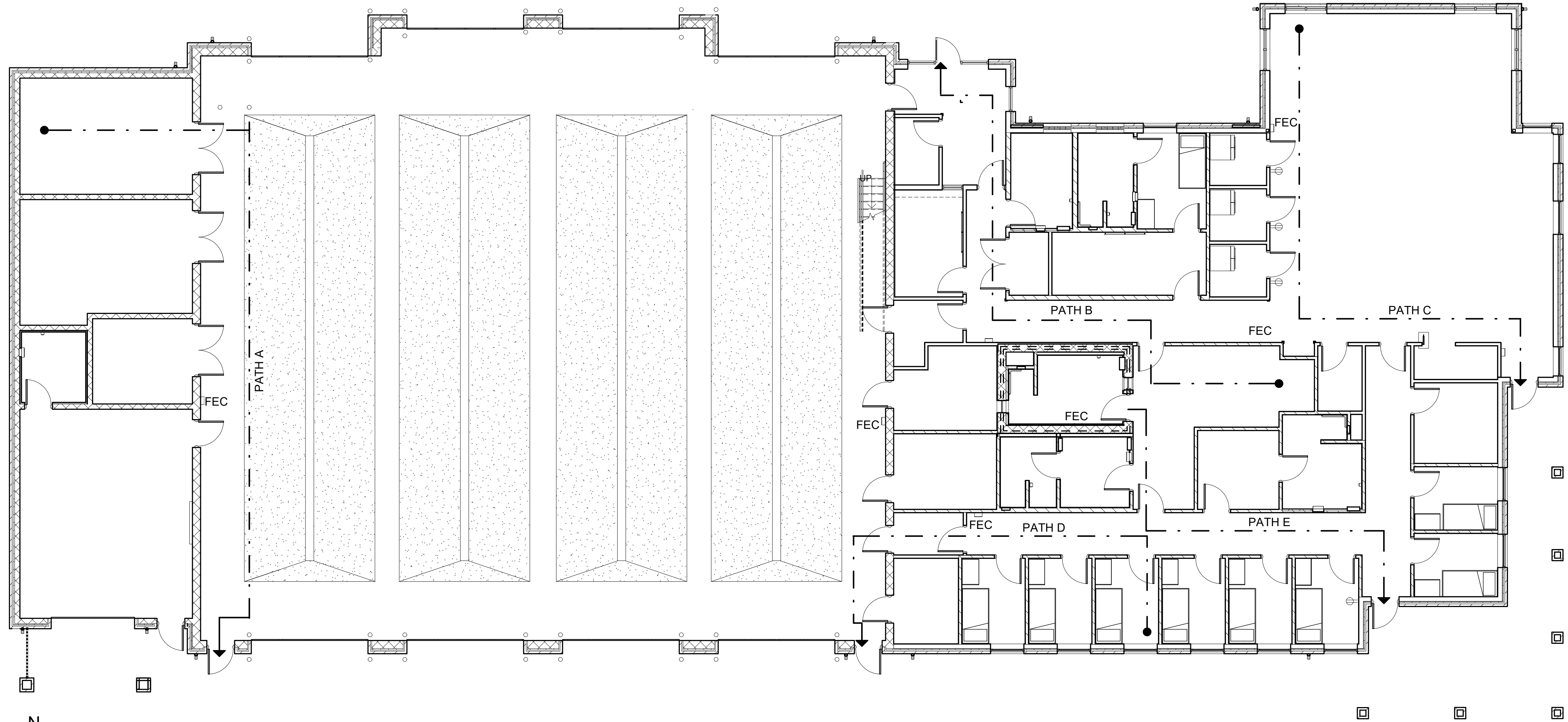
ACTUAL OCCUPANT LOAD 09 AOL
* THE SIZE OF THE SHIFT WHICH EQUALS THE NUMBER OF BEDS IN THE BLDG.*

FIRE STATION STORM SHELTER: SAFE ROOM AREA: AREA OF NO FURNISHINGS: ADA OCCUPANTS: OCCUPANTS:	ICC-500-2014 (USING ACTUAL OCCUPANT LOAD) 112.09 SF_ 96 SF_ 10 SF PER OCCUPANT: 1 OL 5 SF PER OCCUPANT (96SF-10SF = 86SF/ 5SF):17 OL 18 OL
TOTAL OCCUPANCY:	SECTION 1005.1 REQUIRED: 80 OL X .2 = 16" PROVIDED: 160"
REQUIRED MINIMUM EGRESS WIDTH EGRESS WIDTH DOORS .2 INCHES PER OCCUPANT	(TABLE 1006.3.2 and TABLE 1006.3.3(2)) 2 PER FLOOR
MINIMUM NUMBER OF EXITS OCCUPANCY B	SECTION 1017 300'-0"
EXIT ACCESS TRAVEL DISTANCE OCCUPANCY B WITH NO SPRINKLER	TABLE 508.4 NO SEPERATION REQUIREMENT
AREA SEPARATION WALL B - B	TABLE 2902.1 BUSINESS - 1 PER 25 (FIRST 50) 1 PER 50 (REMAINING): 80 OL = 3 BUSINESS - 1 PER 40 (FIRST 80) 1 PER 80 (REMAINING): 80 OL = 2
PLUMBING WATER CLOSET/LAVATORY:	BUSINESS - NONE BUSINESS - 1 BUSINESS - 1 PER 100 ACTUAL WATER CLOSET = 10 (6 TOILETS/4 URINALS) ACTUAL LAVATORY = 7 ACTUAL SHOWER = 4 ACTUAL MOP SINK = 1 ACTUAL ELECTRIC WATER COOLERS: 2 - HI/LOW UNIT
LAVATORY:	
SHOWER: MOP SINK: DRINKING FOUNTAINS:	
PARKING REQUIREMENTS H/C SPACE (UNDER 100) PARKING SPACES	TABLE 1106.1 REQUIRED: 1 H/C SPACE PER 25 SPACES PROVIDED: 2 H/C PARKING SPACE 24 REGULAR PARKING SPACES 26 TOTAL PARKING SPACES

GENERAL NOTES / LEGEND

- A. "= = = = =" INDICATES 2-HR RATED WALL
- B. FEC = FIRE EXTINGUISHER CABINET

TRAVEL DISTANCE	
Travel Path	Travel Distance
	0"
PATH A	92' - 4 3/8"
PATH B	78' - 7"
PATH C	69' - 4 1/4"
PATH D	60' - 11 3/4"
PATH E	53' - 11 15/16"

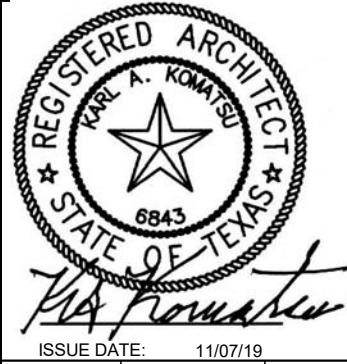


1
G0.02

FIRST FLOOR PLAN
1/8" = 1'-0"

4' 0 4' 8' 16'
GRAPHIC SCALE: 1/8" = 1'-0"

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ISSUE DATE: 11/07/18

MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

LIFE SAFETY PLAN

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

G0.02

CITY OF MANSFIELD
INST# D213125824
D.R.T.C.T.

LEGEND:

PROPERTY BOUNDARY SUBJECT

PROPERTY BOUNDARY ADJOINER

EX. FENCE

EX. GAS LINE

EX. WATER LINE

EX. SEWER LINE

EX. STORM DRAIN

EX. FIBER OPTIC

EX. BUILDING

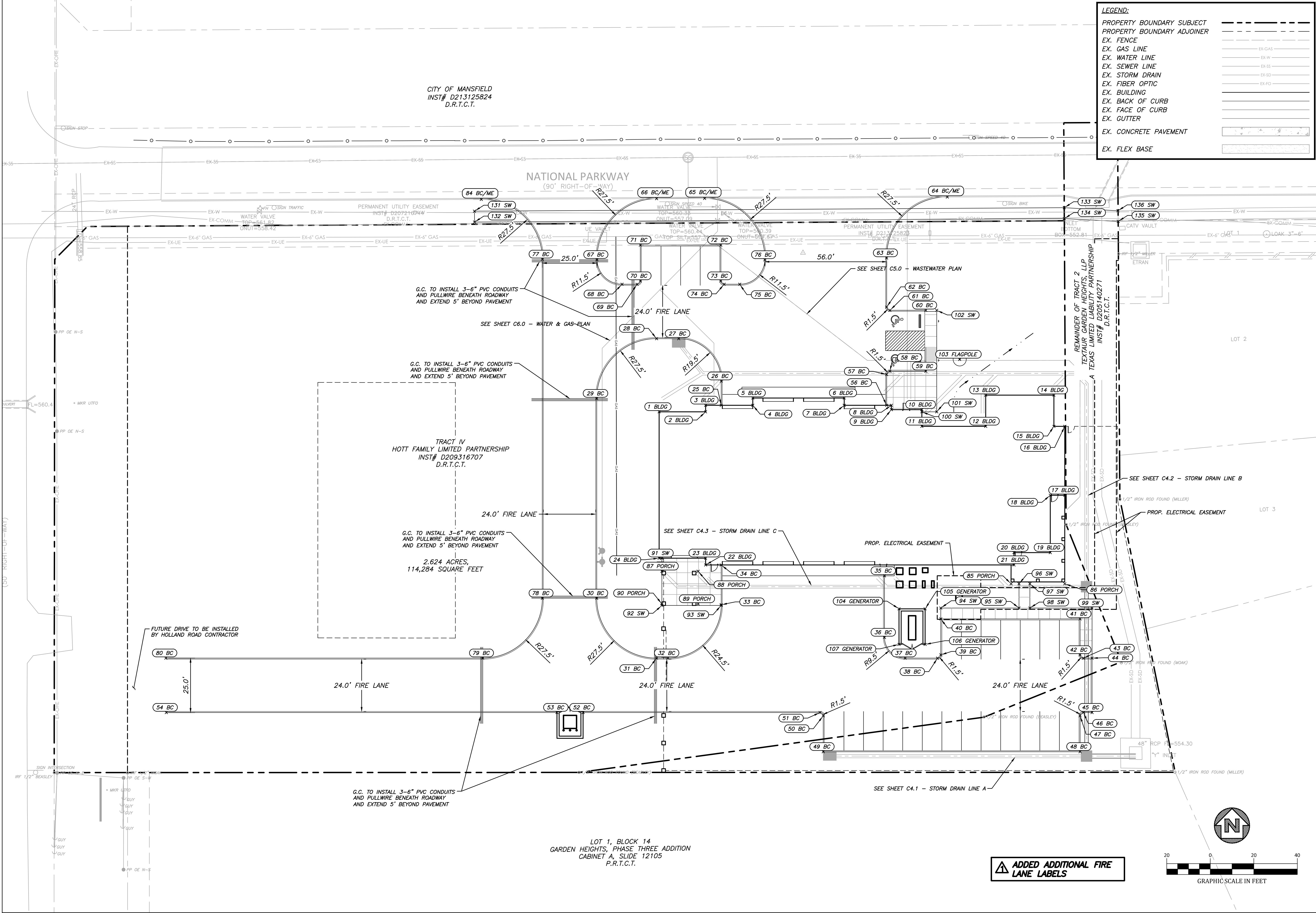
EX. BACK OF CURB

EX. FACE OF CURB

EX. GUTTER

EX. CONCRETE PAVEMENT

EX. FLEX BASE



MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

DATE: 12/10/2019

SHEET: C1.0

James DeOtte Engineering, Inc.

2201 Dottie Lynn Parkway, Suite 119
Fort Worth, Texas 76120
TIRE Firm Reg. No. 8917
TBS Firm Reg. No. 10101400

James E. DeOtte
65840
REGISTERED PROFESSIONAL ENGINEER

Date: 12/10/2019

ADDENDUM 1

1

12/10/19

Date

REVISIONS

Description

No.

FINAL DESIGN

COORDINATE CONTROL PLAN

!!!CAUTION!!!
APPROXIMATE LOCATION OF
EXISTING UNDERGROUND UTILITIES.
CONTRACTOR SHALL USE EXTREME
CAUTION WHEN IN THIS AREA.

GARDEN HEIGHTS
PHASE THREE, SECTION 1
INST# D213250013
P.R.T.C.T.

LOT 1, BLOCK 14
GARDEN HEIGHTS, PHASE THREE ADDITION
CABINET A, SLIDE 12105
P.R.T.C.T.

LEGEND:	
PROPERTY BOUNDARY SUBJECT	---
PROPERTY BOUNDARY ADJOINER	---
EX. FENCE	---
EX. GAS LINE	---
EX. WATER LINE	---
EX. SEWER LINE	---
EX. STORM DRAIN	---
EX. FIBER OPTIC	---
EX. BUILDING	---
EX. BACK OF CURB	---
EX. FACE OF CURB	---
EX. GUTTER	---
PROP. STORM CENTERLINE	---
PROP. STORM DRAIN	---

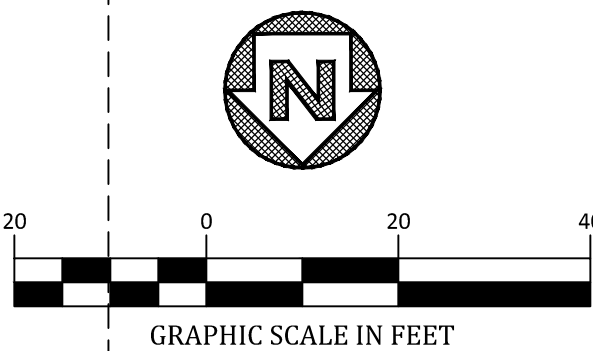
STA 0+00.00 ~ STORM DRAIN LINE A
CONNECT TO EXISTING Y INLET
E 21" IN = 554.30 (W)
N 6887981.18
E 2410578.18

STA 0+22.59 ~ STORM DRAIN LINE A =
STA 0+00.00 ~ STORM DRAIN LINE B
CONST CASCADE SEPERATOR
OR APPROVED EQUAL
N 6887981.18
E 2410555.59

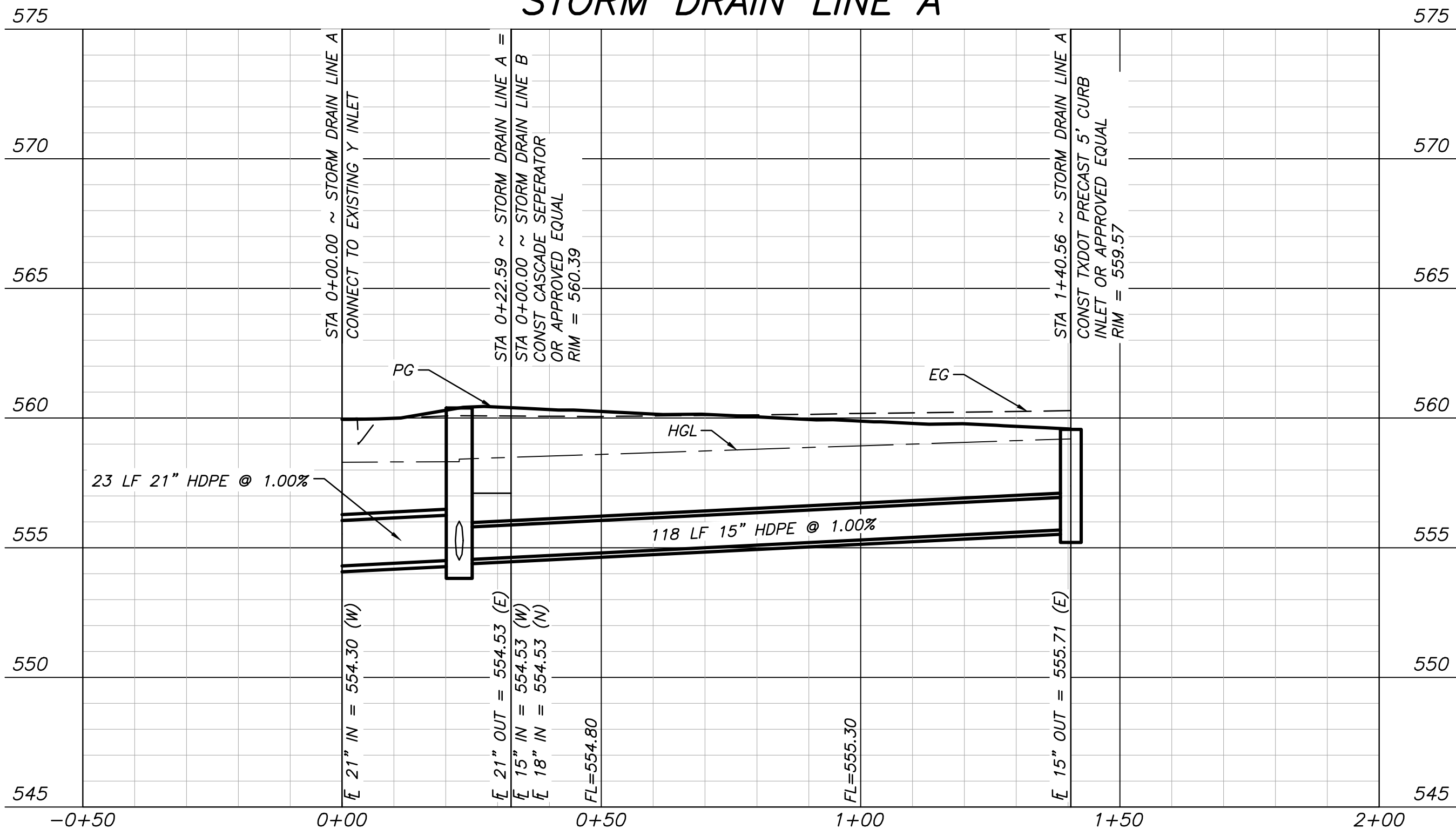
STA 1+40.56 ~ STORM DRAIN LINE A
CONST TXDOT PRECAST 5' CURB
INLET OR APPROVED EQUAL
N 6887981.18
E 2410437.63

2.624 ACRES,
114,284 SQUARE FEET
TRACT IV
HOTT FAMILY LIMITED PARTNERSHIP
INST# D209316707
D.R.T.C.T.

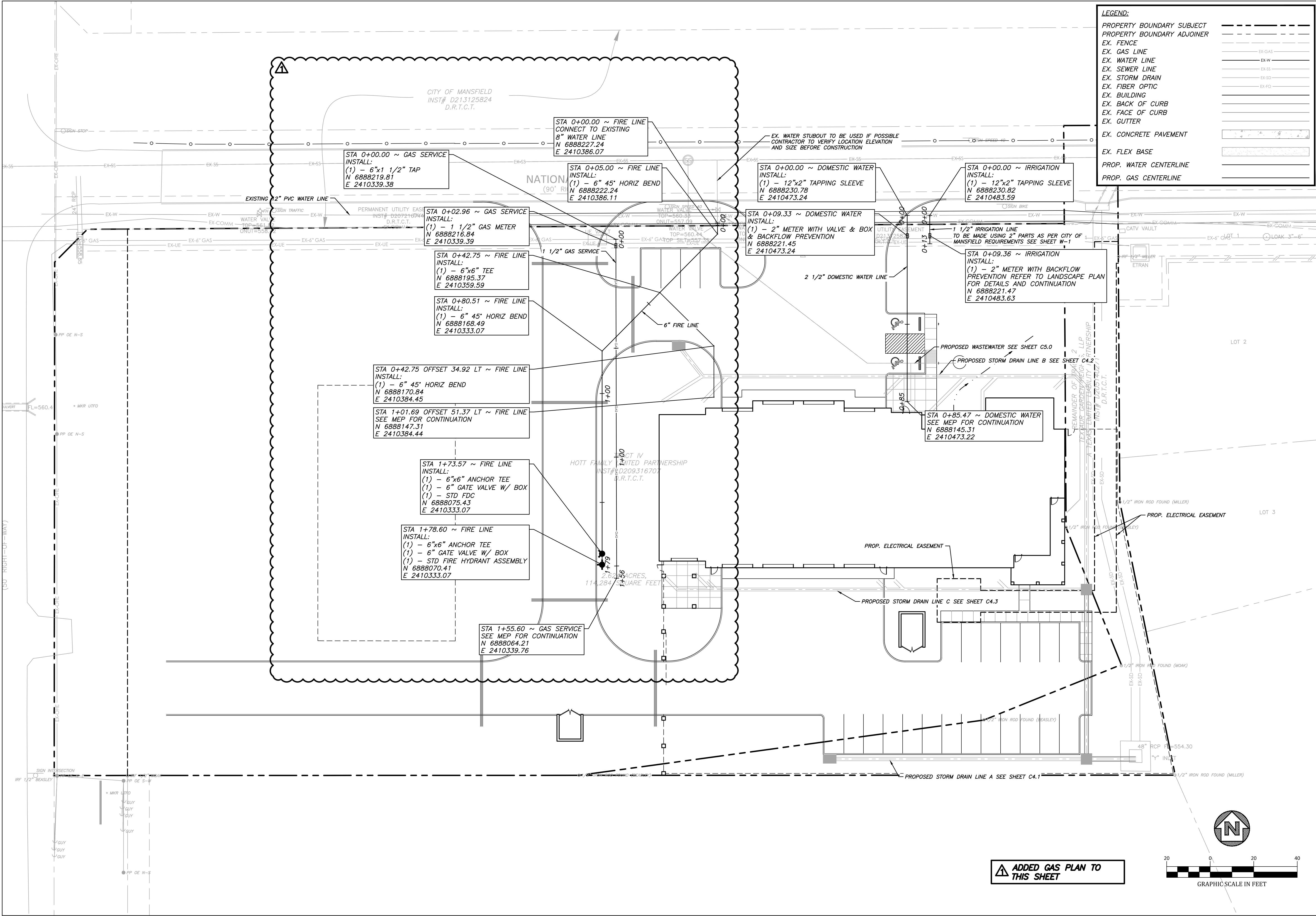
CHANGED TO CASCADE
SEPERATOR



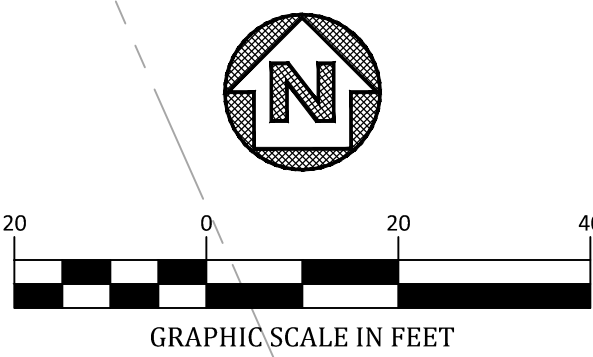
STORM DRAIN LINE A



MANSFIELD FIRE STATION NO. 5		4444 National Parkway Mansfield, Texas 76063		STORM DRAIN LINE A	
SHEET SIZE: 22 x 34		JOB NO: 2016.166		DATE: 12/10/2019	
SHEET:		C4.1			
James DeOtte Engineering, Inc.		2201 Dottie Lynn Parkway, Suite 119 Fort Worth, Texas 76120 Tape Firm Reg. No. 8917 TBS Firm Reg. No. 10101400		FINAL DESIGN	
James E. DeOtte		65840		REGISTERED PROFESSIONAL ENGINEER	
Date: 12/10/2019					
ADDENDUM 1		No. 1		Description	
12/10/19		Date		REVISIONS	

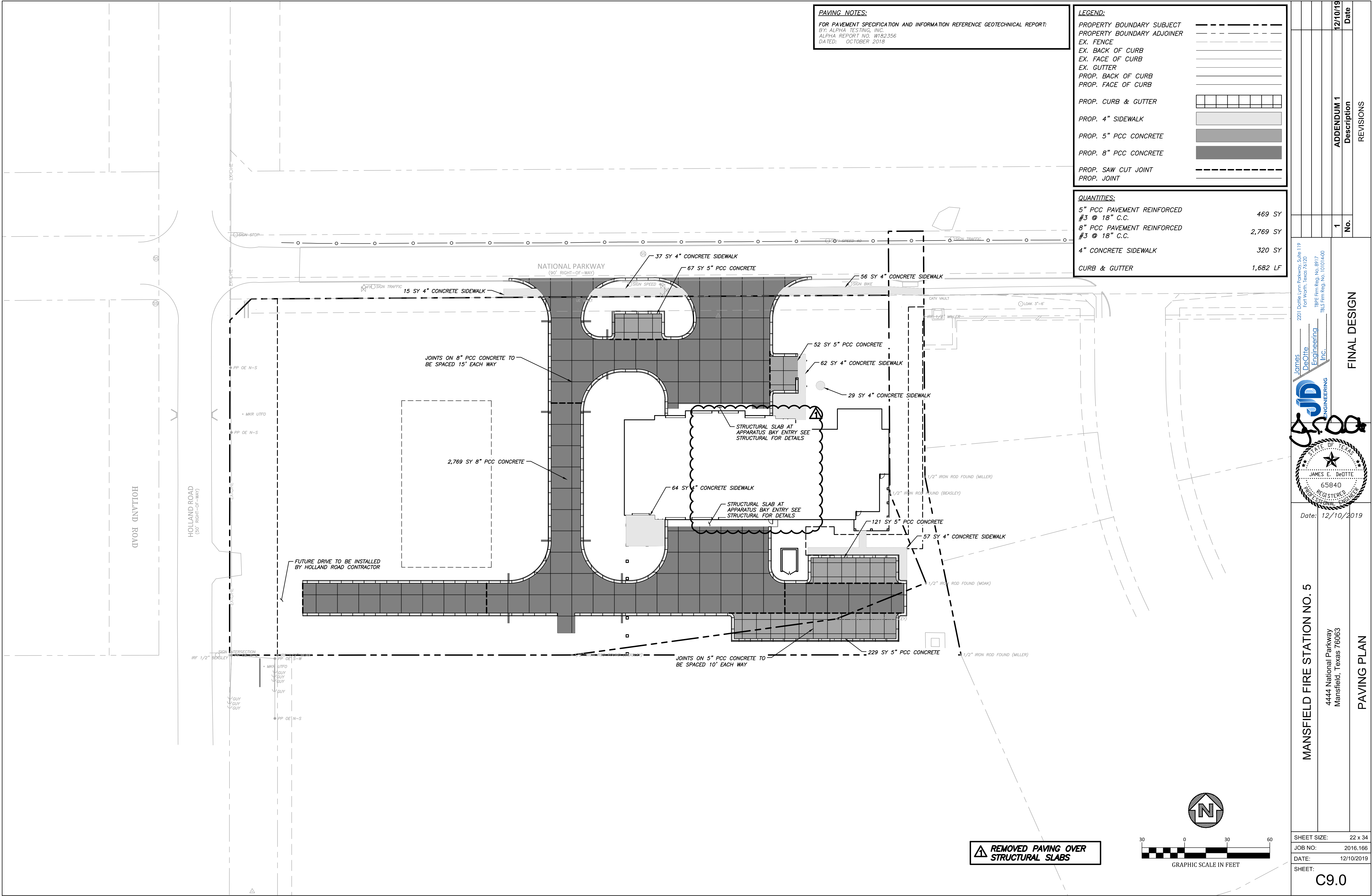


ADDED GAS PLAN TO THIS SHEET



LEGEND:	
PROPERTY BOUNDARY SUBJECT	---
PROPERTY BOUNDARY ADJOINER	---
EX. FENCE	---
EX. GAS LINE	---
EX. WATER LINE	---
EX. SEWER LINE	---
EX. STORM DRAIN	---
EX. FIBER OPTIC	---
EX. BUILDING	---
EX. BACK OF CURB	---
EX. FACE OF CURB	---
EX. GUTTER	---
EX. CONCRETE PAVEMENT	---
EX. FLEX BASE	---
PROP. WATER CENTERLINE	---
PROP. GAS CENTERLINE	---

MANSFIELD FIRE STATION NO. 5		4444 National Parkway Mansfield, Texas 76063		WATER & GAS PLAN	
SHEET SIZE: 22 x 34		JOB NO: 2016.166		DATE: 12/10/2019	
DATE: 12/10/2019		SHEET: C6.0		SHEET: C6.0	
James DeOtte Engineering, Inc.		2201 Dottie Lynn Parkway, Suite 119 Fort Worth, Texas 76120 TBE Firm Reg. No. 8917 TBS Firm Reg. No. 10101400		FINAL DESIGN	
James DeOtte		Professional Engineer		Date: 12/10/2019	
ADDENDUM 1		Description		REVISIONS	
1		No.		Date	



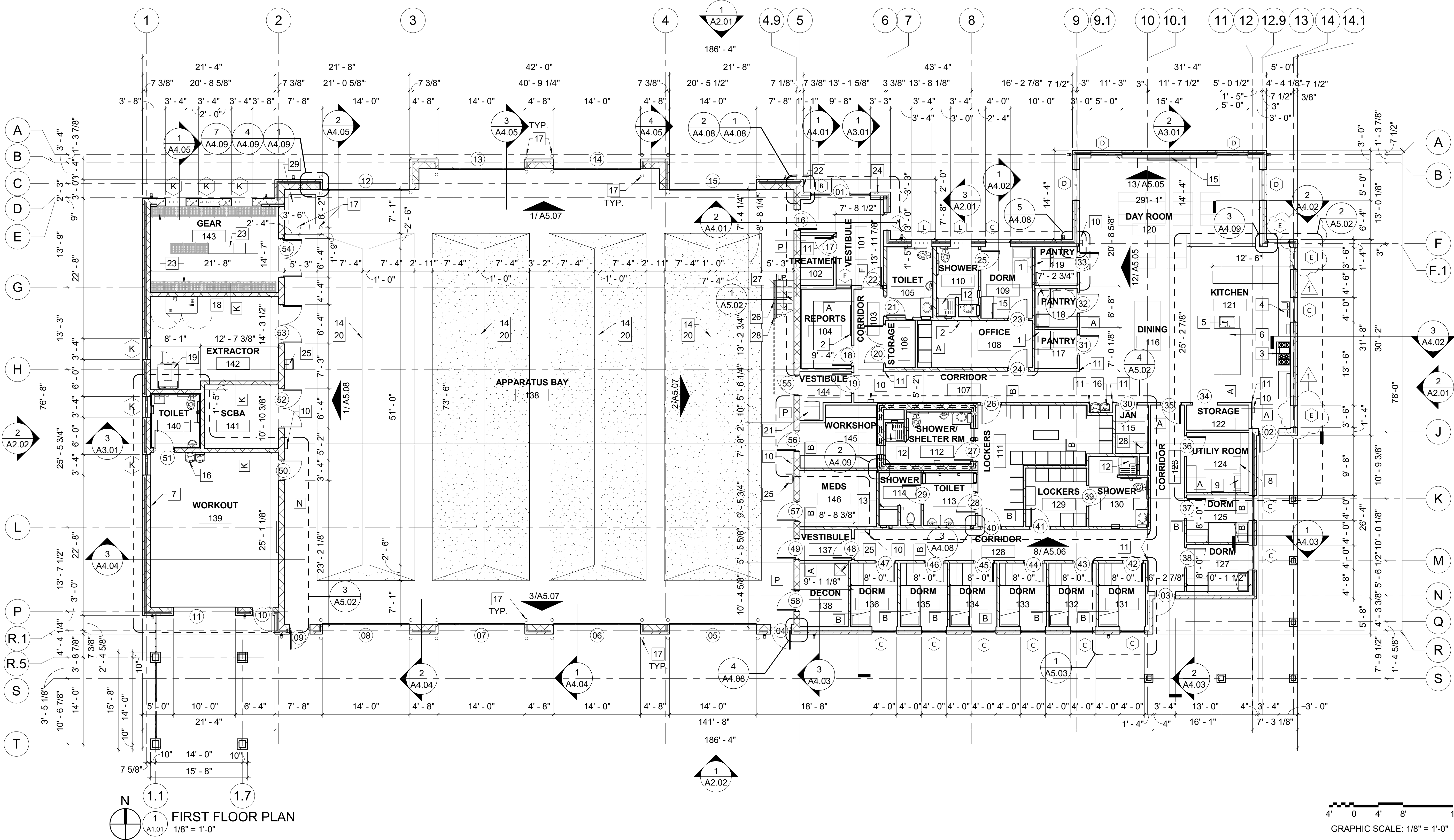
GENERAL NOTES

- A. REFER TO SHEET G0.01 FOR SYMBOLS LEGEND.
B. REFER TO SHEET A5.01 FOR FINISH SCHEDULE.
C. ALL NOTES BY SYMBOL ARE SHEET SPECIFIC.
D. REFER TO SHEET A1.04 FOR PARTITION TYPES.
E. ALL WOOD BLOCKING AND NAILERS SHALL BE FIRE RETARDANT TREATED.
F. " " INDICATES STUD WALLS W/ SOUND ATTENUATION BATTS
G. " = " = " INDICATES TWO HOUR RATED WALL

NOTES BY NUMBER

1. REFRIGERATOR/FREEZER WITH ICE MAKER.
2. DRY ERASE BOARD 'MB'
3. COOKTOP RANGE AND VENT HOOD WITH ANSUL, REFER MECHANICAL
4. STAINLESS STEEL DOUBLE UNDERMOUNT SINK WITH DISPOSAL.
5. STAINLESS STEEL SINGLE UNDERMOUNT SINK WITH DISPOSAL.
6. DISHWASHER
7. WALL MOUNT MIRRORS, ALONG ENTIRE WALL
8. CLOTHES DRYER.
9. CLOTHES WASHING MACHINE
10. FIRE EXTINGUISHER CABINET
11. CORNER GUARD
12. TAS SHOWER WITH TRENCH DRAIN, REF. 3/A5.03
13. NON TAS SHOWER WITH TRENCH DRAIN, REF. 4/A5.03
14. CONCRETE TRENCH, TRENCH FLOOR TO SLOPE 1/4" PER FOOT OR MORE FROM ENDS OF TRENCH TO DRAIN, REFER STRUCTURAL
15. PROVIDE BLOCKING FOR WALL MOUNTED MONITOR
16. ELECTRIC WATER COOLER WITH BOTTLE FILLERS, REFER PLUMBING
17. PREFINISHED STEEL BOLLARD COVER, REF. DETAIL 2/A0.03.
18. DRYING RACK (OWNER PROVIDED, CONTRACTOR INSTALLED)
19. EXTRACTOR (OWNER PROVIDED, CONTRACTOR INSTALLED)
20. TRENCH GRATE AND DRAIN, REFER PLUMBING
21. ICE MACHINE WITH STORAGE BIN
22. KNOX BOX (VERIFY LOCATION WITH FIRE CHIEF)
23. GEAR LOCKERS
24. BUILDING PLAQUE, REFER 2/A2.03

25. SERVICE SINK, REFER PLUMBING
26. 1 1/2" O.D. GALVANIZED STEEL HANDRAIL (36")/GUARDRAIL (42")
27. 1 1/2" O.D. GALVANIZED STEEL HANDRAIL (36")
28. 1 1/2" O.D. GALVANIZED STEEL PIPERAIL (12") FOR CANE DETECTION, ALIGN WITH STAIR STRINGER ABOVE.
29. FIRE RISER, REFER FIRE PROTECTION



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MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

FLOOR PLAN

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A1.01

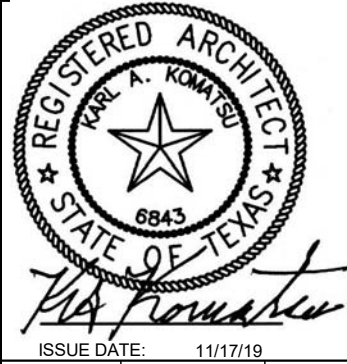
GENERAL NOTES

- A. REFER TO SHEET G0.01 FOR SYMBOLS LEGEND.
B. REFER TO SHEET A5.01 FOR FINISH SCHEDULE.
C. ALL NOTES BY SYMBOL ARE SHEET SPECIFIC.
D. REFER TO SHEET A1.05 FOR PARTITION TYPES.
E. ALL WOOD BLOCKING AND NAILERS SHALL BE FIRE RETARDANT TREATED.
F. " " INDICATES STUD WALLS W/ SOUND ATTENUATION BATTS
G. " = = " INDICATES TWO HOUR RATED WALL

NOTES BY NUMBER

1. 1 1/2" O.D. GALVANIZED STEEL PIPE HANDRAIL (36")/GUARDRAIL (42") WITH SUPPORTS EVERY 5'-0" MAX. WHERE HANDRAILS ARE SUPPORTED BY GUARDRAILS, ALL HANDRAIL TERMINATIONS WILL BE TO A VERTICAL GUARDRAIL POST. 1/2" DIAMETER STEEL ROD BALUSTERS SPACED 4" O.C. MAX. REFER DETAILS 3,4,5,6/A4.10
2. 1 1/2" O.D. GALVANIZED STEEL PIPE HANDRAIL (36"), WITH SUPPORTS EVERY 5'-0" O.C., ATTACH TO WALL, REFER DETAILS 3,4,5,6/A4.10
3. 1 1/2" O.D. GALVANIZED STEEL PIPE GUARDRAIL, WITH SUPPORTS EVERY 5'-0" MAX. 1/2" DIAMETER STEEL ROD BALUSTERS SPACED 4" O.C. MAX
4. CONCRETE FILLED METAL PAN STAIRS, REFER 4,5,6/A4.10
5. FIRE EXTINGUISHER
6. FUNCTION OF MEZZANINE 147 IS TO BE AN EQUIPMENT MEZZANINE FOR MECHANICAL, ELECTRICAL, PLUMBING AND TECHNOLOGY EQUIPMENT.

