

EE'S SUMMIT, MO

OJECT NUMBER

62910099

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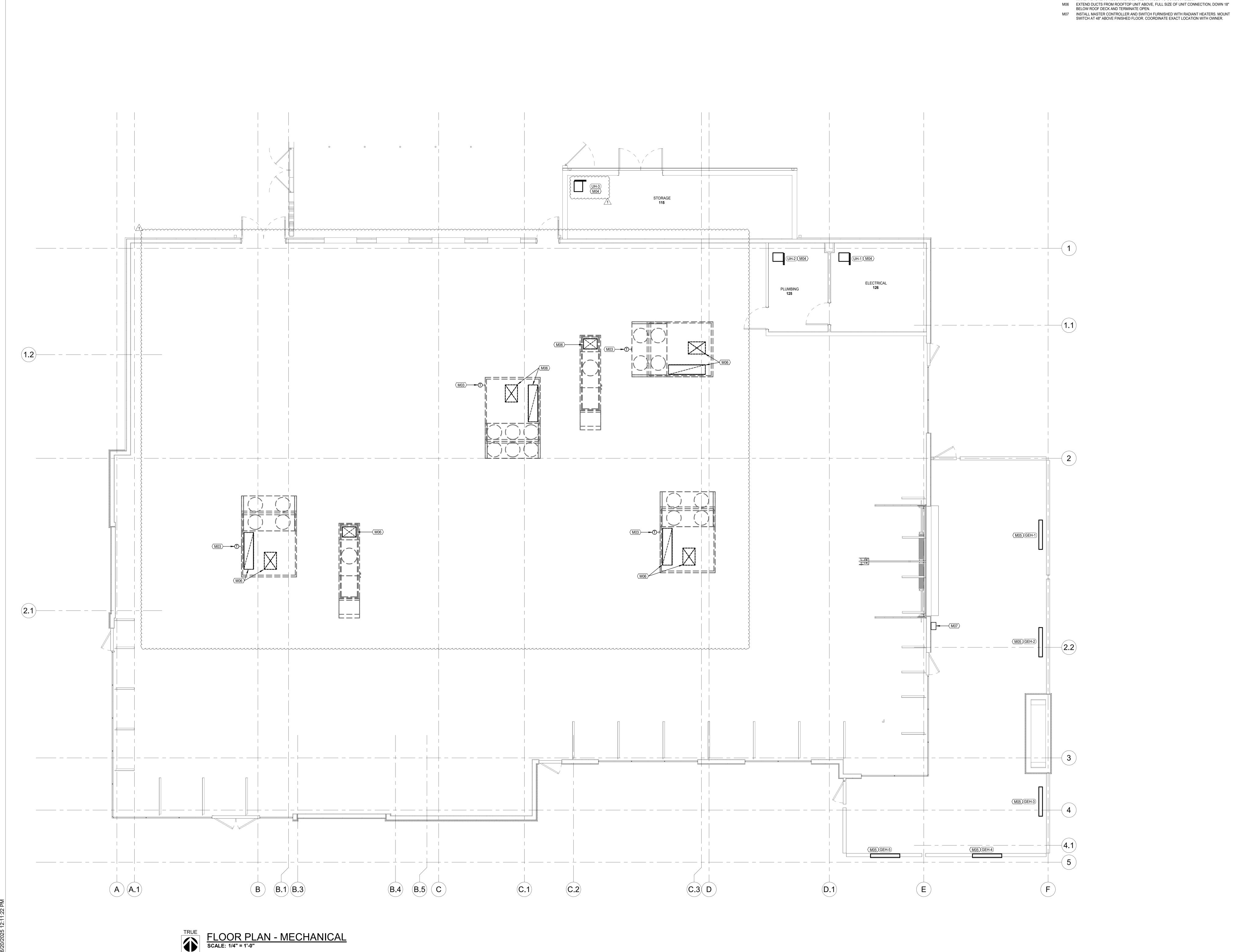
OFESSIONAL SEAL



FLOOR PLAN -MECHANICAL

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M100



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ISSUES AND REVISIONS

NUMBER DATE DESCRIPTION

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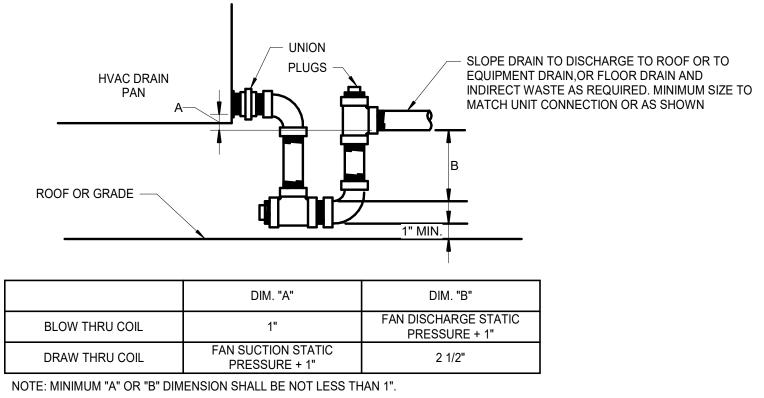
0 05/01/25 ORIGINAL ISSUE

1 06/20/25 ADDENDUM 1

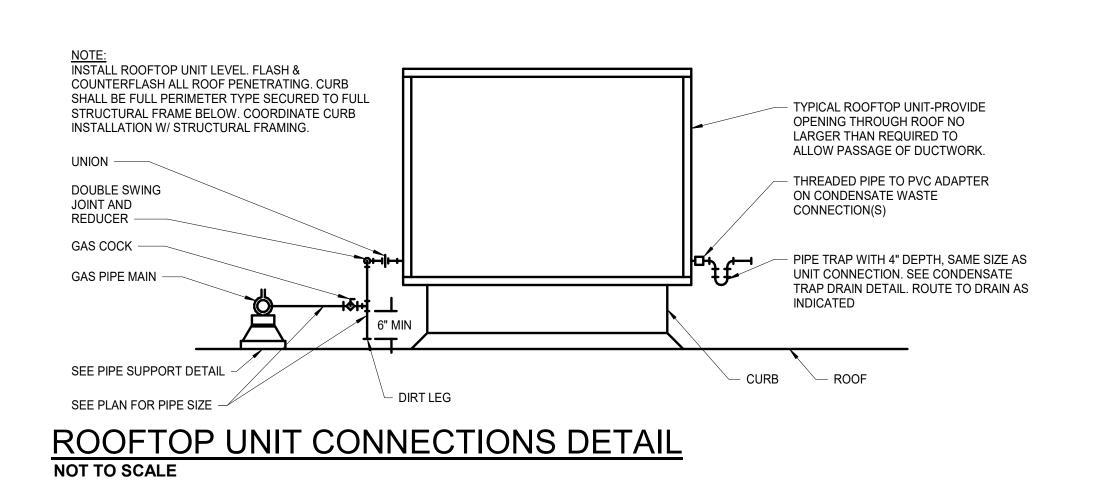
ROOF PLAN -MECHANICAL

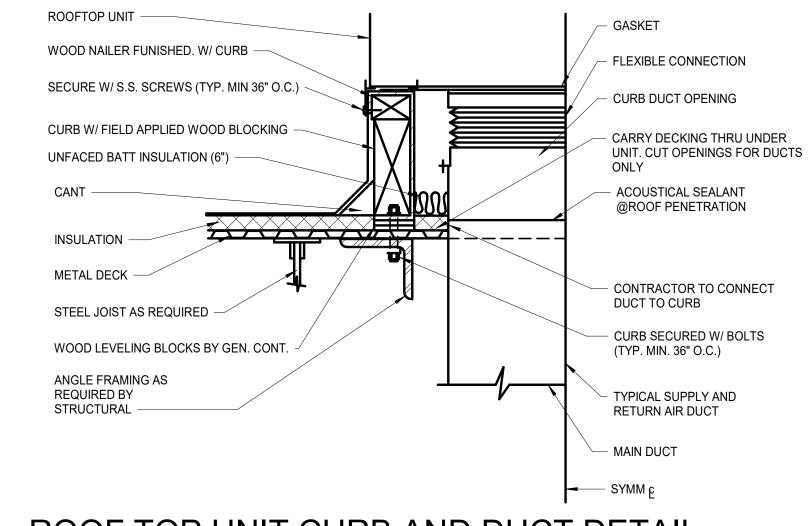
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DRAINABLE HVAC CONDENSATE TRAP DETAIL NOT TO SCALE





ROOF TOP UNIT CURB AND DUCT DETAIL NOT TO SCALE

GENERAL NOTES (TYPICAL ALL SHEETS)

A MECHANICAL CONTRACTOR IS RESPONSIBLE TO SEE THAT WORK MEETS A

CONFLICTS.

A. MECHANICAL CONTRACTOR IS RESPONSIBLE TO SEE THAT WORK MEETS AND IS IN ACCORDANCE WITH ALL REQUIREMENTS OF FEDERAL, STATE, AND LOCAL LAWS AND CODES AND/OR REQUIREMENTS, INCLUDING HEALTH CODES AND BUILDING OWNER.

 B. CUTTING AND PATCHING OF FLOORS, WALLS, CEILING, ETC., REQUIRED IN STRICT ACCORDANCE WITH THE RULES AND REGULATIONS OF THE ARCHITECT'S AND/OR BUILDING OWNER.

REQUIREMENTS.

C. COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO INSTALLATION TO AVOID ROUTING

D. MECHANICAL CONTRACTOR SHALL PROVIDE NEW FILTERS ON ALL AIR HANDLING EQUIPMENT PRIOR TO BALANCING. PROVIDE TEMPORARY FILTERS ON RETURN AIR OPENINGS DURING CONSTRUCTION.

E. INSTALL ELASTOMERIC JOINT SEALER AROUND ALL DUCTS, PIPES, ETC. PASSING THRU INTERIOR NON-RATED CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS. FOR FIRE RATED INTERIOR CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS SEAL ALL DUCTS, PIPES, ETC. INSTALL FIRESTOP MATERIALS IN ALL GAPS PRIOR TO SEALANT APPLICATION. INSTALL SEALER ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

F. UPON REQUEST FOR ELECTRONIC FILES, CONTRACTOR SHALL FILL OUT, SIGN AND RETURN ELECTRONIC MEDIA RELEASE FORM FROM ENGINEER AND PROVIDE PAYMENT FOR FEES STIPULATED ON ELECTRONIC MEDIA RELEASE FORM. UPON RECEIPT OF COMPLETED RELEASE FORM AND PAYMENT, ELECTRONIC FILES WILL BE RELEASED.