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ISSUE DATE: 11/17/18

MANSFIELD FIRE STATION NO. 5

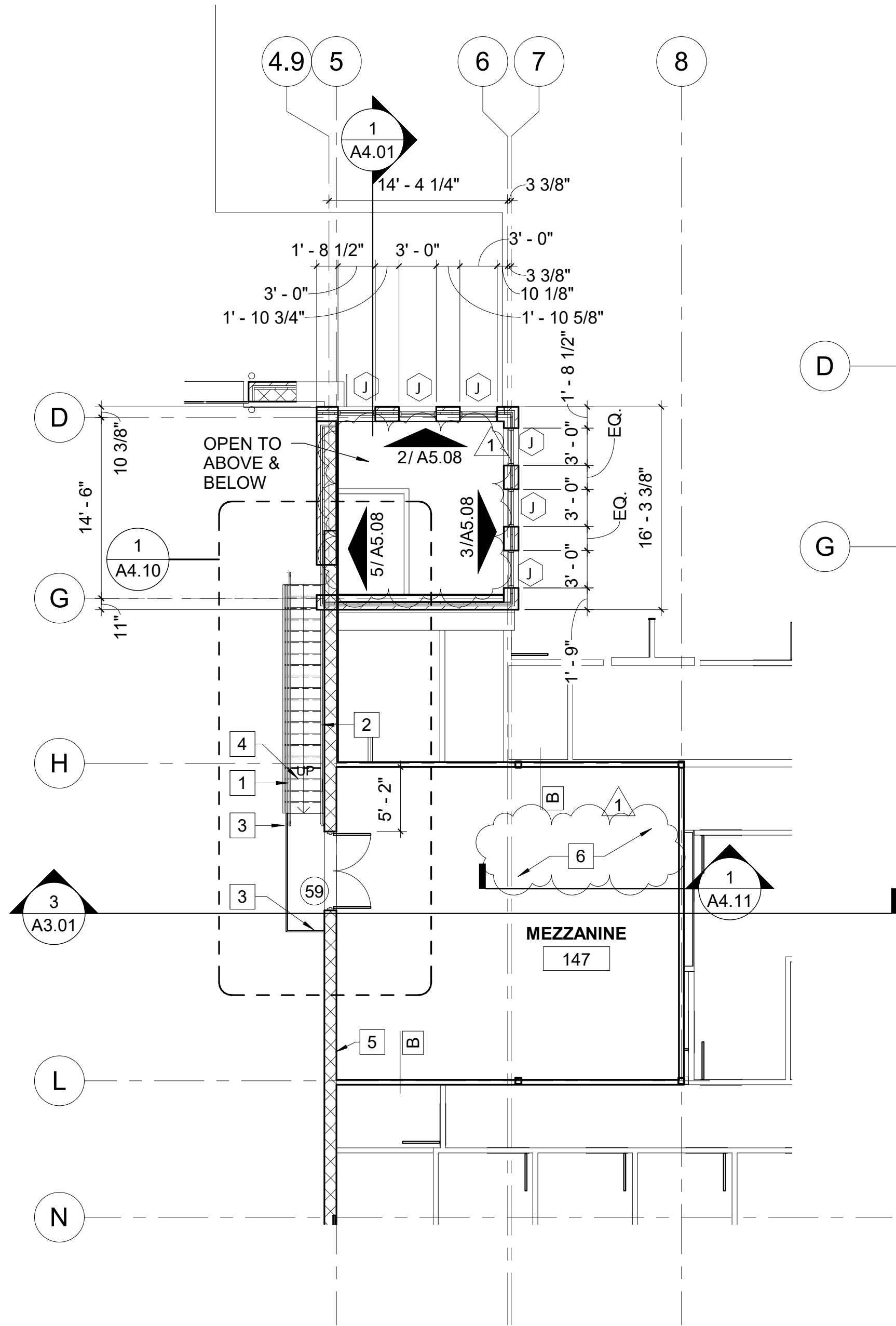
4444 National Parkway
Mansfield, Texas 76063

FLOOR PLAN - MEZZANINE LEVEL

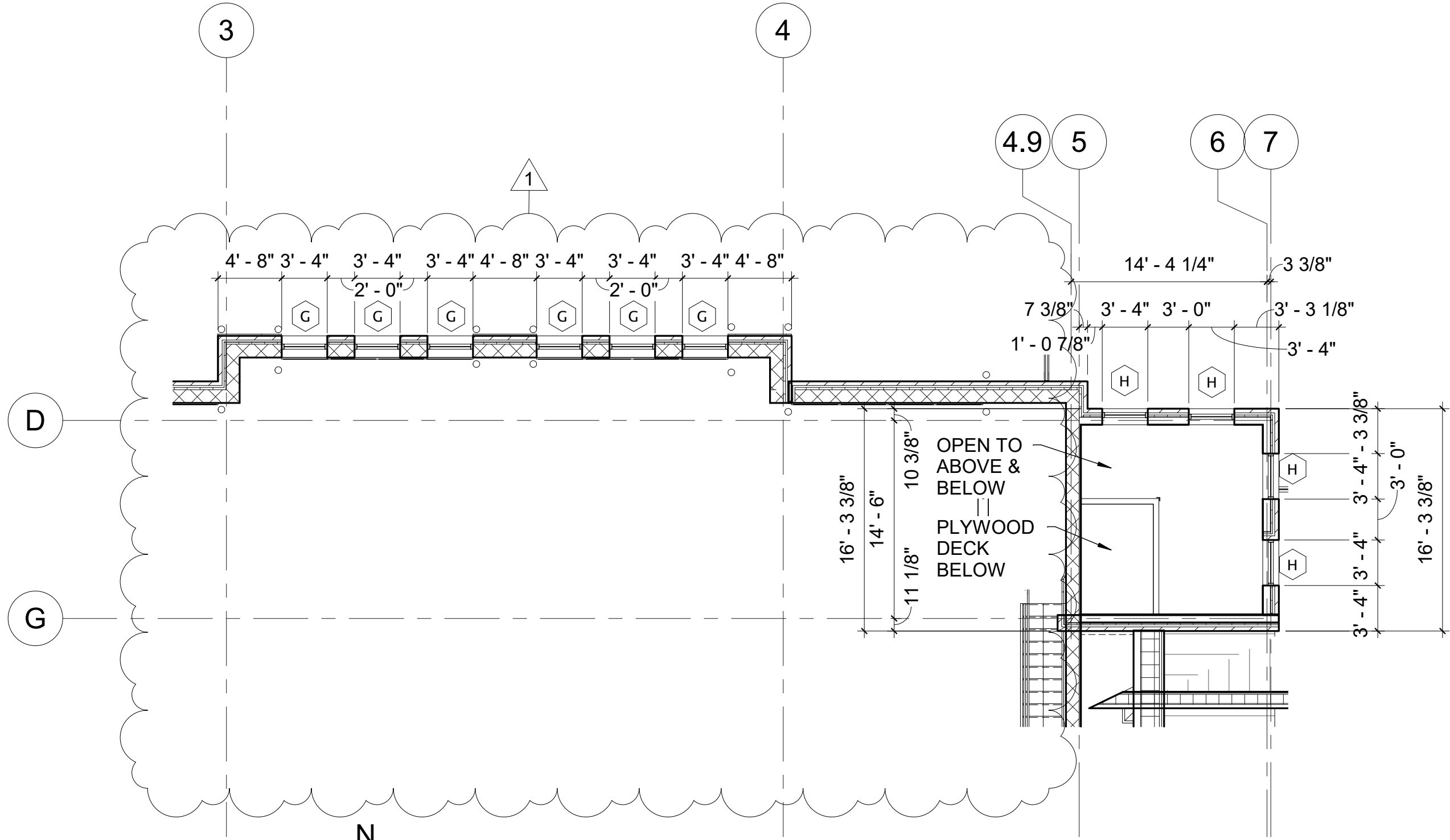
SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A1.02

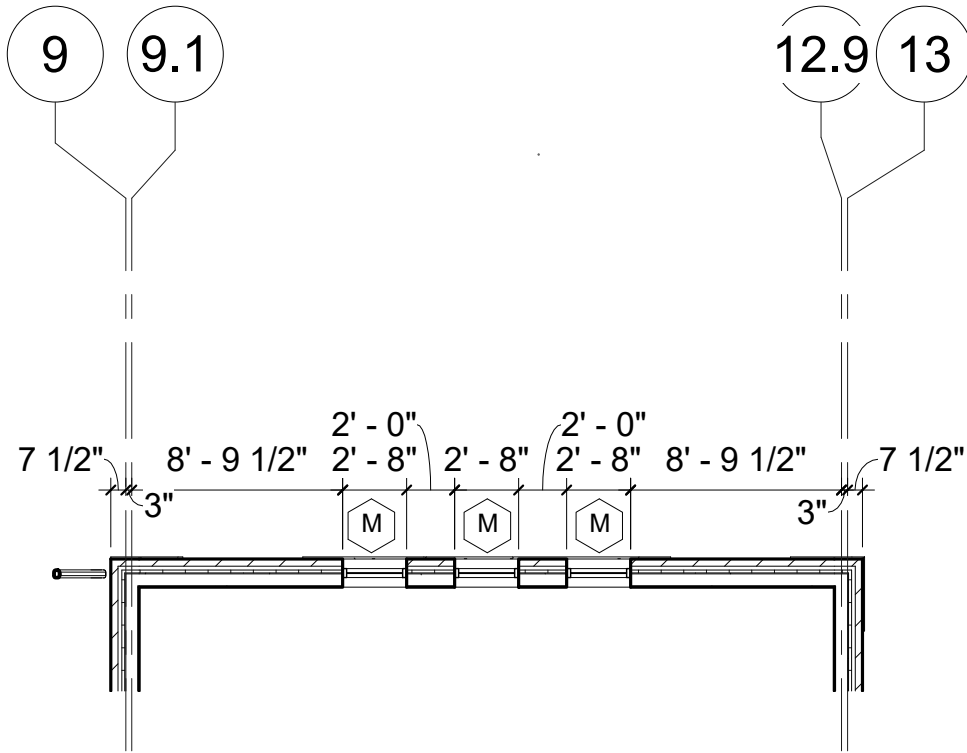
4' 0' 4' 8' 16'
GRAPHIC SCALE: 1/8" = 1'-0"



MEZZANINE FLOOR PLAN
1/8" = 1'-0"



INTERMEDIATE TOWER LEVEL
1/8" = 1'-0"



DAY ROOM INTERMEDIATE LEVEL
1/8" = 1'-0"

GENERAL NOTES

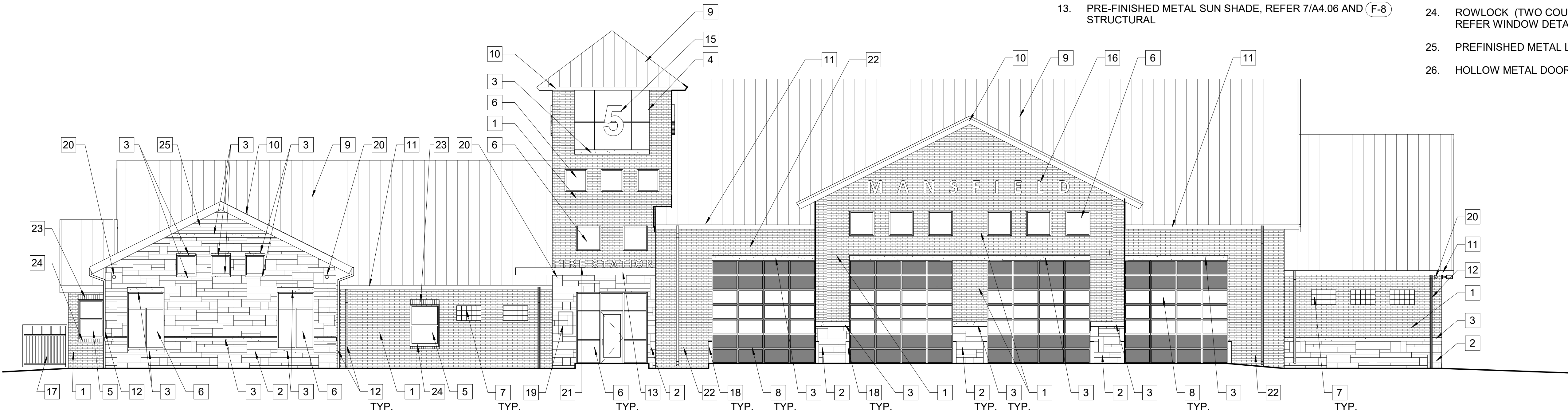
- A. REFER TO G0.01 FOR SYMBOLS LEGEND
B. ALL NOTES BY SYMBOL ARE SHEET SPECIFIC

EXTERIOR FINISH LEGEND

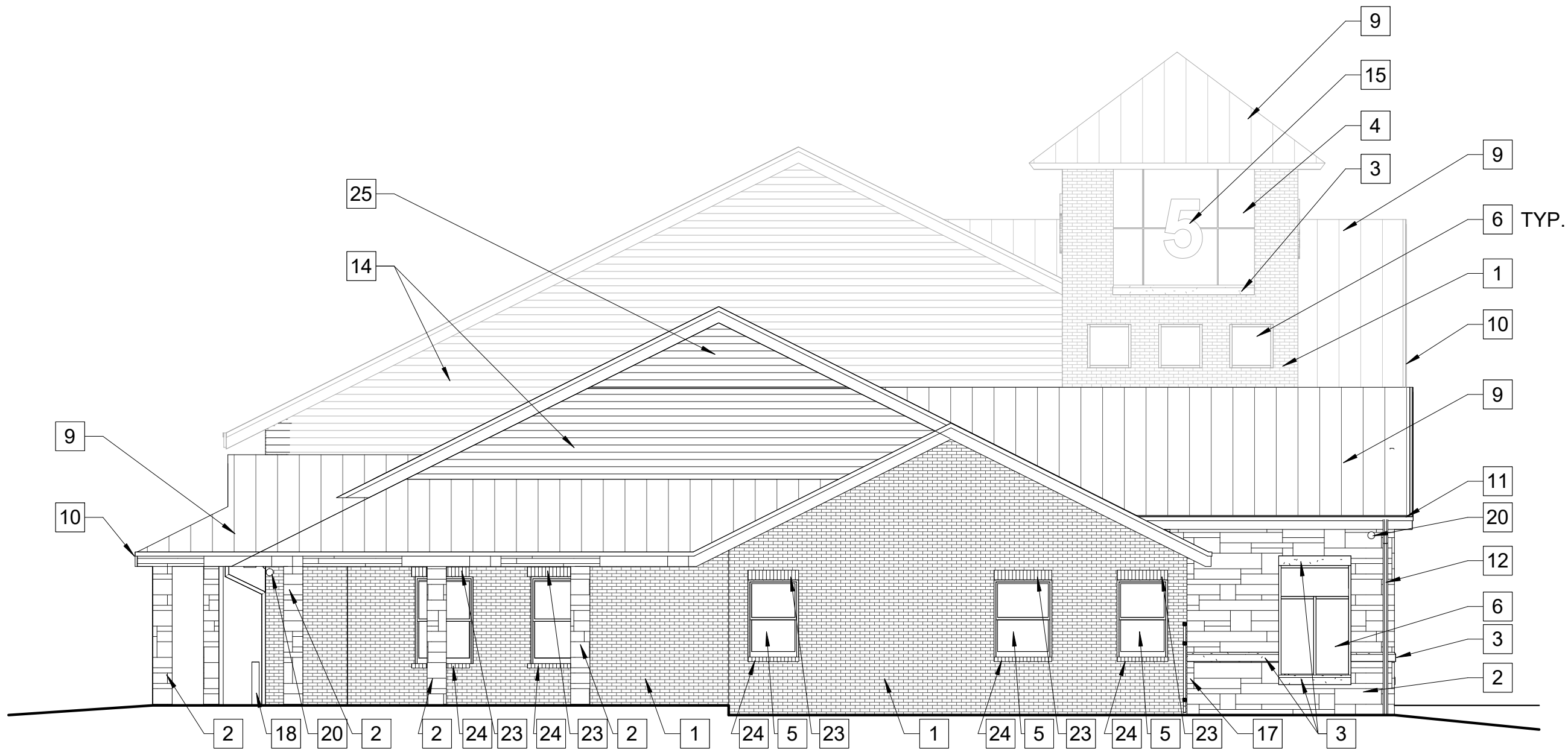
- (F-1) MODULAR FACE BRICK VENEER - FIELD COLOR - 'ACME': CRANBERRY
- (F-2) NATURAL (HONED) LUEDERS; RANDOM ASHLAR PATTERN SIZE TO BE 8", 10", 12" TALL WITH RANDOM CHOPPED LENGTHS, AVOID SLIVERS IN THIS PATTERN. SMOKEY RIVER OR BLUE CHARCOAL
- (F-3) CAST STONE - 'ACME': WHITESTONE
- (F-4) PAINTED METAL - 'PAC CLAD': GRANITE
- (F-5) ALUMINUM ANODIZED - CLEAR ANODIZED
- (F-6) ALUMINUM COMPOSITE PANEL - 'ALUCOBOND': CHAMPAGNE METALLIC COOL
- (F-7) MODULAR FACE BRICK VENEER - ACCENT COLOR - 'ACME': DARK IRON SPOT-VELOUR
- (F-8) PPG RAL 3011 BROWN RED

NOTES BY NUMBER

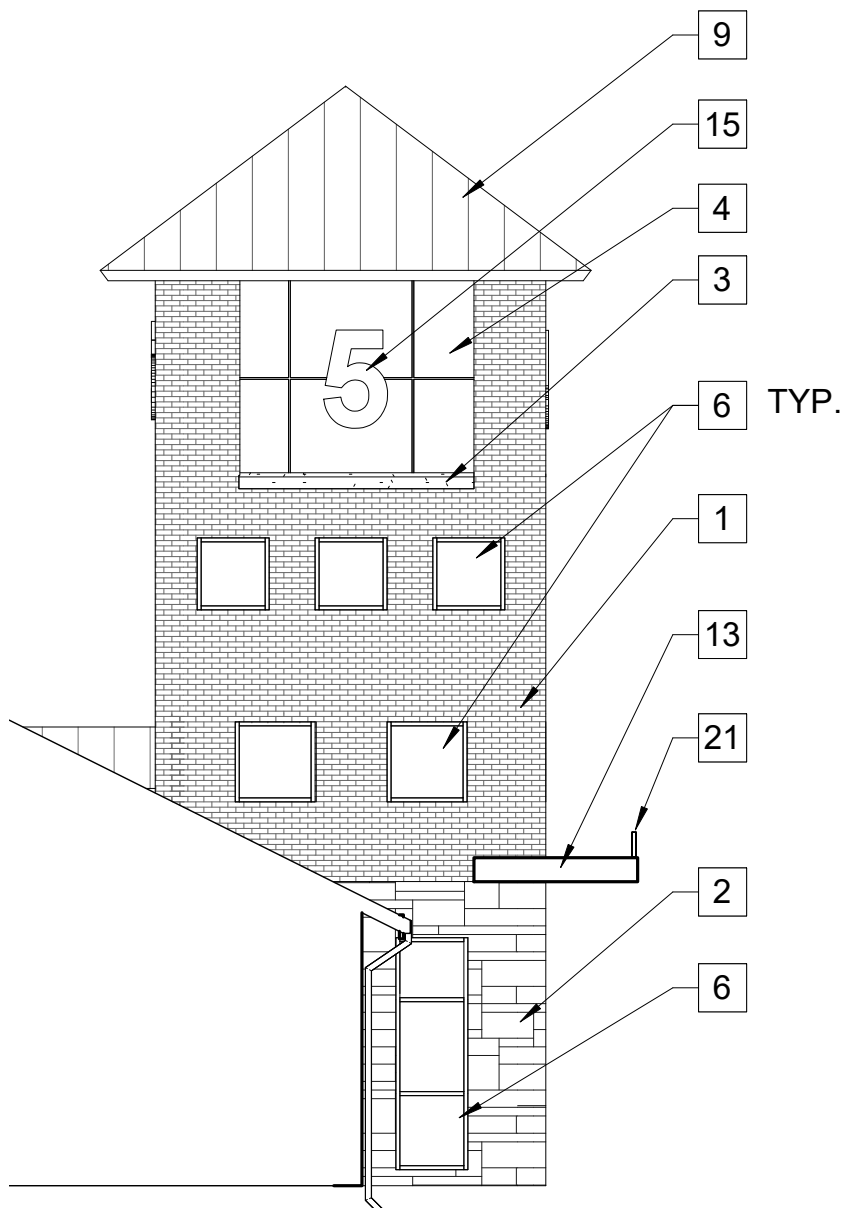
1. MODULAR FACE BRICK VENEER - FIELD COLOR (F-1)
2. NATURAL STONE VENEER (F-2)
3. CAST STONE (F-3)
4. ALUMINUM COMPOSITE PANEL (F-6)
5. SINGLE HUNG WINDOW AS SCHEDULED (F-5)
6. ALUMINUM STOREFRONT (F-5)
7. GLASSBLOCK WINDOW
8. OVERHEAD METAL AND INSULATED GLASS BAY DOOR (F-8)
9. PREFINISHED STANDING SEAM METAL ROOF (F-4)
10. PREFINISHED METAL FASCIA (F-4)
11. PREFINISHED METAL GUTTER (F-4)
12. PREFINISHED METAL DOWNSPOUT WITH CAST IRON BOOT (F-4)
13. PRE-FINISHED METAL SUN SHADE, REFER 7/A.06 AND (F-8) STRUCTURAL
14. PREFINISHED METAL WALL PANEL (F-4)
15. 48" TALL LIGHTED, ALUMINUM PINNED LETTERS, REFER 4/A2.03 AND ELECTRICAL.
16. 22" TALL LIGHTED, ALUMINUM PINNED LETTERS, REFER 1/A2.03 AND ELECTRICAL.
17. IRON FENCE, REFER A0.01 (F-4)
18. PREFINISHED STEEL BOLLARD, REFER 2, 3/A0.03 (F-4)
19. BUILDING PLAQUE, REFER 2/A2.03
20. BLANK PLATE FOR FUTURE SECURITY CAMERA, REFER ELECTRICAL
21. 12" TALL LIGHTED, ALUMINUM PINNED LETTERS, REFER 3/A2.03 AND ELECTRICAL.
22. MODULAR FACE BRICK VENEER - ACCENT COLOR (F-7)
23. ONE SOLDIER COURSE ABOVE WINDOW HEAD, REFER WINDOW DETAILS
24. ROWLOCK (TWO COURSES TALL) BELOW WINDOW SILL, REFER WINDOW DETAILS
25. PREFINISHED METAL LOUVER (F-4)
26. HOLLOW METAL DOOR 'PM'



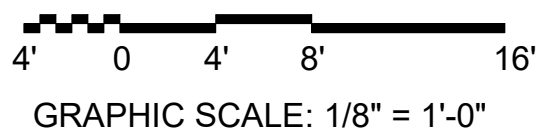
1 NORTH ELEVATION
1/8" = 1'-0"



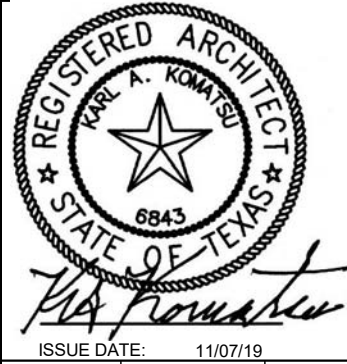
2 EAST ELEVATION
1/8" = 1'-0"



3 EAST TOWER ELEVATION
1/8" = 1'-0"



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MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

BUILDING ELEVATIONS

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A2.01

GENERAL NOTES

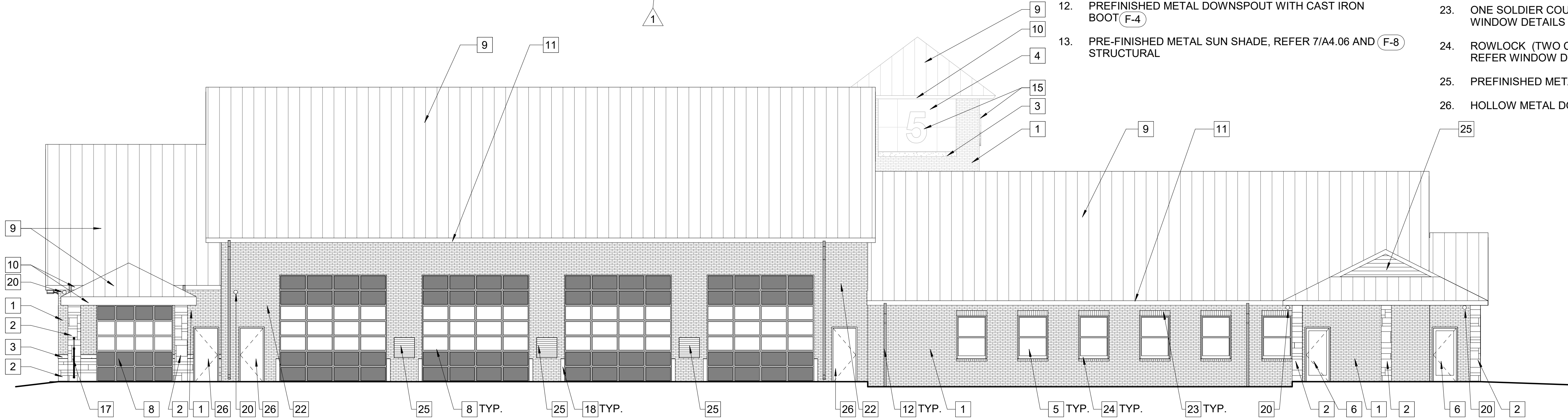
- A. REFER TO G0.01 FOR SYMBOLS LEGEND
B. ALL NOTES BY SYMBOL ARE SHEET SPECIFIC

EXTERIOR FINISH LEGEND

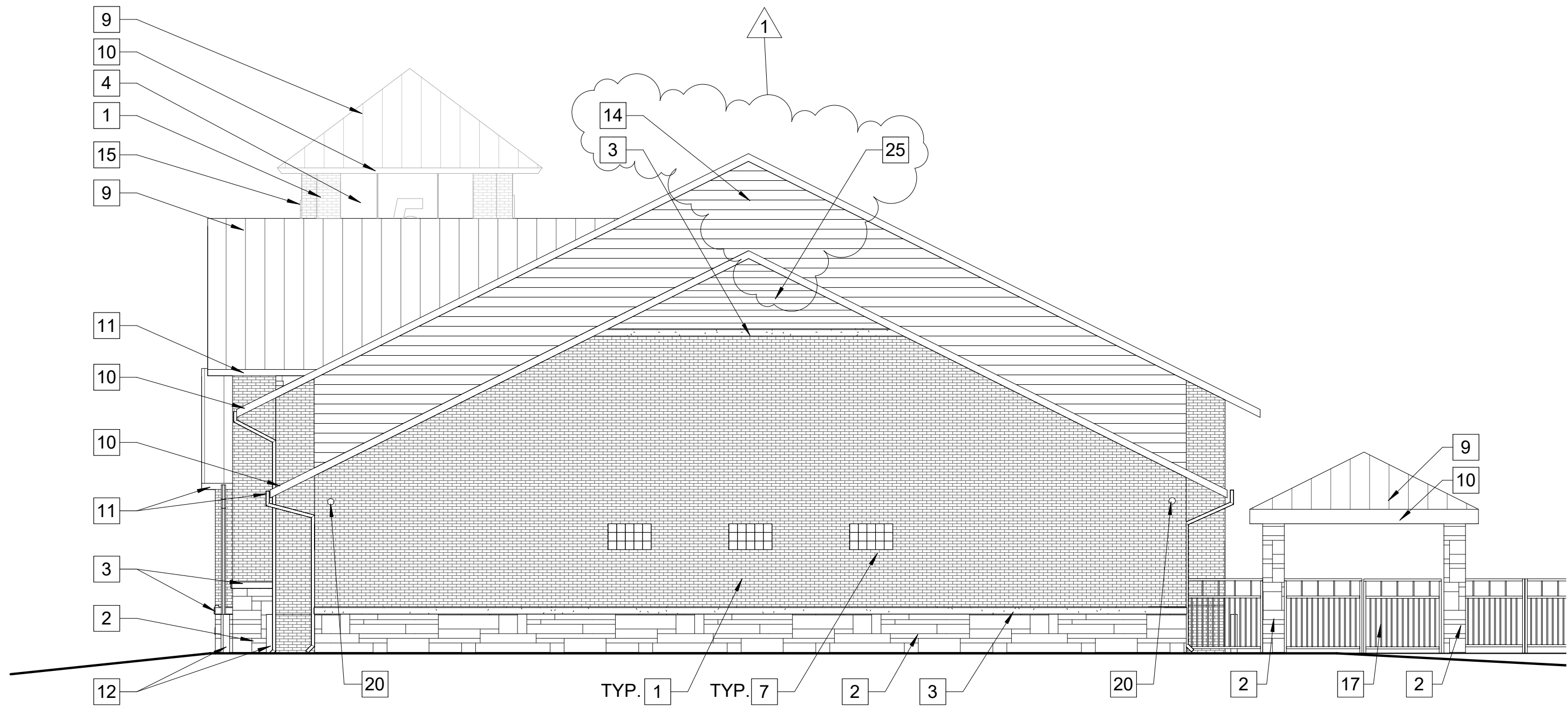
- (F-1) MODULAR FACE BRICK VENEER - FIELD COLOR - 'ACME': CRANBERRY
- (F-2) NATURAL (HONED) LUEDERS; RANDOM ASHLAR PATTERN SIZE TO BE 8", 10", 12" TALL WITH RANDOM CHOPPED LENGTHS, AVOID SLIVERS IN THIS PATTERN. SMOKEY RIVER OR BLUE CHARCOAL
- (F-3) CAST STONE - 'ACME': WHITESTONE
- (F-4) PAINTED METAL - 'PAC-CLAD': GRANITE
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- (F-6) ALUMINUM COMPOSITE PANEL - 'ALUCOBOND': CHAMPAGNE METALLIC COOL
- (F-7) MODULAR FACE BRICK VENEER - ACCENT COLOR - 'ACME': DARK IRON SPOT VELOUR
- (F-8) PPG RAL 3011 BROWN RED

NOTES BY NUMBER

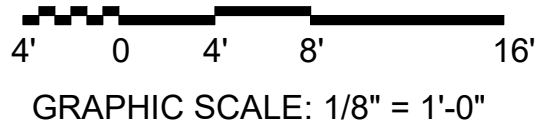
1. MODULAR FACE BRICK VENEER - FIELD COLOR (F-1)
2. NATURAL STONE VENEER (F-2)
3. CAST STONE (F-3)
4. ALUMINUM COMPOSITE PANEL (F-6)
5. SINGLE HUNG WINDOW AS SCHEDULED (F-5)
6. ALUMINUM STOREFRONT (F-5)
7. GLASSBLOCK WINDOW
8. OVERHEAD METAL AND INSULATED GLASS BAY DOOR (F-8)
9. PREFINISHED STANDING SEAM METAL ROOF (F-4)
10. PREFINISHED METAL FASCIA (F-4)
11. PREFINISHED METAL GUTTER (F-4)
12. PREFINISHED METAL DOWNSPOUT WITH CAST IRON BOOT (F-4)
13. PRE-FINISHED METAL SUN SHADE, REFER 7/A4.06 AND (F-8)
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15. 48" TALL LIGHTED, ALUMINUM PINNED LETTERS, REFER 4/A2.03 AND ELECTRICAL.
16. 22" TALL LIGHTED, ALUMINUM PINNED LETTERS, REFER 1/A2.03 AND ELECTRICAL.
17. IRON FENCE, REFER A0.01 (F-4)
18. PREFINISHED STEEL BOLLARD, REFER 2, 3/A0.03 (F-4)
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20. BLANK PLATE FOR FUTURE SECURITY CAMERA, REFER ELECTRICAL
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26. HOLLOW METAL DOOR 'PM'



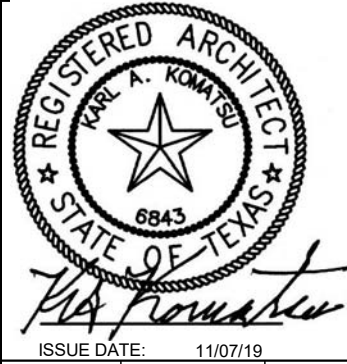
1 SOUTH ELEVATION
1/8" = 1'-0"



2 WEST ELEVATION
1/8" = 1'-0"



KOMATSU
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ISSUE DATE: 11/07/19

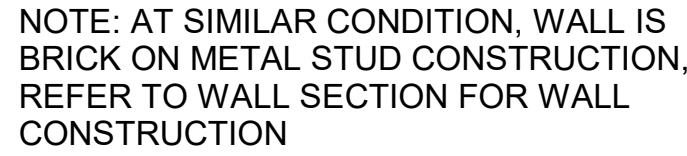
MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

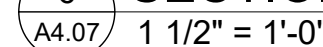
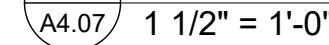
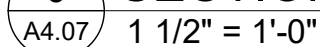
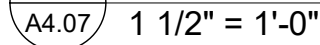
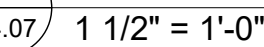
BUILDING ELEVATIONS

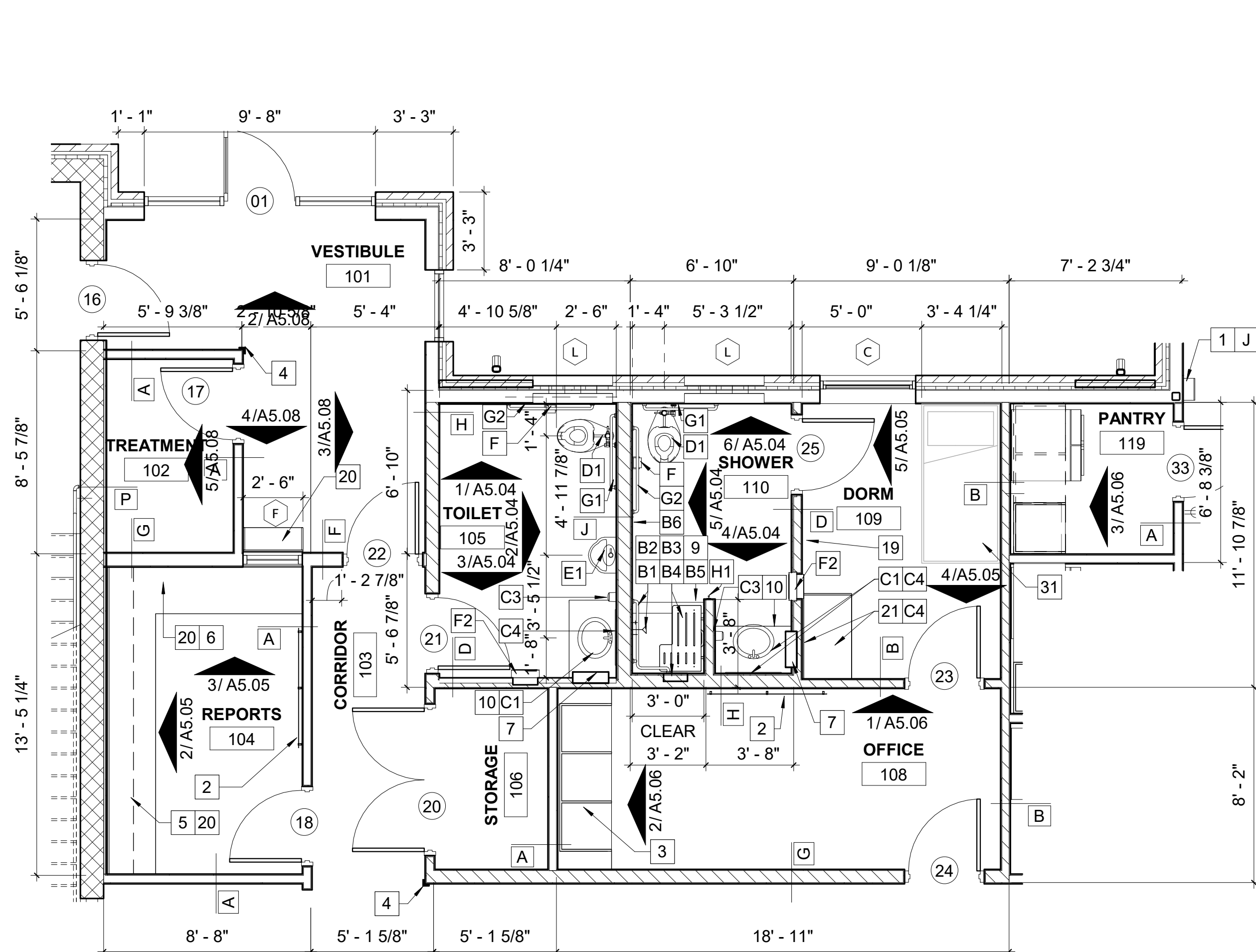
SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A2.02



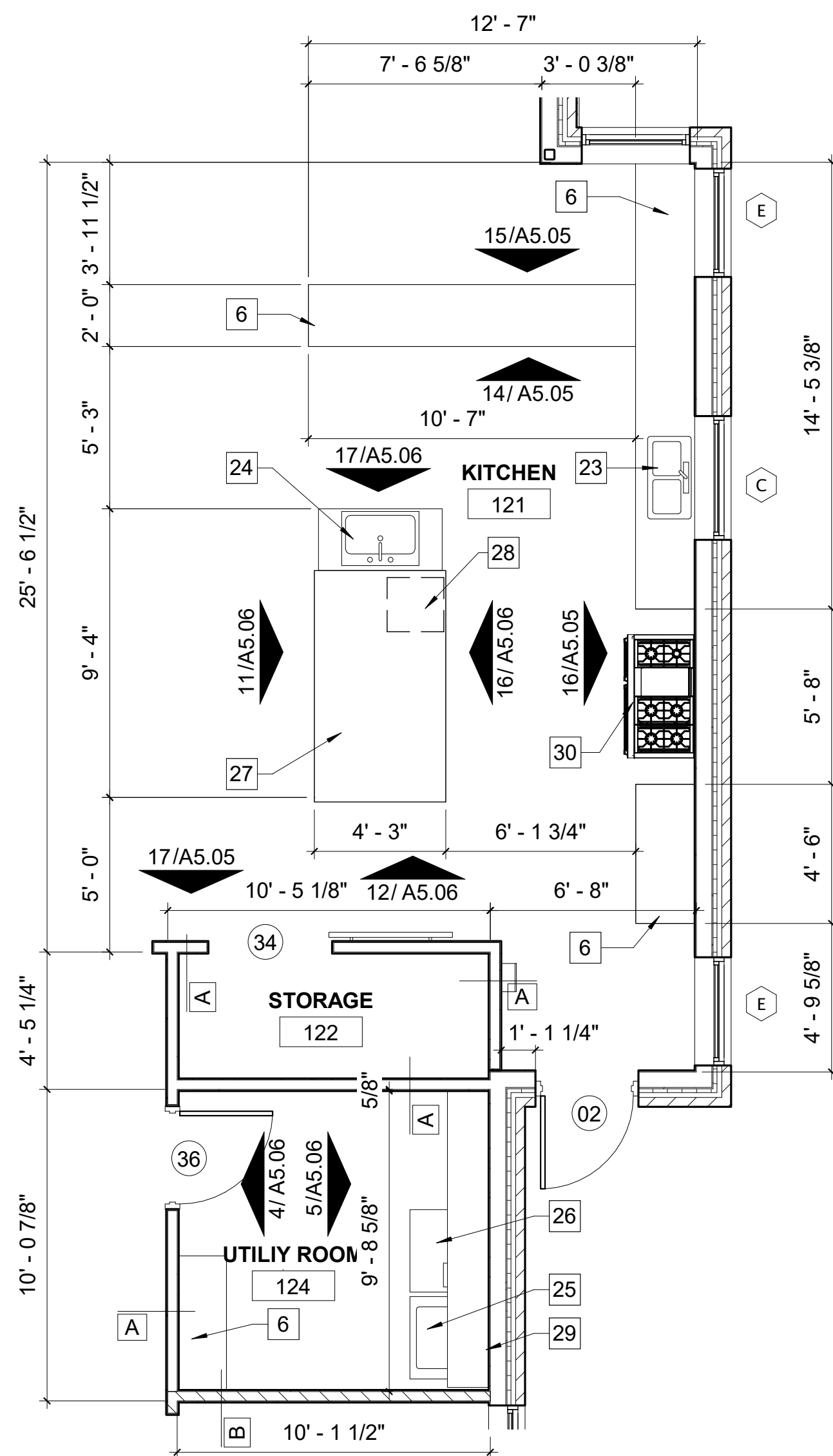
A4.07 $1\frac{1}{2}'' = 1'-0''$





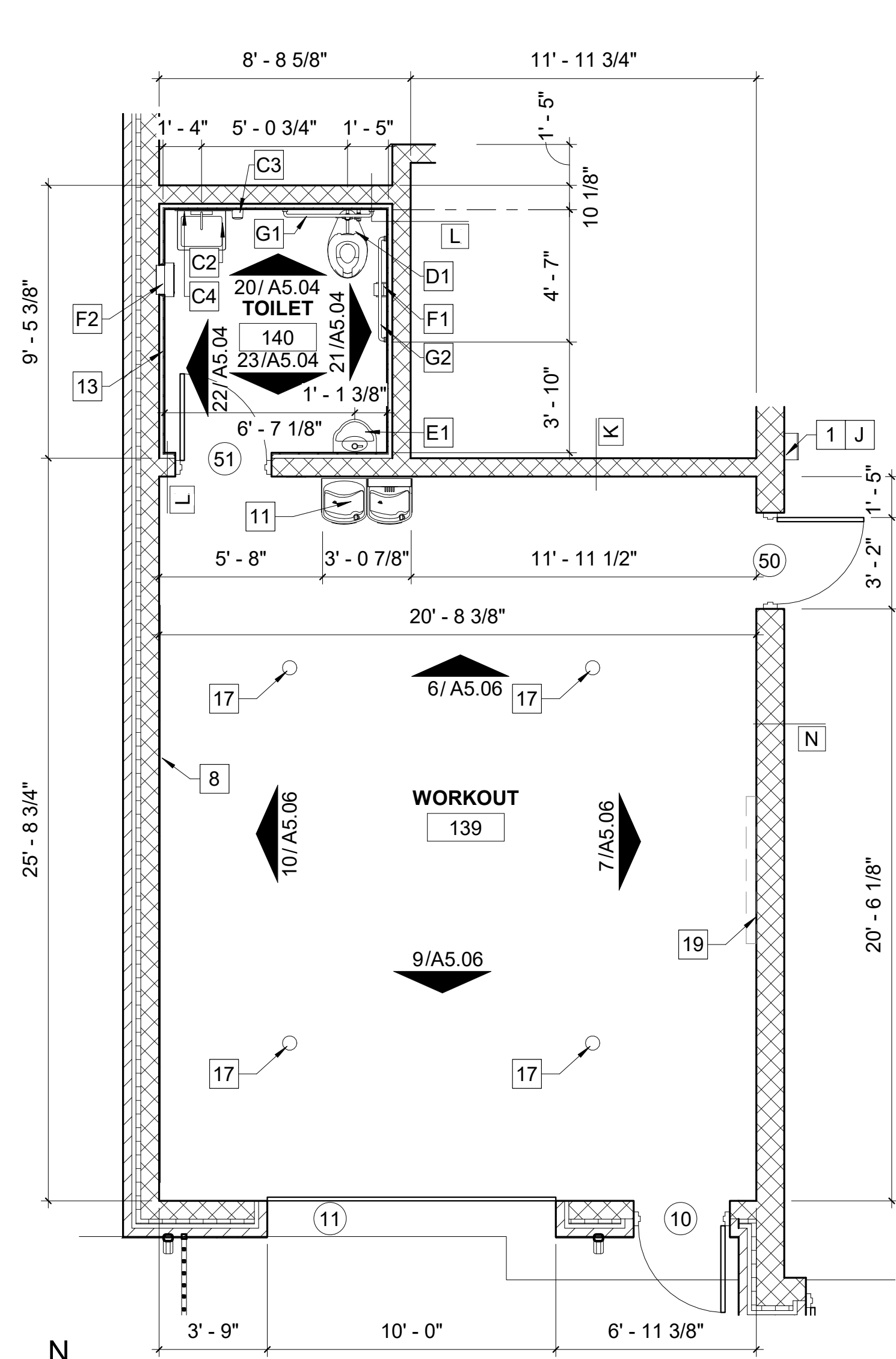
1
A5.02
1/4" = 1'-0"

REPORTS, PUBLIC TOILET & OFFICER DORM & SHOWER & PANTRIES



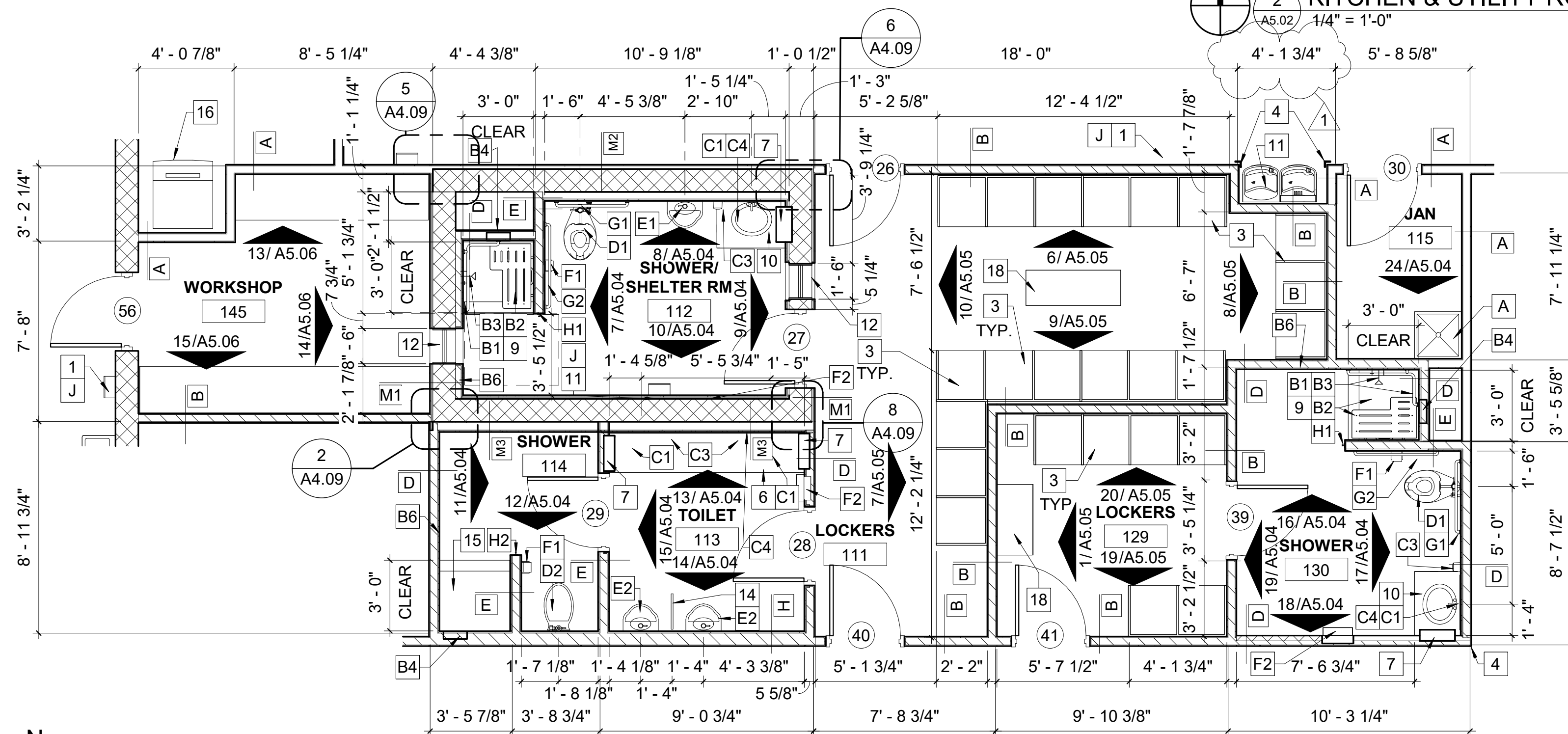
2
A5.02
1/4" = 1'-0"

KITCHEN & UTILITY ROOM



3
A5.02
1/4" = 1'-0"

WORKOUT ROOM & TOILET



4
A5.02
1/4" = 1'-0"

SHOWERS & LOCKERS

GENERAL NOTES

- REFER TO SHEET G0.01 FOR SYMBOLS LEGEND.
- REFER TO SHEET A5.01 FOR FINISH SCHEDULE.
- ALL NOTES BY SYMBOL ARE SHEET SPECIFIC.
- REFER TO SHEET A1.04 FOR PARTITION TYPES.
- ALL WOOD BLOCKING AND NAILERS SHALL BE FIRE RETARDANT TREATED.
- REFER TO SHEET A5.02 FOR TOILET ACCESSORIES AND FIXTURE LEGEND
- DIMENSIONS FOR PARTITION WALLS ARE TAKEN FROM FACE OF STUD TO FACE OF STUD, UNLESS NOTED OTHERWISE
- DIMENSIONS FOR PLUMBING FIXTURES ARE TAKEN FROM CENTERLINE OF FIXTURE TO FINISH OF ADJACENT WALL, UNLESS NOTED OTHERWISE.
- " " INDICATES STUD WALLS W/ SOUND ATTENUATION BATTS
- GC TO PROVIDE BLOCKING FOR ALL OWNER PROVIDED ACCESSORIES (INCLUDING BUT NOT LIMITED TO SOAP DISPENSERS AND TV/MONITORS)

NOTES BY SYMBOL

- | | |
|--|---|
| 1. FIRE EXTINGUISHER CABINET | 18. LOCKER BENCH. REFER 6/A5.09 |
| 2. DRY ERASE BOARD 'MB' | 19. PROVIDE BLOCKING FOR WALL MOUNTED MONITOR |
| 3. STAINED WOOD 'WS' WARDROBE UNIT WITH COMBINATION LOCKS. | 20. CANTILEVER SOLID SURFACE MATERIAL 'SM' COUNTER WITH TRANSACTION TRAY |
| 4. CORNER GUARD. | 21. STAINED WOOD 'WS' CABINET, DRAWERS ONLY WITH COMBINATION LOCKS. |
| 5. STAINED WOOD 'WS' UPPER CABINETS. | 22. COOK TOP RANGE AND VENT HOOD WITH ANSUL, REFER MECHANICAL |
| 6. STAINED WOOD 'WS' CABINET WITH SOLID SURFACE MATERIAL 'SM' COUNTERTOP. | 23. DOUBLE SINK WITH DISPOSER, CENTER SINK ON WINDOW, REF. PLUMBING DRAWINGS. |
| 7. SHOWER CUBBIE, REFER 3 OR 4/A5.09. | 24. ISLAND MILLWORK WITH STAINLESS STEEL TOP AND INTEGRAL DEEP SINGLE SINK WITH DISPOSER. |
| 8. WALL MOUNT MIRRORS, ALONG ENTIRE WALL | 25. CLOTHES WASHING MACHINE. |
| 9. TAS SHOWER, REFER 3/A5.03 AND PLUMBING | 26. CLOTHES DRYER. |
| 10. STAINED WOOD 'WS' REMOVABLE PANEL WITH SOLID SURFACE 'SM' END PANEL | 27. STAINED WOOD 'WS' ISLAND WITH STAINLESS STEEL 'SS' COUNTERTOP |
| 11. ELECTRIC WATER COOLER, HI/LOW UNIT WITH CANE DETECTION | 28. DISHWASHER |
| 12. PREFINISHED METAL LOUVER, PAINTED TO MATCH THE ADJACENT WALL, REFER MECHANICAL | 29. STAINED WOOD 'WS' CUBBIES |
| 13. TILE FINISH ON 5/8" GYPSUM BOARD (TO 6" ABOVE FINISH CEILING) ON 7/8" METAL HAT CHANNEL ON EXTERIOR CMU WALL | 30. COOKTOP RANGE AND VENT HOOD WITH ANSUL, REFER MECHANICAL. |
| 14. URINAL SCREEN 'SM' | 31. BED AND FRAME BY OWNER. |
| 15. NON-TAS SHOWER REFER 4/A5.03 AND PLUMBING | |
| 16. ICE MACHINE, REFER PLUMBING | |
| 17. 4 EQUAL SPACE FLOOR OUTLETS, REFER ELECTRICAL | |

GRAPHIC SCALE: 1/4" = 1'-0"

KOMATSU
ARCHITECTURE



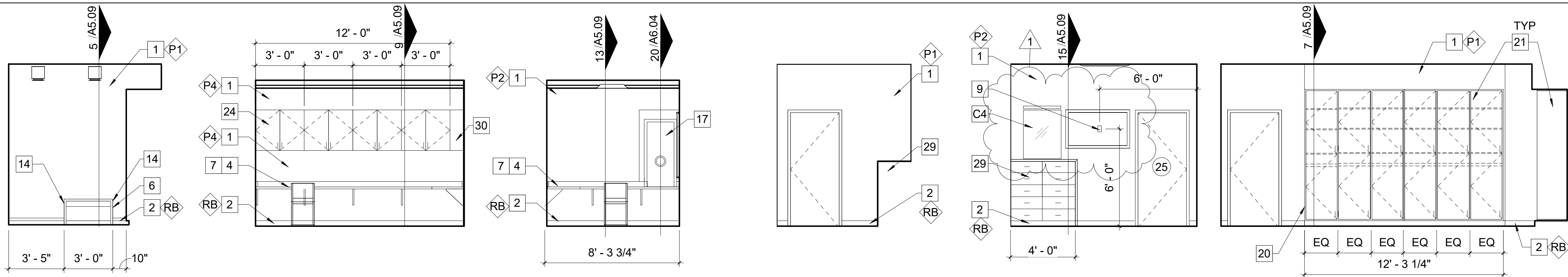
MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

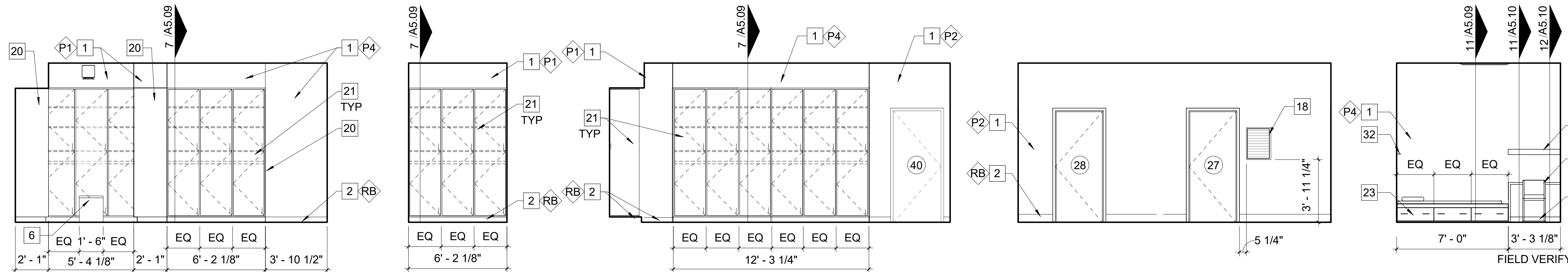
ENLARGED PLANS

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

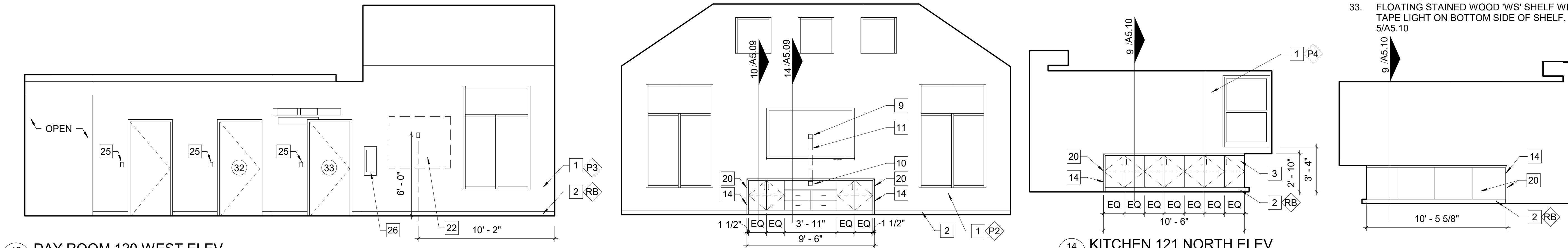
A5.02



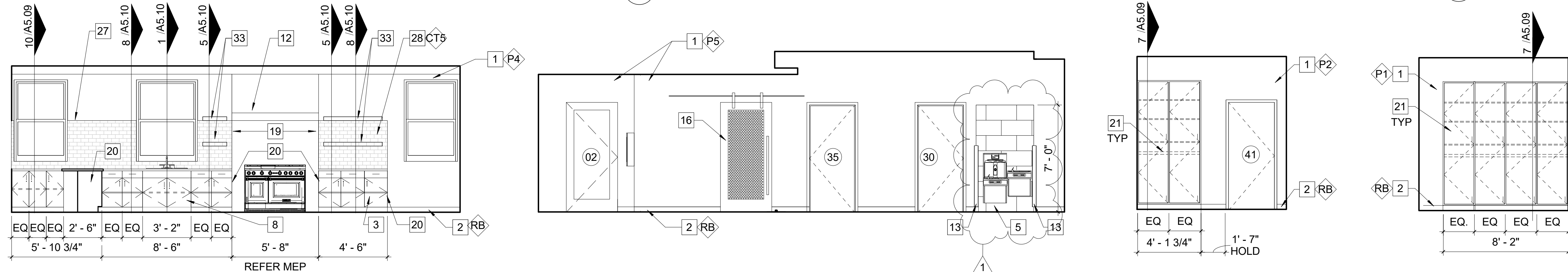
1 LCKRS 129 W ELEV 2 REPORTS 104 WEST ELEV 3 REPORTS 104 NORTH ELEV 4 DORM 109 SOUTH 5 DORM 109 WEST ELEV 6 LOCKERS 111 NORTH ELEV
A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0"



7 LOCKERS 111 EAST ELEVATION 8 LCKRS 111 PARTIAL E ELEV 9 LOCKERS 111 SOUTH ELEVATION 10 LOCKERS 111 WEST ELEVATION 11 TYP. DORM ELEV
A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0"



12 DAY ROOM 120 WEST ELEV 13 DAY ROOM 120 NORTH ELEV 14 KITCHEN 121 NORTH ELEV 15 KITCHEN 121 SOUTH ELEV
A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0"



16 KITCHEN 121 EAST ELEV 17 KITCHEN 121 SOUTH ELEV 19 LCKRS 129 S. ELEV 20 LCKRS 129 N. ELEV
A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0" A5.05 1/4" = 1'-0"

NOTES BY SYMBOL

1. PAINTED GYPSUM BOARD WALL; REFER A5.01 FOR FINISH COLOR
2. 4" RUBBER BASE 'RB'
3. WOOD 'WS' CABINET WITH SOLID SURFACE MATERIAL 'SM' COUNTERTOP
4. SOLID SURFACE MATERIAL 'SM' COUNTER ON WALL MOUNTED METAL BRACKETS PAINTED TO MATCH WALL COLOR, W/ SOLID SURFACE MATERIAL 'SM' BACKSPLASH
5. 'CT4' FULL HEIGHT BACKSPLASH
6. LOCKER BENCH, REFER 6/A5.09
7. GROMMET AT CENTER OF EACH KNEE SPACE
8. SINK WITH WOOD 'WS' CABINET WITH SOLID SURFACE MATERIAL 'SM' COUNTERTOP
9. PROVIDE BLOCKING, POWER AND CABLING TO WALL MOUNTED MONITOR (CFCI)
10. STAINED WOOD 'WS' CUBBIES WITH POWER CONNECTION FOR TELEVISION COMPONENTS
11. CORD CONDUIT
12. EXHAUST HOOD VENT FURRING
13. CORNER GUARDS
14. 'SM' END PANEL WITH MITERED CORNER
15. STAINED WOOD 'WS' DESK UNIT WITH 'SM' COUNTERTOP WITH MITER CORNER
16. BARN DOOR WITH EXPOSED TRACK AND HARDWARE
17. TALK THRU & TRANSACTION COUNTER WINDOW
18. PREFINISHED METAL LOUVER, PAINTED TO MATCH ADJACENT WALL.
19. STAINLESS STEEL 'SS' BACKSPLASH, FULL HEIGHT OF WALL
20. FINISHED END
21. WOOD STAINED 'WS' WARDROBE UNIT WITH COMBINATION LOCKS
22. PROVIDE BLOCKING, POWER AND CABLING TO OWNER PROVIDED WALL MOUNTED MONITOR (OFCI)
23. STAINED WOOD 'WS' BED UNIT WITH DRAWERS UNDER PLATFORM.
24. STAINED WOOD 'WS' UPPER CABINETS
25. CARD READER, REFER ELECTRICAL
26. FIRE EXTINGUISHER CABINET
27. METAL TRIM PIECE, SCHLUTER, ALONG TOP OF CERAMIC TILE
28. CERAMIC TILE 'CT' BACKSPLASH
29. STAINED WOOD 'WS' CABINET, DRAWERS ONLY
30. FILLER PANEL
31. STAINED WOOD 'WS' FLOATING SHELF
32. 3/4" STAINED WOOD 'WS' WITH 1/8" REVEAL, REFER 13/A5.10
33. FLOATING STAINED WOOD 'WS' SHELF WITH TAPE LIGHT ON BOTTOM SIDE OF SHELF, REFER 5/A5.10

KOMATSU
ARCHITECTURE



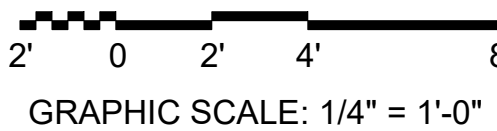
MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

INTERIOR ELEVATIONS

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A5.05



DOOR AND FRAME SCHEDULE																	
DOOR NUMBER	DOOR			TYPE	DOOR		TYPE	MATERIAL	FRAME				HARDWARE		FIRE RATING	SIGN	NOTES BY SYMBOL
	DOOR SIZE				GLAZING	DETAILS			SET NUMBER	KEYSIDE RM NUMBER							
WIDTH	HEIGHT	THK.	MATERIAL	HEAD			JAMB (1)	JAMB (2)			SILL						
01	3' - 0"	7' - 0"	2"	C	ALUM	DG-2	F3	ALUM	2/A6.04	11/A6.04	11/A6.04	22/A6.03	715A	EXTERIOR			6
02	3' - 0"	7' - 0"	1 3/4"	C	ALUM	DG-2	F2	ALUM	1/A6.03	8/A6.03	8/A6.03	22/A6.03	C715A	EXTERIOR			5
03	3' - 0"	7' - 0"	1 3/4"	C	ALUM	DG-2	F2	ALUM	1/A6.03	8/A6.03	8/A6.03	22/A6.03	C715A	EXTERIOR			5
04	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	2/A6.03	9/A6.03	9/A6.03	24/A6.03	C715	EXTERIOR	SMOKE SEAL		5
05	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
06	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
07	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
08	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
09	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	2/A6.03	9/A6.03	9/A6.03	24/A6.03	C715	EXTERIOR	SMOKE SEAL		5
10	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	2/A6.03	9/A6.03	9/A6.03	24/A6.03	C715	EXTERIOR	SMOKE SEAL		5
11	10' - 0"	12' - 0"	1 1/2"	J	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
12	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
13	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
14	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
15	14' - 0"	14' - 0"	1 1/2"	H	ALUM	DG-2	-	ALUM	3/A6.03	10/A6.03	10/A6.03	23/A6.03	001	EXTERIOR			4
16	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	18/A6.03	C785I	101	SMOKE SEAL		3, 5
17	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	503	101		B	
18	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	503	103			
19	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	25/A6.03	731G	107			
20	6' - 0"	7' - 0"	1 3/4"	E	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	12/A6.03	210C	103		1	
21	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	301	103			
22	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	C701G	101			5
23	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	23/A6.04	303G	108	-	B	
24	3' - 0"	7' - 0"	1 3/4"	B	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	14/A6.03	103	107	-	B	
25	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	391C	109		A	
26	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	12/A6.03	801	107	-		
27	3' - 0"	7' - 0"	1 3/4"	ICC 500	STL		F1	HM	4/A6.03	6/A6.03	6/A6.03	12/A6.03	W391	111	90 MIN	A	2
28	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	801	111			
29	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	391	113			
30	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	201	116	-	A	
31	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	C201	116			5
32	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	C201	116			5
33	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	C201C	116			5
34	3' - 0"	7' - 0"	1 3/4"	F	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	002	121			7
35	3' - 0"	7' - 0"	1 3/4"	B	WD	DG-1	F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	801	116	-		
36	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	503	127			
37	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	127			
38	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	303G	123			
39	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	12/A6.03	397	129			
40	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	19/A6.03	801	128			
41	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	801	128			
42	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	128			
43	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	128			
44	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	128			
45	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	128			
46	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	11/A6.03	303G	128			
47	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	25/A6.03	303G	128			
48	3' - 0"	7' - 0"	1 3/4"	A	WD		F1	HM	4/A6.03	6/A6.03	6/A6.03	24/A6.03	731G	137	-		
49	3' - 0"	7' - 0"	1 3/4"	G	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	13/A6.03	C785	138	SMOKE SEAL		3, 5
50	3' - 0"	7' - 0"	1 3/4"	G	HM		F2	HM	21/A6.04	21/A6.04	6/A6.03	18/A6.03	785	138	SMOKE SEAL		3
51	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	19/A6.04	22/A6.04	22/A6.04	12/A6.03	301	139	SMOKE SEAL		
52	6' - 0"	7' - 0"	1 3/4"	E	HM		F2	HM	19/A6.04	22/A6.04	22/A6.04	13/A6.03	584	138	SMOKE SEAL		3
53	6' - 0"	7' - 0"	1 3/4"	E	HM		F2	HM	19/A6.04	22/A6.04	22/A6.04	13/A6.03	584	138	SMOKE SEAL		3
54	6' - 0"	7' - 0"	1 3/4"	E	HM		F2	HM	19/A6.04	22/A6.04	22/A6.04	13/A6.03	584	138	SMOKE SEAL		3
55	3' - 0"	7' - 0"	1 3/4"	G	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	18/A6.03	C785	138	SMOKE SEAL		3, 5
56	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	13/A6.03	585	138	SMOKE SEAL		3
57	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	13/A6.02	C285	138	SMOKE SEAL		3, 5
58	3' - 0"	7' - 0"	1 3/4"	D	HM		F2	HM	18/A6.04	21/A6.04	21/A6.04	13/A6.02	C285	138	SMOKE SEAL		3, 5
59	6' - 0"	7' - 0"	1 3/4"	E	HM		F2	HM	19/A6.04	22/A6.04	22/A6.04	17/A6.02	C284IS	138	SMOKE SEAL	B	1, 3, 5

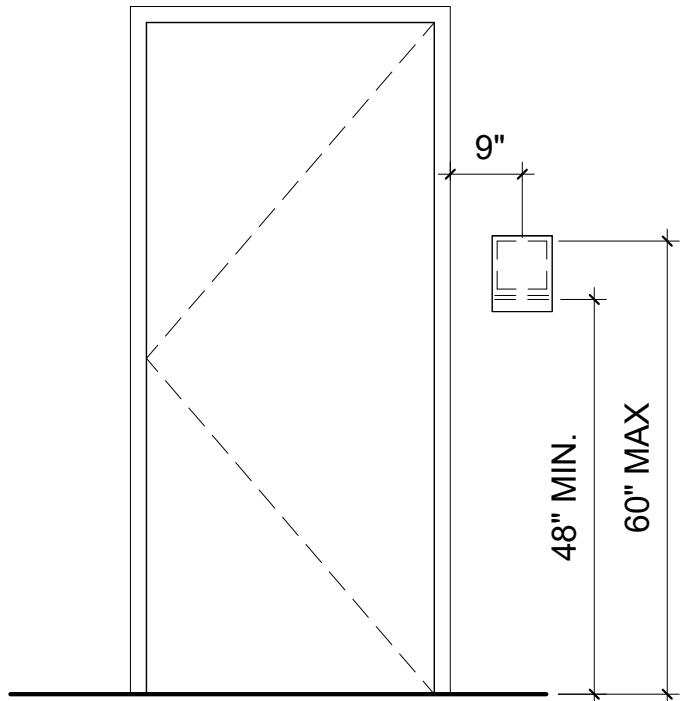
DOOR SCHEDULE - GENERAL NOTES

- A. REFER TO G0.01 FOR SYMBOLS LEGEND.
B. DG-1 INTERIOR DOOR GLAZING SHALL BE 1/4" CLEAR TEMPERED GLASS
C. DG-2 EXTERIOR DOOR GLAZING SHALL BE 1" LOW E TEMPERED GLASS:
VITRO SOLARBAN 90 LOW-E CLEAR GLASS
D. REFERENCE SPECIFICATIONS FOR HARDWARE SET

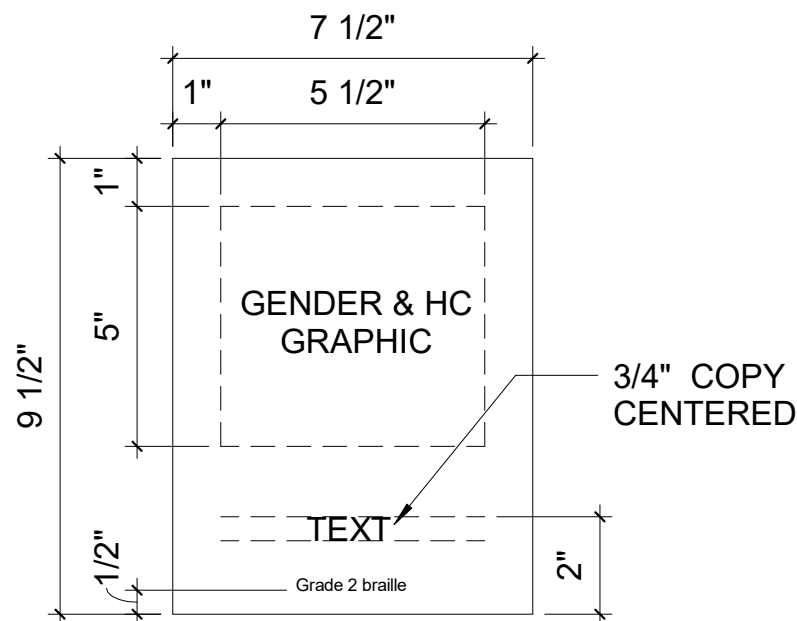
NOTES BY NUMBER

1. PROVIDE CHAIN ON APPARATUS BAY (140) SIDE OF DOOR.
2. DOOR TO MEET ICC 500 SAFE ROOM STANDARDS
3. DOOR TO HAVE CLOSER IN HARDWARE SET
4. UV PROTECTION FILM ON GLAZING
5. CARD READER
6. DOOR BELL
7. STAINLESS STEEL PERFORATED PANEL INSERT, HOLES TO BE .045" ON .088" STAGGER (24% OPEN AREA)

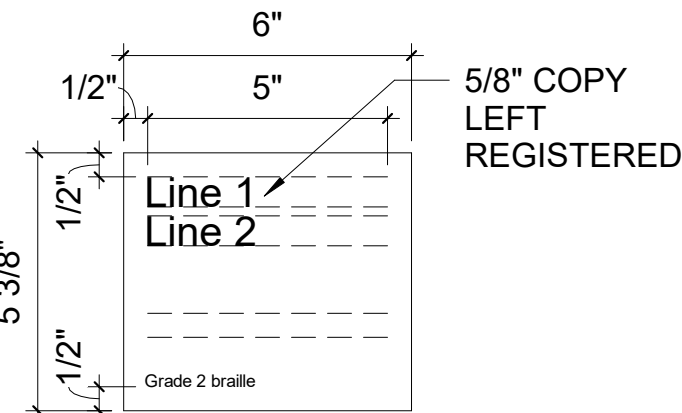
" X "



1 INTERIOR SIGNAGE ELEVATION
A6.01 1/2" = 1'-0"

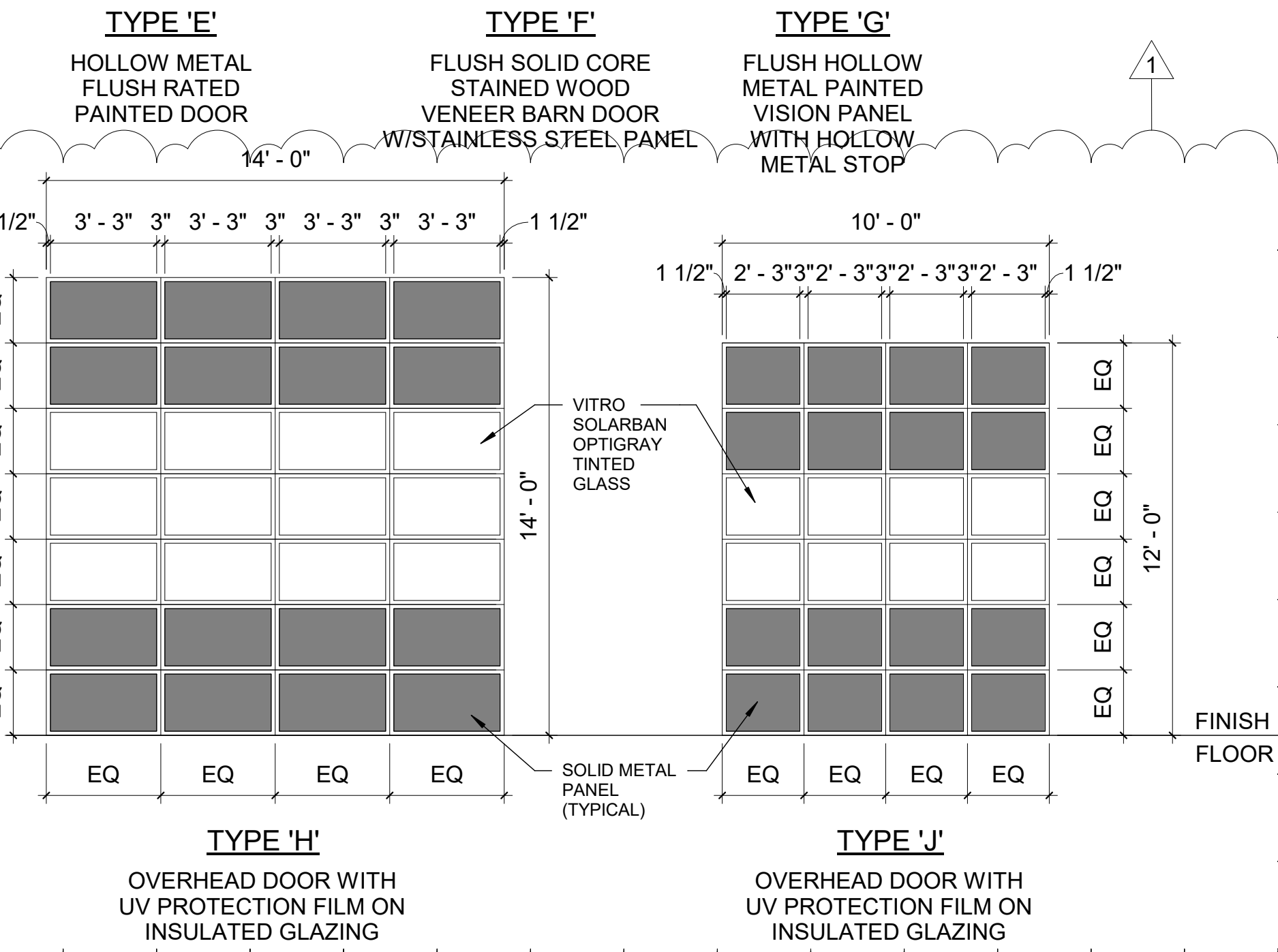
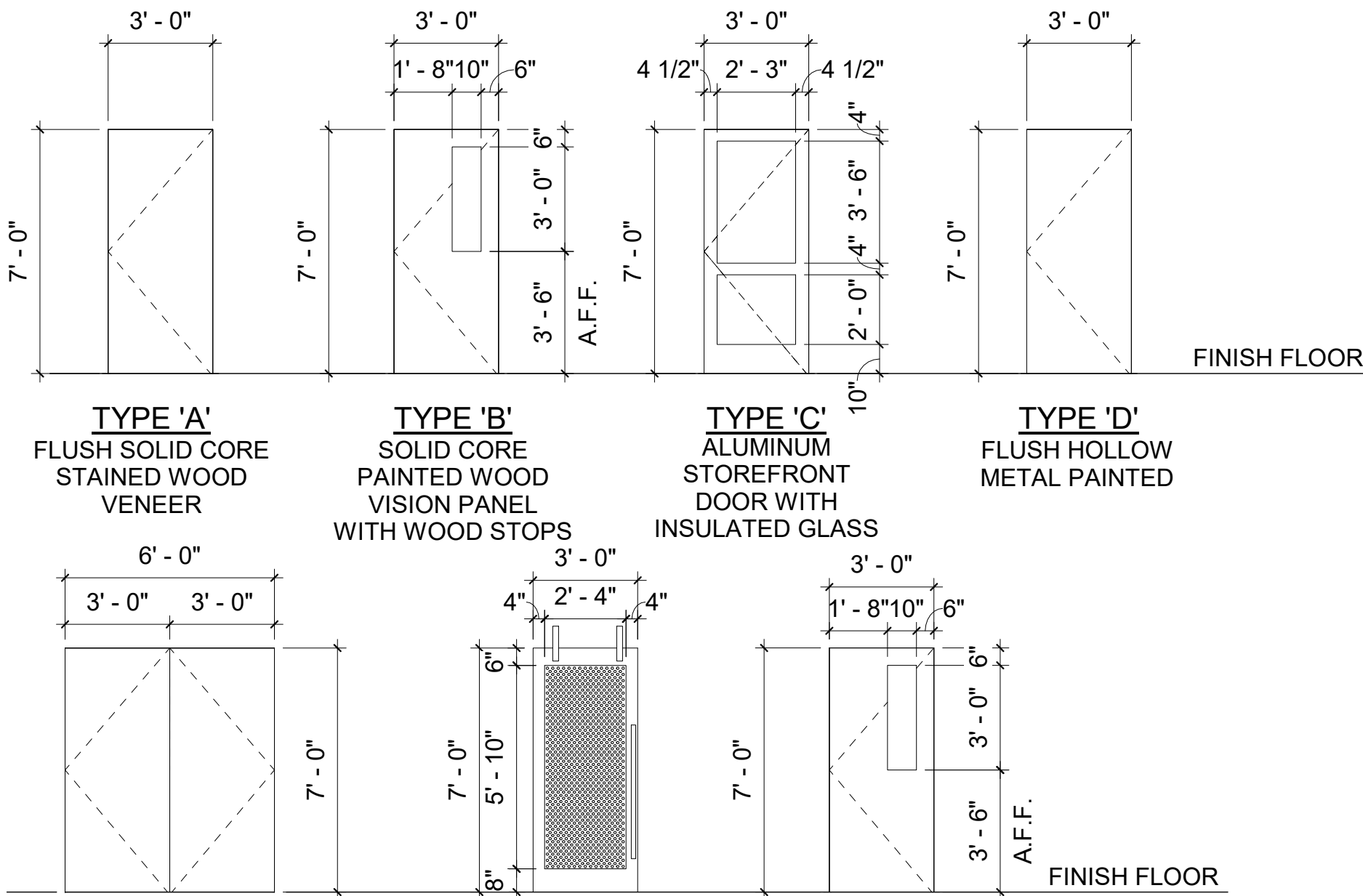


2 TAS ROOM SIGNAGE - TYPE A
A6.01 3" = 1'-0"

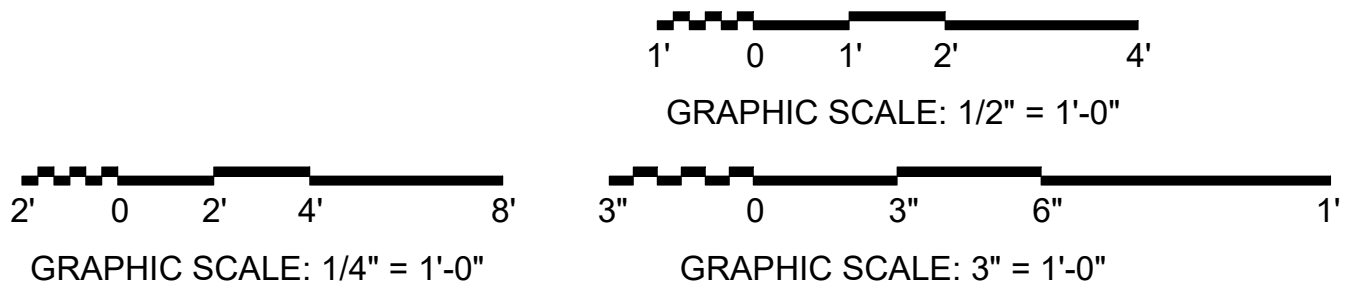
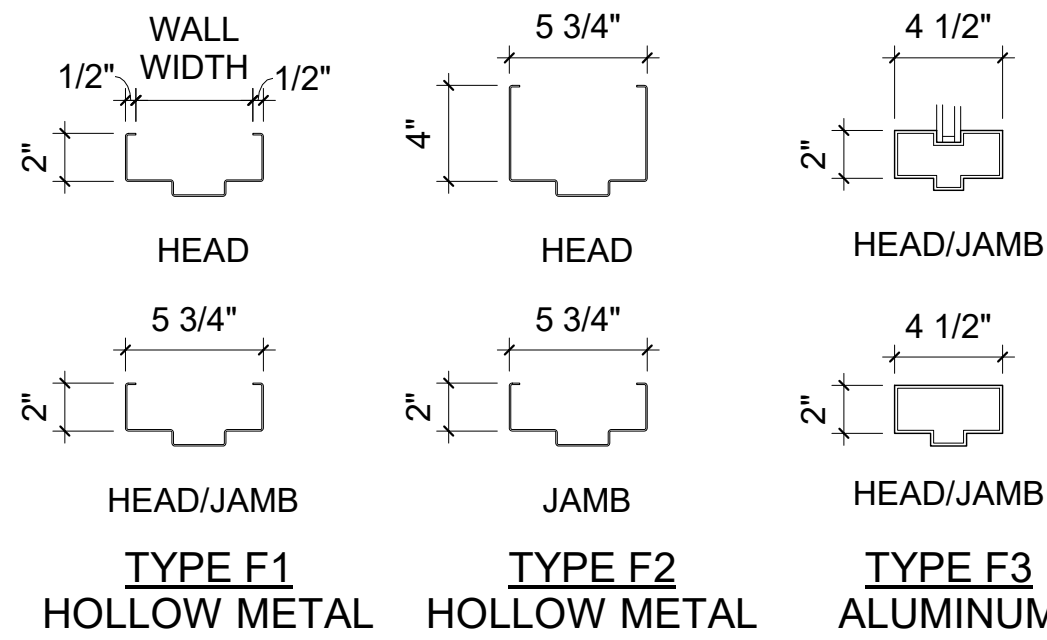


3 TYPICAL ROOM SIGN - TYPE B
A6.01 3" = 1'-0"

DOOR TYPES



FRAME TYPES



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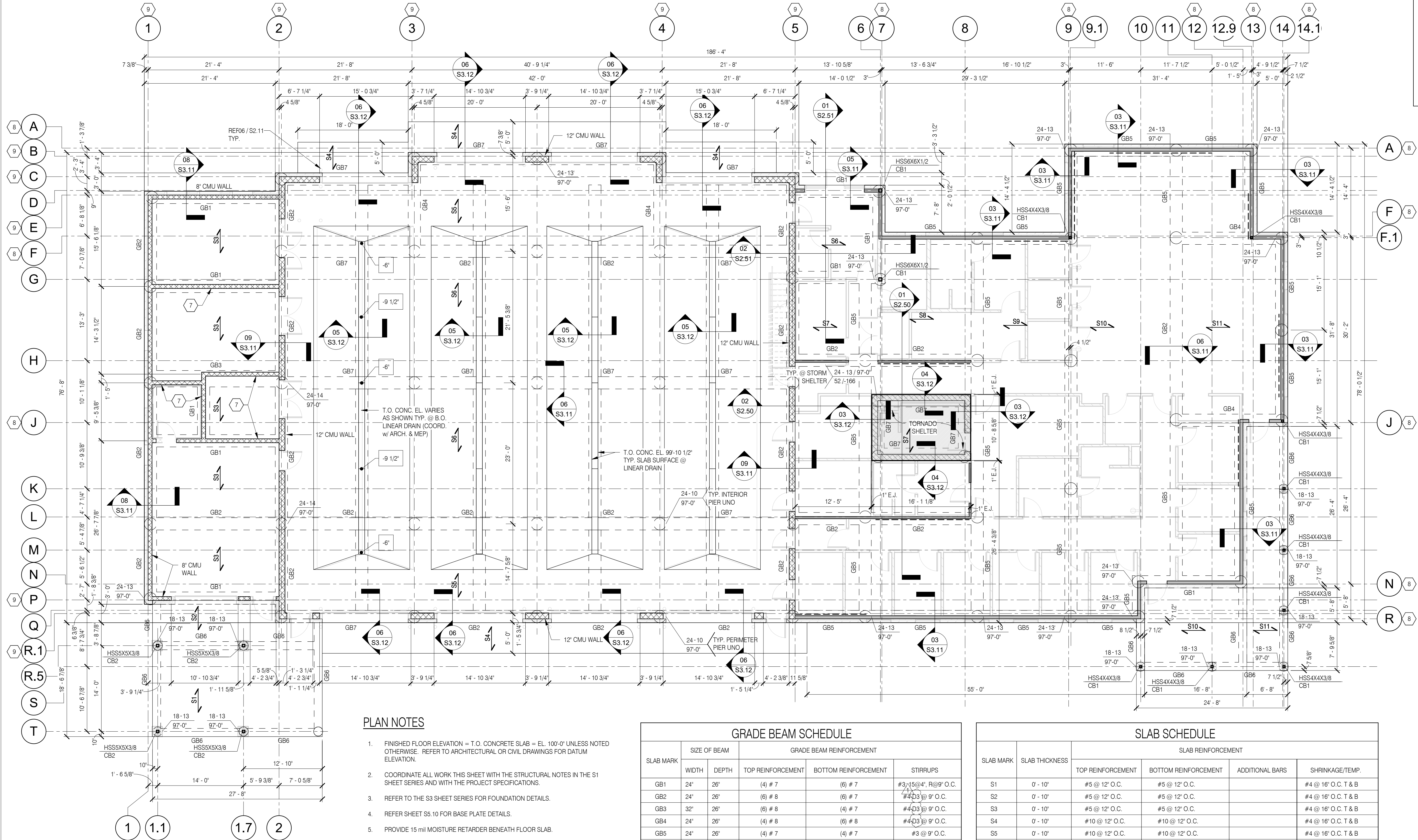
MANSFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

DOOR SCHEDULE

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

A6.01



PLAN NOTES

- FINISHED FLOOR ELEVATION = T.O. CONCRETE SLAB = EL. 100'-0" UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL OR CIVIL DRAWINGS FOR DATUM ELEVATION.
- COORDINATE ALL WORK THIS SHEET WITH THE STRUCTURAL NOTES IN THE S1 SHEET SERIES AND WITH THE PROJECT SPECIFICATIONS.
- REFER TO THE S3 SHEET SERIES FOR FOUNDATION DETAILS.
- REFER SHEET S5.10 FOR BASE PLATE DETAILS.
- PROVIDE 15 mil MOISTURE RETARDER BENEATH FLOOR SLAB.
- UNLESS NOTED OTHERWISE, CENTER PIER ON COLUMN CENTERLINES. IF NO COLUMN IS PRESENT, CENTER PIER ON THE GRADE BEAM.
- 8" INTERIOR CMU WALL. T.O. WALL EL. = 112'-8".
- GRID LINE IS FACE OF STUD.
- GRID LINE IS FACE OF CMU.

GRADE BEAM SCHEDULE					
SLAB MARK	SIZE OF BEAM		GRADE BEAM REINFORCEMENT		
	WIDTH	DEPTH	TOP REINFORCEMENT	BOTTOM REINFORCEMENT	STIRRUPS
GB1	24"	26"	(4) # 7	(6) # 7	#3 @ 15" O.C., R @ 9" O.C.
GB2	24"	26"	(6) # 8	(6) # 7	#4 @ 12" O.C.
GB3	32"	26"	(6) # 8	(4) # 7	#4 @ 12" O.C.
GB4	24"	26"	(4) # 8	(6) # 8	#4 @ 12" O.C.
GB5	24"	26"	(4) # 7	(4) # 7	#3 @ 9" O.C.
GB6	16"	26"	(3) # 7	(3) # 7	#3 @ 9" O.C.
GB7	24"	26"	(6) # 9	(6) # 9	#4 @ 12" O.C.

NOTE: REF. DETAIL 01/S3.12 FOR STIRRUP TYPES. TYPICAL STIRRUPS ARE TYPE S3 U.N.O.

SLAB SCHEDULE				
SLAB MARK	SLAB THICKNESS	SLAB REINFORCEMENT		
		TOP REINFORCEMENT	BOTTOM REINFORCEMENT	ADDITIONAL BARS
S1	0' - 10"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. T & B
S2	0' - 10"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. T & B
S3	0' - 10"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. T & B
S4	0' - 10"	#10 @ 12" O.C.	#10 @ 12" O.C.	#4 @ 16" O.C. T & B
S5	0' - 10"	#10 @ 12" O.C.	#10 @ 12" O.C.	#4 @ 16" O.C. T & B
S6	0' - 10"	#10 @ 12" O.C.	#10 @ 12" O.C.	#4 @ 16" O.C. T & B
S7	0' - 6"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. TOP
S8	0' - 6"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. TOP
S9	0' - 6"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. TOP
S10	0' - 6"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. TOP
S11	0' - 6"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. TOP
S12	0' - 8"	#5 @ 12" O.C.	#5 @ 12" O.C.	#4 @ 16" O.C. T & B

NOTE: REFER TO DETAIL 04/S3.11 FOR TYPICAL REINFORCEMENT DETAIL.

01 FOUNDATION PLAN

1/8" = 1'-0"

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MANSFIELD FIRE STATION NO. 5

4444 NATIONAL PARKWAY
MANSFIELD, TEXAS 76063

FOUNDATION PLAN

ISSUE FOR CONSTRUCTION

Description
REVISIONS

No.