G. ALL CABLE TIES FOR LOW VOLTAGE SYSTEMS LOCATED IN PLENUMS UTILIZED FOR AIR MOVEMENT THAT ARE NOT INSTALLED IN CONDUIT SHALL BE 25/50 FLAME AND SMOKE RATED, HELLERMANN TYTON T50R2C2UL OR EQUIVALENT.

H. THERMOSTAT COVERS SHALL BE WHITE IN COLOR UNLESS OTHERWISE NOTED.
THERMOSTATS/SENSORS SHALL BE INSTALLED AND CALIBRATED PRIOR TO TEST AND BALANCE.

FIRE STOPPING REQUIREMENTS

CONTRACTOR TO PROVIDE FIRESTOPPING AT ALL FIRE RATED ASSEMBLIES MEETING THE MANUFACTURER'S FIRESTOPPING U.L. LISTED DETAILS AND INSTRUCTIONS PER LOCAL CODES AND JURISDICTIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATIONS WITH ARCHITECTURAL FIRE RATINGS ON PLANS OR AS REQUIRED.

MECHANICAL SYMBOLS

NEW DUCTWORK

SUPPLY DUCT

RETURN DUCT

SUPPLY DIFFUSER

RETURN GRILLE

SUPPLY DUCT DOWN

SUPPLY DUCT UP

RETURN DUCT DOWN

RETURN DUCT UP

THERMOSTAT

? EQUIPMENT TYPE AND DESIGNATION

TYPE MARK: (S_) SUPPLY, (R_) RETURN, (E_) EXHAUST DIFFUSER OR GRILLE TYPE MARK AND CFM

CFM
CONNECT TO EXISTING

+ BSSOCIATES

1730 Walnut Street

Kansas City, Missouri 64108

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L | F + a Project No. 25.7674.00

ARCHITECT OF RECORD

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TITLE

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0 05/01/25 ORIGINAL ISSUE

MECHANICAL DETAILS, GEN. NOTES, & SYMBOLS

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2.0 STANDARDS, REGULATIONS AND CODES:

Work shall comply with the edition of the applicable standards, regulations and codes currently in force of all Federal, State and local authorities having jurisdiction. Where quantities, sizes, or other requirements indicated on the drawings or herein specified are in excess of the standard or code requirements, the specifications and/or drawings shall govern. In the absence of other applicable local codes, acceptable to the Architect/Engineer, the International Set of Codes and the National Electrical Code shall apply to this work.

B. The Contractor shall comply with rules and regulations of public utilities and municipal departments affected by connections of services. The Contractor shall pay all fees associated there with.

C. The Contractor shall be licensed to perform associated work in the municipality in which the project is located. All products and types of construction shall meet or exceed the latest edition of applicable standards of manufacturer, testing, performance and installation.

E. Where indicated or required, comply with all provisions of the ADA and/or the ABA Accessibility Guidelines. Where indicated or required, comply with all applicable provisions of energy and ventilation codes in force at the

local jurisdiction. 3.0 GRAPHIC REPRESENTATION AND JOB CONDITIONS: The Contract Documents shall serve as working drawings for the general layout of the various items of equipment;

are diagrammatic unless specifically dimensioned, and do not necessarily indicate every required item. The contractor shall include all necessary components and accessories as required for a complete working system whether so specifically indicated or not. B. Architectural and Structural drawings take precedence over all other drawings in the representation of the general construction work; any conflicts shall be resolved prior to commencing work. Failure to do so shall not be

considered a basis for the granting of additional compensation. Arrange work in a neat, well organized manner. Coordinate work with other trades involved, prior to commencing

work. Sub-contractors shall work together to resolve any conflicts of space or routing. 4.0 GUARANTEES/WARRANTY:

A. The Contractor shall guarantee/warranty all work performed, including labor, materials and equipment furnished under this contract, against defects in materials and workmanship for a minimum period of one year from the date of the Owner's Representative Final Acceptance of the work. Provide extended warranties as noted in each section or specified for specific products.

WORKMANSHIP:

A. All work performed under this Contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the Owner's Representative. The complete installation shall function as designed and intended with respect to efficiency, capacity, and noise level, etc.

6.0 LOCAL CONDITIONS:

A. The Contractor shall carefully examine and become thoroughly familiar with local conditions, existing installations and all other conditions which may affect associated work. The Contractor shall locate all existing utilities and protect them during the execution of the work.

B. The Contractor shall carefully examine all contract documents including project drawings and specifications to become familiar with the type of construction, materials, and equipment to be used for all work and how it will affect the installation of this contract.

C. By the act of submitting a bid, the Contractor will be deemed to have made such examination, to have accepted such conditions, to have made allowance therefore, and included all costs in his proposal. Failure to determine existing conditions will not be considered a basis for the granting of additional compensation.

7.0 OPERATION DURING CONSTRUCTION:

A. The Contractor is responsible for the installation and operation, service and maintenance of all new equipment during construction and prior to acceptance by the Owner of the completed project. Warranty periods shall not commence until final acceptance by the Owner or Owner Representative.

B. The Contractor shall provide, at his own expense, all temporary utilities required to provide for and protect the work and as necessary to maintain an adequate work force.

C. The Contractor shall arrange for and provide, at his own expense, temporary heating and cooling as necessary for prosecution of the work. Permanent air handling, heating and cooling equipment shall not be used for temporary heating and cooling unless pre-approved by the owner or his representative.

SAFETY REGULATIONS:

A. All work shall be performed in compliance with all applicable governing safety regulations, including OSHA regulations. Provide safety lights, guards and signs required.

9.0 HOUSEKEEPING:

A. The Contractor shall be responsible for keeping stocks of material and equipment stored on the premises in a neat B. The Contactor shall clean and maintain their specific portions of the work on a daily basis or as specified in the

C. The Contractor shall remove from the premises all waste material present as a result of his work.

10.0 SUBSTITUTIONS:

A. Materials, products and equipment described in the Bidding Documents established a standard of quality to be met by any proposed substitution.

B. Contractor's bids shall be based on the material identified or specified in the contract documents. Any proposals for substitution shall be made in writing to the Architect/Engineer with all supporting documentation, allowing adequate time for appropriate action. The products of other manufacturers may be accepted, if in the opinion of the Architect/Engineer, the substitute material is of quality as good or better than the material specified, and will serve with equal efficiency and dependability the purpose for which the items specified were intended. The burden of proof of equality is entirely upon the proposer.

C. Refer to Division 1 requirements for additional substitution procedures.

D. Wherever substitutions alter the design or space requirements, the Contractor shall be responsible for confirming all substituted equipment and materials fit within the allocated space while maintaining code required access and clearance. He shall include all associated cost items of the revised design and of construction work required by his or other trades affected by the proposed substitution.

11.0 SHOP DRAWINGS AND PRODUCT DATA:

A. The checking of shop drawings is a gratuitous assistance and in no way relieves the Contractor of responsibility for deviations from the Contract Documents. The Contractor shall submit project shop drawings electronically in PDF format, unless indicated otherwise.

B. Shop drawings and catalog data on all major items of equipment and apparatus, and such other illustrative materials as may be considered necessary by the Owner's Representative shall be submitted by the Contractor in adequate time to prevent delay and changes during construction.

C. Refer to Architectural Documents for additional shop drawing submission procedures.

12.0 PROJECT CLOSEOUT DOCUMENTATION

A. Operating and Maintenance Brochure:

1. On completion of the project, the Contractor shall provide project manuals electronically (PDF format unless otherwise instructed) containing complete product information for all installed or provided equipment and components including cut sheets, parts lists, wiring and installation diagrams, operating, service and lubrication instructions. Provide manufacturer guarantee and warranty certificates.

B. Record Drawings:

1. On completion of the project, the Contractor shall provide record drawings with all field changes clearly and neatly noted. The original routing and layout shall be clearly marked out. References to other

documents, drawings, addenda, RFI's or otherwise for additional information shall not be accepted.

2. The Contractor shall submit record drawings electronically in PDF format (unless otherwise instructed).

3. Refer to Architectural Documents for additional record drawing submission procedures.

13.0 SITE WORK AND CONDITIONS:

A. The Contractor shall do all necessary excavating and backfilling for the installation of associated work. After the piping or conduit has been installed, tested and approved, the trenches shall be backfilled to grade with compacted sand, gravel or AB-3 material or other material as required by local authorities. Compact to 85% density for unpaved areas, 95% density for paved area or under slabs. B. All water bearing piping shall be 48" minimum below grade, all gas piping shall be 24" minimum below grade,

unless instructed otherwise. C. Roads, alleys, street, sidewalks and utilities damaged during this work shall be restored to the satisfaction of

Owner's Representative and authorities having jurisdiction. D. Where subsidence is measurable or observable at excavation during general project warranty period, remove surface, add backfill material, compact, and replace surface treatment. Restore appearance of surface to match

14.0 FOUNDATIONS AND SUPPORTS:

A. The Contractor shall provide concrete bases, hangers and foundations for all machinery and equipment specified or shown in this contract, including fans, air conditioning units, water heaters, pumps, motors, electrical gear, etc., unless specifically noted otherwise.

B. All hangers, brackets, clamps, etc., shall be of standard weight steel. Perforated strap hangers shall not be used in any work. When two (2) or more pipes or conduits are run parallel, or where ducts interfere with the proper location of hangers, they may be supported on trapeze hangers. Other hangers shall be hinged ring malleable iron, by Grinnell or Fee and Mason or approved equal with rods and hanger adjusters for adequate size to carry the loads imposed. All piping, ductwork and conduit systems shall each be independently supported from other systems and from equipment so that no weight is born by equipment. C. The Contractor shall take all precautions against excessive noise or vibration by isolating the various items of

equipment from the building structure. Provide flexible connectors where indicated and at all rotating equipment and for equipment mounted on vibration isolators.

15.0 CUTTING AND PATCHING:

A. All necessary cutting, drilling and patching shall be provided by this Contractor. Structural members shall not be disturbed without prior approval of the Structural Engineer and/or the Owner's Representative. All areas and surfaces disturbed by work performed under this Contract shall be neatly repaired and refinished to the condition of adjoining surfaces in a manner suitable to the Owner's Representative.

16.0 SLEEVES AND ESCUTCHEONS:

A. Penetrations thru walls and floors shall be as detailed.

B. Where not otherwise shown, penetrations shall conform to the following:

on grade, cast iron or steel pipe sleeves shall be used.

1. Where pipes or conduits pass through interior partitions, galvanized steel pipe sleeves or galvanized steel sheet sleeves shall be used. Where pipes or conduits pass thru concrete floors and walls, walls below grade or exterior walls and slabs

Sleeves through interior non-rated walls, including walls indicated as sound partitions, shall be packed with fiberglass or mineral wool and caulked.

D. Sleeves below grade, in exterior walls or thru slabs on grade shall have mechanical link seals, Thunder line or Penetrations of fire rated construction shall be made with a UL listed fire penetration assembly suitable for the rating at each location. Where required, sleeves through fire rated structure shall be fire barrier caulked with putty strip or sheet by 3M, Hilti or acceptable equal.

Provide steel (dry locations) or brass (damp locations) escutcheons to completely cover pipe penetration holes in floors, walls, or ceilings. Provide pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas, brass for exterior.

17.0 MOTORS, CONTROLS AND FIRE ALARM INTERFACE:

A. All motors furnished under this specification shall be recognized manufacturer and of adequate capacity for the loads involved. All motors shall conform to the standards of manufacturer and performance of the National Electrical Manufacturers Association as shown in their latest publications.

All motors 3/4 hp and above shall be high efficiency. Provide ECM motors where indicated. Any motor indicated for use with Variable Frequency Drives (VFD) shall be specifically designed for compatibility.

Disconnects and motor starters for equipment shall be by the Electrical Contractor unless furnished integral with the equipment or as otherwise indicated. Installation shall be by the Electrical Contractor except for devices factory installed and shipped with equipment. Provide manual or magnetic starters with necessary auxiliary contacts to accomplish the specified or required sequence of operation.

D. All temperature controls unless noted otherwise shall be the responsibility of the Mechanical Contractor.

E. If no sequence of operation is included, submit a proposed sequence to the Engineer for approval. All fire alarm devices including duct smoke detector and shut down/interlock wiring shall be the responsibility of the Electrical or Fire Alarm Contractor otherwise noted.

18.0 PIPING IN ELECTRICAL ROOMS: No piping except specifically noted otherwise will be permitted in Electrical Rooms or Data Rooms including Server Rooms and IT Closets. In rooms where piping is indicated over or near electrical equipment, a suitable galvanized

sheet metal pan or gutter piped to the drainage system shall be provided.

END OF SECTION

230 100 HEATING, VENTILATION AND AIR CONDITIONING

1.0 SCOPE: A. The work included under this contract consists of providing all labor, materials, tools, transportation, services, etc., necessary to complete the installation of the heating, ventilating, and air conditioning systems and other items herein listed and as described in these specifications, as illustrated in the accompanying drawings or as directed

2.0 SHEET METAL: Ductwork shall be new prime grade galvanized steel sheets constructed per ASHRAE and SMACNA Standards.

Duct system(s) installation shall be in accordance with SMACNA Duct Construction Standards Manual and industry standards. Provide round or rectangular duct as indicated. Provide Duct System(s), including all necessary components such as dampers, turning vanes, offsets and takeoffs, etc. required by the project (whether shown or not), which shall be fabricated and installed for

maximum efficiency and to minimize pressure drops and objectionable sound and to provide for complete

All duct sizes shown are free area size and do not include liner. B. Fabricate for the pressure and SMACNA seal class required by the application.

Leakage class minimum requirements are: 1. Up thru 2" WG pressure – rectangular – Class 24, round - Class 12.

Up thru 2" WG pressure - class A for all duct joints.

Seal class minimum requirements are:

Duct sealant shall have 25/50 flame and smoke rating with a static pressure class of 10" WG, mold and mildew resistant. Sealant shall be installed per manufacturer instructions. Sealant for concealed ductwork shall be an externally applied solvent or water based joint and seam

sealant with or without tape. Ductwork exposed to view shall be sealed with clear silicone or have gasketed joints. Exposed rectangular flanged duct joints shall have gasketed joints. Exposed round ducts shall have joints with EPDM gaskets in groove, O-ring seals or flanged with neoprene gaskets. Where sealant beads are used, they shall be minimized or concealed, smooth and uniform with any excess sealant trimmed flush with duct and 4. Spiral lock seams and gasketed duct joints are exempted from other sealant requirements.

D. Duct Finishes Concealed ductwork shall be manufacturer's standard mill finished.

Ductwork that is indicated or required to be field painted shall have paint grip finish. Ductwork that will remain exposed to view shall be furnished without marks, markers, shipping identification or other tags located on exterior duct surfaces, no exceptions. Any ductwork so installed shall be removed at contractor expense. Protect exposed ductwork from dents, scratches or other damage during construction. Wipe down and thoroughly clean all exposed duct, fittings and accessories.

Round or oval duct shall be factory built of galvanized steel, suitable for pressure class required or indicated. Snap lock duct and fittings shall be used for low pressure/velocity applications only. Fittings shall have 1.5 times diameter centerline radius. Spiral duct may be used for any pressure/velocity class. Spiral duct shall be Semco or acceptable equal by McGill Airflow or Lindab.

Single wall, 2.0" WG minimum. Round or oval duct joints shall be Ductmate quick sleeve, slip joint, welded or flanged.

3.0 DUCTWORK ACCESSORIES:

A. Duct splits, elbows and reducing fittings shall be fabricated per SMACNA standards. "Ductmate" or acceptable equal flanged and gasketed joint systems are approved. 4.0 DUCT SUPPORTS AND ROUTING

A. Hangers and Supports.

Ductwork shall be supported in accordance with all SMACNA standards including support methods, sizes All hanger and support parts shall be galvanized steel for non-corrosive environments or stainless steel for corrosive or damp environments. Provide sheetmetal straps, adjustable hangers, clamps, channels, rods, flexible connectors,

supplementary steel, etc. as required for proper support of all ductwork. Trapeze may be used for support of single or multiple ducts. Provide accompanying attachments including bolts and nuts, sheetmetal screws Upper attachments shall be manufactured items specific to the applicable structure. Include concrete inserts, wedge type drilled in inserts, steel beam and joist clamps, plates, rods, clips, straps and brackets as required by the application.

Ductwork shall be routed as shown on drawings, parallel to building lines unless otherwise shown, coordinated with building structure and other trades. Adjust ductwork routing and elevations with necessary offsets to accommodate beams and other obstructions.

5.0 HEATING AND AIR CONDITIONING UNITS:

A. Air conditioning units shall be as scheduled or by acceptable equal. Units shall be standard catalogued products with the appropriate approval or certification by AGA, ARI and UL. Efficiencies shall conform to ASHRAE 90

B. Should an alternate manufacturer's equipment be provided that differs in size, weight or configuration from the manufacturer listed as the basis of design, the contractor shall reimburse the architect and engineer for all costs associated with modifying the construction documents to accommodate the alternate manufacturer's equipment. The contractor also shall be responsible for all costs associated with modification to electrical, plumbing, mechanical and structural systems from the original construction documents to accommodate alternate equipment. Packaged Units:

Packaged outdoor units shall be roof or ground mounted, vertical or horizontal discharge, with cooling and/or heating components of characteristics and capacities scheduled. Unit shall have direct or belt drive forward curve or airfoil supply fan, cooling coil with copper tubes and aluminum fins, insulated coil drain pan. Compressors shall be manufacturer's standard with crankcase heaters and vibration isolators and five (5) year warranty, electric coil or gas fired burner and heat exchanger with 10 year warranty as indicated. Accessories shall include suction line accumulators, service valves, sight glass and strainerdryer, as required for a complete operating system. Provide with filters, enthalpy economizers, relief or power exhaust, controls, hinged access doors, condenser coil hail guards, condenser coil cottonwood filters, mounting curb and duct flex connectors and other accessories as indicated or required. Furnish 10 year heat exchanger for gas fired units. Packaged units shall be Lennox or acceptable equal by Carrier, York, Trane, Daikin.

D. Provide units with manufacturer's standard control package. Controls to include factory wired terminals with overload devices and transformers as required. Unit safety control to include high-low pressure switches, fan relays, short cycle safety and internal pressure relief, gas controls with hi limit and anti- cycle protection. E. Provide unit accessories as noted on drawings and as required for a complete operating system.

F. Mount units to provide the required service, access and airflow space.

6.0 MAKE-UP AIR UNIT

A. Provide tempered make-up air unit including direct gas-fired heater with all accessories as scheduled including intake hood, filters, curb as scheduled. Units shall be Greenheck, Accurex, or owner acceptable equal.

7.0 MISCELLANEOUS MECHANICAL EQUIPMENT: A. Provide miscellaneous heating equipment with controls and all accessories as scheduled. Heating equipment Unit Heaters: electric.

a. Electric units shall be Markel, Q'Mark, Trane, Vulcan or acceptable equal.

A. Provide filters in air intake to each units A/C system with size and number of filters standard with air unit manufacturer. Provide 1" and/or 2" thick to suit equipment requirements, hi-velocity, throw-a-way MERV 8 filters, Camfil 30/30 or acceptable equal by American Air Filter, Airguard, Air Filters, Inc., Purolator. Filters shall be new and clean at time of Owner's acceptance. Supply extra set of filters for each unit. CONTROLS AND LOW VOLTAGE SYSTEMS:

A. All temperature controls unless otherwise noted shall be the responsibility of the Mechanical Contractor.

B. Controls system shall be electric/electronic with stand-alone programmable digital thermostats. Provide control installation to accomplish the indicated or required sequence of operation including thermostats/

D. Devices exposed to view and mounted in finished spaces shall be white in color unless otherwise noted or directed. E. All occupant adjustable devices shall be mounted in accordance with ADA and ADAAG requirements.

sensors, controllers, actuators, wiring, piping and tubing, software, graphics and other components as required for

a complete operating system. Where no sequence is indicated, contractor shall submit a proposed sequence for

10.0 PIPE AND FITTINGS: Condensate drain piping:

1. PVC Pipe – Schedule 40 with solvent cement joints. PVC not permitted in plenums used for supply or Provide with plugged tee cleanouts unless otherwise accessible for cleaning. Trap all air unit condensate drains with deep traps. Condensate drain piping:

a. Outdoor units shall discharge indirectly to grade or to primary roof drains or gutters or as otherwise indicated on drawings and shall be in accordance with local codes. Condensate shall not drain to overflow roof drains. Condensate pipe sizing:

Piping for individual units shall be as specified by manufacturer or a minimum of the unit connection

1-1/4"

1-1/2"

Install manufacturer supplied condensate lift pumps and pipe discharge adaptors where indicated d. Common or manifold condensate system shall be minimum size as follows: Equipment Capacity, Tons 3-1/2 to 20

Minimum condensate pipe size shall be 3/4".

21-90

11.0 PIPE SUPPORTS AND ROUTING:

A. Hangers and Supports.

Piping shall be supported in accordance with industry standards including support methods, sizes and spacing. All supports shall conform to MSS SP58 and Fed Spec WW-H-171E and A-A-1192A.