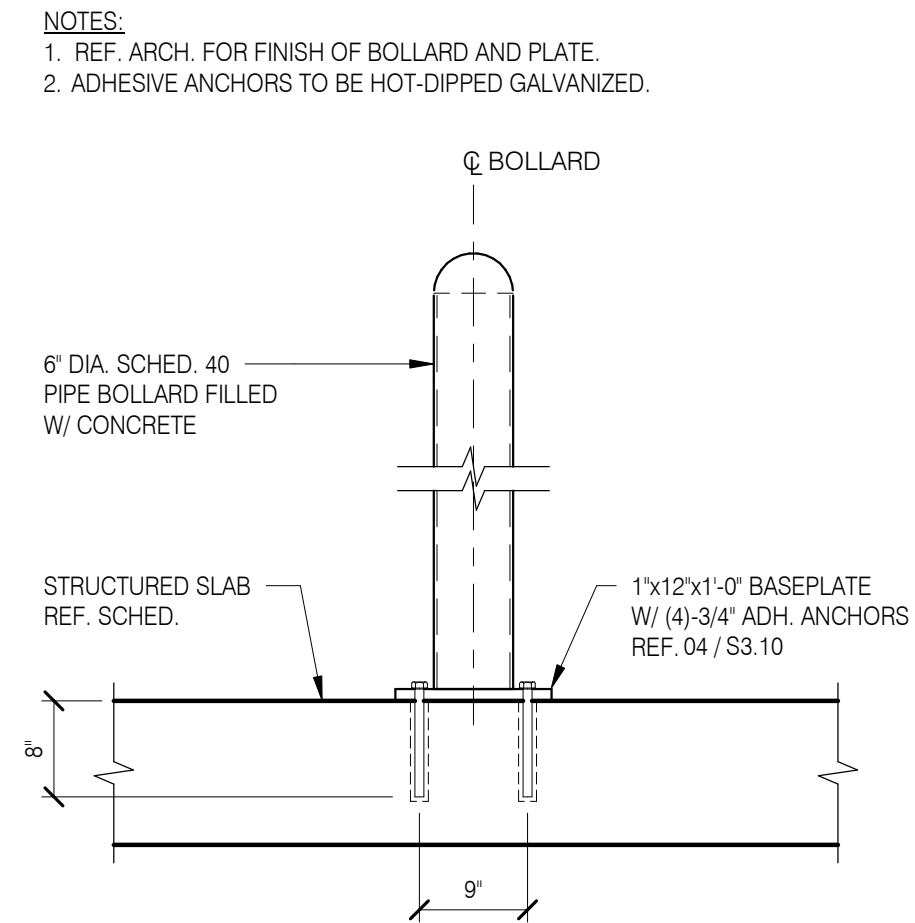
Revision 1

12/10/19

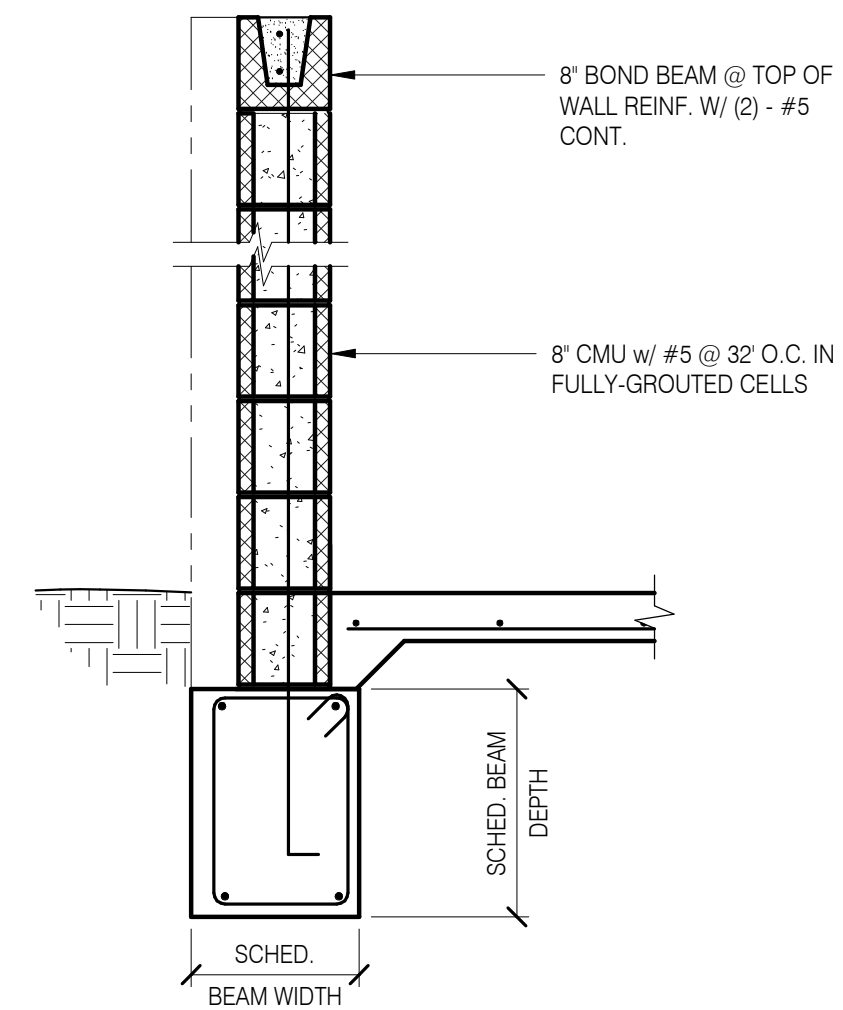
Date

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 11/07/2019
SHEET:

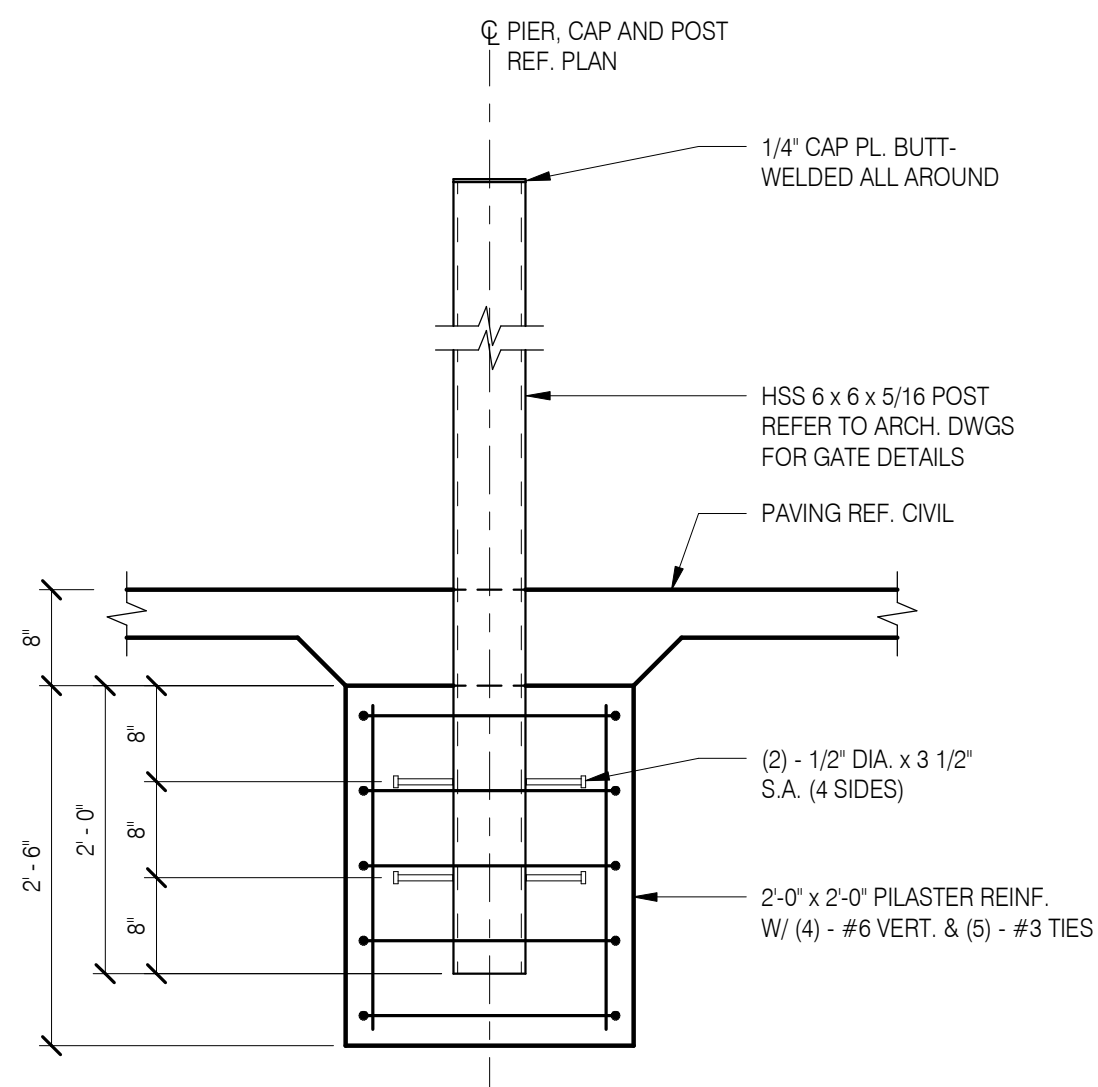
S2.10



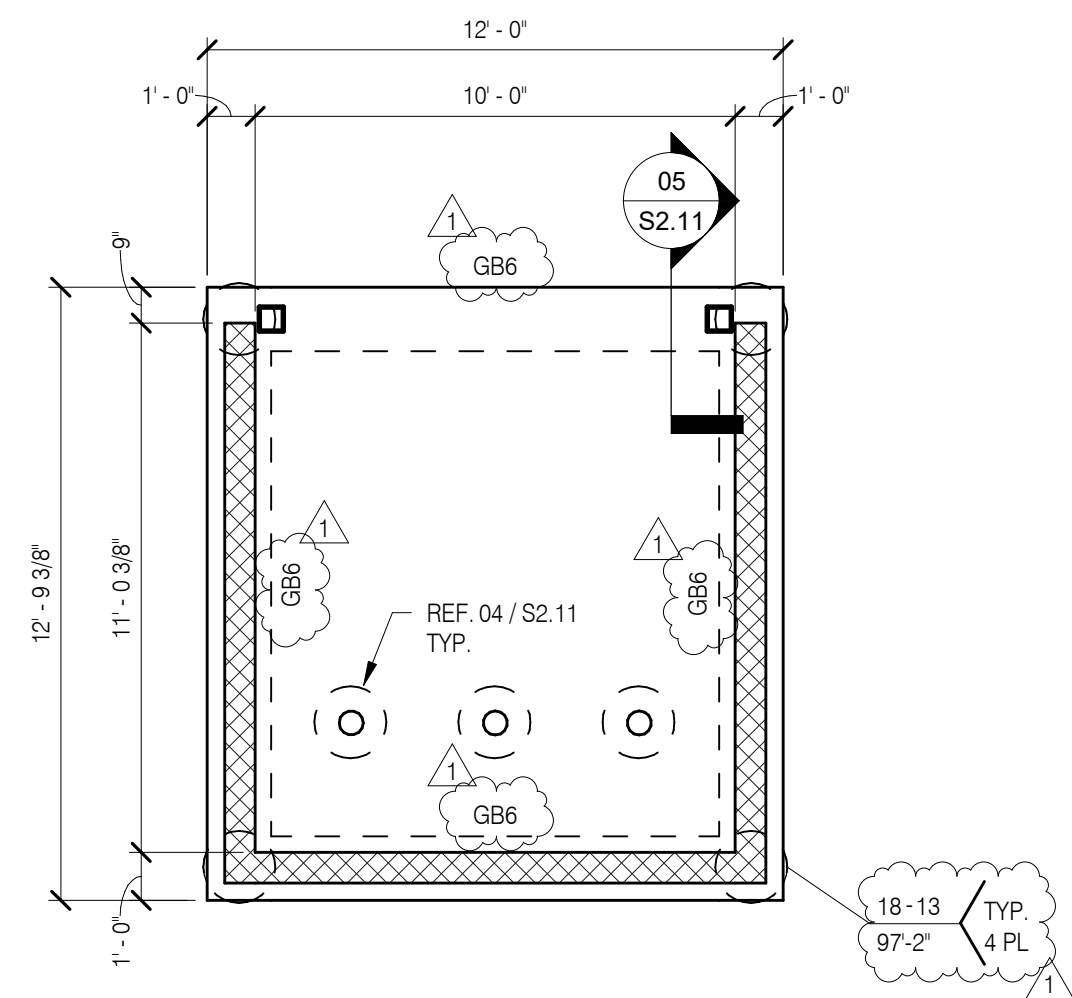
06 BOLLARD DETAIL @ STRUCT. SLAB $\frac{3}{4}" = 1'-0"$



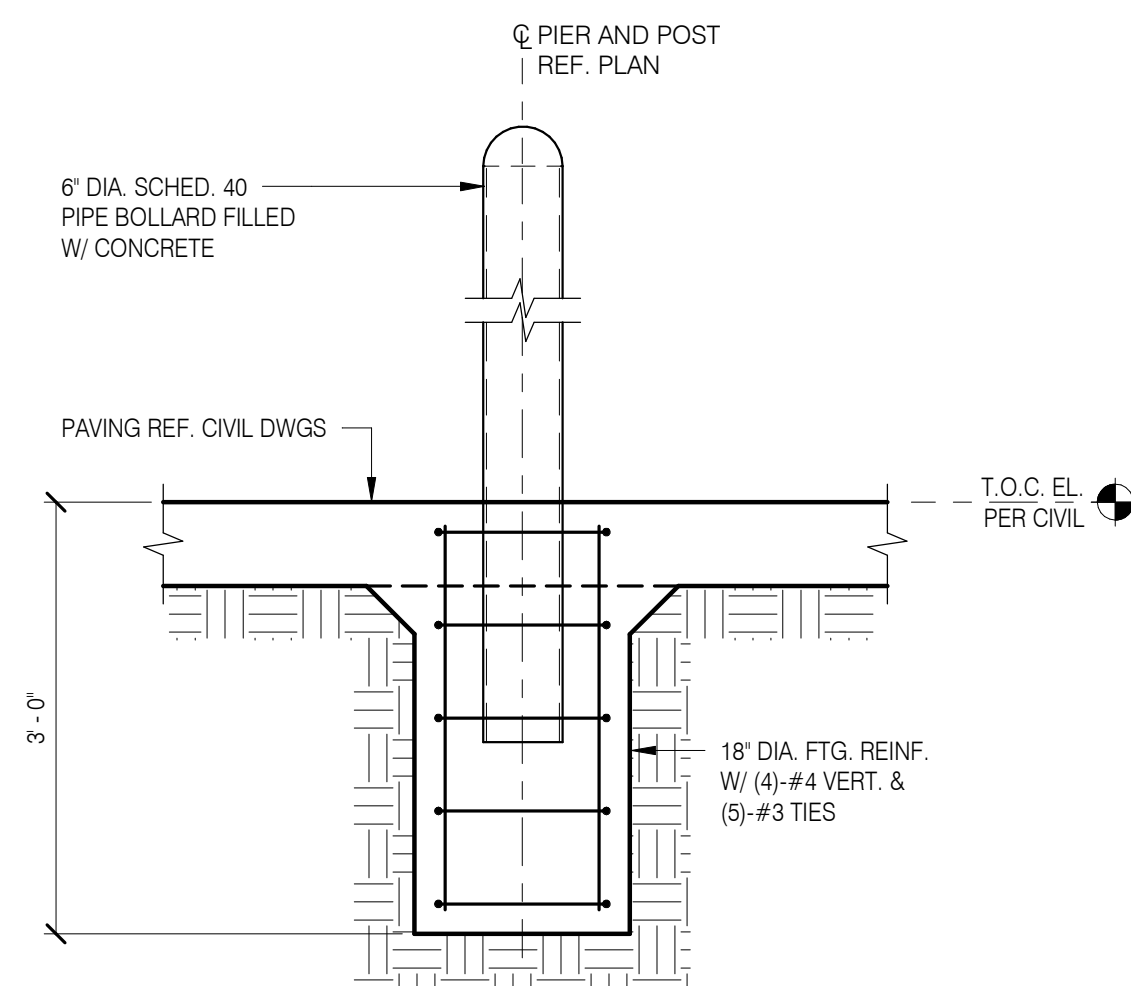
03 SECTION AT CMU ENCLOSURE $3/4" = 1'-0"$



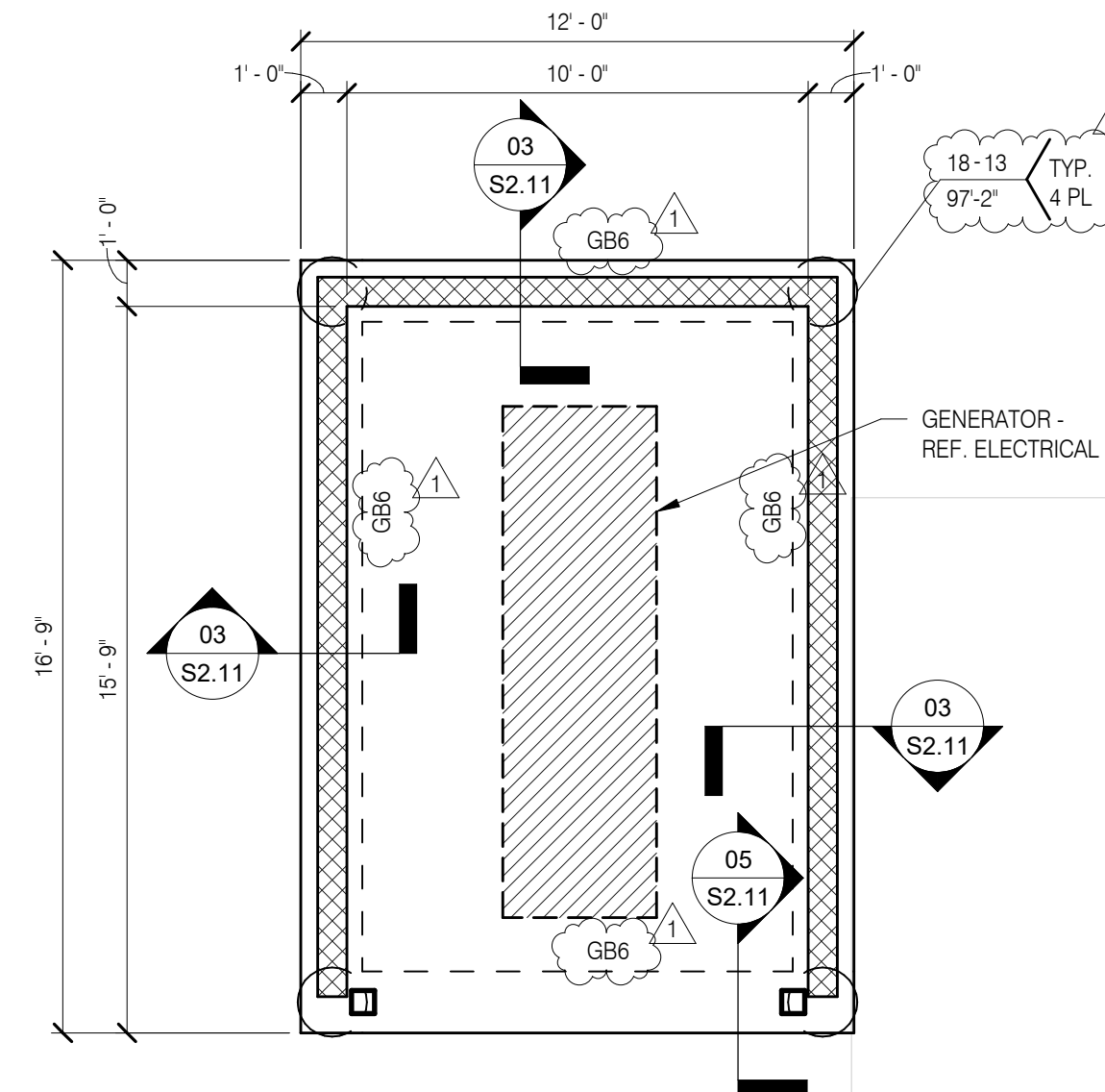
05 GATE POST DETAIL 3/4" = 1'-0"



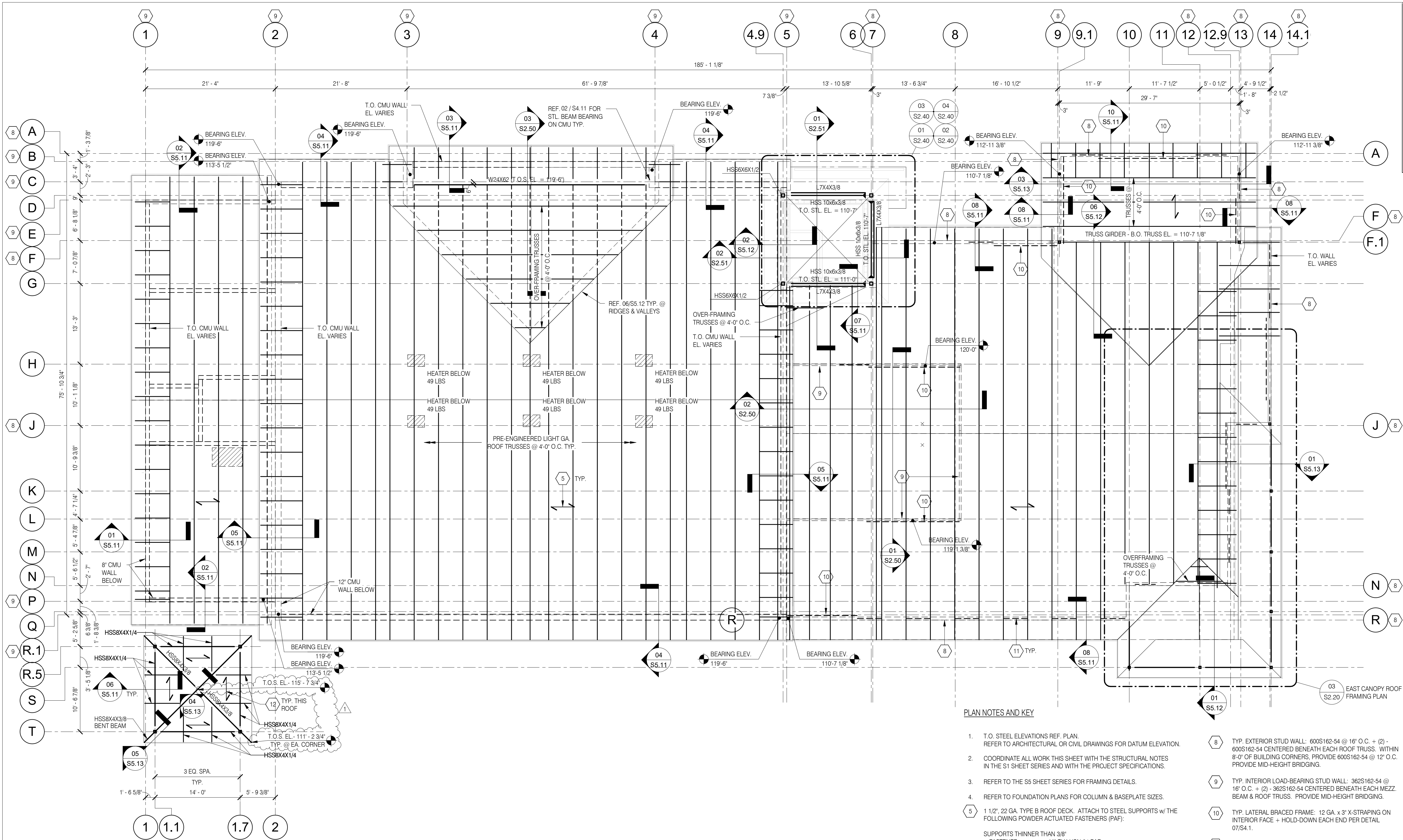
02	DUMPSTER ENCLOSURE FOUNDATION PLAN	1/4" = 1'-0"
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04 SITE BOLLARD DETAIL 3/4" = 1'-0"



01 GENSET FOUNDATION PLAN 1/4" = 1'-0"



PLAN NOTES AND KEY

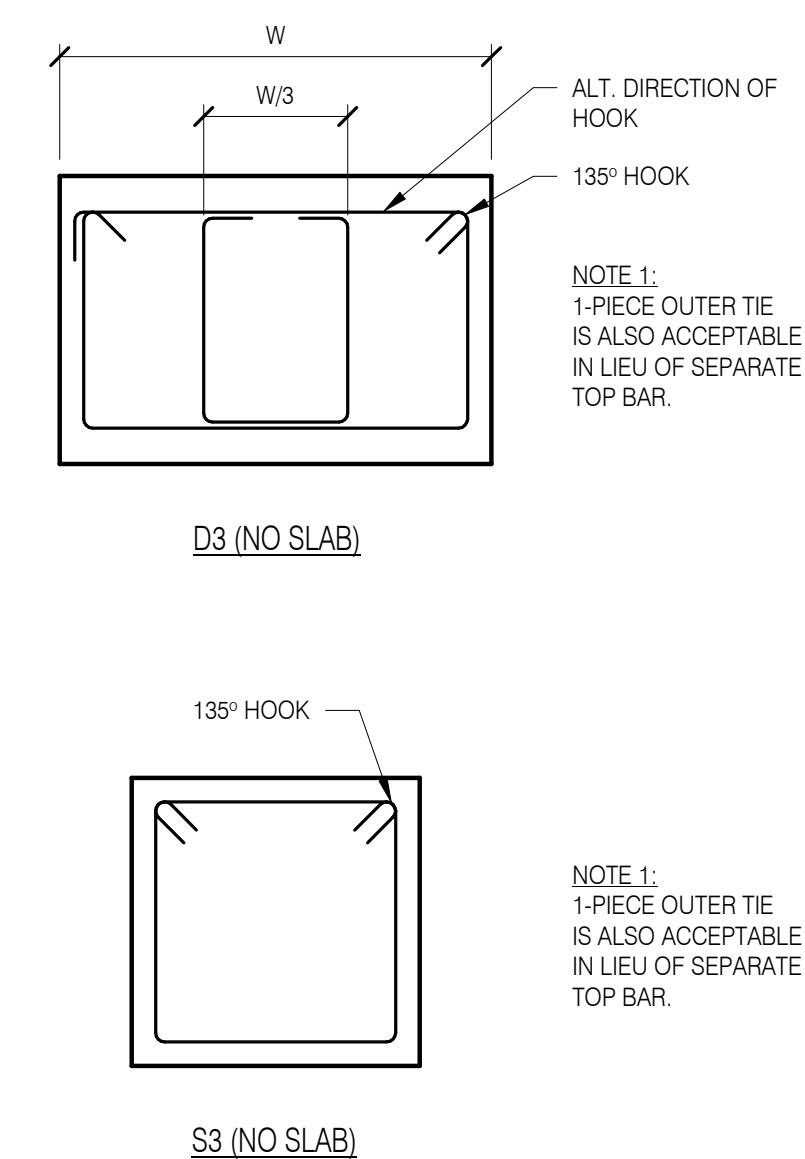
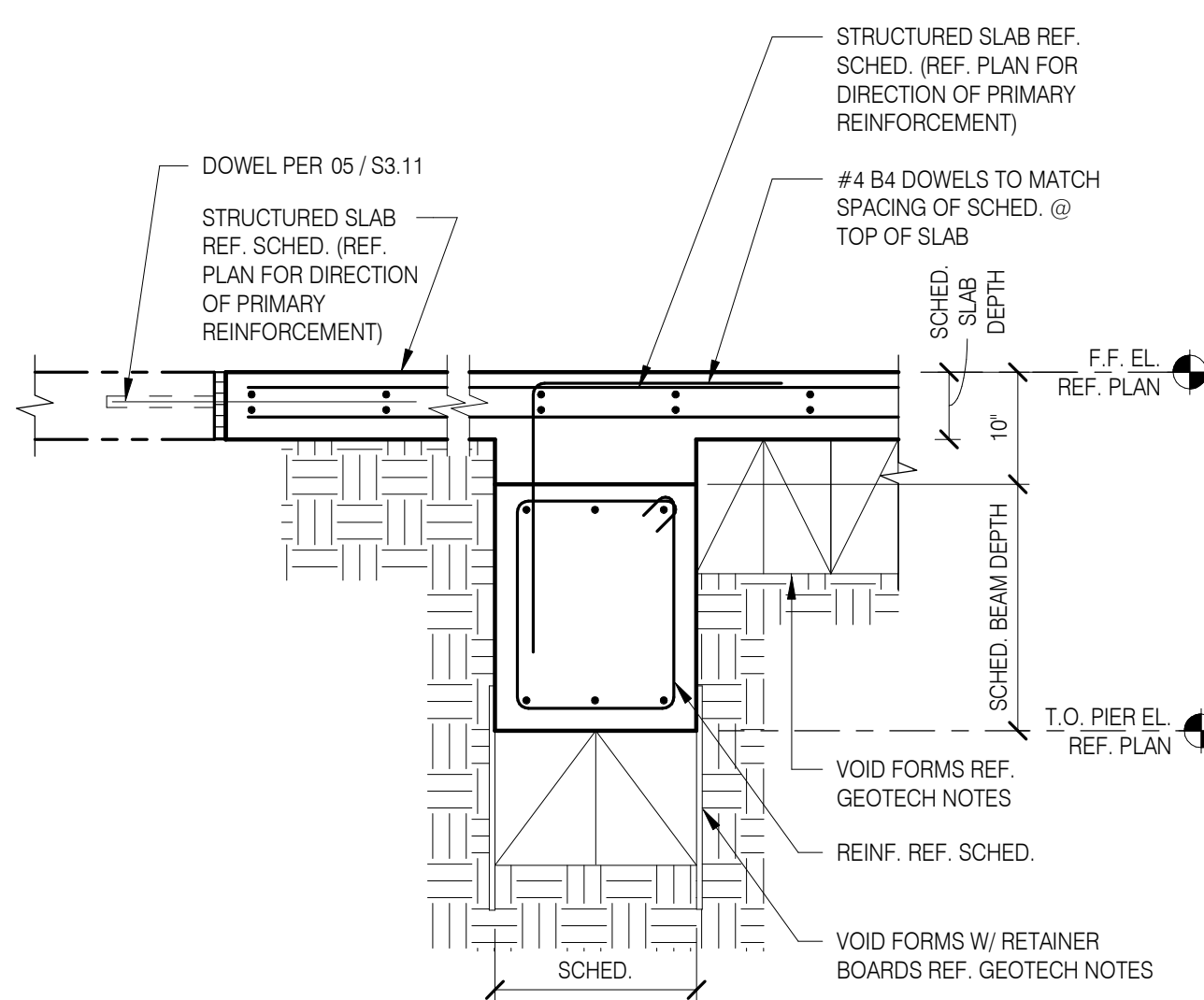
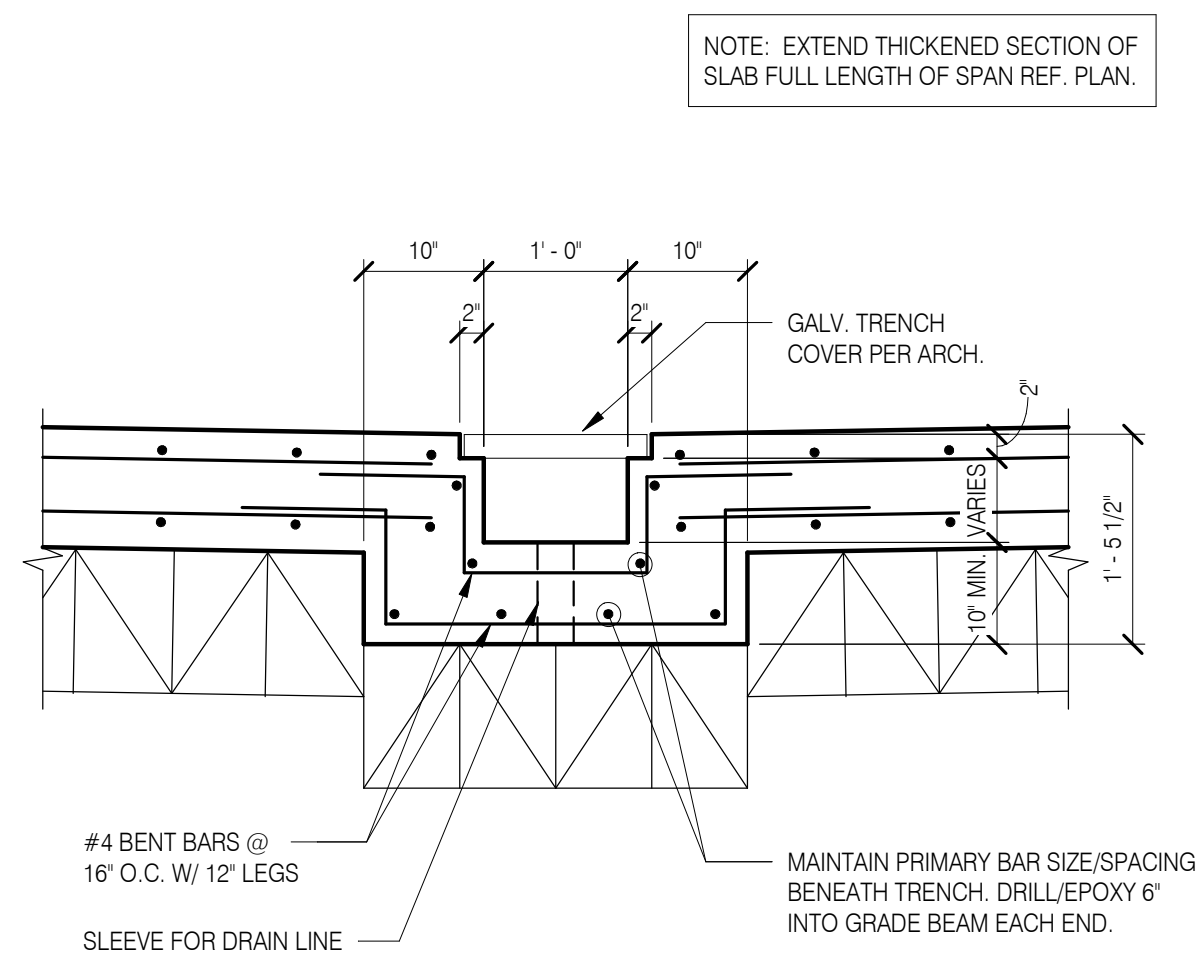
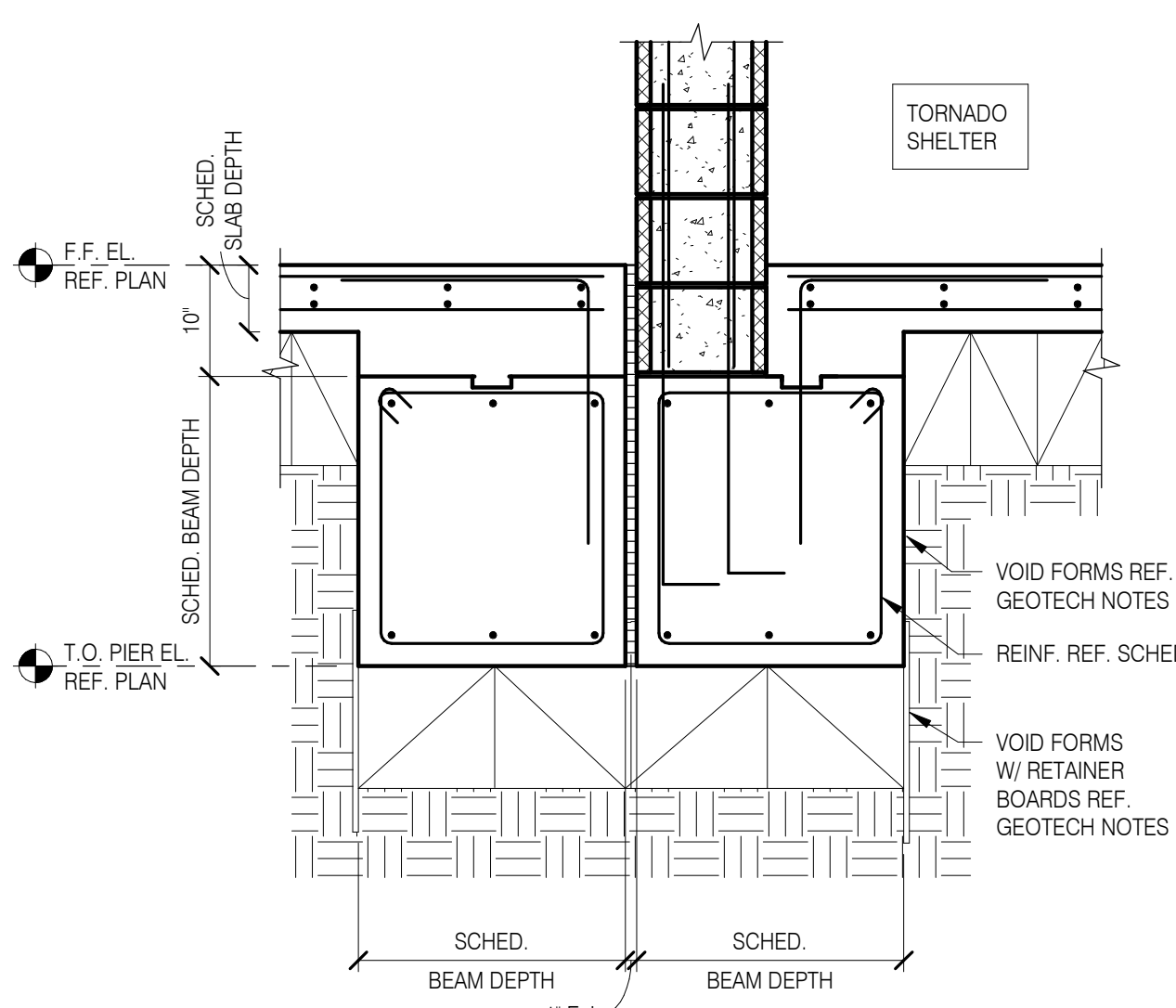
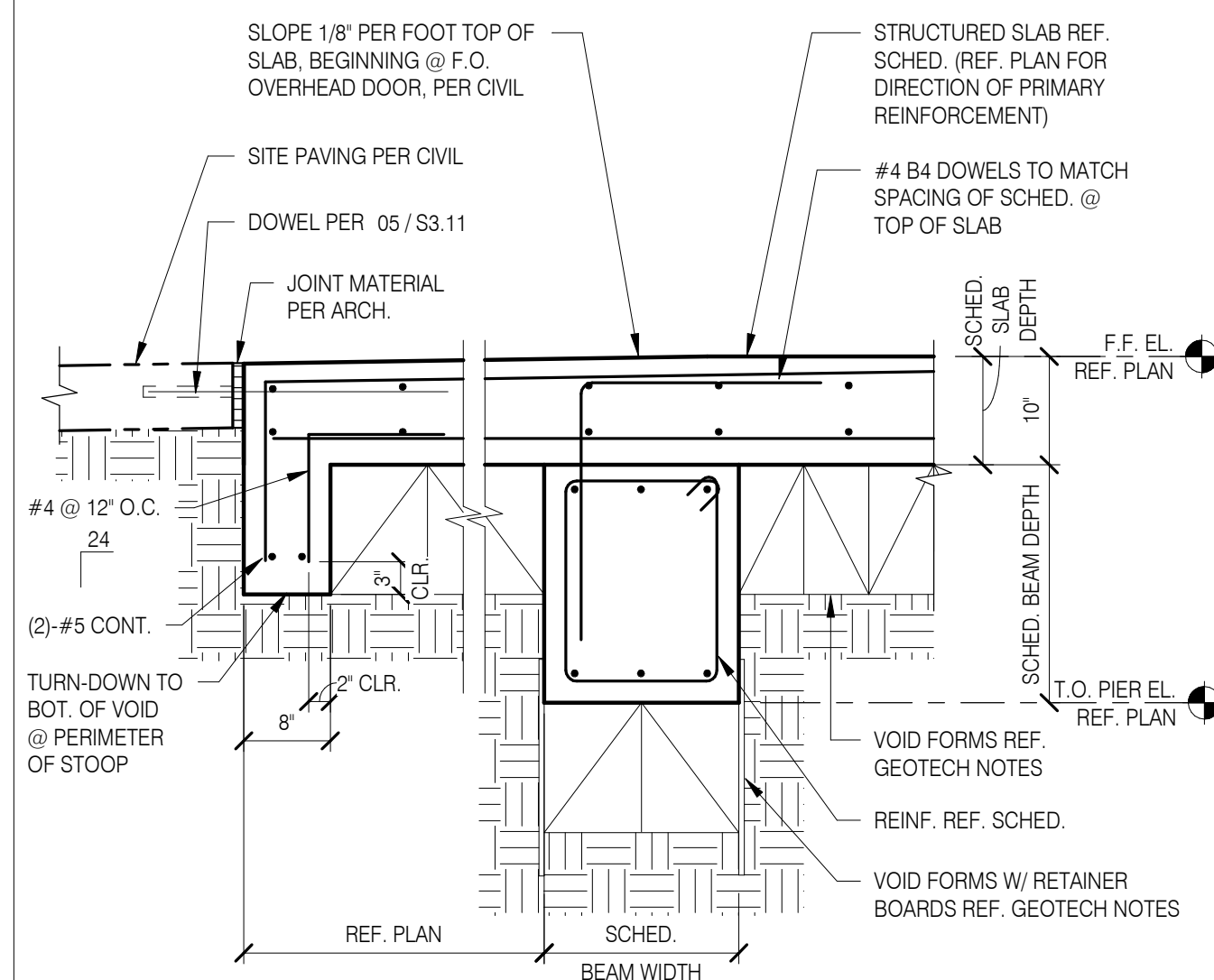
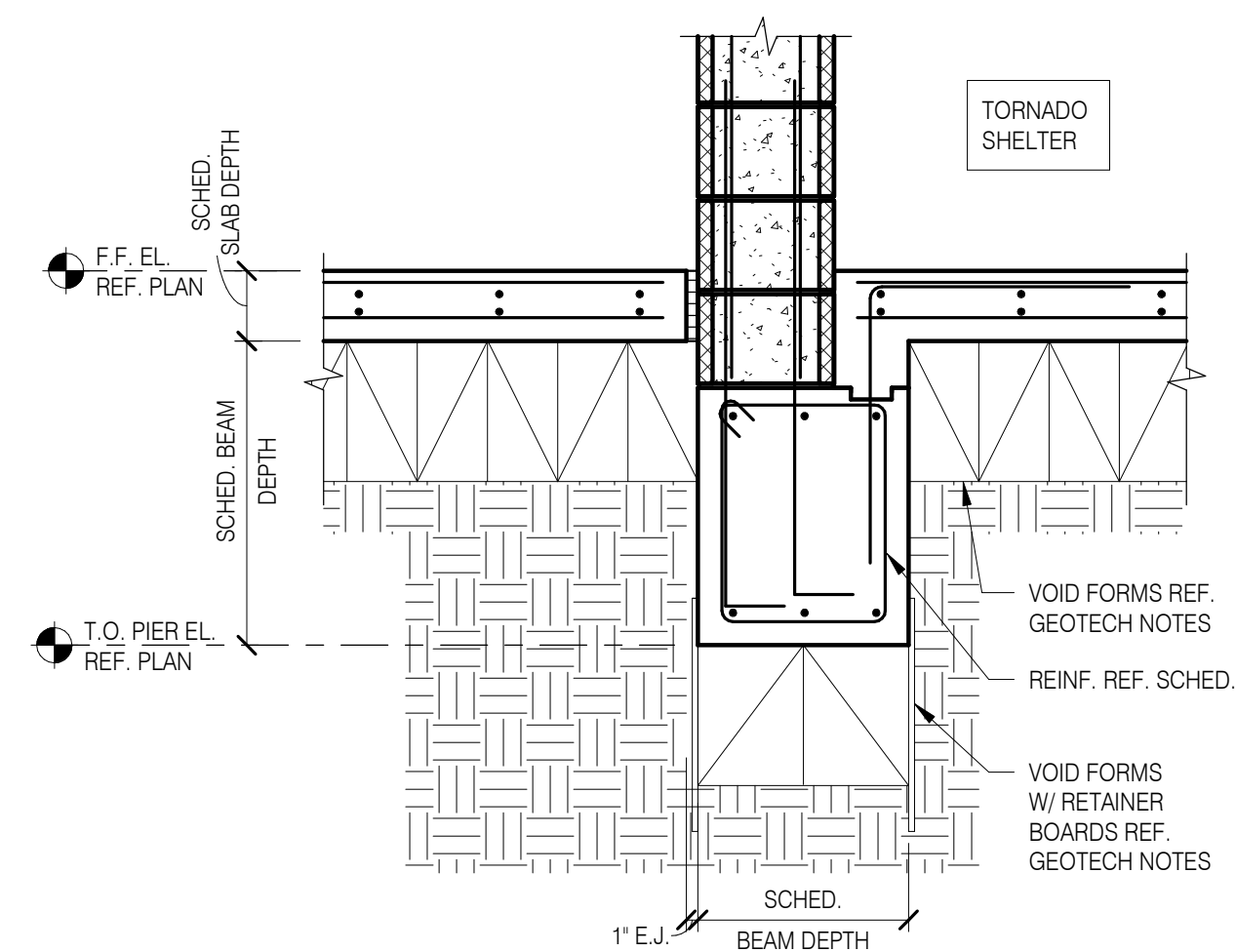
- T.O. STEEL ELEVATIONS REF. PLAN. REFER TO ARCHITECTURAL OR CIVIL DRAWINGS FOR DATUM ELEVATION.
- COORDINATE ALL WORK THIS SHEET WITH THE STRUCTURAL NOTES IN THE S1 SHEET SERIES AND WITH THE PROJECT SPECIFICATIONS.
- REFER TO THE S5 SHEET SERIES FOR FRAMING DETAILS.
- REFER TO FOUNDATION PLANS FOR COLUMN & BASEPLATE SIZES.
- 1 1/2", 22 GA. TYPE B ROOF DECK. ATTACH TO STEEL SUPPORTS w/ THE FOLLOWING POWDER ACTUATED FASTENERS (PAF):
SUPPORTS THINNER THAN 3/8"
FASTENER: HILTI X-HSN 24 PAF
FASTENER PATTERN: 36/4
SIDELAP: HILTI SLC SIDELAP SCREWS @ 12" O.C.
SUPPORTS 3/8" THICK OR THICKER
FASTENER: HILTI X-ENP-19-L-15 PAF
FASTENER PATTERN: 36/4
SIDELAP: HILTI SLC SIDELAP SCREWS @ 12" O.C.
- TRUSS BRIDGING PER TRUSS SUPPLIER IS NOT SHOWN FOR CLARITY.
- LIGHT GA. TRUSS SUPPLIER TO COORDINATE TRUSS PROFILES WITH ARCHITECTURAL PLANS AND SECTIONS.
- TYP. EXTERIOR STUD WALL: 600S162-54 @ 16" O.C. + (2) - 600S162-54 CENTERED BENEATH EACH ROOF TRUSS. WITHIN 8'-0" OF BUILDING CORNERS, PROVIDE 600S162-54 @ 12" O.C. PROVIDE MID-HEIGHT BRIDGING.
- TYP. INTERIOR LOAD-BEARING STUD WALL: 362S162-54 @ 16" O.C. + (2) - 362S162-54 CENTERED BENEATH EACH MEZZ. BEAM & ROOF TRUSS. PROVIDE MID-HEIGHT BRIDGING.
- TYP. LATERAL BRACED FRAME: 12 GA. x 3" X-STRAPPING ON INTERIOR FACE + HOLD-DOWN EACH END PER DETAIL 07/S4.1.
- REPRESENTS LIGHT GA. HEADER PER 01 AND 04/S4.22
- 1 1/2", 20 GA. TYPE BP CELLULAR ROOF DECK. ATTACH TO STEEL SUPPORTS PER NOTES IN NOTE #5.