Pipe Slopes: Install hangers and supports to provide indicated or required pipe slopes to provide for drainage and venting. Deflection: Maximum pipe deflections and stresses as allowed by ANSI B31 are not exceeded. Each piping system shall be independently supported with no piping bearing on another and installed such that no weight of piping is borne by the equipment. Space hangers and supports within maximum piping span length indicated in MSS SP-58. Install building attachments at required locations for proper piping support.

Provide adjustable hangers, inserts, brackets, rolls, clamps, channels, rods, guides, anchors, flexible connectors, supplementary steel, etc., as required for proper support of all pipe lines. Trapeze may be used for support of multiple pipes. Provide accompanying attachments including bolts and nuts, sheetmetal screws or rivets suitable for application Provide copper plated, plastic coated or felt lined hangers where required to prevent electrolysis or abrasion on copper or plastic piping systems. Upper attachments shall be manufactured items specific to the applicable structure. Include concrete inserts, wedge type drilled in inserts, steel beam and joist clamps, plates, rods, clips, straps and brackets as required by the application. Hangers shall be designed to allow for expansion and contraction of pipe lines and shall be of adequate

size to permit covering when required. Provide protective saddles and blocking where supporting insulated piping to prevent crushing insulation. All hanger and support parts shall be galvanized steel for non-corrosive environments or stainless steel for

B. Routing.

corrosive or damp environments.

Piping shall be routed as shown on drawings, parallel to building lines unless otherwise shown, coordinated with building structure and other trades. Adjust pipe routing and drop locations with necessary pipe offsets or changes in elevation to accommodate beams and other obstructions.

INSULATION:

A. Ductwork

a. Line low velocity rectangular sheetmetal supply ductwork and return ducts, with mat faced 3 lb. density fiberglass or textile liner with anti-microbial coating. Apply with mastic and pins with erosion

Rectangular supply and return air ducts - 1" thick liner. Outside Air ducts in any location – No liner permitted in any circumstance. Under no circumstance shall ductwork conveying kitchen hood makeup air or exhaust be

13.0 FOUNDATIONS AND VIBRATION ISOLATION: A. Foundations: Provide fabricated supports for all equipment. Mount on 4" concrete housekeeping pads where

protection on all exposed edges.

Provide flexible connections at all motor driven equipment, where shown and where required to hold transmitted noise and vibration to an acceptable minimum at piping and duct connections.

Duct flexible connection shall be Durodyne non-combustible, 22 ounce (minimum) polymer coated woven fabric or Equipment Vibration Isolation: All motor driven equipment shall be furnished with isolating mountings. Motors

shall be mounted on resilient bases, spring or rubber supports as recommended by the manufacturer. Isolators

shall be Amber Booth or acceptable equal by Kinetics, Mason Industries, Vibration Eliminator Co. 14.0 SLEEVES AND SEALS, FLASHINGS, ROOF PIPE SUPPORTS AND UV PROTECTION:

A. Flash all pipes and vents extending through roof. Flashing details shall be in accordance with roof manufacturer's Roof pipe supports shall be prefabricated with UV resistant rubber base, unistrut channel and pipe clamp, length and height for consistent pipe elevation to suit application. Mi-Fab C6 series or acceptable equal.

C. Plastic piping without UV inhibiters which is exposed to UV radiation from sunlight shall be protected by coating

with a UV resistant paint. EQUIPMENT LABELS: Equipment labels shall be provided for all mechanical equipment and shall be self adhesive engraved plastic, blue with white lettering, sized, minimum 1-1/2" high, and located for viewing from ground or floor level. Label shall

16.0 CLEANING: A. New Work

indicate drawing designation or unique equipment number.

1. Clean air system by operating at least three hours prior to final acceptance with temporary filters. Remove all filters and replace with clean. END OF SECTION

220 100 **PLUMBING**

1.0 SCOPE: A. The work included under this contract consists of providing all labor, materials, tools, transportation, services, etc., necessary to complete the installation and to provide complete working systems of the Plumbing Systems, including hot and cold water, waste and vent, storm drainage, fixtures, equipment and other items described in these specifications, as

B. Extend piping systems as indicated on contract documents or to point of connection as follows:

illustrated in the accompanying drawings or as directed by the Architect/Engineer.

DOMESTIC WATER SERVICE AND SYSTEMS.

5'-0" from exterior building wall lines.

A. Contractor shall verify water service availability, including size and available pressure to service the building.

The pressure provided to fixtures within the building shall not exceed that allowed by local code or shall not exceed 80 PSIG. Provide pressure regulator(s) as required to limit the maximum pressure. PIPING, FITTINGS AND VALVES:

A. Provide hot and cold-water supply to each and every fixture, piece of equipment and to systems where makeup water is

B. Provide service valves at each main riser and as required by code.

C. Provide service valves for each item of equipment, at branch piping, fixture groups, individual fixtures and elsewhere as indicated or required. Provide balance valves, strainers, check valves and other valves as indicated or required by the

D. Provide a union or flanged connection between each item of equipment and its service valve. Copper to ferrous pipe connections shall have isolation coupling, flange or union.

E. Domestic cold water underground -

1. Pipes, copper -- type "K", soft temper, wrought copper fittings, silver solder joints, 1/2" through 3". a. Under slab water piping shall be installed in sand fill and shall be jointless where possible or joints

minimized. Required joints shall be made with lead free silver solder. 2. Water piping installed exterior to the building shall be a minimum of 48" below grade.

F. Domestic water, interior, above ground –

2-1/2" and Smaller - Type "L" hard temper copper, wrought or cast copper fittings, Lead free 95/5 or Eagle Hard Silvabrite or "CB" solder joints, or roll grooved mechanical joints or pressure seal joint fittings

2. Provide valves where indicated on the drawings, where required by code, or required for service.

a. 1/4 turn Service –

1/2" thru 2" - Nibco 585-66-LF bronze lead free, 600 PSIG, full port, stainless steel ball and stem. 2) 2" thru 12", Nibco LD-2110 lead free, 200 PSIG, lug style, EPDM seals, ductile iron butterfly with nickel plated ductile disk. 3) Provide isolation valves where indicated on drawing, including at branches, terminations, each

piece of equipment and elsewhere as required by code.

b. Check, Strainers and Miscellaneous –

1) Check – 1/2" thru 2" – Nibco 480-Y-LF lead free, 200 PSIG, PTFE seats, spring loaded, resilient disc, spring loaded inline non-slam check valve, in pump discharge. 3. Water service back flow preventers shall be reduced pressure type, lead free unless otherwise indicated.

a. Up thru 2" - Watts LF-009, lead free bronze body with ball valves, ASSE 1013/AWWA C511 and USC compliant. Securely anchor and support piping, valves and fittings, with adequate provisions for expansion and contraction. Grade lines, free of traps, to low point at cut-off and drain valve.

G. Natural Gas --

 Pipe above ground: a. 2" and smaller – Schedule 40 black steel piping with threaded fittings. 2-1/2" and larger – Schedule 40 black steel piping with welded fittings.

Apollo PowerPress or equal. Pipe below ground:

Schedule 40 black steel with a 3 layer factory coating of epoxy, adhesive and polyethylene, threaded or welded fittings. Joints shall have a cover kit of epoxy paint, adhesive and heat shrink PE Sleeves. All underground steel piping and/or fittings shall be cathodically protected. Natural gas piping installed exterior to the building shall be a minimum of 36" below grade and shall

. 4" and smaller – Schedule 40 black steel pipe with pressure seal steel fittings. Viega Megapress XL,

be installed with a tracer wire above the pipe, terminated in an accessible location or shall be installed

Natural gas piping shall not be permitted to be installed interior under slab. e. Underground gas piping shall rise above grade before entering any enclosed structure.

Valves & Connectors: Shutoff Service -1/2" thru 1" - Nibco GB-1A, brass body, chrome plated brass ball, PTFE seats, screwed ends, 5 PSIG per CGA, lever handle. 1/2" thru 2" – Nordstrom 142, iron lubricated tapered plug valve, 200 PSIG, threaded ends.

2" thru 5" – Nordstrum 143, iron lubricated tapered plug valve, 200 PSIG, flanged ends. Connections to each piece of equipment or appliances shall be made with gas cock, dirt leg and union. Appliance connections may be made with UL listed appliance connectors with union ends. Regulator, 3/4" thru 1-1/2" - Fisher type S, spring loaded diaphragm, 1.5" WC to 2.5 PSIG discharged pressure, threaded, vented to atmosphere. Regulator, 1/2" thru 2" - Maxitrol 235L, spring loaded diaphragm, 2 PSIG Maximum inlet, 7" to 11" WC outlet, threaded, vent limited.

e. Flex Connectors, Metraflex GASCT 300 series stainless steel braided hose with carbon steel threaded

Natural gas piping in return air plenum, where permitted shall be either installed in vented fabricated enclosure; sleeved and vented; or welded or one piece.

5. Paint exterior natural gas piping with corrosion inhibiting paint, color to be selected.

H. Sanitary sewer, vent, interior --

Pipe – Standard weight cast iron hubless with no-hub shielded mechanical joints; solid wall schedule 40 PVC, ABS with solvent cement joints; vents may be galvanized malleable iron Plastic piping shall not be allowed in return air plenums Floor or equipment drains shall be provided at all locations where equipment is indirect wasted. Floor drains shall

be provided outside all ADA showers for roll-in applications or where there is no threshold. All gravity drainage shall be graded per code but not less than 1/8" per foot unless noted otherwise, except that piping sizes up thru 2-1/2" shall be sloped at 1/4" per foot. Piping sizes up thru 4" to be sloped at 1/4" per foot where possible and where required by local codes. Vents shall be sloped upward in direction of flow.

 Sanitary sewer, vent, below grade --Pipe – Standard weight cast iron hubless with no-hub heavy duty mechanical joint fittings; solid wall schedule 40 VC, ABS with solvent cement joints.

J. Sanitary sewer, exterior --

All gravity drainage shall be graded per code but not less than 1/8" per foot unless noted otherwise, except that piping sizes up thru 2-1/2" shall be sloped at 1/4" per foot. Piping sizes up thru 4" to be sloped at 1/4" per foot where possible and where required by local codes. Vents below grade shall be 2" minimum size and shall be sloped up in direction of flow.

1. Pipe -- Cast or ductile iron service weight, with compression gaskets; ABS, PVC with solvent cement joints.

CLEANOUTS, TEST TEES, TRAPS AND TRAP SEALS: Provide cleanout at the base of each stack or riser, at ends of runs greater than 100', each 135° aggregate change of direction in horizontal piping, where indicated on the drawings or as required by code. Plugs, extra heavy cast brass, screwed. Scoriated tops in unfinished areas, carpet markets in carpet floors, tile top in tile floors, stainless steel cover in finished walls. Cleanouts shall be the same size as pipe up to 4" diameter, 4" cleanouts for larger pipe unless otherwise

noted. Cleanouts outside the building extend to grade and terminate with extra heavy soil pipe cleanout set in 12" square

B. Provide test tees at base of risers and elsewhere as required by code.

C. All traps shall be deep seal type with liquid seal not less than specified by code.

5.0 SLEEVES AND SEALS, FLASHINGS, ROOF PIPE SUPPORTS AND UV PROTECTION:

Where trap primers are not specified provide all floor and hub drains with trap seal with EPDM or silicone diaphragm. conforming to requirements of ASSE 1072 or 1017.2. Provent Proset Series SG22 or TG22. Sioux Chief series 835 Rectorseal SS series or acceptable equal.

A. Flash all pipes and vents extending through roof. Flashing details shall be in accordance with roof manufacturer's

shall be as detailed on drawings. Roof pipe supports shall be prefabricated with UV resistant rubber base, unistrut channel and pipe clamp, length and eight for consistent pipe elevation to suit application. Mi-Fab C6 series or acceptable equal.

D. Provide sleeves where piping penetrations are required thru partitions, concrete floors, concrete slabs on or below grade

or foundation walls. Where penetrations are through fire rated assemblies, sleeves shall be fire stopped in accordance with UL listing requirements. Sleeves shall be galvanized steel pipe, sheet steel or cast iron. Penetrations of below grade

B. Continuous roof piping penetrations shall be made weather tight, conform to roof manufacturer warranty. Penetrations

structures and slabs on grade shall be water proofed with mechanical link seal system, Thunder Line or acceptable Plastic piping without UV inhibiters which is exposed to UV radiation from sunlight shall be protected by coating with a UV

water supply system. Where the possibility of back-siphonage exists, water supply to the fixture shall be introduced through a suitable backflow preventer device suitable for the hazard protected. Installed backflow preventers must be approved through the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. 1. They may be an air gap, anti-syphon valve, atmospheric vacuum breaker, pressure vacuum breaker, double check, reduced pressure backflow preventer or as otherwise required by the authority having jurisdiction.

A. No plumbing device or piping shall be installed which will provide cross-connection or interconnection between a

distributing supply or waste so as to make possible the backflow or back-siphonage of polluted water into the potable

INTERCEPTORS A. Interceptors shall include the following applications:

6.0 CROSS- CONNECTIONS AND INTERCONNECTIONS:

Grease

B. Provide interceptors according to manufacturer listing and requirements.

manufacturer, performed in accordance with all local jurisdiction requirements.

C. Interceptors and accessories shall be installed and inspected per manufacturer and local jurisdiction requirements. Provide engineered hydromechanical interceptors as scheduled, sized for the connected load per code or per manufacturers sizing requirements to meet their listings. Interceptors shall be engineered polymer and shall be complete with all required accessories including integral flow control devices, access risers and gas tight access cover, manway risers, hold down straps, support structures, inspection port. Interceptor to be vented in accordance with code. Install in accordance with manufacturer requirements. Schier or acceptable equal.

F. Provide interceptors with all required accessories including but not limited to:

Engineered hydromechanical polymer interceptors shall be installed and tested in accordance with manufacturer

equirements. Provide vacuum testing of installed units. Meet all preparation and vacuum testing requirements of

Inlets, outlets, vents, flow control devices, riser tubes, manhole covers, hold down devices, inspection and pump

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 $L \mid F+a \text{ Project No. } 25.7674.00$

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Wet sprinkler system -- NFPA 13.

1. Cold water piping insulation: 1" fiber glass sectional pipe covering with universal vapor barrier jacket. At Contractor's option, Armacell AP Armaflex unicellular insulation or acceptable equal with 25/50 flame and smoke rating with equal thermal performance may be substituted for fiberglass products.

D. Seal all joints on cold water insulation to maintain vapor barrier.

Insulation shall run continuously thru hangers and supports without interruption.

PIPE SUPPORTS AND ROUTING: A. Hangers and Supports

8.0 INSULATION:

Piping shall be supported in accordance with industry standards including support methods, sizes and spacing. ll supports and installation shall conform to MSS SP58 and 69 and Fed Spec WW-H-171E and A-A-1192A. Pipe Slopes: Install hangers and supports to provide indicated or required pipe slopes to provide for drainage and

Deflection: Maximum pipe deflections and stresses as allowed by ANSI B31 are not exceeded. Each piping system shall be independently supported with no piping bearing on another and installed such that no weight of piping is borne by the equipment. Provide adjustable hangers, inserts, brackets, rolls, clamps, channels, rods, guides, anchors, flexible connectors,

supplementary steel, etc., as required for proper support of all pipe lines. Trapeze may be used for support of multiple pipes. Provide accompanying attachments including bolts and nuts, sheetmetal screws or rivets suitable Upper attachments shall be manufactured items specific to the applicable structure. Include concrete inserts, wedge type drilled in inserts, steel beam and joist clamps, plates, rods, clips, straps and brackets as required by

Hangers shall be designed to allow for expansion and contraction of pipe lines and shall be of adequate size to permit covering when required. Provide protective saddles and blocking where supporting insulated piping to prevent crushing insulation.

Piping shall be routed as shown on drawings, parallel to building lines unless otherwise shown, coordinated with building structure and other trades. Adjust pipe routing and drop locations with necessary pipe offsets or changes in elevation to accommodate beams and other obstructions.

10.0 EQUIPMENT AND PIPE LABELS: A. Equipment labels shall be provided for all plumbing equipment and shall be self-adhesive engraved plastic, blue with

Pipe labels for domestic water, waste, vent and gas piping shall be preprinted, color-coded, with 1-1/2" lettering indicating service, and showing flow direction, locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and locations as follows:

white lettering, sized, minimum 1-1/2" high, and located for viewing from ground or floor level. Label shall indicate drawing

Near each valve and control device. Near penetrations through walls, floors, ceilings, and inaccessible enclosures. Near major equipment items and other points of origination and termination.

Warning labels shall be self-adhesive engraved plastic or preprinted plastic as required by application with white lettering on red background provided at locations as required by code or where hazards to personnel exist.

11.0 MISCELLANEOUS

designation or unique equipment number.

A. Indirect wastes shall discharge full size thru an air gap to a floor, equipment drain, sanitary floor sink or hub drain. The floor or equipment drain grate shall be fitted with a funnel, the sanitary floor sink shall have a partial grate or the grate shall be omitted. Drains shall be located so they are accessible and not a tripping hazard. B. Provide escutcheons at all penetrations of exposed walls and ceilings. Escutcheons shall be chrome plated brass in occupied areas, prime paint finish for unoccupied areas unless otherwise noted. Escutcheons for exterior or moist areas

12.0 PROTECTION OF WORK

A. Protection

shall be brass.

Protect and cover piping and fixture waste and water openings to prevent entry of dirt and debris. Cover and protect fixtures and plumbing equipment to prevent damage.

A. Soil, waste and vent piping testing:

Initial Piping Water Test: Fill with water to the top of the highest point of the system extending through roof. Systems may be tested in whole or part. The system shall remain leak free under test for a minimum period of a. Gravity Drain Test: Either 10' water column or at a pressure not less than 10% above that the piping will be subjected to during nominal operation

Final Piping Test: The completed system(s) shall be visually inspected to determine compliance with all codes and standards. Where required by the building official, the completed system shall be smoke tested with all traps water filled and system pressured to 1" WC for a minimum period of fifteen (15) minutes.

B. Water and gas line testing:

Water piping shall be purged and tested with compressed air or water at 50 PSIG above the operating pressure but not to exceed the pressure rating of piping system materials for a period of 2 hours with no measurable Natural gas lines shall be inspected and blown out with dry compressed air or nitrogen to purge of debris and tested at 1-1/2 times the operating pressure or a minimum of 25 PSIG pressure with no measurable pressure drop. All test procedures including duration of test shall be in accordance with NFPA 54 and the International Fuel

C. After successful testing, sterilize water system with an approved solution in accordance with local health officials. D. Contractor to submit all test data and other documentation for record.

14.0 FIXTURE BRANCH PIPING:

A. Fixture branch and connection sizes shall be as shown in the plumbing fixture schedule on the drawings and not less than Minimum waste or vent size below slab on grade shall be 2".

15.0 PLUMBING FIXTURES:

Drains and Drainage Products

Refer to plumbing fixture schedule for plumbing fixtures and accessories. Include all fittings and accessories as required B. Where required for ADA compliance, provide lavatory and sink offset drain and tailpiece assembly.

16.0 FIXTURE AND ACCESSORY MANUFACTURERS:

A. Fixtures, equipment and accessories are specified by manufacturer's numbers as to the type and quality required.

B. Specified manufacturers and approved equal manufacturers are as follows: APPROVED EQUAL MANUFACTURERS

FIXTURE, ITEM OR EQUIPMENT Waste Fittings

> Woodford, J R Smith, Josam, Zurn, Prier Brass **END OF SECTION**

Dearborn Brass, McGuire, ProFlo, Jones

J R Smith, Sioux Chief, Wade, Watts, Zurn, Josam

Stephens, Watts

A. Fire protection shall be governed by all applicable provisions of the Contract Document. B. Provide a complete and operational fire protection system as required by NFPA, systems shall include:

210 100

Dry or pre-action sprinkler system – NFPA 13. Private Fire Service Mains – NFPA 24. Wet chemical fire suppression system – NFPA 17A.

Systems shall be compliant with NFPA 70, 72, FM and UL as applicable. All fire protection components shall be UL and FM approved devices where applicable as required by NFPA.

Upon completion of the work, system acceptance testing shall be performed by the sprinkler contractor in

accordance with requirements of NFPA. Perform all flushing and testing of the system including pressure and flow tests and testing of all electrical, controls and safety components. Provide permanent identification of all valves, piping, electrical components and equipment in accordance with

F. Contractor shall provide spare sprinklers in cabinet as required by NFPA. Upon completion of the project, the fire protection contractor shall furnish 'Record' documentation including plans, equipment data sheets for all component and testing results as required by NFPA.

WET AND DRY SPRINKLER AND STANDPIPE SYSTEMS

Systems shall be in accordance with NFPA 13 and complete in every respect to provide complete coverage of all areas in the building, or throughout the area of work as indicated. Sprinkler system shall be hydraulically designed Sprinkler system shall be a delegated design, and contractor shall be responsible for layout and design of the fire

sprinkler system. Submit all necessary documentation (plans, calculations, cut sheet literature and flow tests) and obtain necessary permits for approval and installation of the system. Provide PE or NICET stamp, as required by the Authority Having Jurisdiction, on submittal drawings. As required by application, system shall include but not be limited to pipe and hangers, sprinklers, valves, inspector

tests, fire department connection, audible and visible alarms, pressure, flow and tamper switches, gauges, deluge valves, control panels, wiring, hose valves, etc. System shall extend from point of connection 5' from building wall lines. Service entrance piping shall be in accordance with NFPA 24 including installation, testing and flushing. Sprinkler system service entrance.