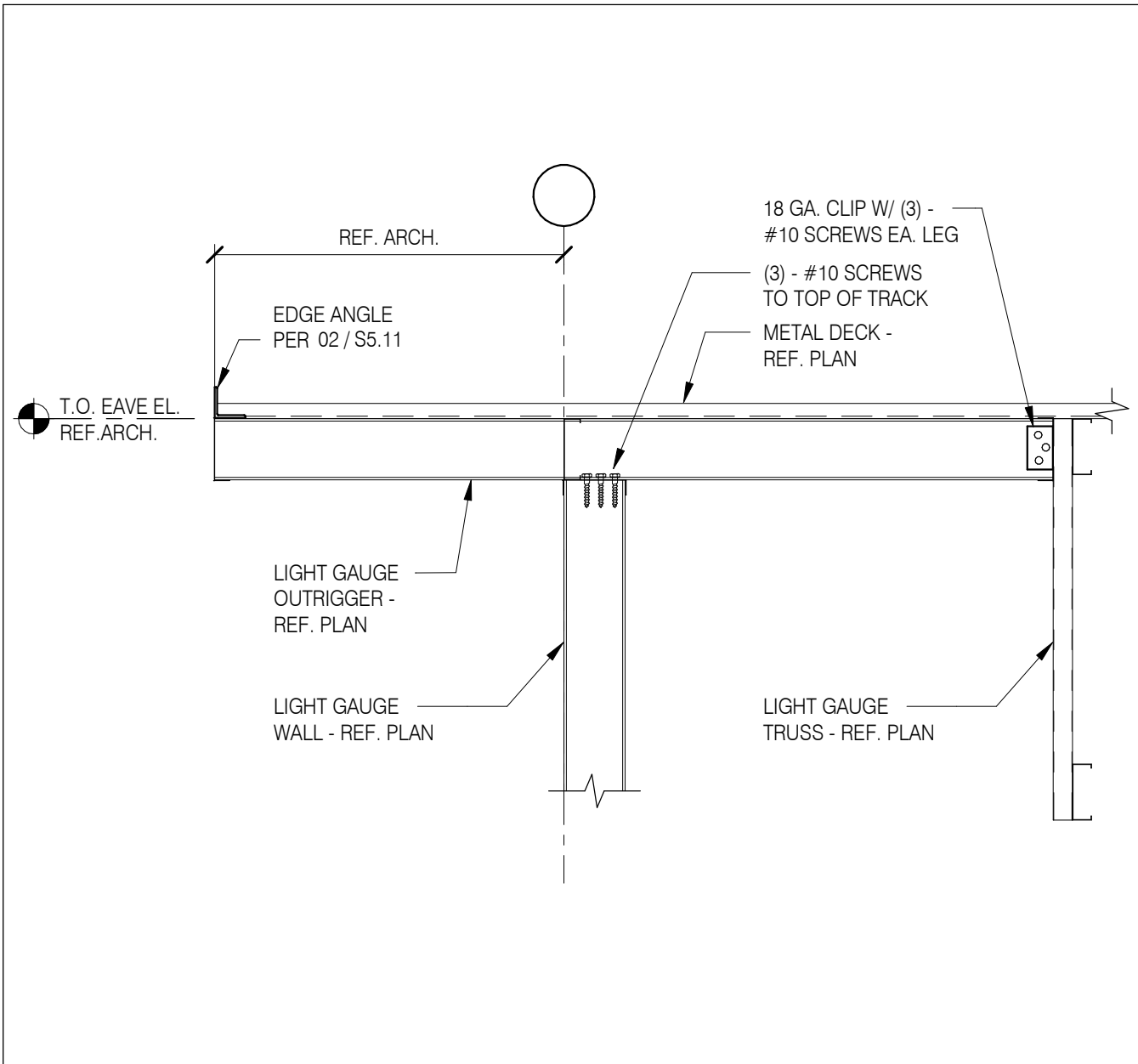
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Suite 202
Dallas, Texas 75201
214.237.7022
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structural engineers

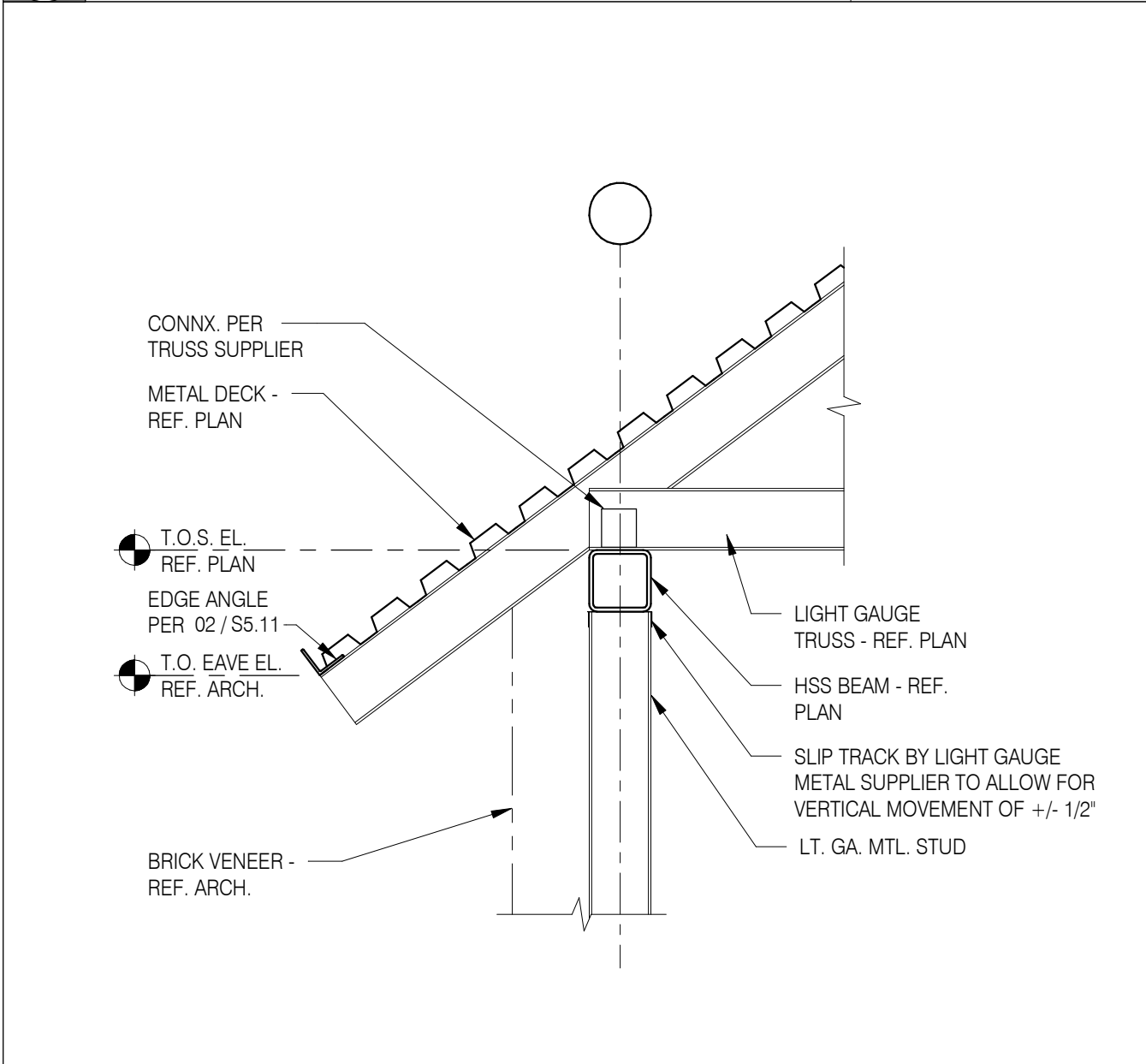
19.097.00

KOMATSU ARCHITECTURE		12/10/19	
ISSUE FOR CONSTRUCTION		Date	
Revision 1		No.	
MANSFIELD FIRE STATION NO. 5		REVISIONS	
4444 NATIONAL PARKWAY MANSFIELD, TEXAS 76063		Description	
ROOF FRAMING PLAN		12/10/19	
SHEET SIZE: 22 x 34		DATE: 11/07/2019	
JOB NO: 2016.166		SHEET: S2.30	

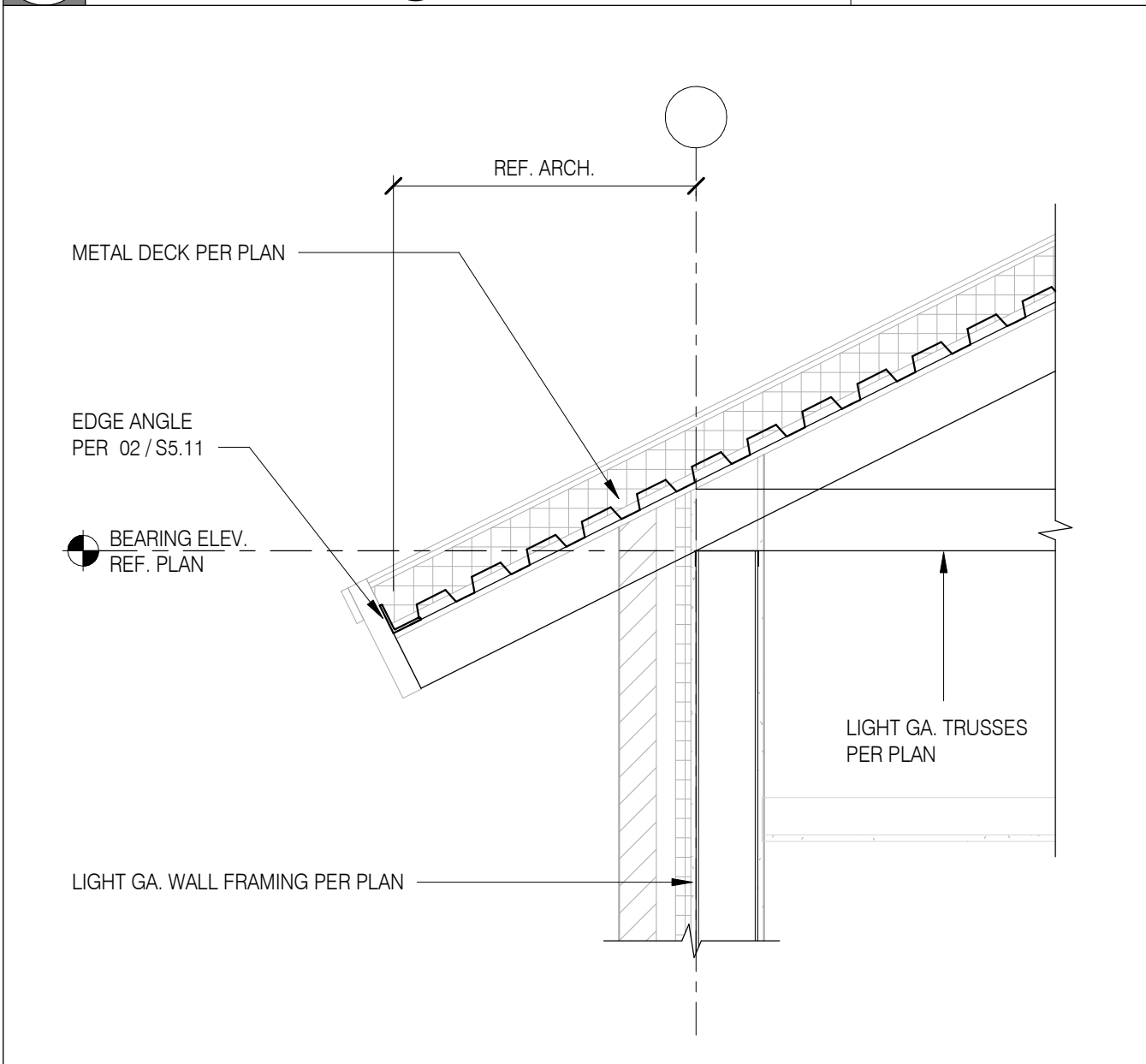




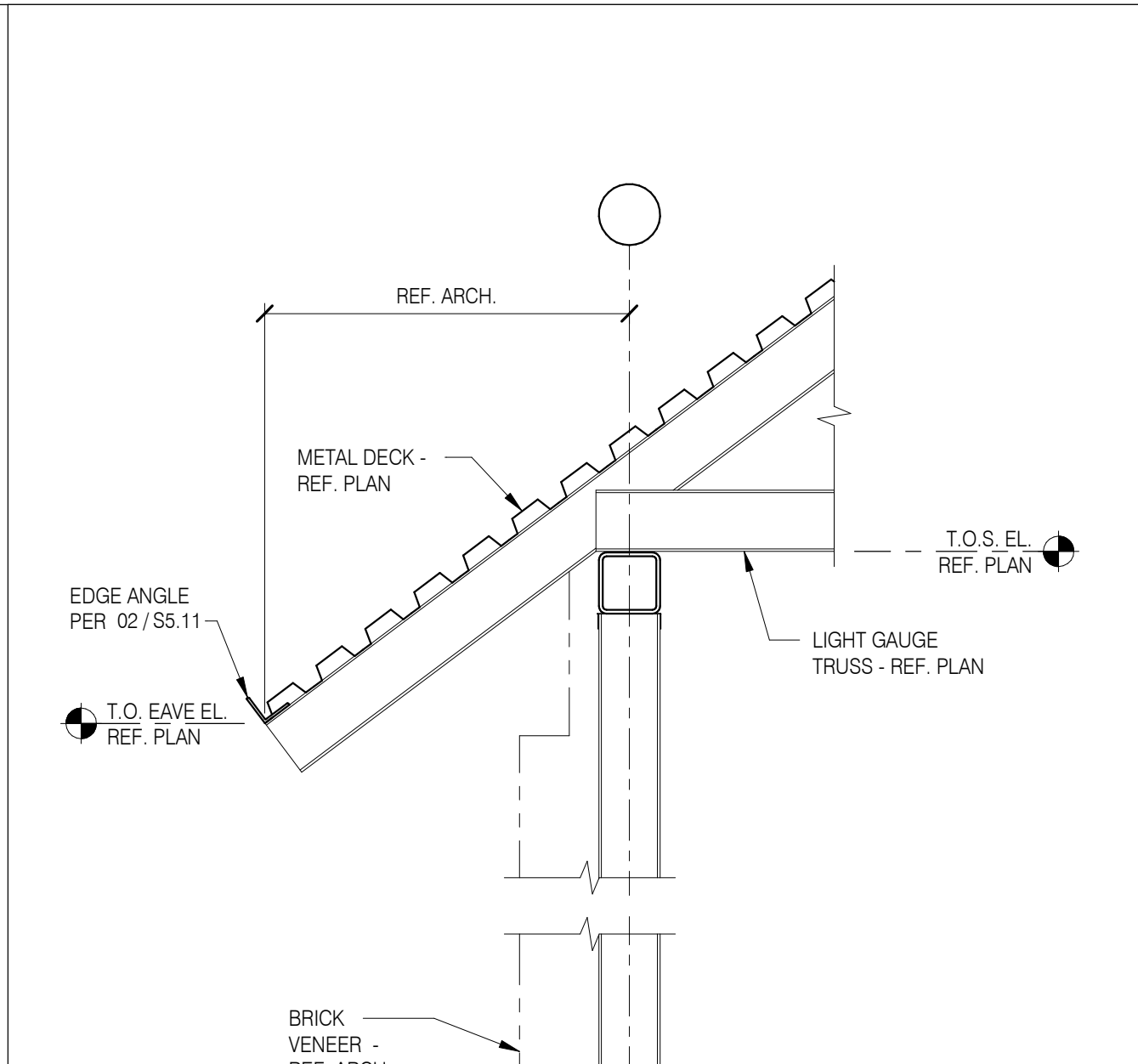
10 TYP. OUTRIGGER DETAIL 3/4" = 1'-0"



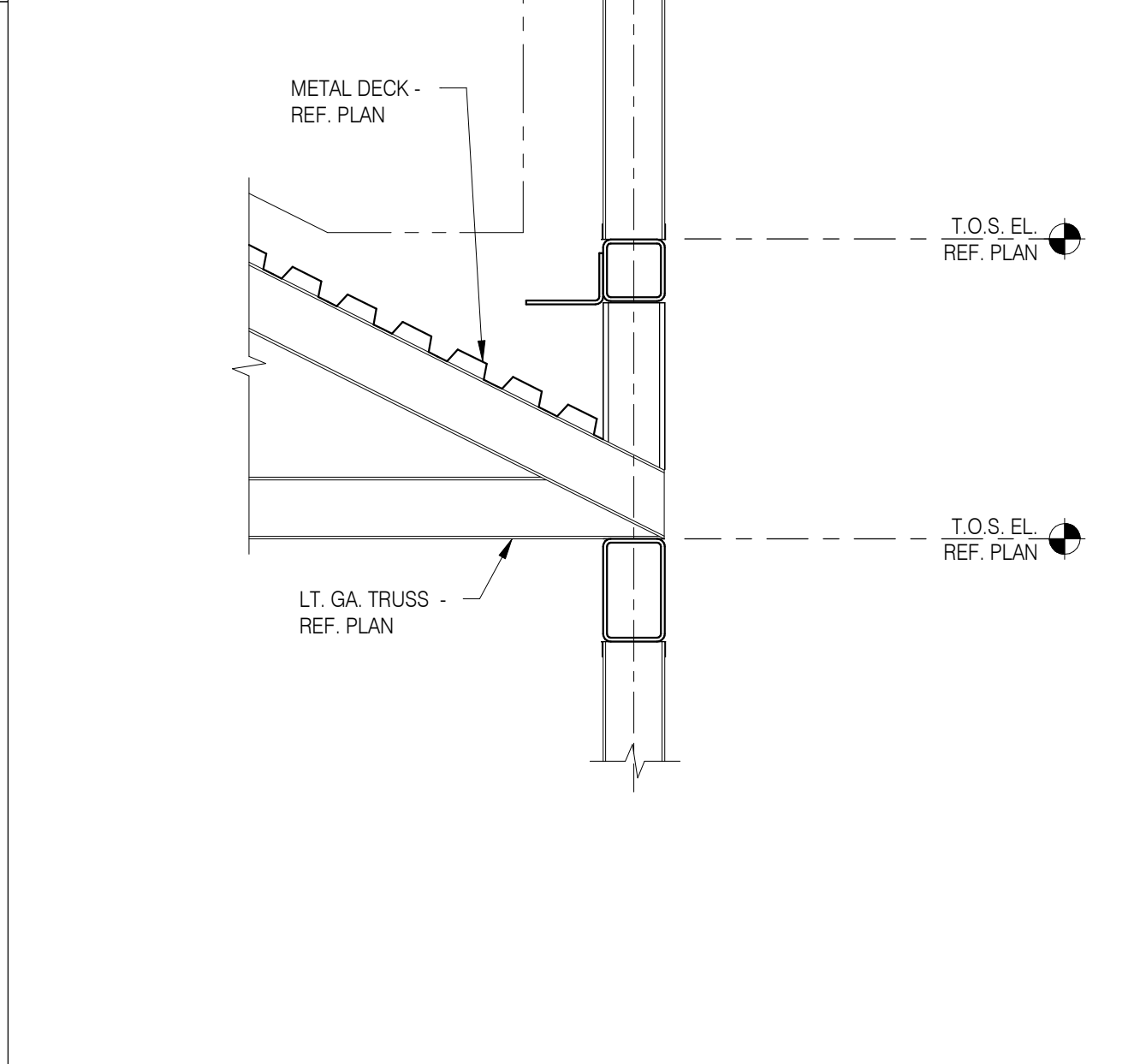
09 TRUSS BRG. @ TOWER ROOF 3/4" = 1'-0"



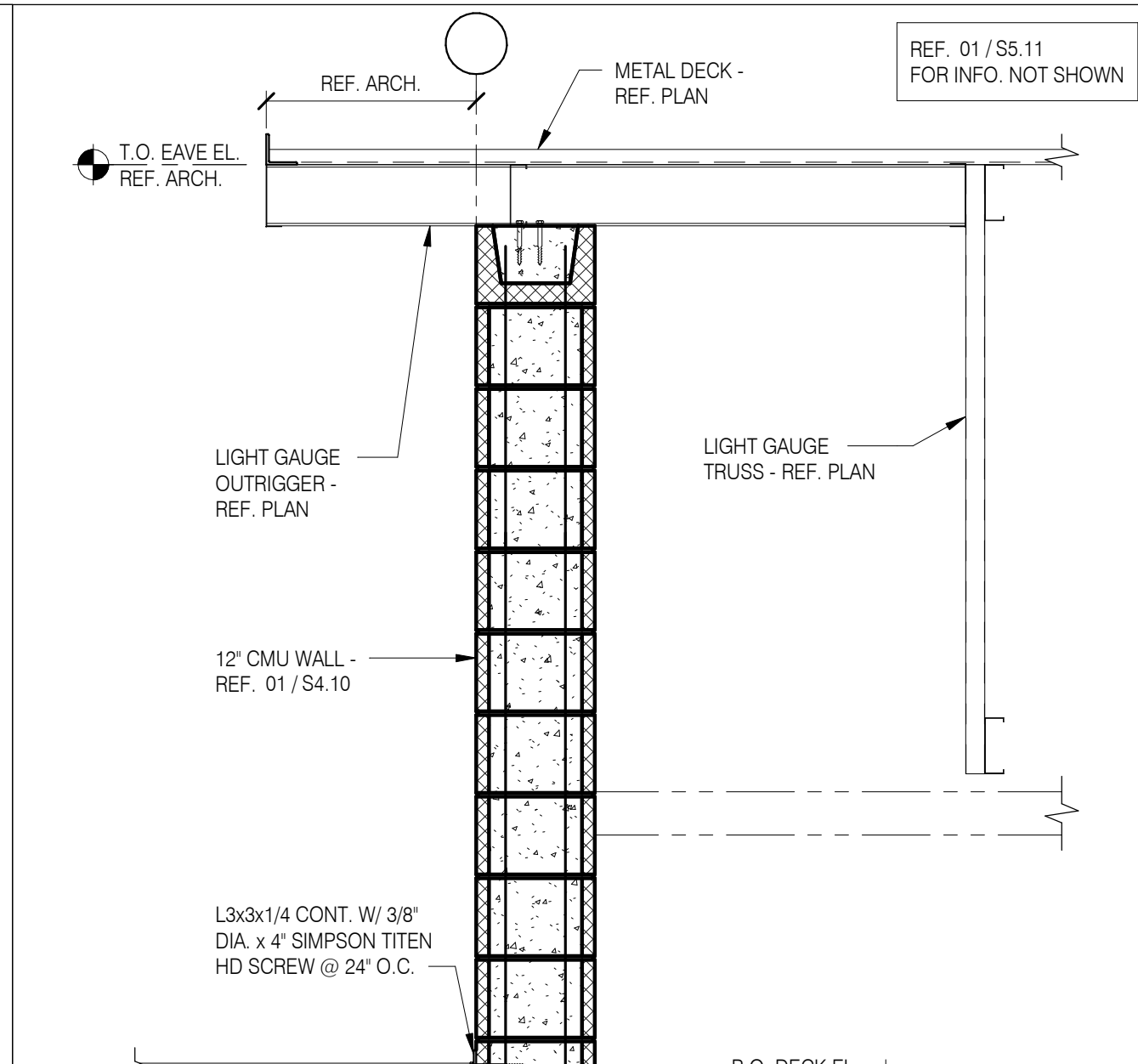
08 TRUSS BRG. ON LG WALL 3/4" = 1'-0"



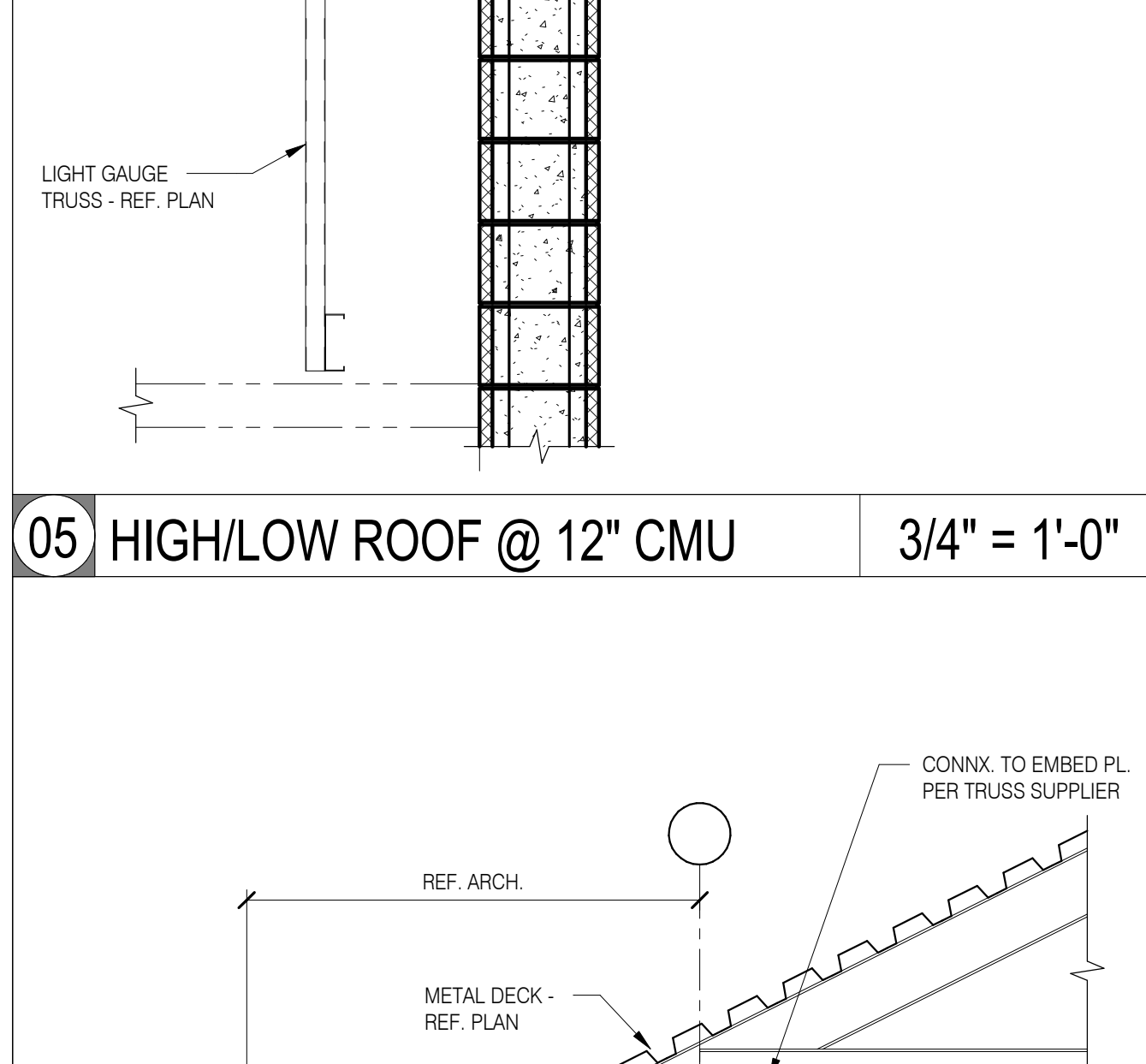
07 TRUSS BRG. @ TOWER WALL 3/4" = 1'-0"



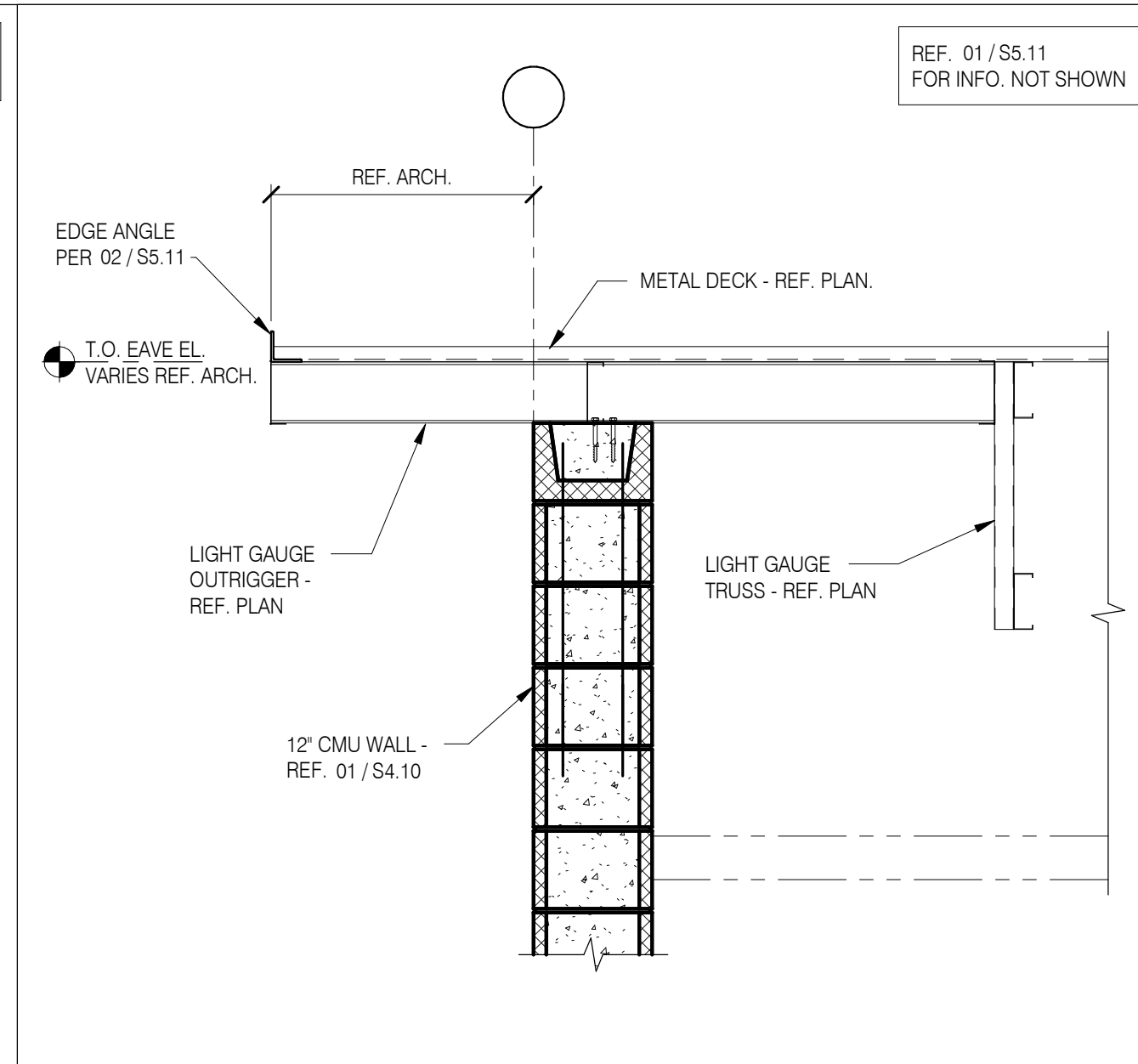
06 CANOPY DETAIL 3/4" = 1'-0"



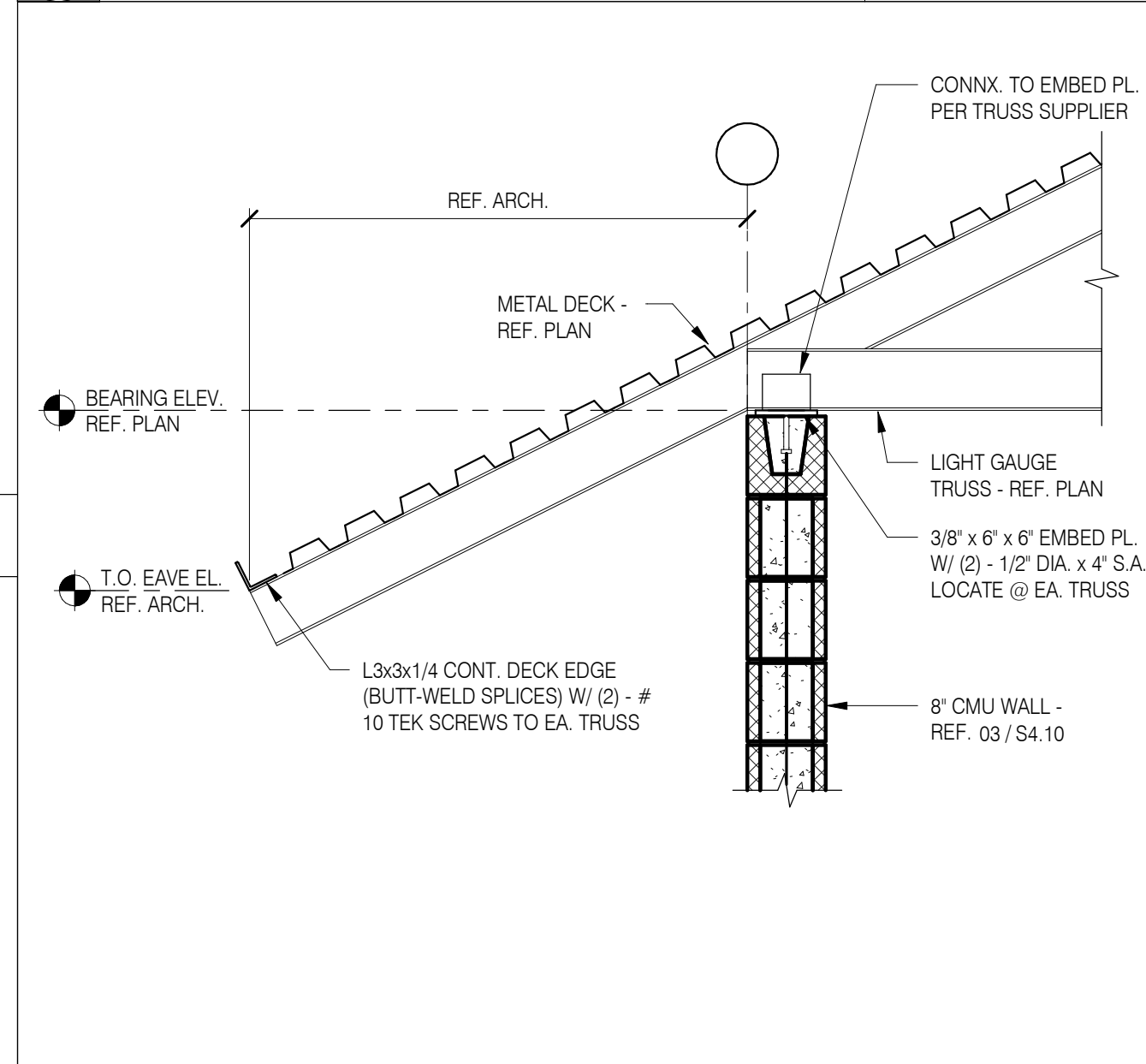
05 HIGH/LOW ROOF @ 12" CMU 3/4" = 1'-0"



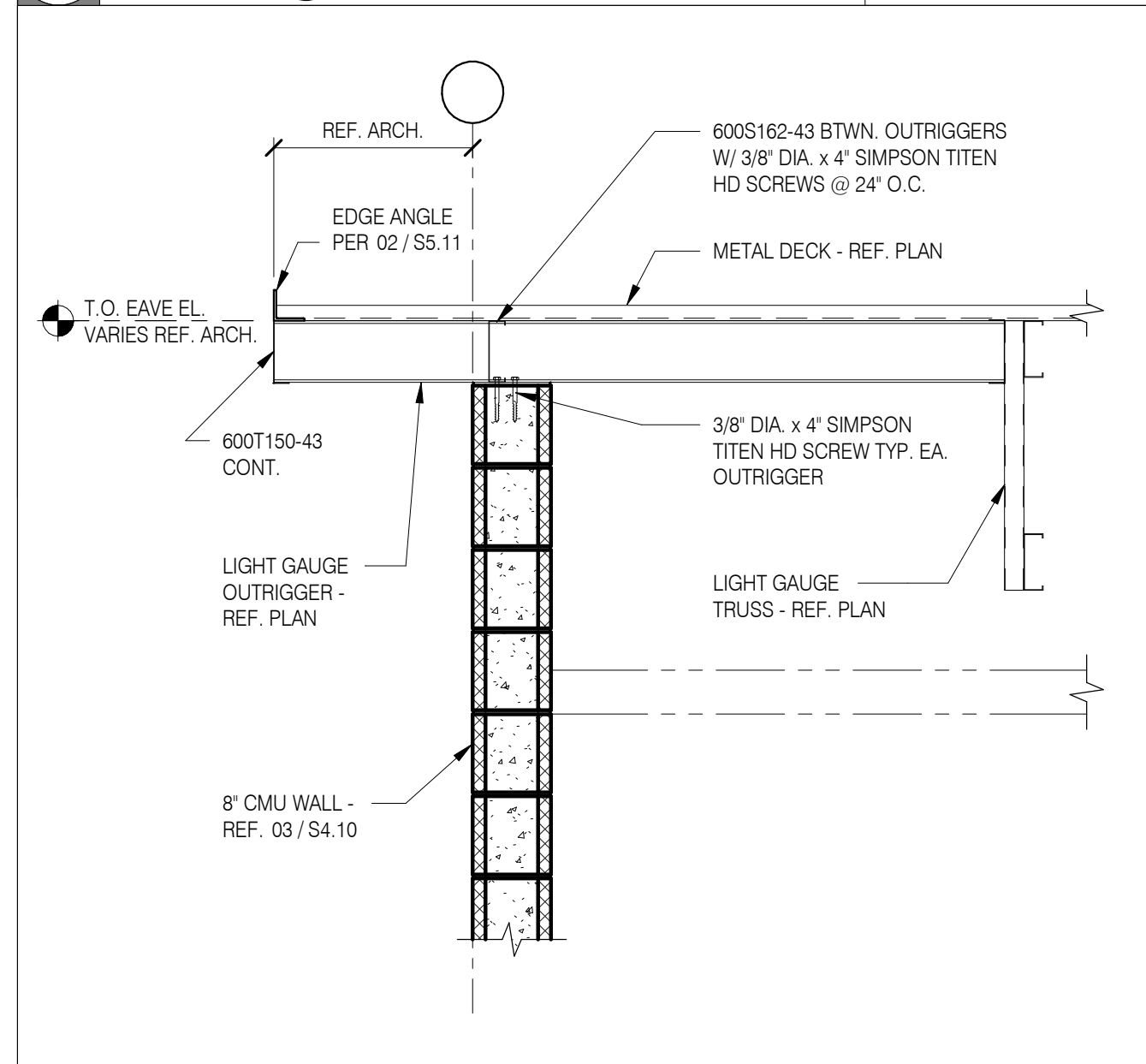
04 TRUSS @ EAVE - 12" CMU 3/4" = 1'-0"



03 OUTRIGGER @ EAVE - 12" CMU 3/4" = 1'-0"



02 TRUSS @ EAVE - 8" CMU 3/4" = 1'-0"



01 OUTRIGGER @ EAVE - 8" CMU 3/4" = 1'-0"

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12/10/19

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Revision 1

Description

REVISIONS

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ISSUE FOR CONSTRUCTION

STATE OF TEXAS

SCOTT R. ARMSTRONG

83205

PROFESSIONAL ENGINEER

12/10/19

MANSFIELD FIRE STATION NO. 5

4444 NATIONAL PARKWAY
MANSFIELD, TEXAS 76063

FRAMING DETAILS

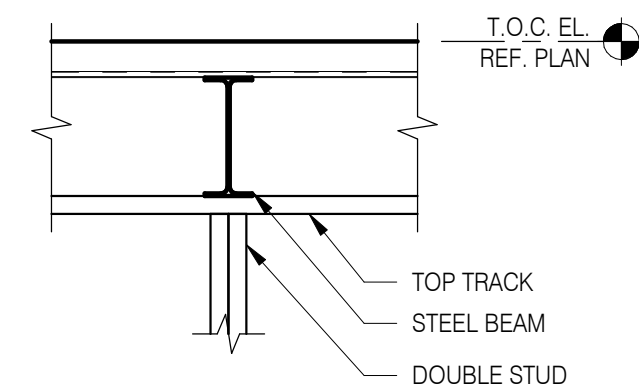
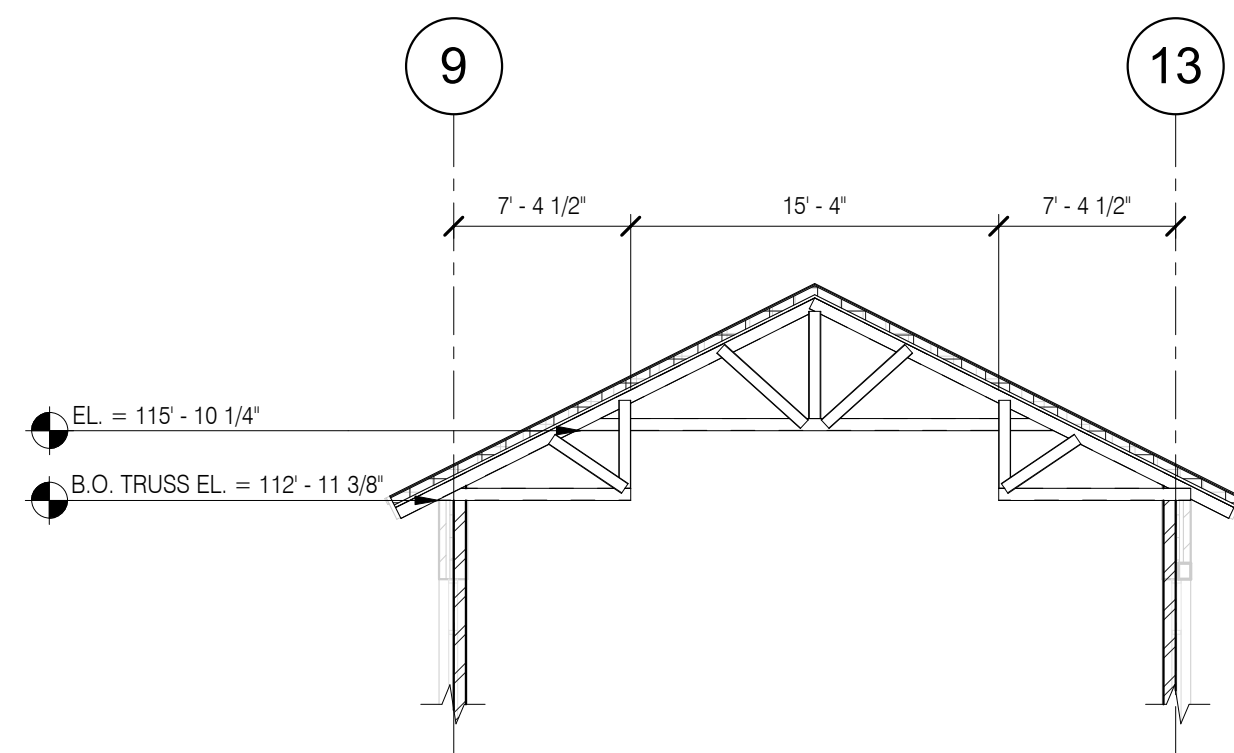
SHEET SIZE: 22 x 34

JOB NO: 2016.166

DATE: 11/07/2019

SHEET: S5.11

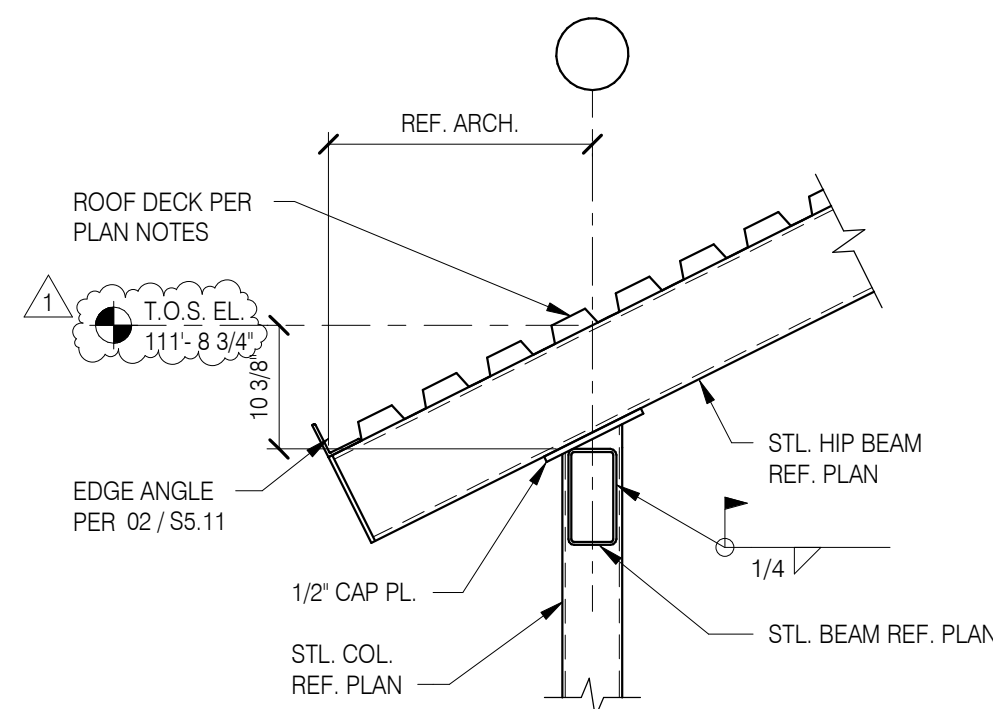
© 2016 Komatsu Architecture, Inc.