Underground fire main – Provide new 6" minimum fire protection main outside the building and extended to the fire protection water service in the sprinkler riser room. Backflow preventer – provide new Double Detector Check Valve Assembly. Provide new fire sprinkler riser(s) system control valve with tamper switches and manifolded riser with

isolation valves for each wet and dry sprinkler system. All valves shall be provided with tamper switches. E. Provide new sprinkler piping and sprinklers throughout area of work. Where required to prevent freezing of the system, provide dry sidewall or pendant sprinklers, an approved dry sprinkler system with air compressor and nitrogen generation system, or a UL-listed anti-freeze system with fill

station. Include all necessary components including isolation and control valves, alarm devices and related items

for a complete working system. 3.0 PIPING, FITTING AND VALVES:

A. Fire protection underground -

1. Pipe -- Class 50 molded ductile iron pipe, cement mortar lined, with ductile fittings and mechanical compression joints, 3" and larger. PE pipe and fittings with minimum thickness equivalent to Class 150 and Molded PE Fittings: PE buttfusion type, made to match PE pipe dimensions and class. PVC pipe and fittings - AWWA C900 or UL 1285, Class 150 and Class 200, with bell end with gasket, and

B. Fire protection piping and components above ground -

1) 2-1/2" thru 12"

Pipe –

a. 2" and smaller – Schedule 40, black steel, malleable iron threaded, flanged or welded fittings; roll or cut groove mechanical joints with wrought or forged steel fittings or roll grooved end couplings. b. 1-1/2" and larger – Schedule 10, black steel; roll groove mechanical joints with roll grooved end c. Contractor to match existing building piping material standards.

with spigot end with PVC Fittings with bell-and-spigot or double-bell ends. Include elastomeric gasket in

Sprinkler piping shall be independently supported from all other systems, no other system or component may bear on any sprinkler pipe or support. In accordance with NFPA 25 or where required by local authority, sprinkler piping shall not be subjected to external loads by materials either hung from or resting

Valves – Nibco T-104-0 Bronze, UL and FM approved OS&Y Gate, 175 PSIG. 2) 2-1/2" thru 12" a) Nibco F607-OTS Cast Iron, UL and FM approved OS&Y Gate, 175 PSIG. b. Check –

a) Nibco F-908W, Cast Iron Horizontal Swing, Bolted Bonnet, UL and FM approved, c. Double Check Detector Assembly – 1) 3" thru 10" a) Watts 757DCDA-OSY, stainless steel double check assembly with OS&Y shutoff

valves, detector meter, UL and FM approved. d. Sectional Zone Valves – Nibco T-104-0 Bronze, UL and FM approved OS&Y Gate, 175 PSIG. Provide with

tamper and flow switches. Sprinklers may be supplied by UL 2443 listed 1" minimum 304 stainless steel (braided or unbraided corrugated) 175 PSIG rated flexible hoses with all associated UL listed fittings, threaded ends, brackets and other attachments, 6' maximum length. Victaulic Vic-Flex or acceptable equivalent. Auxiliary Drains shall be provided in accordance with NFPA 13 at all system low points for complete

4.0 SPRINKLERS Provide quick response sprinklers including replacement sprinklers, standard response, extended coverage or dry

system drainage. Provide signage indicating all drain locations.

Replace existing non-compliant sprinklers as required by application. Sprinklers older than 50 years shall be removed and replaced with new, or a representative sample from each area shall be tested per NFPA 25.

Sprinklers shall be of the following styles, subject to application. Recessed chrome plated brass with 2-piece adjustable escutcheon in gypsum and lay-in tile ceilings.

Pendant chrome plated brass with escutcheon in gypsum and lay-in tile ceilings. Concealed brass with painted flat concealer plates in gypsum and lay-in tile ceiling. Upright brass in unfinished areas. Provide wire cage in areas subject to damage. Upright chrome plated brass in finished areas with exposed structure. Where not otherwise indicated, sprinkler type, style, appearance and coverage to match existing.

Any sprinklers removed shall be replaced with new sprinklers. Locate sprinklers at center of 2 x 2 lay-in tiles or 2 x 2 portion of 2 x 4 lay-in tiles. Align sprinklers in a row when in gypsum board ceilings. All location tolerances shall be +/- 1/2".

Refer to reflected ceiling plans for coordination with lights, diffusers, exit signs, etc.

Install sprinklers above combustible ceilings in concealed combustible space per NFPA 13-8.15. Install sprinklers above and below all cloud ceilings in accordance with NFPA 13 8.15.24. Install sprinklers above ceilings where spaces have ceilings that are lower than the rest of the area, the space above the lower ceiling shall be sprinklered unless it complies with the rules of 8.15.1.2 for allowable unsprinklered concealed spaces. The sprinkler system shall extend beyond the lower ceiling as required by NFPA 13 and be designed in accordance with 8.15.23.3.

END OF SECTION

15.0 FIRE ALARM SYSTEM:

260 100

ELECTRICAL

a. Electrical service and distribution system revisions.

Systems of conduit, conductors, and boxes

Power service to the various motors.

Complete lighting and power systems.

. All systems, wiring and conduit as required.

Rough-in and final connection to equipment furnished by others.

A. The work included under this contract consists of the furnishing of all labor, materials, tools, transportation,

services, etc., necessary to complete the installation of the electrical systems and other items herein listed, all

as directed by the Architect or Engineer, which work is comprised of, but not limited to the following principal

2. Control wiring and electrical installation and connections for items in other contracts as may be listed in the

5. All cable ties for low voltage cable systems located in plenums utilized for air movement that are not

Raceway wiring systems shall be concealed in all finished parts of the building, where possible. Where the

raceways are exposed, they shall be run parallel with the building walls in a neat and workmanlike manner.

Should it appear necessary to expose any conduit or wiring in finished spaces, it shall be brought to the

Architect's attention immediately and this Contractor shall rearrange associated work as directed to facilitate an

Contractor is responsible to provide liaison with electrical and communication companies. The Contractor shall

provide and install all required equipment and connect as required to complete an operating service to the

All electrical conductors are to be installed in metal raceways, unless specifically specified or noted otherwise.

Galvanized steel or intermediate steel conduit as permitted by code. No conduit smaller than 3/4" to be used.

Use set screw Provide flexible conduit connection for final connection to each motor not to exceed 3' in length

and recessed lighting fixtures not to exceed 6' in length. Provide pull wires in all empty conduit systems. Identify

terminus of each pull wire. All exposed raceways shall be installed with runs parallel and/or perpendicular with

building walls. Fasten all rigid/non-flexible conduit every 8' and 2' from each box. Conduit shall be EMT where

not subject to mechanical damage as permitted by National Electric Code (N.E.C.). EMT connectors and

couplings 4" and smaller shall be compression type. Type MC Cable with ground wire is allowed in concealed

spaces only, behind walls and above ceiling. Fasten all MC and or FMC every 4.5' feet and within 12" inches of

Conduit bushings shall be provided and installed inside all disconnects, pull boxes, panelboards, switchboard

Schedule 40 PVC conduit may be used for underground installation and where permitted by National Electric

Electrical conductors, soft annealed copper with conductivity 98% of that of pure, stranded copper, 90 degree -

600V insulation and equal to General Cable Company. Wire and cable for all feeders, subfeeders, motor circuits

and high ambient location type shall be THHN. All other branch circuit wiring shall be type XHHN or THHN.

• Contractor shall use the following color designations and be consistent throughout the project. Color

For conductors larger than #4, Field-Applied, Color-Coding Conductor Tape can be applied in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply

last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings. When using black insulated conductors, contractor shall color-code conductor inside all pullbox

b. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and

c. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN, single conductors in

d. Feeders Concealed below Slabs-on-Grade, and Underground: Type THWN-2, single conductors in

g. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN, single conductors in raceway.

h. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THWN-2, single

Ground all electrical apparatus in accordance with N.E.C. and as specified herein. Provide a separate grounding conductor for all lighting, receptacle and equipment circuits. All cabinets, switchboards, equipment

cases, motor frames, interior metal cold water piping systems, and system neutral conductors shall be effectively

grounded. Use solderless pressure type connectors, no perforated strap connectors will be allowed. Ensure

Flush or surface mounted as indicated on drawings. Provide where shown on drawings and where required by

General Electric, Appleton, Steel City or Raco hot dipped galvanized steel boxes, or equal. Install at terminal

of each conduit run, each outlet, or device. Provide size, type and design to suit structural conditions. Adequate

to accommodate size and number of raceways, conductors, device or fixture served. Provide plaster rings or

covers on boxes where required on exposed work, use approved cast ferrous alloy outlet, junction boxes and

fittings. Fixture or device cover shall completely conceal the size outlet box used. Install 3/8" fixture stud for

lighting fixtures where required. Locate ceiling outlets to work with architectural features as directed. Switches

installed 48" above floor on strike side of door as finally hung. Receptacles and telephone outlets, 18" above

Panel boards are as indicated on the drawings. Main lugs only unless noted or specified otherwise. Provide

typewritten schedule of circuits in index cardholder. Provide with hinged door and hinged cover. All circuit

breakers shall be bolt-on molded case and have positive "trip" indication. Breakers used on existing panels shall match existing units and shall be labeled to have positive "trip" indication. Breakers shall be labeled to

indicate suite number and use. Panelboards shall be ABB(General Electric), Square D, Siemens or Eaton/Cutler Hammer. All single pole circuit breakers shall be 'switch duty rated'. Panelboards shall be fully

Heavy duty NEMA type 'HD' - same manufacturer as panelboards. Plastic nameplate properly engraved with name of equipment served, secured to switch cover. Fuses shall be Bussmann of sizes and types scheduled.

This Contractor to provide all necessary conduit, boxes and supports to equipment furnished by Owner and as

Outlets, adhesive film label, machine printed clear background with black letters, by thermal transfer or

equivalent process. Minimum letter height shall be 1/4 inch. Face plate shall be labeled with panel and circuit

Interior equipment self-adhesive, engraved, laminated acrylic or melamine label: adhesive backed, with white

Exterior equipment: Stenciled or engraved, laminated acrylic or melamine label: punched or drilled for screw

A. Contractor shall label each and every j-box above ceiling with a permanent marker with panel and circuit

finished floor unless otherwise noted. Verify all outlet locations on job with Architect.

indicated on drawings. Provide a disconnect switch and starter if required.

letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

Comply with NEMA ST 20, and list and label as complying with UL 1561.

2. Finish: Comply with NEMA 250 for indoor corrosion protection.

F. Manufacturers: Square-D, Siemens, ABB/GE or Eaton/Cutler Hammer.

steel cover plates to mate and match device for each outlet.

mounting. White letters on a black background. Minimum letter height shall be 1 inch (25 mm).

1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.

Taps for transformers 25 KVA and larger: Two 2.5 percent taps above and two 2.5 percent taps below normal

Duplex receptacles shall be Hubbell #5352-X grounding type, 20A., 125V.; G.F.C.I. shall be Hubbell GF-5352 X, 20A., 125V.; duplex, G.F.C.I. TYPE. Isolated ground receptacles shall be orange in color, Hubbell IG-5352, 20A, 125V, duplex. Isolated ground receptacles shall be equipped with a Hubbell IGP-8 plate, orange in color inscribed "Isolated Ground". Wall toggle switches shall be Hubbell Number 1221-X and Number 1223-X for single pole and three way types respectively. Other switch, receptacle, and outlet device variations shall be by Hubbell of "Spec. Grade" quality. Equivalent devices of P & S or Leviton will be acceptable in lieu of the above listed devices. Contractor to verify color of devices with Architect before purchase. Provide brushed stainless

This Contractor shall furnish and install complete, unless otherwise specified, a lighting fixture on each and every lighting outlet shown on the drawings of each type scheduled by letter and description. All fixtures shall be equipped with lamps as scheduled or specified herein. All fixtures installed in suspended ceilings must be

securely fastened to framing members per NEC 410-36b and local seismic code requirements.

continuous bond where flexible conduit is used. Provide bonding jumper inside all flexible conduit. Grounding

f. Exposed Branch Circuits, Including in Crawlspaces: Type THHN, single conductors in raceway.

larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

c. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

designation for switch legs and or travelers: Violet, Pink or Purple may be used.

a. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

d. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

Conductor insulation and multi-conductor cable application and wiring methods:

e. Feeders Concealed in Concrete: Type THHN, single conductors in raceway.

a. Service Entrance: Type THWN-2, single conductors in raceway.

b. Exposed Feeders: Type THHN, single conductors in raceway.

conduit termination, excluding final connections to motors and lighting fixtures.

or similar type equipment and where permitted by National Electric Code (N.E.C.).

Minimum wire size shall be #12 gauge AWG. Control wiring may be #14 gauge.

B. For conductors #4 or small use the following color-code:

or similar type enclosures.

conductors in raceway.

6.0 CABINETS, JUNCTION AND PULL BOXES:

per N.E.C. 250, and any local requirements.

rated. Series rated panels are not permitted.

10.0 MOTOR AND CONTROL WIRING AND CONNECTIONS:

Make splices at junction boxes, pull boxes, or outlet boxes only.

code. Construct of cold gauge steel for flush surface mounting.

4.0 GROUNDING:

5.0 SPLICE AND TAPS:

7.0 OUTLET BOXES:

8.0 PANELBOARDS:

9.0 DISCONNECT SWITCHES:

12.0 TRANSFORMERS:

13.0 WIRING DEVICES:

14.0 LIGHTING FIXTURES:

B. Cores: One leg per phase.

C. Coil Material: Aluminum.

D. Enclosure: Ventilated, NEMA 250, type,

Finish Color: Gray.

208Y/120V, 1-phase: black, red, white.

208Y/120V, 3-phase: black, red, blue, white.

Green shall be used for ground wire conductor.

480Y/277V, 3-phase: brown, orange, yellow, gray.

approved installation. Contractor to coordinate with mechanical trades to avoid ductwork and piping.

installed in conduit shall be 25/50 flame and smoke rated, Hellermann Tyton T50R2C2UL or equivalent.

3. Empty conduit and boxes for future installation of telephone wiring and miscellaneous systems.

1.0 SCOPE:

2.0 RACEWAYS:

3.0 WIRES AND CABLES:

Electrical system for light and power:

Switches and panel boards.

d. Receptacles and wiring devices.

e. Lighting fixtures and lamps.

Fire alarm system shall be a delegated design, contractor shall be responsible for layout and design of the fire alarm system. Submit all necessary documentation including stamped and signed drawings to the authority having jurisdiction and obtain necessary permits for approval and installation of the system prior to submitting

> Engineer's drawings showing fire alarm devices are schematic, and only provide code intent, coordination, and all devices may not be indicated. Final layout shall be provided by the Fire Alarm contractor. Fire alarm contractor shall become the Designer of Record as such, the contractor shall be responsible to verify device layouts comply with all applicable codes and shall include in bid all cost associated with additional devices should they be required. Final layout shall be coordinated with the architect and plans.

Contractor shall include in bid all cost associated with Fire alarm modifications.

Contractor shall provide a complete fire alarm system with intelligent addressable devices. Systems shall be non-coded fire alarm protective type system. Fire alarm audible and visual devices shall be placed throughout the facility. Manual pull stations shall be located at each exterior exit and stairwell per code requirements. Heat/smoke detectors for mechanical equipment shall be interlocked and connected to alarm system in accordance with NFPA 90A and 96. Water flow devices, tamper devices and elevator capture shall be per NFPA and local code requirements.

All detection devices shall be addressable, non-coded fire alarm protective type matching base building type and style. Overall system shall utilize the following:

1. Fire alarm speakers and strobes shall be located throughout the facility per code requirements. 2. Manual pull stations shall be located at each exterior exit and stairwell and be per code requirements. 3. System signal wire shall be type THHN in conduit or shall be UL listed plenum cable.

F. All new equipment shall be ADA compliant, be by one manufacturer, and warranted for a minimum of one year. END OF SECTION

SECTION 260573 OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit

B. The AIC ratings indicated on the Drawings are preliminary and will be finalized based on the results of the fault current study. Equipment AIC ratings for furnished equipment shall be as required by the results of the fault current study at no additional cost.

Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

D. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

The study shall be performed by a professional engineer employed by the manufacturer of the switchboards and

panelboards furnished for the project. The report shall be submitted with the manufacturers name, logo and

standard letterhead. A study performed by a third-party engineer that is not employed by the manufacturer will not be accepted. F. Overcurrent protective device coordination study must be completed and accepted prior to ordering associated

equipment so that device ratings can be coordinated and modified as required. Product data submittals for switchboards, panelboards and overcurrent protection devices received prior to receiving the overcurrent protective device study will be rejected and returned. Product data submittals for switchboards, panelboards and overcurrent protection devices will not be returned until the coordination study has been reviewed and accepted by the Engineer.

1.1 SCOPE

A. The study shall originate at the utility service entrance and include the distribution system that serves the equipment included in the project scope. The study shall include the equipment indicated in the Riser / One Line Diagrams included in the Construction Documents.

1.2 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled. Existing to remain items shall remain functional throughout the construction period.

B. Field Adjusting Agency: An independent electrical testing agency with full-time employees and the capability to adjust devices and conduct testing indicated and that is a member company of NETA.

C. OCPD: Overcurrent Protective Device

D. One-Line Diagram: A diagram that shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein. Sometimes also referred as "Single Line Diagram" or "Electrical Riser Diagram".

Power System Analysis Software Developer: An entity that commercially develops, maintains, and distributes computer software used for power system studies.

F. Power Systems Analysis Specialist: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located.

G. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion of the circuit from the system.

H. SCCR: Short-circuit current rating. I. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system

B. Qualification Data: For coordination-study specialist; For Field Adjusting Agency

of the premises served.

1.3 SUBMITTALS

A. Product Data: For computer software program to be used for studies;

Study Report Submittal: Study input data, including completed computer program input data sheets; Short-circuit analysis study and equipment evaluation report; Coordination-study analysis along with recommended OCPD settings report; Arc flash hazard analysis study; Study output data, tables, and related information; Study recommendations; Include the short-circuit study, overcurrent protective device coordination study, and arc flash study into a complete combined report.

1.4 CLOSEOUT SUBMITTALS

maintenance manuals; Final report after any noted corrections; Provide maintenance procedures in equipment manuals according to requirements in NFPA 70E.

A. Operation and Maintenance Data: For overcurrent protective devices to include in emergency, operation, and

1.5 QUALITY ASSURANCE

A. Study shall be performed using commercially developed and distributed software designed specifically for power

B. Software algorithms shall comply with requirements of standards and guides specified in this Section.

C. Manual calculations are unacceptable.

D. Coordination Study Specialist Qualifications: An organization experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices. Professional engineer, licensed in the state where Project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of this professional engineer. The professional engineer shall be employed by the manufacturer of the switchboards and panelboards furnished for the project. The report shall be submitted with the manufacturers name, logo and standard letterhead. A study performed by a third-party engineer that is not employed by the manufacturer will not be accepted.

E. Comply with IEEE 399 for general study procedures.

F. Comply with IEEE 242 for short-circuit currents and coordination time intervals. G. Comply with IEEE 1584 and NFPA 70E for arc-flash hazard calculations.

PART 2 - PRODUCTS

2.1 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary of study findings.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for

C. One-line diagram of modeled power system.

D. Comments and recommendations for system improvements or revisions in a written document, separate from

Evaluate equipment and protective devices and compare to available short-circuit currents. Verify that equipment

withstand ratings exceed available short-circuit current at equipment installation locations.

F. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties. Short-Circuit Study Input Data: One-line diagram of system being studied; Power sources available;

Manufacturer, model, and interrupting rating of protective devices; Conductors; Transformer data. H. Short-Circuit Study Output Reports: Low-Voltage Fault Report; Momentary Duty Report; Interrupting Duty

2.2 COORDINATION STUDY REPORT CONTENTS

A. Executive summary of study findings. B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for

C. One-line diagram of modeled power system. D. Protective Device Coordination Study: Report recommended settings of protective devices, ready to be applied

in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective

E. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation.

2.3 ARC-FLASH STUDY REPORT CONTENT

A. Executive summary of study findings.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of results.

C. One-line diagram, showing the following: OCPD, conductors, transformers, motor and generators, switchgear, switchboard, motor-control center, panelboard designations, and ratings.

E. Incident Energy and Flash Protection Boundary Calculations:

F. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of computer printout.

2.4 ARC-FLASH WARNING LABELS

Label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis: Location designation; Nominal voltage; Protection boundaries; Arc flash PPE category; Required minimum arc rating of PPE in Cal/cm squared; Available incident energy; Working distance; Engineering report number, revision number, and issue date.