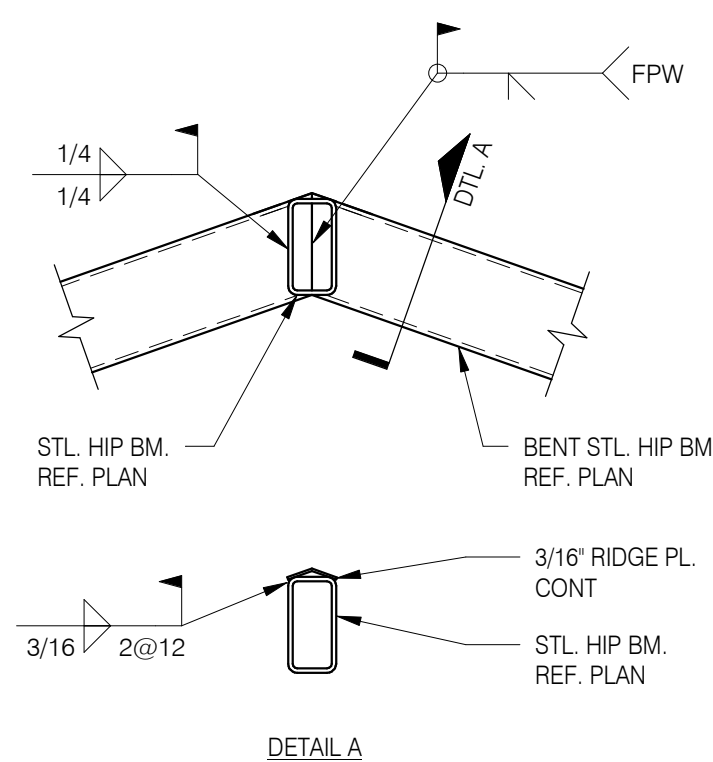
03 TRUSS PROFILE

$$1/8'' = 1'-0''$$

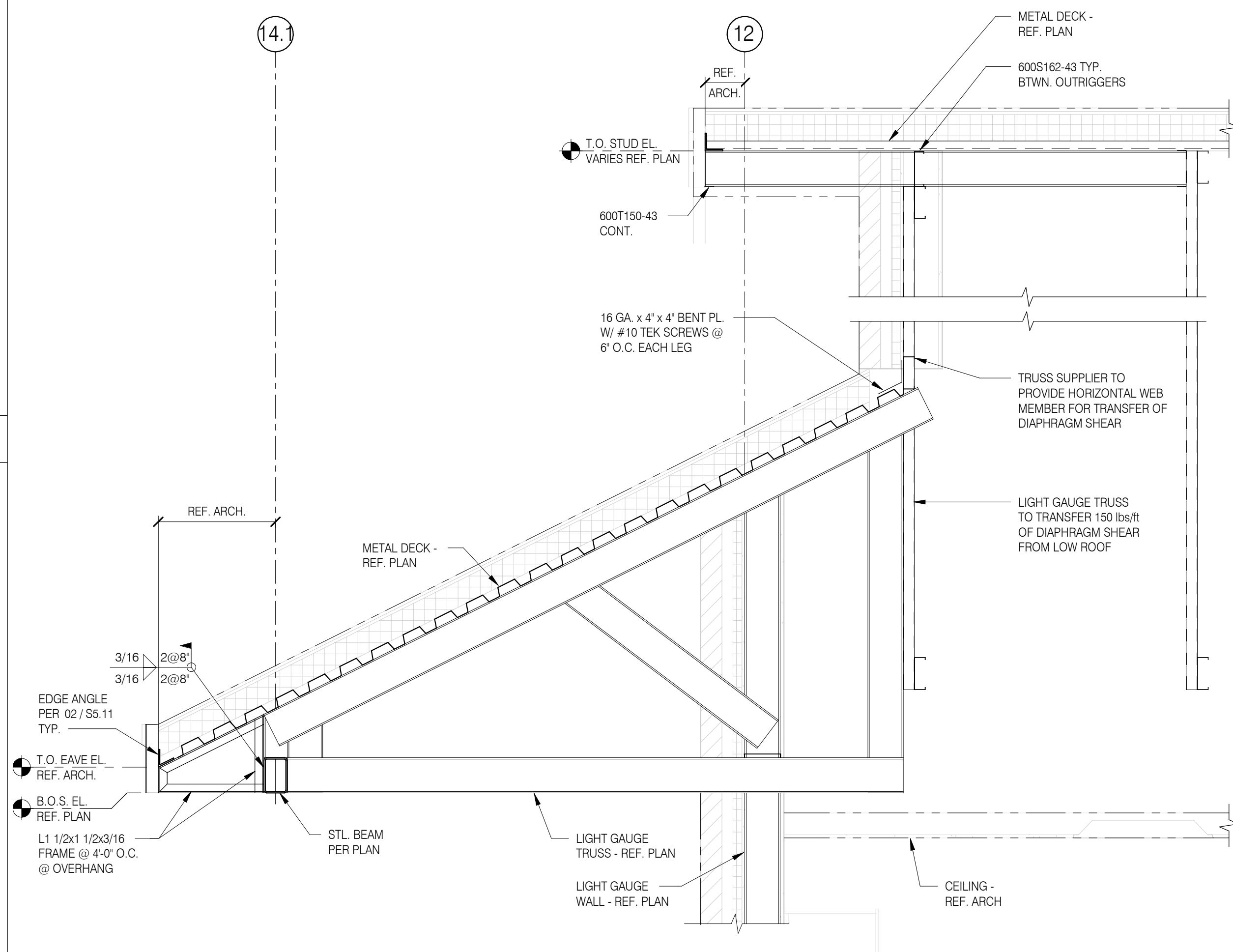
02 TYP. BEAM BEARING ON STUD

$$\frac{3}{4}'' = 1'-0''$$


05 SECTION

$$\frac{3}{4}'' = 1'-0''$$


04 SECTION

$$\frac{3}{4}'' = 1'-0''$$


01 SECTION

$$\frac{3}{4}'' = 1'-0''$$

MULTI-ZONE DX SPLIT SYSTEM SCHEDULE																																
MARK FCU- /HR- /CU-		INDOOR UNIT										HEAT RECOVERY UNIT								CONDENSING UNIT								FCU(EACH)/CU COOLING PERFORMANCE DATA				REMARKS
		ARRANGEMENT	UNIT CFM	O/A CFM	ESP (IN)	POWER CONNECTION				UNIT WT	LG MODEL SERIES	# OF PORTS	LG MODEL SERIES	POWER CONNECTION				QUANTITY COMP	REF TYPE	QUANTITY FANS	POWER CONNECTION				UNIT WT	LG MODEL SERIES	MIN CAP (MBH)		AMB DB	MIN. SEER		
						V	PH	MCA	MOCP					V	PH	MCA	MOCP				V	PH	MCA	MOCP			TOTAL	SENS				
L1-L4/L1/L1	CEILING CASSETTE	600	60	N/A	208	1	0.2	15	35	ARNU183	6	PRH043A	208	1	0.2	15	1	R-410A	2	208	3	30.9	40	550	ARUM121BTE5	19.1	15.0	105	17.0	1,2,3,4,5,6,7,8,9		
L5/L2/L1	CEILING CASSETTE	250	25	N/A	208	1	0.2	15	35	ARNU073		7.5	5.5	1,2,3,4,5,6,7,8,9																		
L6/L2/L1	CEILING CASSETTE	150	15	N/A	208	1	0.2	15	35	ARNU053		5.5	4.7	1,2,3,4,5,6,7,8,9																		
L7/L2/L1	CEILING CASSETTE	500	50	N/A	208	1	0.2	15	35	ARNU153		15.4	11.0	1,2,3,4,5,6,7,8,9																		

REMARKS:

1. CONDENSING UNIT SERVES MULTIPLE INDOOR UNITS.
2. SIZE, ROUTE, INSULATE AND PROVIDE APPURTENANCES FOR DX PIPING SYSTEMS, IN STRICT ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS.
3. LISTED CAPACITIES ARE FOR THE EACH FAN COIL UNIT. UNITS SHALL PERFORM TO LISTED CAPACITIES.
4. LG IS THE BASIS OF DESIGN. ACCEPTABLE MANUFACTURERS ARE: DAIKIN, MITSUBISHI, CARRIER.
5. SEER / EER. RATINGS ARE AT ARI CONDITIONS FOR CONDENSING UNIT ONLY.
6. PROVIDE FILTER DRYER AND SIGHT GLASS ON THE DX LINES.
7. PROVIDE INTEGRAL CONDENSATE PUMP AND DIRECT CONNECTION OUTDOOR AIR.
8. PROVIDE CENTRAL TOUCH-SCREEN CONTROL/DISPLAY UNIT FOR INDIVIDUAL UNIT CONTROL.
9. PROVIDE FACTORY PROGRAMMABLE THERMOSTAT 7-DAY, 2-EVENT.

[illegible]

REMARKS

1. FUEL FOR FURNACE SHALL BE NATURAL GAS.
2. EXTERNAL STATIC PRESSURE ("WG") INCLUDES DUCTWORK, BALANCING DAMPERS AND AIR DEVICES ONLY.
3. SIZE, ROUTE, INSULATE AND PROVIDE APPURTENANCES FOR DX PIPING SYSTEMS, IN STRICT ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS.
4. LISTED CAPACITIES ARE FOR THE AIR HANDLER UNIT AND CONDENSER UNIT COMBINATION. UNITS SHALL PERFORM TO LISTED CAPACITIES.
5. TRANE IS THE BASIS FOR DESIGN. ACCEPTABLE MANUFACTURER'S ARE: YORK, CARRIER, AAO, CONTRACTOR IS RESPONSIBLE FOR VARIATIONS FROM DESIGN BASIS IN FIT AND ELECTRICAL SERVICE.
6. SEER / EER RATINGS ARE AT ARI CONDITIONS FOR CONDENSING UNIT ONLY.
7. PROVIDE FILTER DRYER AND SIGHT GLASS ON THE DX LINES.
8. PROVIDE FILTER RACK, PLACE AND ORIENT FOR EASY FILTER ACCESS.
9. FOR LONG DX LINE RUNS, USE MANUFACTURER'S PUBLISHED LONG LINE INSTALLATION GUIDELINES.
10. PROVIDE WITH FACTORY, WALL MOUNTING, PROGRAMMABLE 7-DAY/2-EVENT THERMOSTAT.
11. MINIMUM 80-PERCENT EFFICIENCY (AFUE) ON GAS FURNACE.
11. PROVIDE WITH FACTORY CONCENTRIC VENT KIT.

DX SPLIT SYSTEM SCHEDULE																							
MARK FCU- / CU-	INDOOR UNIT							CONDENSING UNIT								FCU COOLING PERFORMANCE DATA							REMARKS
	ARRANGEMENT	UNIT CFM	OUTDOOR AIR (CFM)	ESP (IN)	FLA	UNIT WT	LG MODEL SERIES	QUANTITY COMP	REF TYPE	QUANTITY FANS	POWER CONNECTION				UNIT WT	LG MODEL SERIES	MIN CAP (MBH)		AMB DB	ENTERING		MIN. SEER	
											V	PH	MCA	MOCP			TOTAL	SENS		DB	WB		
6.7	WALL MOUNT	300	--	0.1	0.2	20 LBS	LSN	1	R-410A	1	208	1	7.0	15	20 LBS	LSU	12.0	10.0	105	75	62.5	17.0	1,2,3,4,5,6,7,8,9,10,11,12

REMARKS

1. INDOOR UNIT IS POWERED THROUGH OUTDOOR UNIT CIRCUIT.
2. SIZE, ROUTE, INSULATE AND PROVIDE APPURTENANCES FOR DX PIPING SYSTEMS, IN STRICT ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS
3. LISTED CAPACITIES ARE FOR THE AIR HANDLER UNIT AND CONDENSER UNIT COMBINATION. UNITS SHALL PERFORM TO LISTED CAPACITIES.
4. LG IS THE BASIS OF DESIGN. ACCEPTABLE MANUFACTURERS ARE: MITSUBISHI, FREIDRICH, DAIKIN, CARRIER.
5. SEER / EER. RATINGS ARE AT ARI CONDITIONS FOR CONDENSING UNIT ONLY.
6. PROVIDE FILTER DRYER AND SIGHT GLASS ON THE DX LINES.
7. PROVIDE LITTLE GIANT EC-OP-K CONDENSATE PUMP PACKAGE
8. PROVIDE FACTORY PROGRAMMABLE THERMOSTAT 7-DAY, 2-EVENT.
9. COORDINATE OUTDOOR UNIT MOUNTING REQUIREMENTS AND ROOF PENETRATIONS.
10. PROVIDE FACTORY CONDENSER COIL HAIL GUARDS
11. UNITS SHALL BE PROVIDED WITH TVX VALVES
12. FOR LONG DX RUNS, USE MANUFACTURER'S RECOMMENDED LONG LINE INSTALLATION GUIDELINES

[illegible]

REMARKS

1. OR APPROVED EQUAL.
2. PROVIDE FACTORY MOUNTED HARDWARE FOR SUSPENSION FROM BUILDING STRUCTURE INCLUDING SPRING HANGER ISOLATORS.
3. PROVIDE CEILING FIRE DAMPER AND INTEGRAL METAL GRILLE.
4. INTERLOCK START-STOP WITH LIGHT SWITCH.
5. PROVIDE FACTORY 7-DAY TIMECLOCK FOR CONTINUOUS FAN OPERATION DURING OCCUPIED HOURS.
6. FAN RUNS CONTINUOUSLY.
7. PROVIDE WITH FACTORY ROOF CURB - BOTTOM SLOPED TO MATCH ROOF PITCH.
8. PROVIDE WITH INTEGRAL DISCONNECT, GRAVITY BACKDRAFT DAMPER, AND ALUMINUM BIRDSCREEN.
9. KITCHEN HOOD EXHAUST FAN. REFER TO CONTROLS DIAGRAM ON M6.02.
10. PROVIDE GREASE CAPTURE AND CONTAINMENT SYSTEM.
11. PROVIDE WITH COMBINATION STARTER/DISCONNECT WITH NEMA 3R ENCLOSURE.
12. PROVIDE WITH MOTORIZED BACKDRAFT DAMPER.
13. FAN SHALL BE UL705 AND UL762 RATED.

MANSFIELD FIRE STATION NO. 5		 KOMATSU ARCHITECTURE				
4444 National Parkway Mansfield, Texas 76063			1	Addendum 01		
HVAC SCHEDULES			No.	Description	Date	
SHEET SIZE:		22 x 34				
JOB NO:		2016.166				
DATE:		11/19/2019				
SHEET:		M0.02				



 12/10/2019
 JOHN S. O'KELLEY
 31583
 REGISTERED
 PROFESSIONAL ENGINEER
 240.12.10.2019.19024

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 Texas Registration # F-10963

AIR DEVICE SCHEDULE									
MARK	SERVES	NECK SIZE	FACE SIZE	MOUNTING	TYPE	MATERIAL	MAXIMUM NC	DESIGN BASIS MANUFACTURER/ MODEL SERIES	REMARKS
A	SUPPLY	6,8,10,12,14	24" x 24"	CEILING	LOUVERED	STEEL	30	TITUS/TDC	1,2,3
B	SUPPLY	6,8,10	12" x 12"	CEILING	LOUVERED	STEEL	30	TITUS/TDC	1,2,3
C	SUPPLY	10" x 6"	12" x 8"	SIDEWALL	AEROBLADE	STEEL	30	TITUS/272RS	2
H	RETURN/EXHAUST	VARIES	24" x 24"	CEILING	PERFORATED	STEEL	30	TITUS/PAR	1,2,3
K	RETURN/EXHAUST	10" x 10"	12" x 12"	CEILING	PERFORATED	STEEL	30	TITUS/PAR	1,2,3
L	RETURN/EXHAUST	10" x 6"	12" x 8"	SIDEWALL	AEROBLADE	STEEL	30	TITUS/23RS	2

REMARKS:

1. PROVIDE MOUNTING FRAME TO BE COMPATIBLE WITH TYPE OF CEILING IN WHICH THE DEVICE IS TO BE MOUNTED
REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR CEILING TYPES.
2. PROVIDE WHITE BAKED ENAMEL FINISH.
3. WHERE ROUND NECK SIZE IS NOTED ON DUCTWORK PLAN, PROVIDE RECTANGULAR TO ROUND DUCT COLLAR.

LOUVER SCHEDULE								
MARK - WL	SERVES	MATERIAL	CFM (FREE AREA-SQ-FT)	EXT. S.P. IN. W.G.	WIDTH IN.	HEIGHT IN.	MANUFACTURER	REMARKS
1,2,3	INTAKE	ALUMINUM	1500	0.08	32	32	POTTORFF EOD	1,2,3,4,5,6
4	EXHAUST	ALUMINUM	2000	0.08	32	32	POTTORFF EFD	1,4,5,7
5	INTAKE	ALUMINUM	(0.5)	0.08	18	18	POTTORFF XAV545	1,2,4,5,8
6	INTAKE	ALUMINUM	1000	0.08	26	26	POTTORFF EFD	1,4,5,7
7	EXHAUST	ALUMINUM	1000	0.08	26	36	POTTORFF EFD	1,4,5,7
8	EXHAUST	ALUMINUM	4500	0.08	144	36	RUSKIN ELT(ELFX375DX)	1,3,4,5,9
9	INTAKE	ALUMINUM	1200	0.08	72	18	RUSKIN ELT(ELFX375DX)	1,3,4,5,9
10	EXHAUST	ALUMINUM	300	0.08	16	16	POTTORFF EFD	1,4,5,7
11	INTAKE	ALUMINUM	740	0.08	72	18	RUSKIN ELT(ELFX375DX)	1,3,4,5,9

1. OR APPROVED EQUAL.
2. PROVIDE 120 VAC TWO-POSITION MOTORIZED DAMPER FULL SIZE OF LOUVER BEHIND LOUVER.
3. PROVIDE EXTRUDED ALUMINUM, 6" DRAINABLE OPERABLE WALL LOUVER WITH INSECT SCREEN.
4. PROVIDE LOUVER WITH ANODIZED FINISH, COORDINATE COLOR WITH ARCHITECT
5. PROVIDE WITH EXTENDED SILL.
6. INTERLOCK ACTUATOR WITH EF-6. ACTUATOR SHALL OPEN DAMPER WHEN EXHAUST FAN IS ON AND SHALL CLOSE DAMPER WHEN EXHAUST FAN IS OFF.
7. PROVIDE WITH INSECT SCREEN.
8. INTERLOCK DAMPER WITH RED MUSHROOM PUSH BUTTON. DAMPER SHALL BE NORMALLY CLOSED AND OPEN IN THE EVENT THAT THE PUSH BUTTON IS ACTIVATED OR THE BUILDING LOSES POWER.
9. PROVIDE TRIANGULAR SHAPED LOUVER TO MATCH ROOF PITCH.

GAS RADIANT HEATER (HIGH INTENSITY) SCHEDULE

MARK IR-	SERVES	TYPE	CAPACITY (MBH)		STAGES	MOTOR DATA			DESIGN BASIS REZNOR MODEL SERIES
			INPUT	OUTPUT		FLA	VOLTS	PH	
1	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH
2	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH
3	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH
4	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH
5	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH
6	APPARATUS BAY	HIGH INTENSITY	100	85	2	1.7	120	1	RIH

REMARKS:

1. FUEL SOURCE IS NATURAL GAS.
 2. CERAMIC HEATING ELEMENT WITH STANDARD POLISHED ALUMINUM REFLECTOR.
 3. UNITS SHALL BE CSA RATED FOR COMMERCIAL/INDUSTRIAL USE.
 4. 15-FEET MINIMUM MOUNTING HEIGHT.
 5. DOUBLE-STAGE BURNER.
 6. COORDINATE WITH ELECTRICAL FOR DIRECT WIRED ELECTRICAL CONNECTION.
 7. PROVIDE WITH MOUNTING HARDWARE FOR SUSPENSION FROM ROOF STRUCTURE.
 8. MOUNT AT 20-DEGREE ANGLE; 30-DEGREES MAXIMUM ANGLE FROM HORIZONTAL.
9. PROVIDE FACTORY LINE VOLTAGE THERMOSTAT, HEAVY DUTY FOR INDUSTRIAL APPLICATION.

INDIRECT-FIRED MAKE-UP AIR UNIT WITH GAS HEAT SCHEDULE

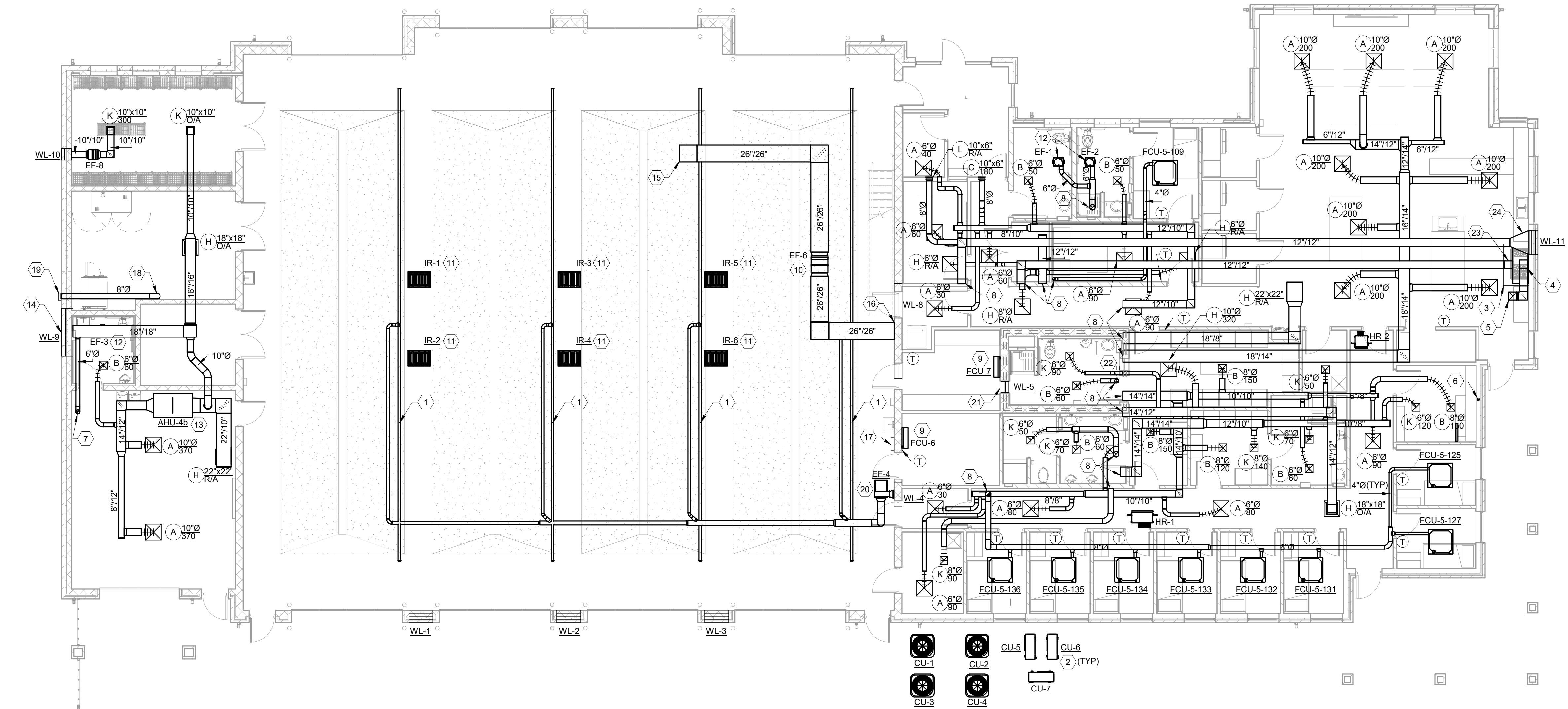
MARK MAU.	SERVES	ARRANGEMENT	FAN				POWER CONNECTION			GAS HEATING (MBH)			UNIT WEIGHT (LBS)	DESIGN BASIS MANUFACTURER/ MODEL SERIES	REMARKS
			CFM	EXT SP	DRIVE	HP	V	PH	UNIT FLA	INPUT (MBH)	CAP (MBH)	DELTA T (F)			
1	KITCHEN HOOD	IN-LINE	740	0.35	BELT	1.0	208	1	6.9	40	36	47	350	CAPTIVAIRE/D76	1,2,3,4

REMARKS:

1. EXTERNAL STATIC PRESSURE ("WG") INCLUDES DUCTWORK, BALANCING DAMPERS AND AIR DEVICES ONLY
2. PROVIDE FACTORY DISCONNECT.
3. CONTRACTOR IS RESPONSIBLE FOR VARIATIONS IN FIT AND ELECTRICAL SERVICE FOR ALTERNATE MANUFACTURERS.
4. FUEL FOR HEATING SHALL BE NATURAL GAS.

MANSFIELD FIRE STATION NO. 5	
4444 National Parkway Mansfield, Texas 76063	
HVAC SCHEDULES	
SHEET SIZE:	22 x 34
JOB NO:	2016.166
DATE:	11/19/2019
SHEET: M0.03	





M2.01 NOTES BY SYMBOL	
NUMBER	NOTE
1	DRIVE THRU VEHICLE TAILPIPE EXHAUST SYSTEM ASSEMBLY WITH (1) HOSE DROP, PLYMOVENT,STR OR APPROVED EQUAL.
2	TYPICAL CONDENSING UNIT. REFER TO DETAILS 9/M6.01 AND 10/M6.01 FOR ADDITIONAL INFORMATION.
3	COMMERCIAL GRADE TYPE I HOOD WITH SUPPLY PLENUM, CAPTIVAIRE BD-2 OR APPROVED EQUAL.
4	12/12-INCH EXHAUST DUCT DOWN TO KITCHEN HOOD.
5	12/12-INCH EXHAUST DUCT UP TO KITCHEN EXHAUST FAN ON ROOF. TRANSITION TO FULL SIZE OPENING AS REQUIRED.
6	4-INCH DRYER EXHAUST DUCT UP FROM DRYER VENT BOX UP TO ROOF. ROUTE EXHAUST DUCT IN ACCORDANCE WITH DRYER MANUFACTURER'S INSTRUCTIONS.
7	6-INCH/8-INCH EXHAUST DUCT UP TO ROOF. REFER TO DETAIL 4/M6.01 FOR ADDITIONAL INFORMATION.
8	REFER TO M2.02 FOR CONTINUATION.
9	TYPICAL DUCTLESS SPLIT SYSTEM. REFER TO DETAIL 3/M6.01 FOR ADDITIONAL INFORMATION.
10	TYPICAL INLINE EXHAUST FAN. REFER TO DETAIL 7/M6.01 FOR ADDITIONAL INFORMATION.
11	TYPICAL HIGH INTENSITY GAS-FIRED RADIANT HEATER. REFER TO DETAIL 1/M6.02 FOR ADDITIONAL INFORMATION.
12	TYPICAL CEILING MOUNTED EXHAUST FAN. REFER TO DETAIL 6/M6.01 FOR ADDITIONAL INFORMATION.
13	TYPICAL AIR HANDLING UNIT. REFER TO DETAIL 1/M6.01 FOR ADDITIONAL INFORMATION.
14	16/16-INCH OUTDOOR AIR DUCT INTO WALL LOUVER. TRANSITION TO FULL SIZE OPENING OF LOUVER AS REQUIRED.
15	TURN DOWN 90-DEGREES AND TERMINATE DUCT. COVER OPENING WITH TYPE 304 STAINLESS STEEL BIRD SCREEN.
16	26/26-INCH EXHAUST DUCT INTO WAL LOUVER. TRANSITION TO FULL SIZE OPENING AS REQUIRED.
17	VEHICLE EXHAUST EXTRACTION CONTROL PANEL. COORDINATE FINAL LOCATION WITH OWNER (VIA ARCHITECT) PRIOR TO INSTALLATION.
18	8-INCH EXHAUST DUCT FROM DRYER. INSTALL PER MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.
19	TERMINATE 8-INCH DRYER EXHAUST DUCT WITH MANUFACTURER'S WALL CAP. MOUNT AT 12-FT ABOVE FINISH FLOOR. INSTALL PER MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.
20	MOUNT EXHAUST FAN 21-FEET ABOVE FINISHED FLOOR.
21	FEMA RATED WALL LOUVER WITH DUAL POSITION OPPOSED BLADE DAMPER SECTION.
22	RED MUSHROOM PUSH BUTTON WITH NON-LOCKABLE ACCESS COVER FOR PROTECTION AGAINST ACCIDENTAL ACTIVATION.
23	12/12-INCH SUPPLY DUCT DOWN TO CONNECTION ON SUPPLY CONNECTION ON KITCHEN HOOD. TRANSITION TO HOOD CONNECTION AS REQUIRED.
24	12/12-INCH SUPPLY DUCT FROM WALL LOUVER. TRANSITION TO FULL SIZE OPENING OF LOUVER AS REQUIRED.

KOMATSU
ARCHITECTURE



ISSUE FOR CONSTRUCTION

MANSFIELD FIRE STATION NO. 5

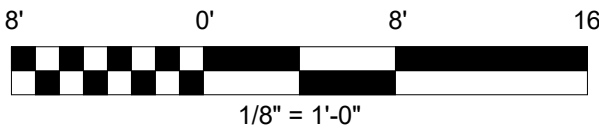
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Mansfield, Texas 76063

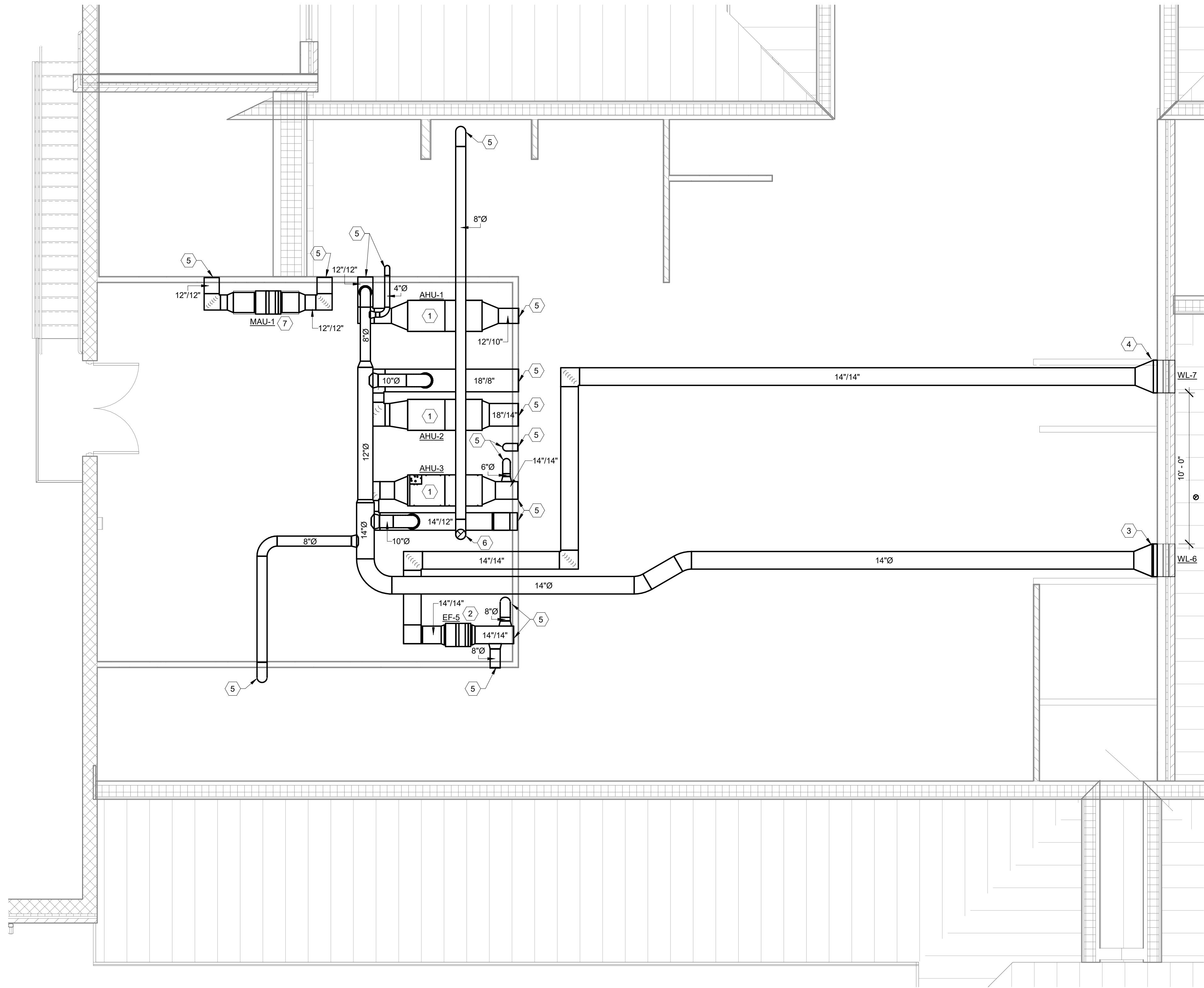
FLOOR PLAN - HVAC

SHEET SIZE:	22 x 34
JOB NO:	2016.166
DATE:	11/19/2019
SHEET:	M2.01



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M2.02 NOTES BY SYMBOL	
NUMBER	NOTE
1	TYPICAL AIR HANDLING UNIT. REFER TO DETAIL 1/M6.01 FOR ADDITIONAL INFORMATION.
2	TYPICAL INLINE EXHAUST FAN. REFER TO DETAIL 7/M6.01 FOR ADDITIONAL INFORMATION.
3	14" OUTDOOR AIR DUCT INTO WALL LOUVER. TRANSITION TO FULL SIZE OPENING AS REQUIRED.
4	14"/14-INCH EXHUAST DUCT INTO WALL LOUVER. TRANSITION TO FULL SIZE OPENING AS REQUIRED.
5	REFER TO M2.01 FOR CONTINUATION.
6	8-INCH EXHAUST DUCT UP TO ROOF.
7	IN-LINE MAKEUP AIR UNIT WITH GAS HEAT. INSTALL IN ACCORADANCE WITH ALL MANUFACTURER'S REQUIRED INSTALLATION INSTRUCTIONS

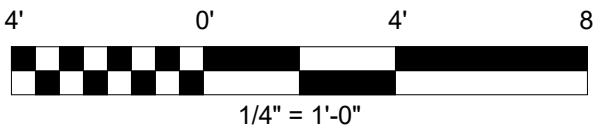
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M2.02

MEZZANINE PLAN - HVAC

1/4" = 1'-0"



SEAL

12/10/2019

JOHN S. O'KELLEY

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REGISTERED PROFESSIONAL ENGINEER

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MEZZANINE PLAN - HVAC

KOMATSU

ARCHITECTURE

ISSUE FOR CONSTRUCTION

1

No.

12/10/19

Date

Addendum 01

Description

REVISIONS

SHEET SIZE: 22 x 34

JOB NO: 2016.166

DATE: 11/19/2019

SHEET: M2.02

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REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY SCHEDULE									
MARK	SERVICE	SIZE	FLOWRATE (GPM)	PRESSURE LOSS(PSIG)	MANUFACTURER AND MODEL NUMBER	REMARKS			
RPZ1	DOMESTIC WATER	2-1/2"	0-80	0-15	WILKINS MODEL 475V	1			
1. MOUNT AND SUPPORT FROM FLOOR WITH METAL STANDS. PROVIDE FUNNEL AND PIPE, SIZED PER THE MANUFACTURER'S RECOMMENDATIONS, ROUTE TO FLOOR SINK PROVIDING AN AIR GAP 2 TIMES THE SIZE OF PIPE.									

DOMESTIC NATURAL GAS WATER HEATER SCHEDULE												
MARK	SERVICE	TYPE	GAS INPUT (MBH)	STORAGE CAPACITY (GAL)	RECOVERY RATE (40° TO 120°) (GPH)	LEAVING WATER TEMPERATURE (°F)	ELECTRICAL CHARACTERISTICS			MANUFACTURER AND MODEL NUMBER	REMARKS	
							AMPS	VOLTS	PHASE	HZ		
WH1	DOMESTIC HOT WATER	NATURAL GAS	100	98	81	140	2	120	1	60	AO SMITH PCG-100	① ② ③
① PROVIDE AIR INTAKE ASSEMBLY (ADAPTER ON BURNER ASSEMBLY) FOR DIRECT VENT CONNECTIONS (DUCTED COMBUSTION) ② 6"Ø, TYPE "B" GAS VENT (VERIFY WITH MANUFACTURER FOR SIZE AND SPECIFIC ROUTING)												
③ DIRECT VENT/SEALED COMBUSTION CONNECTIONS (DUCTED COMBUSTION). SIZE FLUE AND COMBUSTION AIR DUCTS IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS												

PLUMBING FIXTURE SCHEDULE									
MARK	DESCRIPTION	ROUGH IN (MINIMUM)					MANUFACTURER AND MODEL NUMBER	ADA /TAS	
		W	V	CW	HW	E			
WC1	WATERCLOSET, ADA COMPLIANT, FLOOR MOUNT, FLUSHOMETER VALVE, TOP SPUD, ELONGATED, SIPHON ACTION JETTED BOWL, VITREOUS CHINA, WHITE, ASME A112.19.2M, 2" FULLY GLAZED TRAPWAY, 10" ROUGH-IN, 1.28 GPF	4"	2"	-	-	-	AMERICAN STANDARD, 3043.001; KOHLER, K-96057; ZURN, Z5665-BWL1; SLOAN, ST-2029.		
	FLUSHOMETER VALVE, 1.28 GPF, EXPOSED DIAPHRAGM-TYPE, CHROME PLATED, 1 1/2" TOP SPUD, SPUD COUPLING AND FLANGE, OSCILLATING NON-HOLD OPEN HANDLE, CHROME PLATED ANGLE STOP WITH STOP CAP, VACUUM BREAKER FLUSH CONNECTION, CAST WALL FLANGE WITH SET SCREW, ANSI/ASME 112.19.6	-	-	1 1/2"	-	-	SLOAN, 111-1.28; ZURN, Z6000AV-HET.		
	SEAT, EXTRA HEAVY WEIGHT, POSTURE MOLDED SOLID PLASTIC, ELONGATED, OPEN FRONT, LESS COVER, EXTERNAL CHECK HINGES, STAINLESS STEEL HINGE POSTS, WHITE	-	-	-	-	-	CHURCH 9500C; BEMIS, 1655C; OLSONITE, 95/SS		
WC2	WATERCLOSET, WALL MOUNT, FLUSHOMETER VALVE, TOP SPUD, ELONGATED, SIPHON ACTION JETTED BOWL, VITREOUS CHINA, WHITE, ASME A112.19.2M, 2" FULLY GLAZED TRAPWAY, 1.28 GPF.	4"	2"	-	-	-	AMERICAN STANDARD, 2257.101; KOLHER, K-4325; ZURN, Z5615-BWL; SLOAN, ST-2459.		
	FLUSHOMETER VALVE, 1.28 GPF, EXPOSED DIAPHRAGM-TYPE, CHROME PLATED, 1 1/2" TOP SPUD, SPUD COUPLING AND FLANGE, OSCILLATING NON-HOLD OPEN HANDLE, CHROME PLATED ANGLE STOP WITH STOP CAP, VACUUM BREAKER FLUSH CONNECTION, CAST WALL FLANGE WITH SET SCREW, ANSI/ASME 112.19.6	-	-	1 1/2"	-	-	SLOAN, 111-1.28; ZURN, Z6000AV-HET.		
	SEAT, EXTRA HEAVY WEIGHT, POSTURE MOLDED SOLID PLASTIC, ELONGATED, OPEN FRONT, LESS COVER, EXTERNAL CHECK HINGES, STAINLESS STEEL HINGE POSTS, WHITE	-	-	-	-	-	CHURCH 9500C; BEMIS, 1655C; OLSONITE, 95/SS		
U1	FIXTURE CARRIER, ADJ. HEIGHT, FOOT/ANCHOR LEG SUPPORT, HORIZONTAL/VERTICAL DISCHARGE	-	-	-	-	-	JOSAM SERIES 12000; WATTS, ISCA; OR EQUAL IN ZURN OR JR SMITH		
	URINAL, 0.5 GPF, WALL MOUNT, VITREOUS CHINA, 14" EXTENDED FLUSHING RIM, SIPHON JET ACTION, 3/4" INLET SPUD, INLET AND OUTLET SPUDS AND HANGERS, ASME/ANSI A112.19.2	2"	2"	-	-	-	AMERICAN STANDARD, 6550.001; KOHLER, K-5016-ET; ZURN, Z5730.		
	FLUSHOMETER VALVE, 0.5 GPF, EXPOSED DIAPHRAGM-TYPE, CHROME PLATED, 3/4" TOP SPUD, SPUD COUPLING AND FLANGE, NON-HOLD OPEN HANDLE, CHROME PLATED ANGLE STOP WITH STOP CAP, VACUUM BREAKER FLUSH CONNECTION, CAST WALL FLANGE WITH SET SCREW, ANSI/ASME 112.19.6	-	-	3/4"	-	-	SLOAN, 186-0.5; ZURN, Z6003AV-EWS.		
L1	FIXTURE CARRIER, HANGER AND BEARING PLATES, ADJ. SUPPORTING RODS, UPRIGHTS, WELDED FEET	-	-	-	-	-	JOSAM SERIES 17560-UR; WATTS, CA-321; ZURN, Z1222-OR; JR SMITH, A632		
	LAVATORY, 21"x15" RECTANGULAR UNDER MOUNT, VITREOUS CHINA, FRONT OVERFLOW, UNGLAZED RIM, ANSI A112.19.2.	2"	1 1/2"	-	-	-	AMERICAN STANDARD, 0614.000; KOHLER, K-2339; SLOAN, SS-3021.		
	FAUCET, DECK MOUNTED WITH 4" CENTERS, POLISHED CHROME, 9-1/2" L-TYPE SWING SPOUT, 4" WRIST BLADE HANDLES, CERAMIC 1/4-TURN OPERATING CARTRIDGE, NSF 61 COMPLIANT, ANSI A112.18.1M, 0.5 GPM MAX. FLOW RATE	-	-	1/2"	1/2"	-	CHICAGO FAUCETS, 404-E70-317XKABCP;		
	SUPPLY AND STOPS, LOOSE KEY, CHROME PLATED BRASS VALVES AND CHROME PLATED COPPER RISERS	-	-	-	-	-	MCGUIRE, H2165CCLK; T&S BRASS, B-1305; OR BRASSCRAFT, OCR1912A		
	P-TRAP, CHROME PLATED CAST BRASS BODY WITH CLEANOUT, SEAMLESS WALL BEND, 17 GA.	-	-	-	-	-	MCGUIRE, 8902; BRASSCRAFT, 507; OR EQUAL IN T&S BRASS		
	OFFSET TAILPIECE AND STRAINER, CHROME PLATED CAST BRASS	-	-	-	-	-	MCGUIRE, 155WC, OR EQUAL IN T&S BRASS; OR BRASSCRAFT		
	THERMOSTATIC MIXING VALVE, 0.25 GPM MINIMUM FLOW, INTEGRAL INLET CHECK VALVES AND STRAINER, SET TEMPERATURE TO 105°, ASSE 1070.	-	-	1/2"	1/2"	-	WATTS, LFUSG-B; LEONARD, 170-LF; OR EQUAL		
	LAVATORY, 23"x31", SEAMLESS WELDED CONSTRUCTION OF 14 GAUGE TYPE 304 STAINLESS STEEL, EXPOSED EXTERIOR WITH STANDARD BRUSH FINISH, STAINLESS STEEL WALL BRACKET AND CLIP	2"	1 1/2"	-	-	-	JUST MANUFACTURING, A-18664-TF; OR EQUAL		
	FAUCET, WALL MOUNTED, CHROME PLATED, RIGID 6-7/8" REACH, TUBULAR GOOSENECK SPOUT, 3/8" IPS CONNECTION NSF 61 COMPLIANT, ANSI A112.18.1M, 0.5 GPM MAX. FLOW RATE	-	-	1/2"	1/2"	-	JUST MANUFACTURING, JS-10; OR EQUAL		
	SUPPLY AND STOPS, LOOSE KEY, CHROME PLATED BRASS VALVES AND CHROME PLATED COPPER RISERS	-	-	-	-	-	MCGUIRE, H2165CCLK; T&S BRASS, B-1305; OR BRASSCRAFT, OCR1912A		
SHR1	P-TRAP, CHROME PLATED CAST BRASS BODY WITH CLEANOUT, SEAMLESS WALL BEND, 17 GA.	-	-	-	-	-	MCGUIRE, 8902; BRASSCRAFT, 507; OR EQUAL IN T&S BRASS		
	TYPE 304 STAINLESS STEEL, FLAT STRAINER, DIE CAST ZINC LOCK NUT	-	-	-	-	-	JUST MANUFACTURING, J-35-SSF; OR EQUAL		
	FIXTURE CARRIER, CONCEALED ARMS, LEVELING AND SECURING SCREWS, UPRIGHTS, WELDED FEET	-	-	-	-	-	JOSAM, SERIES 17100; WATTS, CA-411; ZURN, Z1231; OR JR SMITH, 0700		
	THERMOSTATIC MIXING VALVE, 0.25 GPM MINIMUM FLOW, INTEGRAL INLET CHECK VALVES AND STRAINER, SET TEMPERATURE TO 105°, ASSE 1070.	-	-	1/2"	1/2"	-	WATTS, LFUSG-B; LEONARD, 170-LF; OR EQUAL		
	DOUBLE PEDAL VALVE, WALL MOUNTED, HEAVY DUTY CAST BRASS BODY, 1/2" INLET AND OUTLET, CAST ALUMINUM FOOT PEDALS, POLISHED CHROME PLATE, ASME A112.18.1, NSF 61 COMPLIANT	-	-	1/2"	1/2"	-	JUST MANUFACTURING, JFV-320; OR EQUAL		
	SHOWER WITH INSTITUTIONAL HEAD, PRESSURE BALANCING, LEVER HANDLE, INTEGRAL SERVICE STOPS	-	-	1/2"	1/2"	-	SYMMONS 96-1-295-XL; LEONARD VALVE 4500-H06-ADJ		
	SHOWER STALL STRAINER, HEAVY CAST BRASS BODY, STAINLESS STEEL GRID	2"	1 1/2"	-	-	-	JOSAM SERIES 30000-A-50; OR EQUAL IN ZURN, WADE OR JR SMITH		
	SHOWER W/ HANDSPRAY, PRESSURE BALANCING, LEVER HANDLE, INTEGRAL SERVICE STOPS	-	-	1/2"	1/2"	-	SYMMONS 96-500-B30LVX295; LEONARD VALVE 4500-H06-ADJ-501P-D2L		
	SHOWER STALL STRAINER, HEAVY CAST BRASS BODY, STAINLESS STEEL GRID	2"	1 1/2"	-	-	-	JOSAM SERIES 30000-A-50; OR EQUAL IN ZURN, WADE OR JR SMITH		
	MSB1	MOP SINK BASIN, ONE PIECE-PRECAST TERRAZZO 24"x24"x12" (1 1/4" WALL THICKNESS WITH MINIMUM 9.75" INSIDE DEPTH) 6" DROP FRONT, STAINLESS STEEL EDGE CAPS ON ALL SIDES, STAINLESS STEEL WALL GUARDS, CAST BRASS DRAIN WITH STAINLESS STEEL STRAINER	3"	2"	-	-	-		FIAT MODEL TSB-3000; STERN WILLIAMS HL-1810; FLORESTONE MODEL 92
FAUCET, EXPOSED YOKE, WALL MOUNTED UTILITY FAUCET, VACUUM BREAKER, 6"THREADED SPOUT		-	-	3/4"	3/4"	-	MOEN, 8124;CHICAGO,540-LD897SWXFCP;DELTA, 28T2383;T&S BRASS, B-0665		
24"x3" STAINLESS STEEL MOP BRACKET WITH THREE RUBBER TOOL GRIPS		-	-	-	-	-	FIAT MODEL 889-CC; OR EQUAL		
30" RUBBER HOSE (5/8"), CHROME COUPLING 1 END, 5"x3" STAINLESS STEEL BRACKET W/ RUBBER GRIP		-	-	-	-	-	FIAT MODEL 832-AA; OR EQUAL		
ALUMINUM BUMPER GUARD ON LEADING EDGE OF MOP SINK BASIN		-	-	-	-	-	FIAT MODEL 1239-BB; OR EQUAL		

- NOTES:
- CONTRACTOR SHALL FURNISH AND INSTALL SUPPLIES, STOPS, TRAPS, TAILPIECES AND ALL APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION OF ALL FIXTURES.
 - ALL ADA ACCESSIBLE SINKS AND LAVATORIES SHALL BE EQUIPPED WITH TRUEBRO #103 UNDER SINK PROTECTIVE PIPE COVERS WHERE NOT CONCEALED BY MILLWORK.
 - COMPLY WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AND THE TEXAS ACCESSIBILITY'S STANDARD (TAS). PLUMBING CONTRACTOR SHALL PROVIDE PLUMBING FIXTURES WITH FLUSH VALVE HANDLES LOCATED ON THE WIDE SIDE OF EACH STALL, OR ROOM.
 - FLOOR CLEANOUT ACCESS COVERS IN ALL FINISHED AREAS SHALL BE OF THE RECESSED TYPE TO ALLOW FOR INSERTION OF FINISHED FLOOR TREATMENT. TILE OR CARPET MARKER AS NECESSARY.
 - ABOVE THE FLOOR P-TRAPS ON LAVATORIES AND SINKS SHALL BE 17 GAUGE, CHROME PLATED BRASS. ACCEPTABLE MANUFACTURERS: MCGUIRE, T&S BRASS, OR BRASSCRAFT.
 - CONTRACTOR SHALL VERIFY FIXTURE SUPPLIES AND APPURTENANCES FOR EACH FIXTURE PRIOR TO BIDDING AND PURCHASING.
 - ALL FLOOR MOUNTED WATER CLOSETS SHALL HAVE 10" ROUGH-IN UNLESS OTHERWISE NOTED.
 - CONTRACTOR SHALL VERIFY PLUMBING FIXTURES PROVIDED COMPLY WITH HANDICAPPED ACCESSIBILITY STANDARDS INCLUDING HEIGHT AND CLEARANCE REQUIREMENTS.
 - ALL WATER CLOSET AND URINAL FLUSH VALVES SHALL INCLUDE CHROME PLATED CAST WALL FLANGE WITH SETSCREW AND COVER TUBE.
 - WATER CLOSETS AND URINALS INDICATED WITH SENSOR OPERATED FLUSH VALVES SHALL INCLUDE METAL COVER AND MANUAL OVERRIDE BUTTON.
 - LAVATORIES INDICATED WITH SENSOR OPERATED FAUCETS SHALL BE BATTERY OPERATED AND PROVIDED WITH A OF TEMPERING VALVE SET FOR 85°F.
 - PROVIDE NON-SHRINK GROUT BELOW ALL SHOWER ENCLOSURES AND SHOWER RECEPTORS AS RECOMMENDED BY THE MANUFACTURER.

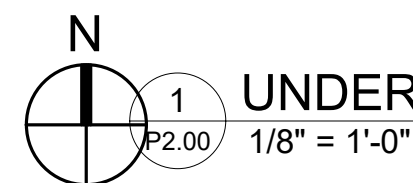
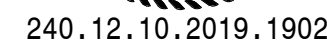
GREASE INTERCEPTOR SCHEDULE
GT-1, GREASE INTERCEPTOR, PARK GT-500 OR APPROVED EQUAL GREASE INTERCEPTOR WITH 500 GALLON LIQUID HOLDING CAPACITY, 1,200 LBS. GREASY SLUDGE CAPACITY. INTERCEPTOR SHALL BE CONSTRUCTED OF CLASS II CONCRETE WITH A MINIMUM DESIGN STRENGTH OF 4,500 PSI AT 28 DAYS. UNIT SHALL BE OF MONOLITHIC CONSTRUCTION INCLUDING BAFFLE. INTERCEPTOR SHALL BE CLASSIFIED WITH GRADE 60 REINFORCEMENT WITH STEEL REBAR CONFORMING TO ASTM A615. MANHOLE FRAMES AND COVERS SHALL BE GRAY CAST IRON CONFORMING TO ASTM A48-76, CLASS 30. MANHOLE COVERS SHALL BE NOMINAL 24 INCH DIAMETER AND BE HEAVY TRAFFIC DUTY (H-20 LOADING). PROVIDE CONCRETE EXTENSIONS AS REQUIRED TO EXTEND MANHOLE COVERS TO FINISHED GRADE. GREASE INTERCEPTOR SHALL BE PARKS EQUIPMENT, GT-1500 OR EQUAL. REFER TO P-601. SW-1, SAMPLE WELL PROVIDE SAMPLE WELL BASIN (TEST WELL) DOWNSTREAM OF GREASE INTERCEPTOR. SAMPLE WELL SHALL BE CONSTRUCTED SAME AS GREASE INTERCEPTOR WITH MANHOLE COVER LABELED "SAMPLE WELL". SAMPLE WELL BASIN SHALL BE PARKS EQUIPMENT, SWB-154 OR EQUAL. RE: P4.01

OILY WASTE INTERCEPTOR SCHEDULE					
SI-1, SOLIDS SEPARATOR, PARK SOLIDS TROOPER SYSTEM STSC-200 OR APPROVED EQUAL SOLIDS INTERCEPTOR AND ALARM SYSTEM WITH 20 GPM FLOW CAPACITY, 480 SOLIDS CAPACITY; 120 V, 5 AMP AUDIBLE & VISUAL ALARM. GASTITE REMOVABLE STEEL ACCESS COVER WITH NEOPRENE GASKET, SECURED WITH STAINLESS STEEL BOLTS, EXTRA HEAVY LEAK PROOF GASKET, OIL RESISTANT INNER COATING AND BITUMINOUS OUTSIDE COATING. THE SEPARATOR SHALL HAVE A REMOVABLE STAINLESS STEEL FILTER SCREEN WITH MAINTENANCE PROBE. A SERVICE ALERT PANEL NOTIFIES OF CLOGGED FILTER WITH AUDIBLE & VISUAL ALARM. RE" P-601.					
LINT INTERCEPTOR SCHEDULE					
TAG	CAPACITY (GAL)	WASTE	VENT	MANUFACTURER	MODEL
LT-1	50	1.5	1.5	PARK USA	LTSSB-50

PUMP SCHEDULE												
MARK	SERVICE	TYPE	FLOWRATE (GPM)	TOTAL DYNAMIC HEAD (FEET)	SPEED (RPM)	EFFIC. (%)	ELECTRICAL CHARACTERISTICS				MANUFACTURER AND MODEL NUMBER	REMARKS
							HP	VOLTS	PHASE	HZ		
CP1	DOMESTIC HOT WATER CIRCULATION	INLINE, CENTRIFUGAL	2	10	1,725	65	1/12	115	1	60	TACO 100 SERIES	① ②
① PROVIDE PUMP WITH AUTOMATIC DISCHARGE CONTROLLED BY INTERNAL PRESSURE SWITCH. ③ PUMPS SHALL BE RATED FOR CONTINUOUS OPERATION AT WATER TEMPERATURES OF WATER SYSTEM												
② PROVIDE 7-DAY TIME CLOCK FOR OPERATION OF CIRCULATION PUMP (SET TO OPERATE BETWEEN 5:00 AM TO 9:00 PM, ADJUSTABLE). ④ OR EQUAL.												

THERMOSTATIC MIXING VALVE SCHEDULE									
MARK	TYPE	FLOWRATE CAPACITY		PRESSURE DROP (PSIG)	INLET HOT WATER TEMPERATURE (°F)	INLET COLD WATER TEMPERATURE (°F)	LEAVING WATER TEMPERATURE (°F)	MANUFACTURER AND MODEL NUMBER	REMARKS
		HIGH (GPM)	LOW (GPM)						
TMV1	TEMPERED WATER - LAVATORIES	2.7	.25	15	110	60	95	LEONARD 270LF	①
TMV2	TEMPERED WATER - KITCHEN SINKS	7	0.5	15	110	60	95	LEONARD 370-LF-BV	①
① PROVIDED WITH PAINTED, SURFACE MOUNT CABINET ASSEMBLY. VERIFY WITH ARCHITECTURAL SPECIFICATIONS FOR COLOR.									

PLUMBING FIXTURE SCHEDULE									
MARK	DESCRIPTION	ROUGH IN (MINIMUM)					MANUFACTURER AND MODEL NUMBER	ADA /TAS	
		W	V	CW	HW	E			
S1	SINK, SINGLE COMPARTMENT, 30"x18"x6", UNDERMOUNT, #18 GAUGE TYPE 304 STAINLESS STEEL, FULLY UNDERCOATED, ANSI A112.19.3M. DRAIN CENTERED IN REAR OF BASIN.	2"	1 1/2"	-	-	-	JUST, USN-ADA-1830-A-GR; OR APPROVED EQUAL		
	FAUCET, DECK MOUNT, CHROME PLATED BRASS, RIGID SWING GOOSENECK SPOUT, TWO-HANDLE, 1/4 TURN 4" WRIST BLADE HANDLES, 4" CENTERS, NSF 61 COMPLIANT, ANSI A112.18.1M, 2.2 GPM MAX. FLOW RATE	-	-	1/2"	1/2"	-	CHICAGO, 895-317; MOEN COMMERCIAL, 8278; DELTA 2171WBHHDF; T&S BRASS, B-0892		
	SUPPLY AND STOP, LOOSE KEY, CHROME PLATED BRASS VALVES AND CHROME PLATED COPPER RISERS	-	-	1/2"	1/2"	-	MCGUIRE, H2167CCLK; OR EQUAL IN T&S BRASS OR BRASSCRAFT		
	P-TRAP, CHROME PLATED CAST BRASS BODY WITH CLEANOUT, SEAMLESS WALL BEND, 17 GA.	-	-	-	-	-	MCGUIRE, 8912; OR EQUAL IN T&S BRASS OR BRASSCRAFT		
S2	TAILPIECE AND FORGED STAINLESS STEEL BASKET STRAINER	-	-	-	-	-	JUST J-ADA-35; OR EQUAL IN MCGUIRE, T&S BRASS OR BRASSCRAFT		
	SINK, DOUBLE COMPARTMENT, 32"x18"x8", UNDERMOUNT, #18 GAUGE TYPE 304 STAINLESS STEEL, FULLY UNDERCOATED, ANSI A112.19.3M	2"	1 1/2"	-	-	-	JUST, UDF-1832-A, OR APPROVED EQUAL		
	FAUCET, DECK MOUNT, 10" SWING SPOUT, CHROME PLATED BRASS, 8" CENTERS, W/HAND SPRAY, CHROME PLATED BRASS, TWO-1/4 TURN 4" WRIST BLADE HANDLES, NSF 61 COMPLIANT, ANSI A112.18.1M, 2.2 GPM	-	-	1/2"	1/2"	-	CHICAGO, 2300-8CP; MOEN, 8720; DELTA, 400-WFELHHDF; T&S BRASS, B-2721		
	SUPPLY AND STOP, LOOSE KEY, CHROME PLATED BRASS VALVES AND CHROME PLATED COPPER RISERS	-	-	-	-	-	MCGUIRE, H2167CCLK; OR EQUAL IN T&S BRASS OR BRASSCRAFT		
EW1	P-TRAP, CHROME PLATED CAST BRASS BODY WITH CLEANOUT, 17 GA., END-OUTLET CONTINUOUS WASTE	-	-	-	-	-	MCGUIRE, 8912/111C16G20, OR EQUAL IN T&S BRASS OR BRASSCRAFT		
	TAILPIECE AND FORGED STAINLESS STEEL BASKET STRAINER	-	-	-	-	-	JUST J-ADA-35; OR EQUAL IN MCGUIRE, T&S BRASS OR BRASSCRAFT		
	GARBAGE DISPOSER, CONTINUOUS FEED, 1/2 HP, GALV. STEEL GRINDING ELEMENTS, S.S. 360° SWIVEL LUGS	-	-	-	-	-	IN-SINK-ERATOR, BADGER 5; GE GFC520; WHIRLPOOL GC2000PE		
	TWO STATION WATER COOLER, INDOOR BI-LEVEL WALL MOUNTED, SELF-CONTAINED ELECTRIC REFRIGERATION, STAINLESS STEEL BASIN AND CABINET WITH ANTI-SPLASH RIDGE, INTEGRAL DRAIN STRAINER, NON-SQUIRT BUBBLER, PUSH BUTTON ACTIVATION ON FRONT OF WATER COOLER. PROVIDE WITH BOTTLE FILLER, REFRIGERATION SYSTEM SERVING BOTH BI-LEVELS TO INCLUDE HIGH EFFICIENCY COMPRESSOR, R-134A, FULLY INSULATED STAINLESS STEEL TANK, 8 GPH WITH 50°F SUPPLY TEMPERATURE AND 80°F AMBIENT, 115VOLT. ANSI 117.1, NFS/ANSI 61.	2"	1 1/2"	-	-	115V	ELKAY LVRCGRNLT8WSK ADA HALSEY TAYLOR HTHB-HVRGRN8BL-WF ADA OR APPROVED EQUAL		
HANDICAPPED COMPLIANT APRON, MOLDED STAINLESS STEEL SKIRT KIT FOR INSTALLATION ON THE HIGH UNIT	-	-	-	-	-	ELKAY MODEL LKAPREZL; HAWS SK9SS			
SERVICE STOP WITH DIELECTRIC COUPLING	-	-	1/2"	-	-	REFER TO MANUFACTURER FOR REQUIREMENTS			
P-TRAP, PVC, WHITE	-	-	-	-	-	DEARBORN BRASS, A9701BG; KEYSAN MOEM9100; OR EQUAL			
WMB1	FIXTURE CARRIER, STEEL TOP AND BOTTOM PLATES W/ ADJ. HOLES, CHROME PLATED CAP NUTS/WASHERS	-	-	-	-	-	JOSAM SERIES 17905; WATTS, CA-431-1; OR EQUAL IN ZURN OR JR SMITH		
	WASHING MACHINE CONNECTION BOX, STAINLESS STEEL WITH CENTER DRAIN, 1/2" HALF TURN VALVES	2"	1 1/2"	1/2"	1/2"	-	GUY GRAY, SSWB OR EQUAL		
	FLOOR DRAIN, CAST IRON BODY, ANCHOR FLANGE, WEEPHOLE FOR DOUBLE DRAINAGE, 6" SQUARE STAINLESS STEEL FLAT STRAINER. ADJUSTABLE DRAIN HEAD W/ MACHINED INTEGRAL BODY THREADS, ASME A112.21.1	-	-	-	-	-	JOSAM SERIES 30000-S-SS; MIFAB F1000-C-S6-3; ZURN Z-415-S6		
	PROVIDE TRAP SEAL SYSTEM COMPRISED OF AN DRAIN INSERT CONSTRUCTED OF SMOOTH, SOFT, FLEXIBLE, ELASTOMERIC PVC MATERIAL MOLDED INTO SHAPE OF DUCK'S BILL, OPEN ON TOP WITH CURL. CLOSURE AT BOTTOM.	-	-	-	-	-	PROSET SYSTEMS, INC., TRAP GUARD		
FS1	FLOOR SINK, 8"x8"x6", CI BODY, DBL DRAINAGE FLANGE, STAINLESS STEEL DOME STRAINER, 3/4 GRATE, NON-PUNCTURING FLEXING COLLAR, PORCELAIN ENAMEL OR EPOXY COATED INTERIOR	-	-	-	-	-	JOSAM SERIES 49000-4; MIFAB FS1520-175; ZURN Z-1910		
TD1	TRENCH DRAIN, 12" WIDE WITH 10" THROAT, POLYPROPYLENE MODULAR CHANNEL SECTIONS, INTERLOCKING ENDS, RADIUS BOTTOM, 0.75% BUILT-IN SLOPE, CENTER BOTTOM OUTLET, ACID RESISTANT COATED FRAME, HEAL PROOF DUCTILE IRON GRATE, VANDAL PROOF SECURED GRATE	-	-	-	-	-	WATTS, DEAD LEVEL; OR EQUAL.		
WCO	WALL CLEANOUT, CI BODY, RECESSED, THREADED BRASS PLUG, STAINLESS STEEL ACCESS COVER	-	-	-	-	-	JOSAM SERIES 58890; MIFAB C1460; ZURN Z-1441		
FCO	FLOOR CLEANOUT, COATED CAST IRON BODY, COMBINATION ADJUSTABLE ROUND STAINLESS STEEL COVER AND PLUG TOP ASSEMBLY, GASKET SEAL, ASME 112.36.2	-	-	-	-	-	JOSAM SERIES 58360; MIFAB C1000-R/S; ZURN Z-1400		
GCO	GRADE CLEANOUT, HEAVY DUTY COATED CAST IRON ACCESS BODY WITH ANCHOR FLANGES, HEAVY DUTY DUCTILE IRON ACCESS COVER WITH VANDAL RESISTANT STAINLESS STEEL SCREWS	-	-	-	-	-	JOSAM SERIES 56680-5-26-VP; MIFAB C1300-MF-6; ZURN Z-1474-SG-VP		
DCO	2-WAY GRADE CLEANOUT, TWO-RISER CLEANOUT BODY WITH GUY TOP COATED CAST IRON ACCESS BODY WITH ANCHOR FLANGES, HEAVY DUTY DUCTILE IRON ACCESS COVER WITH VANDAL RESISTANT STAINLESS STEEL SCREWS	-	-	-	-	-	JOSAM SERIES 56680-5-26-VP; MIFAB C1300-MF-6; ZURN Z-1474-SG-VP		
PCO	SPIGOT CONNECTION, RAISED HEAD THREADED BRASS PLUG	-	-	-	-	-	JOSAM; MIFAB; ZURN		
HB1	HOSE BIBB, BRASS WITH CHROME FINISH, VACUUM BREAKER, 3/4" MALE N.H.T OUTLET, WALL FLANGE	-	-	3/4"	-	-	MIFAB MHY-90; ZURN Z1341; WOODFORD #24		
NFWH1	NON-FREEZE WALL HYDRANT, CONCEALED WALL TYPE, CHROME FINISH ON BRASS CASTINGS, VACUUM BREAKER, LOOSE KEY HANDLE, 3/4" MALE HOSE THREAD NOZZLE. PROVIDE SAMPLES OF MATERIAL AND FINISHES FOR THE EXTERIOR HOSE CONNECTION FOR ARCHITECTURAL SELECTION OF FINISH.	-	-	3/4"	-	-	WOODFORD, #B67; MIFAB MHY-35; JOSAM SERIES 71020; ZURN Z-1300		
IMB1	REFRIGERATOR ICE MAKER CONNECTION BOX, 8"x8" RECESSED STAINLESS STEEL ENCLOSURE			3/4"			GUY GREY MODEL SSB1; OR EQUAL		

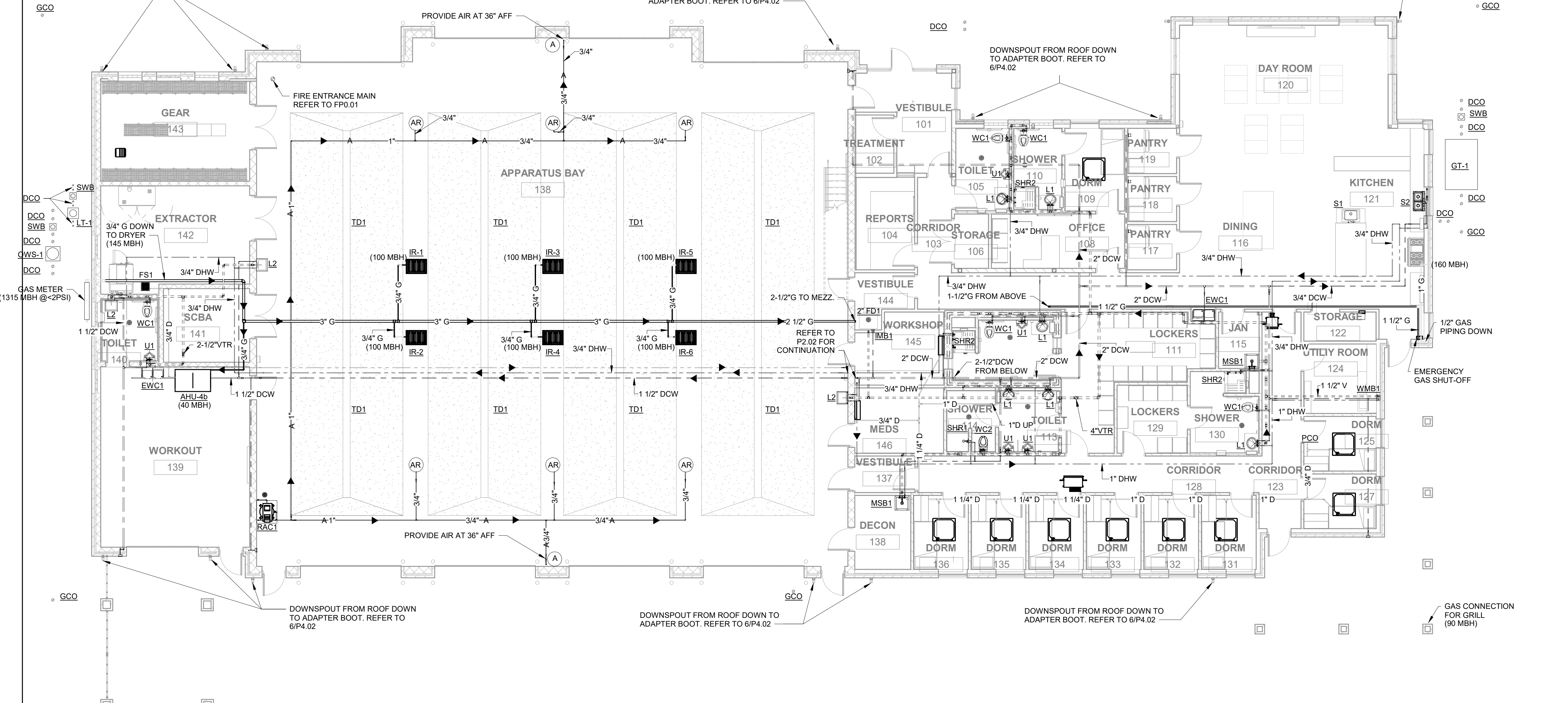

$$\frac{1}{8}'' = 1'-0''$$


8' 0' 8' 16'

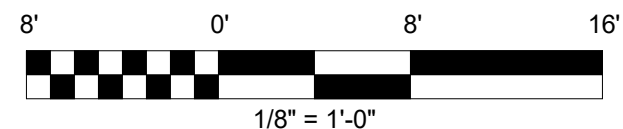
$1/8" = 1'-0"$

SHEET SIZE:	22 x 34
JOB NO:	2016.166
DATE:	12/10/2019
SHEET:	

DOWNSPOUT FROM ROOF DOWN TO
ADAPTER BOOT. REFER TO 6/P4.01

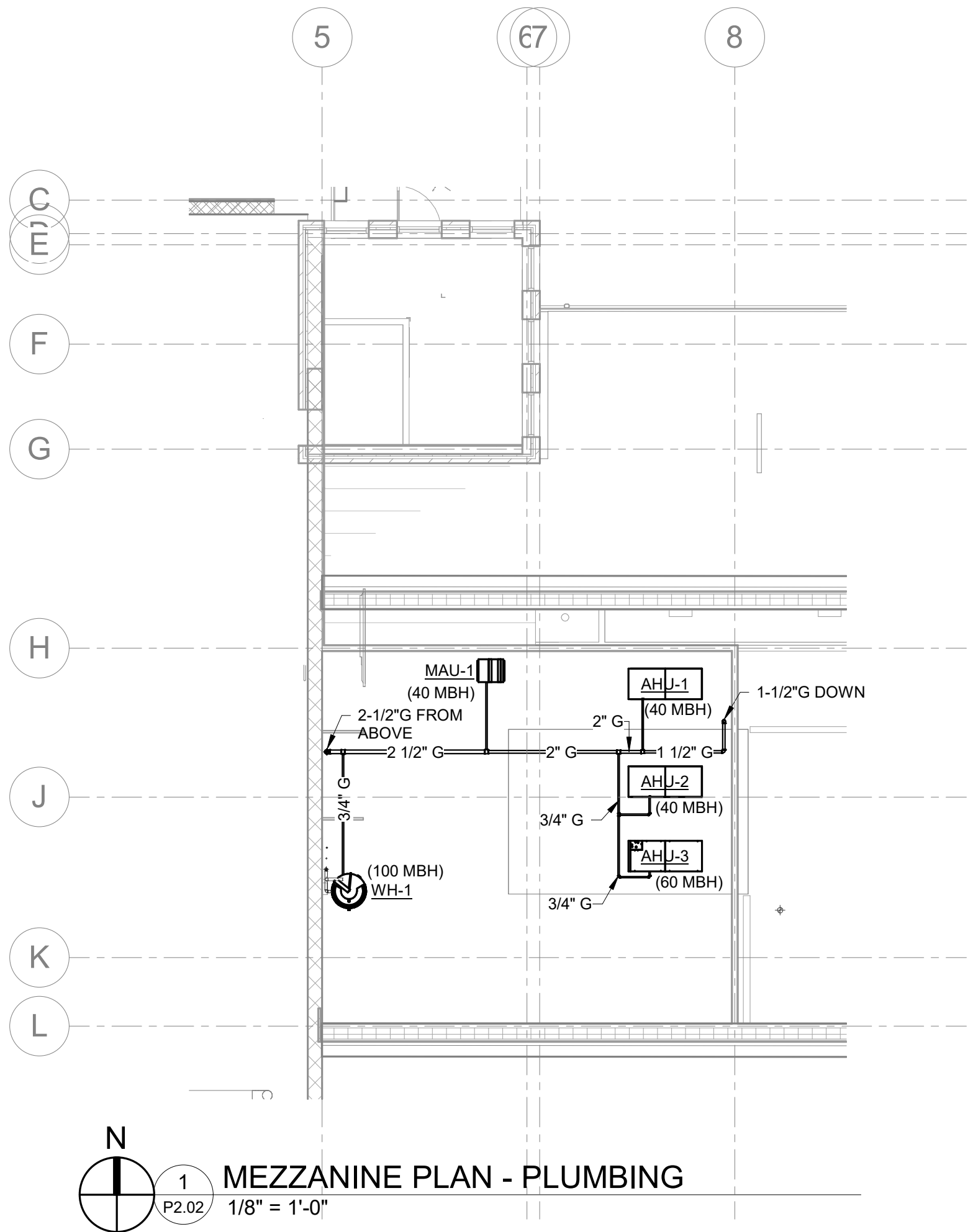


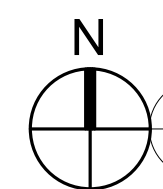
1 FLOOR PLAN - PLUMBING
1/8" = 1'-0"

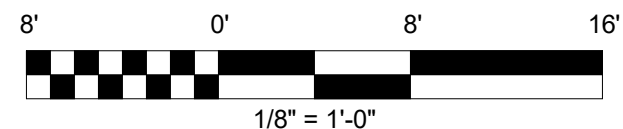



240.12.10.2019.19024

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 1
P2.02
MEZZANINE PLAN - PLUMBING
1/8" = 1'-0"



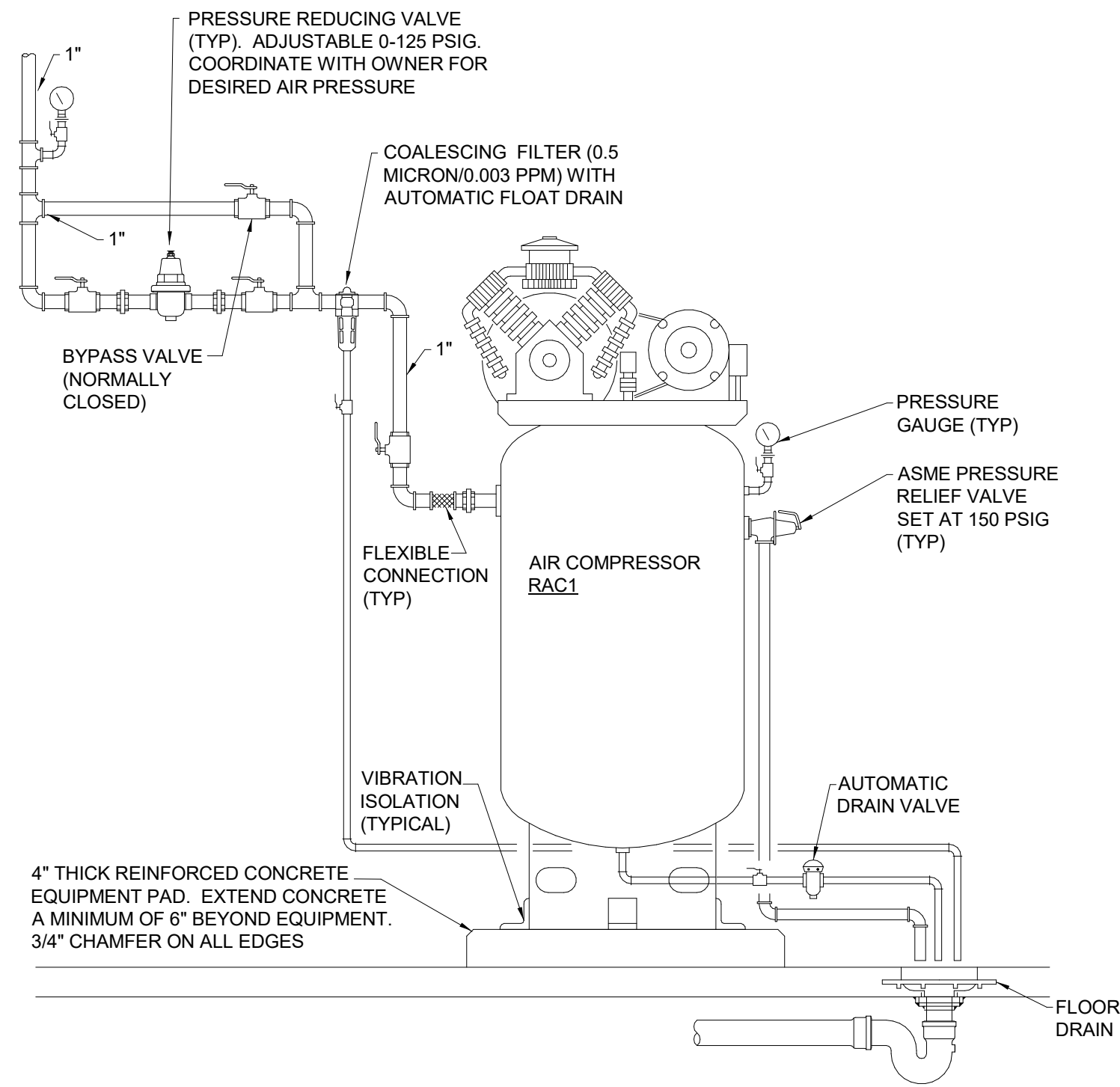


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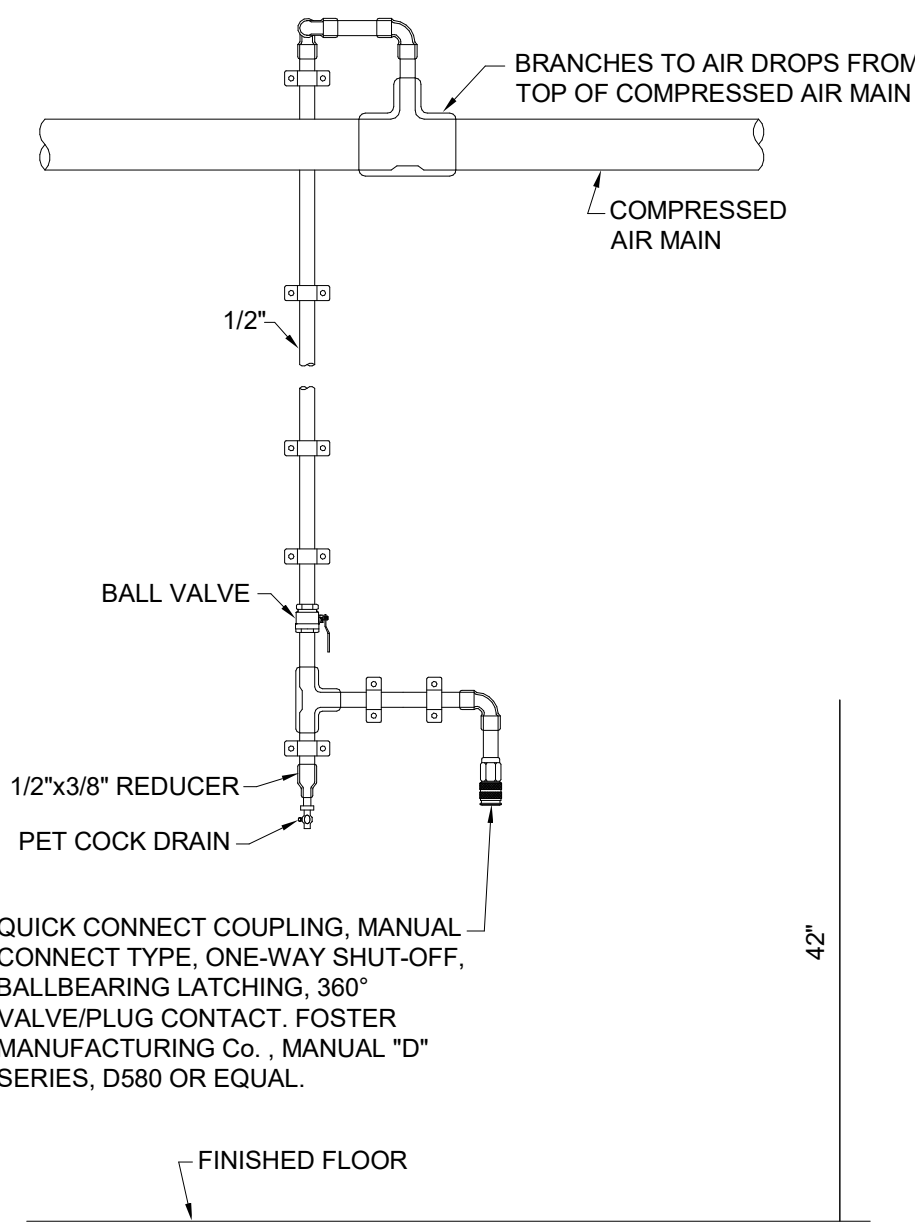


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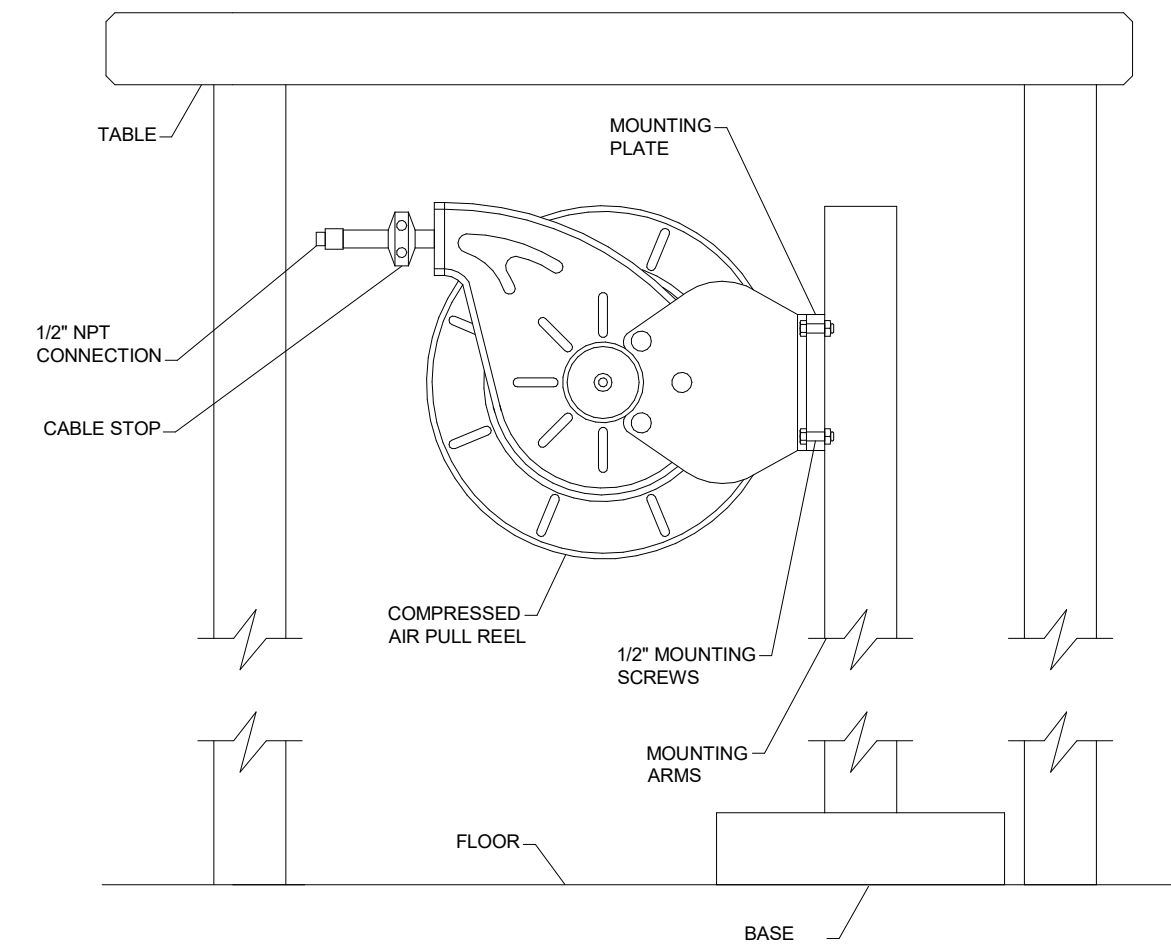
SHEET SIZE: 22 x 34		KOMATSU ARCHITECTURE		
JOB NO: 2016.166		ISSUE FOR CONSTRUCTION		
DATE: 12/10/2019		Addendum 01		12/10/19
SHEET: 1 P2.02		No.	Description	Date
		REVISIONS		



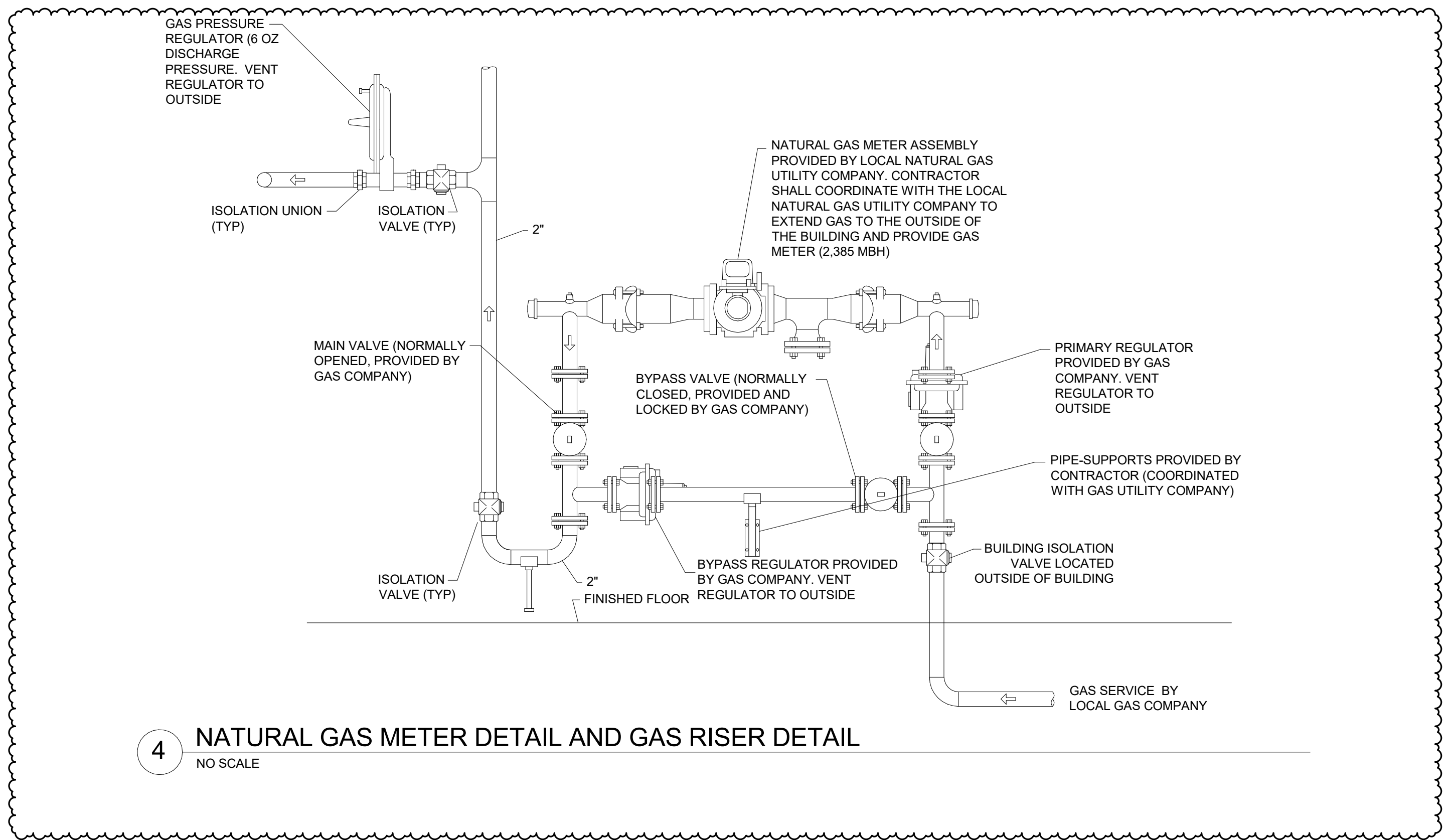
1 AIR COMPRESSOR DETAIL
NO SCALE



2 COMPRESSED AIR DROP DETAIL
NO SCALE



3 COMPRESSED AIR PULL REEL
NO SCALE



4 NATURAL GAS METER DETAIL AND GAS RISER DETAIL
NO SCALE



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KOMATSU
ARCHITECTURE

ISSUE FOR CONSTRUCTION

MANSFIELD FIRE STATION NO. 5

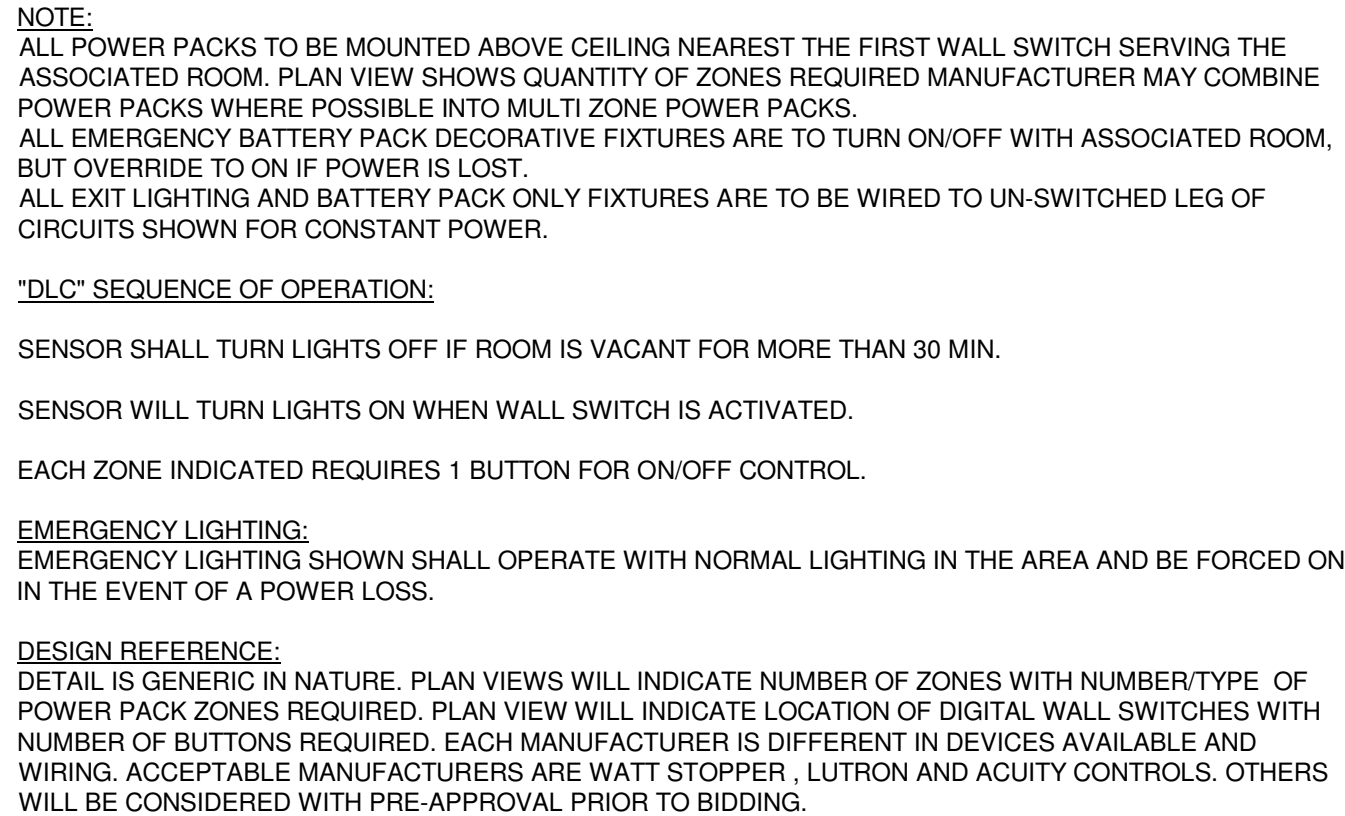
4444 National Parkway
Mansfield, Texas 76063

PLUMBING DETAILS CONTINUED

SHEET SIZE: 22 x 34
JOB NO: 2016.166
DATE: 12/10/2019

P4.03

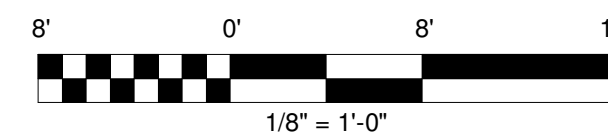
2 LIGHT POLE DETAIL

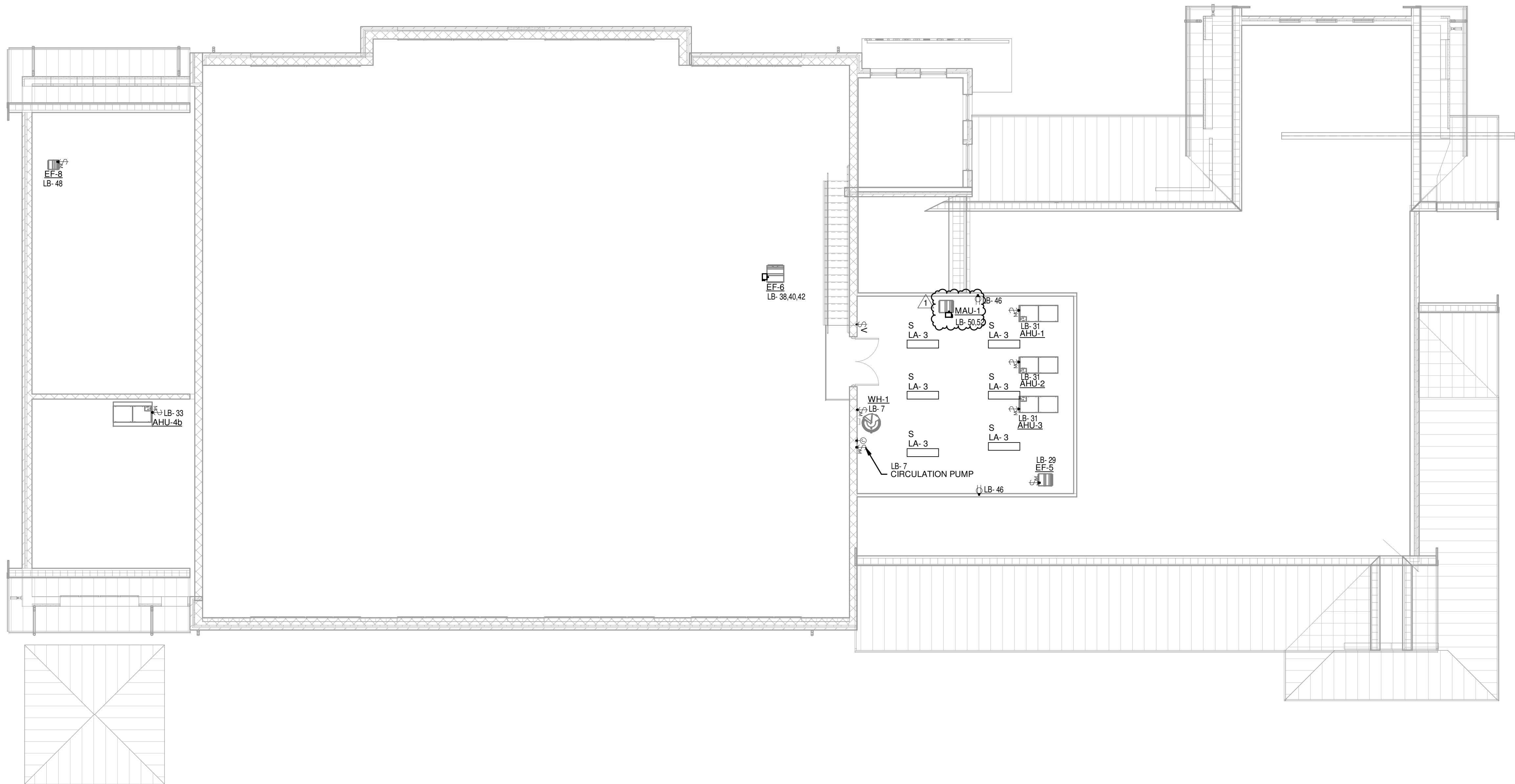


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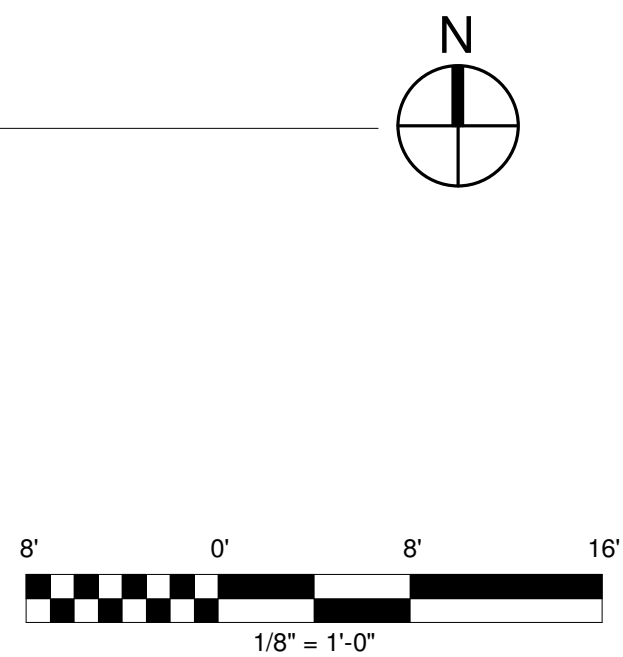


E2.01 GENERAL NOTES	
1	FINAL LOCATIONS OF EXIT SIGNS AND EMERGENCY LIGHTING ARE SUBJECT TO THE APPROVAL OF THE GOVERNING JURISDICTION. ANY RELOCATION SHALL BE AT THE CONTRACTOR'S EXPENSE.
2	FIXTURES "DE" ARE RED DOWN LIGHTS AND SHALL BE CONNECTED TO THE EMERGENCY NOTIFICATION SYSTEM FOR THE FIRE STATION. REFER TO INTERIOR LIGHTING CONTROLS SHEET E3.02 FOR ADDITIONAL INFORMATION.
3	REFER TO LIGHTING CONTROLS DETAILS ON E3.02 FOR CONTROLS LAYOUT.



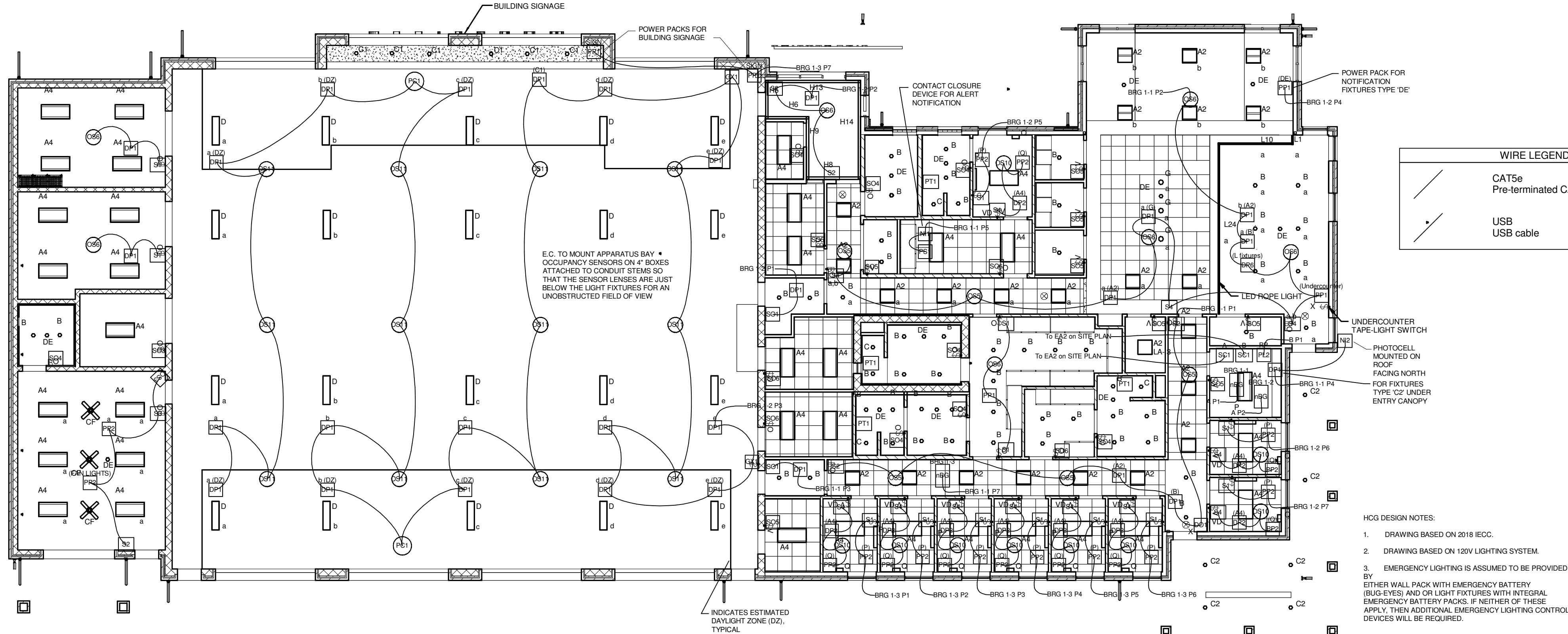


1 MEZZANINE PLAN - ELECTRICAL
E2.03 1/8" = 1'-0"



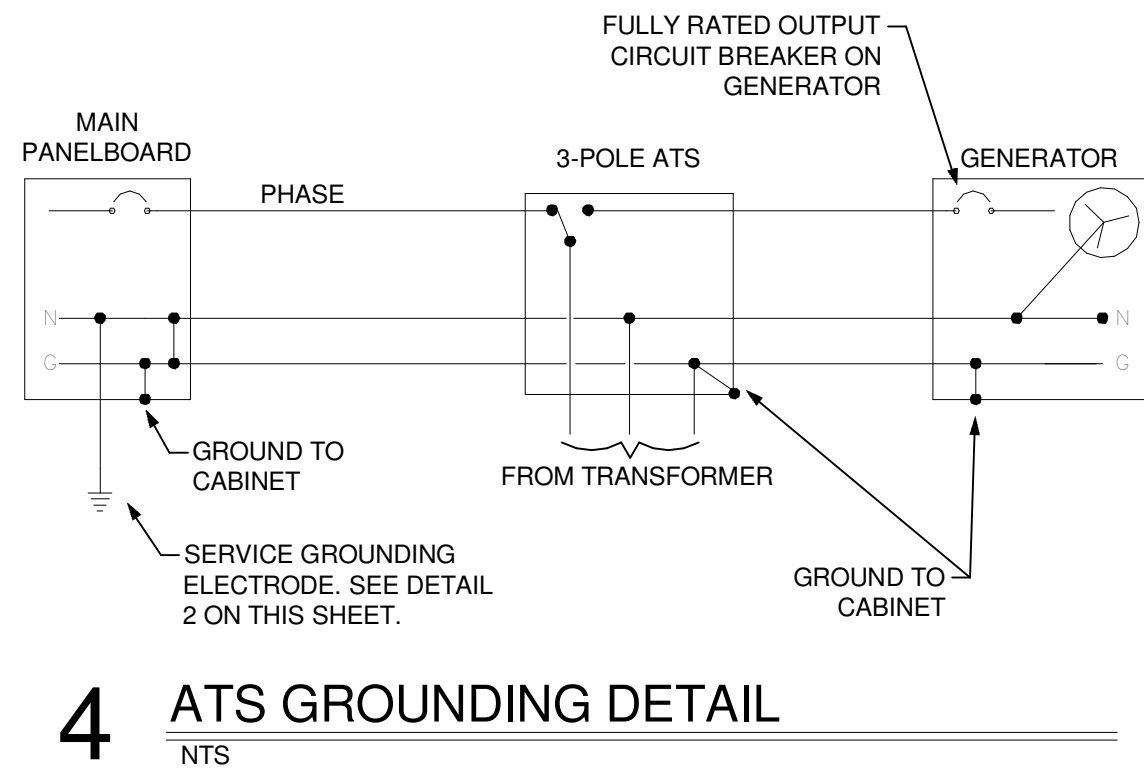
Created by JDA
FLOOR PLAN
Project: MANSFIELD
FIRE STATION NO. 5

1	DO1 NWSX LV DX XX Wall Switch Sensor, Low Voltage, Raise/Lower Dimming Without Wires	1	NE2 NIO PC KIT nLight Device, On/off photocell, Kit	1	PL2 ARP INTENC16 NLT 12FCR MVOLT SC SM Acuity Relay Panel, Include INT and ENC, 16-Size, nLight, 12-field configurable relays, 120-277 VAC, Screw Cover, Surface Mount	12	S4 NPODM 2P DX XX Low Voltage Push-Button Wallpod, 2-Pole, Raise/Lower Dimming Without Wires
28	DP1 NPP16 D EFP Power/Relay Pack, Occupancy Controlled Dimming, External Fault Protection	9	OS10 NCM PDT 9 Low Voltage Ceiling Mount Sensor, Passive Dual Technology, Small Motion / Standard Range 360° Lens	5	PP1 NPP16 EFP Power/Relay Pack, External Fault Protection	2	SC1 NECY MVOLT BAC ENC GFXK nLight Eclipse, 120-277 VAC, BACnet, 14 1/4" H x 14 1/4" W x 4" D metal enclosure for ECLYPSE EnergySyle or nLight ECLYPSE, NGWY2 GFX and PS 150 power supply with CAT5 cable
9	DP2 NPP16 D EFP SA Power/Relay Pack, Occupancy Controlled Dimming, External Fault Protection, Vacancy (default) or Auto-On	12	OS11 NCM 6 LT Low Voltage Ceiling Mount Sensor, High Bay 360° Lens, Low Temperature / High Humidity	20	PP2 NPP16 EFP SA Power/Relay Pack, External Fault Protection, Vacancy (default) or Auto-On	2	SO1 NWSX LV XX Wall Switch Sensor, Low Voltage
1	DP6 NSP5 PCD ELV 120 Secondary Relay Pack, Phase Control Dimming, Electronic Low Voltage, 120 VAC	1	OS3 NWV 16 KIT Low Voltage Corner Mount Sensor, 16 , Kit	1	PS1 NPS 80 Power Supply, 80 mA	1	SO3 WSX XX Wall Switch Sensor
2	GX1 NPOD GFX XX Low Voltage Wallpod, Graphic Touchscreen	5	OS5 NCM 10 Low Voltage Ceiling Mount Sensor, Large Motion / Extended Range 360° Lens	4	PT1 PTS 60 XX Preset Timer Switch, 60 Minute Max	8	SO4 WSX PDT XX Wall Switch Sensor, Passive Dual Technology
3	nBG NBRG 8 KIT Bridge, Kit	7	OS6 NCM PDT 10 Low Voltage Ceiling Mount Sensor, Passive Dual Technology, Large Motion / Extended Range 360° Lens	13	S1 NPODM XX Low Voltage Push-Button Wallpod	9	SO5 WSX SA XX Wall Switch Sensor, Vacancy (default) or Auto-On
1	NI1 NIO 1S KO nLight Device, Contact Closure Input, Chase Nipple Mounting	2	PC1 NCM ADCX Low Voltage Ceiling Mount Sensor, Photocontrol w/ Auto Dimming; No Wires	5	S2 NPODM DX XX Low Voltage Push-Button Wallpod, Raise/Lower Dimming Without Wires	4	SO6 WSX PDT SA XX Wall Switch Sensor, Passive Dual Technology, Vacancy (default) or Auto-On



The diagram illustrates a generator grounding system. A generator is connected to a service disconnect (DP) via a #3/0 conductor. The service DP has a neutral bus and a ground bus. A grounding electrode point is connected to the neutral bus and the generator's frame. The grounding electrode point is also connected to the building steel and a concrete encased electrode (UFER) via #3/0 conductors. The UFER is a 20'-0" minimum long concrete footing. A metallic water pipe is also connected to the grounding system. The generator's frame is grounded to three 3/4" x 10' ground rods spaced 10'-0" apart via a #2/0 conductor. The generator is also connected to the building steel via a #3/0 conductor.

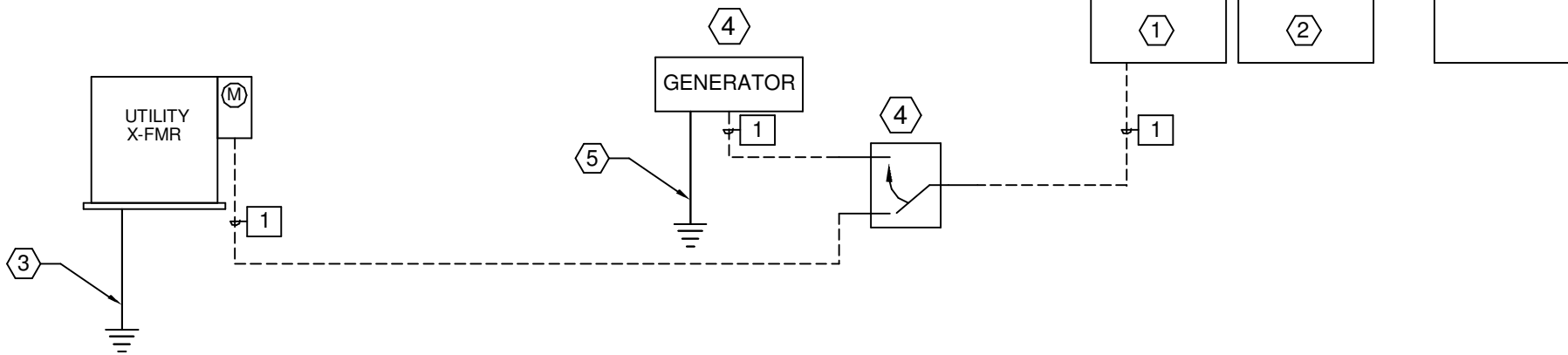
1 ELECTRICAL RISER DIAGRAMS



The diagram illustrates the wiring connections for a fire alarm system. It features three main components: a **CONTROL PANEL**, a **FIRE SUPPRESSION SYSTEM**, and an **EXHAUST HOOD**.

- CONTROL PANEL** is connected to terminals **1** and **2** on the left. It has two output lines at the bottom labeled **3** and **4**.
- FIRE SUPPRESSION SYSTEM** is connected to the **CONTROL PANEL** via lines **7** and **8**. It has two output lines on the right labeled **5** and **6**.
- EXHAUST HOOD** is connected to the **CONTROL PANEL** via line **9**.

PANEL FEEDER AND METER CENTER WIRE SCHEDULE			
NO.	SERVICE SIZE	WIRE SIZE	CONDUIT SIZE (EACH SET)
1	400 AMPS	(2 SETS) 4 #3/0, #3 G	2-1/2"
2	400 AMPS	(2 SETS) 4 #3/0, #3 G	2-1/2"



- ① PROVIDE 42 POLE, 400 AMP, 3-PHASE, 4-WIRE PANEL WITH 400 AMP MAIN CIRCUIT BREAKER. PANEL SHALL HAVE 225 AMP FEED-THROUGH LUGS WHICH WILL SERVICE PANEL "LB".
- ② PROVIDE 72 POLE, 225 AMP, 3-PHASE, 4-WIRE PANEL WITH MAIN LUGS ONLY.
- ③ RE: 2/E6.01 BUILDING SERVICE, ENTRANCE GROUNDING DETAIL FOR ADDITIONAL INFORMATION.
- ④ PROVIDE 150KW DIESEL GENERATOR. PROVIDE ALL NECESSARY ELECTRICAL HARDWARE TO COMPLETE CONNECTION BETWEEN GENERATOR AND PANEL. IN ADDITION, PROVIDE SOUND ATTENUATING ENCLOSURE "LEVEL 1" FOR GENERATOR. PROVIDE OPEN TRANSITION. MANUFACTURER'S RECOMMENDED AUTOMATIC TRANSFER SWITCH (MINIMUM OF 400 AMPS) (ATS) WHICH SHALL BE COMPATIBLE WITH PROVIDED GENERATOR. GENERATOR FUEL TANK SHALL BE SIZED SO THAT GENERATOR CAN SUPPLY POWER AT FULL LOAD FOR 24HRS (TANK NO. 29 OR 322 GALLONS). INFORMATION IS BASED ON GENERAC GENERATORS.
- ⑤ REFER TO DETAIL 2 ON THIS SHEET.



KOMATSU
ARCHITECTURE

ISSUE FOR CONSTRUCTION

ELECTRICAL DETAILS

MANFIELD FIRE STATION NO. 5

4444 National Parkway
Mansfield, Texas 76063

Description	REVISIONS
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1

Addendum 01

12/10/19

LET SIZE: 22 x 34

JOB NO: 2016.166

DATE: 11/07/2019

SHEET:

E6.01

240.12.10.2019.19024

SOLARE
ENGINEERING UNLIMITED, INC.
1300 Summit Avenue, Suite 514 Fort Worth, Texas 76102
Tel 817.529.6800 Fax 817.529.0649 www.solare-eng.com
Texas Registration # F-10963

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Branch Panel: LA															
Mounting: SURFACE					Volts: 120/208 Wye					A.I.C. Rating: 30,000 AIC					
Supply From:					Phases: 3					Mains Type: MCB					
Enclosure: NEMA 1					Wires: 4					Mains Rating: 400 A					
CK T	Circuit Description	BKR (A)	P	Loa d (A)	A		B		C		Loa d (A)	P	BKR (A)	Circuit Description	CK T
1	DECON/DROM RM/ HALL...	20	1	9	1056	719					6	1	20	DINING/PANTRY/DAY RM...	2
3	WORKSHOP/MEDS/LOCKERS...	20	1	7			884	1052			9	1	20	RPORTS/OFFICE 108/HALL...	4
5	APPARATUS BAY Lighting	20	1	11					1314	1496	12	1	20	APPARATUS BAY Lighting	6
7	APPARATUS BAY BUILDING...	20	1	10	1200	1188					10	1	20	SCBA/WORKOUT RM Lighting ...	8
9	SITE LIGHTING	20	2	2			165	330		165	330	3	2	20	SITE LIGHTING
11															
13	WORKOUT FLOOR BOX	20	1	3	360	1260					11	1	20	RESTROOM RECEPTACLES	14
15	WORKOUT RECEPTACLES	20	1	12			1440	360			3	1	20	WORKOUT FLOOR BOX	16
17	DRYING RACK	20	1	13					1550	1200	10	1	20	WORKOUT WATER COOLER	18
19	EXTRACTOR/EXPRESS WASHER	15	3	6	750	900					8	1	20	APPARATUS BAY...	20
21							750	900			8	1	20	GEAR/EXTRACTOR...	22
23									750	1200	10	1	20	EXPRESS DRYER	24
25	FCU-109,125,127,131,132,133,134,135,136/HR-1,2	20	2	3	275	4813					46	2	60	SOUTH OVERHEAD DOORS	26
27							275	4813					28		
29	APPARATUS BAY HEATERS	20	1	12					1440	3850				NORTH OVERHEAD DOORS	30
31	NORTH SIDE OVERHEAD...	30	1	21	2500	3850					37	2	50	AIR COMPRESSOR	32
33	NORTH SIDE OVERHEAD...	30	1	21			2500	2907							34
35	NORTH SIDE OVERHEAD...	30	1	21					2500	2907	24	3	60		36
37					9742	2907									38
39	LC	100	3	69			8447	2500			21	1	30	NORTH SIDE OVERHEAD...	40
41									6592	540	5	1	20	NORTH SIDE OVERHEAD...	42
Total Load:					30 kVA		24 kVA		21 kVA						
Total Amps:					250 A		204 A		174 A						
Load Classification		Connected Load		Demand Factor		Estimated Demand		Panel Totals							
Cooling		25150 VA		100.00%		25150 VA									
Heating		1440 VA		100.00%		1440 VA		Total Conn. Load: 74 kVA							
Lighting		7446 VA		125.00%		9308 VA		Total Connrt. Amps: 206 A							
Lighting - Exterior		990 VA		125.00%		1238 VA		Total Demand Load: 74 kVA							
Motor		17325 VA		100.00%		17325 VA		Total Demand Amps: 205 A							
Other		440 VA		100.00%		440 VA									
Power		9378 VA		100.00%		9378 VA									
Receptacle		14537 VA		84.40%		12268 VA									
Schedule Notes:															

Branch Panel: LC																	
Mounting: SURFACE					Volts: 120/208 Wye					A.I.C. Rating: 30,000 AIC							
Supply From: LA					Phases: 3					Mains Type: MLO							
Enclosure: NEMA 1					Wires: 4					Mains Rating: 100 A							
CK T	Circuit Description	BKR (A)	P	Loa d (A)	A(VA)		B(VA)		C(VA)		Loa d (A)	P	BKR (A)	Circuit Description	CK T		
1	CU-1	20	2	12	1250	2167					18	3	20	CU-3	2		
3							1250	2167									4
5									1450	2167							
7	CU-2	20	3	12	1450	2650					25	2	20	CU-5	8		
9								1450	2650								
11	CU-4	20	2	14					1475	750	7	2	20	CU-6	12		
13					1475	750											14
15	CU-7	20	2	7			750	180			2	1	20	Receptacle	16		
17									750	0	--	1	20	SPARE	18		
Total Load:					10 kVA		8 kVA		7 kVA								
Total Amps:					84 A		73 A		55 A								
Load Classification		Connected Load		Demand Factor		Estimated Demand		Panel Totals									
Cooling		24600 VA		100.00%		24600 VA											
Receptacle		180 VA		100.00%		180 VA		Total Conn. Load: 25 kVA									
								Total Connnt. Amps 69 A									
								Total Demand Load: 25 kVA									
								Total Demand Amps: 69 A									
Schedule Notes:																	

Branch Panel: LB															
Mounting: SURFACE					Volts: 120/208 Wye					A.I.C. Rating: 30,000 AIC					
Supply From:					Phases: 3					Mains Type: MCB					
Enclosure: NEMA 1					Wires: 4					Mains Rating: 225 A					
CK T	Circuit Description	BKR (A)	P	Loa d (A)	A		B		C		Loa d (A)	P	BKR (A)	Circuit Description	CK T
1	SOUTH SIDE OVERHEAD...	30	1	21	2500	2500					21	1	30	SOUTH SIDE OVERHEAD...	2
3	SOUTH SIDE OVERHEAD...	30	1	21			2500	540			5	1	20	SOUTH SIDE OVERHEAD...	4
5	SOUTH SIDE OVERHEAD...	30	1	21					2500	1080	9	1	20	APPARATUS BAY...	6
7	WATER HEATER +...	20	1	4	420	1200					10	1	20	CORRIDOR WATER COOLER	8
9	DECON RECEPTACLES	20	1	7			805	1080			9	1	20	MEDS RECEPTACLES	10
11	DEDICATED...	20	1	3					360	1538	13	1	20	WORKSHOP RECEPTACLES	12
13	PANTRY 117 FRIDGE	20	1	8	1000	969					8	1	20	OFFICE 108 Receptacle	14
15	PANTRY 118 FRIDGE	20	1	8			1000	900			8	1	20	REPORTS RECEPTACLES	16
17	PANTRY 119 FRIDGE	20	1	8					1000	1440	12	1	20	133,134,135,136...	18
19	CLOTHES WASHER	20	1	13	1500	1660					14	1	20	CORRIDOR 107 RECEPTACLES	20
21	KITCHEN MICROWAVE	20	1	10			1200	1440			12	1	20	125,127,131,132...	22
23	KITCHEN RECEPTACLES	20	1	5					540	3640	35	2	50	CLOTHES DRYER	24
25	GAS RANGE	20	1	2	180	3640									26
27	RANGE HOOD	20	1	5			600	1200			10	1	20	KITCHEN DISHWASHER	28
29	EF-1,2,5	20	1	11					1330	540	5	1	20	KITCHEN RECEPTACLES	30
31	AHU-1,2,3	50	1	27	3220	180					2	1	20	GARBAGE DISPOSER	32
33	AHU-4	20	1	8			960	1200			10	1	20	UTILITY CONTROLLER	34
35									2007	720	6	1	20	EXTERIOR RECEPTACLE +...	36
37	EF-4	40	3	17	2007	900					7	3	20	EF-6	38
39							2007	900							40
41									585	900					42
43	EF-7	20	2	6	585	50					0	1	20	STORM SHELTER DAMPER	44
45							4000	960			8	1	20	MEZZANINE RECEPTACLES	46
47	FUTURE PANEL FOR REMOTE BUILDING	60	3	--					4000	530	4	1	20	EF-8	48
49					4000	832					8	2	15	MUA-1	50
51	FACP	20	1	--			500	832							52
53	SPARE	20	1	--					0	0	--	1	20	SPARE	54
55	SPARE	20	1	--	0	0					--	1	20	SPARE	56
57	SPARE	20	1	--			0	0			--	1	20	SPARE	58
59	SPARE	20	1	--					0	0	--	--	--	SPACE	60
61	SPARE	20	1	--	0	0					--	--	--	SPACE	62
63	SPARE	20	1	--			0	0			--	--	--	SPACE	64
65	SPACE	--	--	--					0	0	--	--	--	SPACE	66
67	SPACE	--	--	--	0	0					--	--	--	SPACE	68
69	SPACE	--	--	--			0	0			--	--	--	SPACE	70
71	SPACE	--	--	--					0	0	--	--	--	SPACE	72
Total Load:					22 kVA		17 kVA		20 kVA						
Total Amps:					191 A		141 A		166 A						
Load Classification		Connected Load		Demand Factor		Estimated Demand		Panel Totals							
Cooling		4180 VA		100.00%		4180 VA									
Power		11640 VA		100.00%		11640 VA		Total Conn. Load:		59 kVA					
Receptacle		31538 VA		65.85%		20769 VA		Total Conn. Amps:		163 A					
Spare		12500 VA		100.00%		12500 VA		Total Demand Load:		48 kVA					
HVAC		1664 VA		100.00%		1664 VA		Total Demand Amps:		134 A					
Schedule Notes:															