B. Labels shall be machine printed, with no field-applied markings.

D. Arc-Flash Study Output Reports: Interrupting Duty Report

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PART 3 - EXECUTION

- 3.1 POWER SYSTEM DATA
- A. Obtain all data necessary for conduct of the study.
- B. Gather and tabulate the required input data to support the study. Record data on a Record Document copy of one-line diagram. Comply with recommendations in IEEE 551 as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification.
- 3.2 SHORT-CIRCUIT STUDY
- Perform study following the general study procedures contained in IEEE 399.
- B. Calculate short-circuit currents according to IEEE 551.
- C. Base study on device characteristics supplied by device manufacturer.
- D. Extent of electrical power system to be studied is indicated on Drawings.
- E. Begin short-circuit current analysis at the service, extending down to system overcurrent protective devices to where fault current is 10 kA or less.
- F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.
- G. Include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and apply to low- and medium-voltage, three-phase ac systems. Also account for the fault-current dc decrement to address asymmetrical requirements of interrupting equipment.
- H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and a single line-to-ground fault at each equipment indicated on one-line diagram.
 I. Include in the report identification of any protective device applied outside its capacity.
- 3.3 COORDINATION STUDY
- A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.
- B. Comply with IEEE 399 for general study procedures.
- C. Base study on device characteristics supplied by device manufacturer.
- D. Extent of electrical power system to be studied is indicated on Drawings.
- E. Begin analysis at the service, extending down to system overcurrent protective devices where fault current is 10
- F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.
- G. Transformer Primary Overcurrent Protective Devices:
- H. Motor Protection: Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
- I. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.
- J. Generator Protection: Select protection according to manufacturer's written instructions and to IEEE 242.
 K. Include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and apply to low- and medium-voltage, three-phase ac systems. Also account for fault-current dc decrement, to
- address asymmetrical requirements of interrupting equipment.

 L. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and a single line-to-
- ground fault at each equipment indicated on one-line diagram.

 M. Protective Device Evaluation: Evaluate equipment and protective devices and compare to short-circuit ratings;

 Adequacy of equipment bus bars to withstand short-circuit stresses: Any application of series-rated devices shall
- M. Protective Device Evaluation: Evaluate equipment and protective devices and compare to short-circuit ratings; Adequacy of equipment bus bars to withstand short-circuit stresses; Any application of series-rated devices shall be recertified, complying with requirements in NFPA 70; Include in the report identification of any protective device applied outside its capacity.
- 3.4 ARC-FLASH HAZARD ANALYSIS
- A. Comply with NFPA 70E and its Annex D for hazard analysis study.
- B. Preparatory Studies: Perform the Short-Circuit and Protective Device Coordination studies prior to starting the Arc-Flash Hazard Analysis.
- C. Calculate maximum and minimum contributions of fault-current size.
- D. Calculate the arc-flash protection boundary and incident energy at locations in electrical distribution system where personnel could perform work on energized parts.
- E. Calculate the limited, restricted, and prohibited approach boundaries for each location.
- F. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time.
- G. Arc-flash energy shall generally be reported for the maximum of line or load side of a circuit breaker.
- H. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.
- 3.5 FIELD ADJUSTING
- Adjust relay and protective device settings according to recommended settings provided by the coordination study.
- B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.
- C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.
- 3.6 ARC FLASH LABELING
- A. Apply arc-flash label on the front cover and on side or rear covers with accessible live parts and hinged doors or removable plates for each equipment included in the study. Base arc-flash label data on highest values
- B. Each piece of equipment listed below shall have an arc-flash label applied to it: Motor-control center; Low-voltage switchboard; Switchgear; Low voltage transformers; Panelboards; Safety switches; Control panel; Automatic Transfer Switch; Generator.
- C. Note on record Drawings the location of equipment where the personnel could be exposed to arc-flash hazard during their work. Indicate arc-flash energy. Indicate protection level required.
- 3.7 APPLICATION OF WARNING LABELS
- A. Install arc-flash warning labels under the direct supervision and control of Power System Analysis Specialist.
- 3.8 DEMONSTRATION
- A. Engage Power Systems Analysis Specialist to train Owner's maintenance personnel.
- B. Acquaint personnel in fundamentals of operating the power system in normal and emergency modes.
- C. Hand-out and explain the coordination study objectives, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting time-current coordination curves.
- D. For Owner's maintenance staff certified as NETA ETT-Certified Technicians Level III or NICET Electrical Power Testing Level III Technicians, teach how to adjust, operate, and maintain overcurrent protective device settings.
 E. Inform of the potential arc-flash hazards associated with working on energized equipment and the significance of
- arc-flash warning labels.

 END OF SECTION

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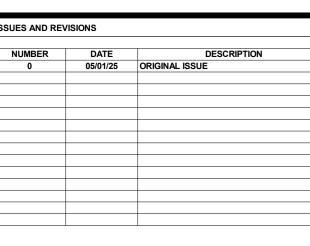
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SPECIFICATIONS

BRR ORIGINAL PRINTED ON RECYCLED PAPER

MEP102

ROC	FTOP U	NIT S	CHE	DUI	LE																										
				MIN	EXT.		FAN						COOLING						HEATING-GA	S							ELE	CTRICAL			
MARK NO.	MANUFACTURER	MODEL	AIRFLOW CFM	O.A.	S.P.	FAN HP	DRIVE	RPM	AMB.	EDB	EWB	LDB	LWB	TOTAL	SENS.	STAGES	EER OR	INPUT	OUTPUT	STAGES	NOTES	VOLT	DUASE	U 7	FLA	MCA	МОСР	DISCONNECT	CIRCUIT TO	BRANCH CIRCUIT	NOTES
				CFM	(IN W.G.)		TYPE		(°F)	(°F)	(°F)	(°F)	(°F)	MBH	MBH	STAGES	SEER	MBH	MBH	STAGES		VOLI	PHASE	HZ	FLA	IVICA	IVIOCE	DISCONNECT	PANEL	TAG / SIZE	NOTES
RTU-1	LENNOX	LGM180U5M	6000	1800	0.8	5	BELT	868	95	80	67	58.2	56.9	181.8	132.7	3	12 EER	360	292	2	1-8	480	3	60	35.8	37	40	INTEGRAL	HDP	3/4" C. (4) #8, (1) #10 G.	
RTU-2	LENNOX	LGM156U5M	5000	1500	0.8	3	BELT	786	95	80	67	57	56.3	159.9	116.8	3	12 EER	260	211	2	1-8	480	3	60	30.7	31	35	INTEGRAL	HDP	3/4" C. (4) #8, (1) #10 G.	
RTU-3	LENNOX	LGM156U5M	5000	1500	0.8	3	BELT	786	95	80	67	57	56.3	159.9	116.8	3	12 EER	260	211	2	1-8	480	3	60	30.7	31	35	INTEGRAL	HDP	3/4" C. (4) #8, (1) #10 G.	
RTU-4	LENNOX	LGM240U5M	8000	2400	0.8	7.5	BELT	1015	95	80	67	57.9	56.6	249	179.3	4	12 EER	360	292	2	1-8	480	3	60	47.9	50	60	INTEGRAL	HDP	3/4" C. (4) #4, (1) #10 G.	
																								<u> </u>		<u> </u>					

NOTES: 1. PROVIDE WITH WALL MOUNTED 24/7 PROGRAMMABLE THERMOSTAT WITH HUMIDITY CONTROL AND REMOTE TEMPERATURE/HUMIDITY SENSOR, COTTONWOOD FILTERS SUCH AS AIR SOLUTION COMPANY MEDIUM DUTY COMMERCIAL GRADE FILTERS, HINGED ACCESS PANELS, DISCONNECT SWITCH, CONDENSATE DRAIN TRAP, AND DRAIN PAN OVERFLOW SWITCH TO SHUT DOWN UNIT IF DRAIN BECOMES CLOGGED.

2. PROVIDE WITH HOT GAS REHEAT.

3. PROVIDE WITH ECONOMIZER WITH DIFFERENTIAL ENTHALPY CONTROL. INCLUDE WITH BAROMETRIC RELIEF DAMPER UNLESS NOT REQUIRED FOR UNITS EQUIPPED WITH POWERED EXHAUST.

4. PROVIDE WITH POWERED EXHAUST.

5. PROVIDE WITH MULTI-SPEED SUPPLY FAN TO VARY FAN SPEED WITH COMPRESSOR STAGING ON UNITS WITH 2 STAGES OF COOLING. ADJUST OUTSIDE AIR DAMPER MINIMUM POSITION FOR HIGH AND LOW FAN SPEEDS.

6. PROVIDE WITH UNIT MOUNTED GFCI OUTLET WITH WEATHERPROOF COVER. OUTLET TO BE FIELD POWERED/WIRED FROM BUILDING POWER 7. PROVIDE WITH ROOF CURB OF HEIGHT REQUIRED TO HAVE THE TOP OF THE CURB A MINIMUM OF 8" ABOVE THE TOP OF THE ROOF SURFACE, OR MINIMUM CURB HEIGHT OF 18", WHICHEVER IS GREATER.

8. UNIT TO BE CONFIGURED FOR DOWNFLOW DISCHARGE.

MAK	E-UP AIF	R SUPPL	Y PA	CKA	AGE	SCH	HEDU	JLE																				
			AIDEL OW	EXT.						COO	LING					HEATING-GA	NS							ELE	CTRICAL			
MARK NO.	MANUFACTURER	MODEL	AIRFLOW CFM	S.P.	FAN HP	RPM	AMB.	EDB	EWB	LDB	LWB	TOTAL	SENS.	STAGES	INPUT	OUTPUT	STAGES	NOTES	VOLT	DUACE	HZ	FLA	MCA	МОСР	DISCONNECT	CIRCUIT TO	BRANCH CIRCUIT	NOTES
				(IN W.G.)			(°F)	(°F)	(°F)	(°F)	(°F)	MBH	MBH	STAGES	MBH	MBH	STAGES		VOLI	PHASE	П	FLA	IVICA	IVIOCE	DISCONNECT	PANEL	TAG / SIZE	NOTES
MAU-1	ACCUREX	XDGX-P116-H12-MF-10	4400	0.5	3	2008	100	99.1	80	72.9	72.9	127.7	113.3	1	335.2	308.4	VARIABLE	1,2	480	3	60	20.2	25.2	40	INTEGRAL	HDP	3/4" C. (4) #8, (1) #10 G.	-
MAU-2	ACCUREX	XDGX-P116-H12-MF-10	4400	0.5	3	2008	100	99.1	80	72.9	72.9	127.7	113.3	1	335.2	308.4	VARIABLE	1,2	480	3	60	20.2	25.2	40	INTEGRAL	HDP	3/4" C. (4) #8, (1) #10 G.	-
																											1	
NOTES:	1. PROVIDE WITH DISC	CONNECT SWITCH.	•				•		•		•			•	•	•	•		NOTES:	A.				•				

2. PROVIDE WITH ROOF CURB OF HEIGHT REQUIRED TO HAVE THE TOP OF THE CURB A MINIMUM OF 8" ABOVE THE TOP OF THE ROOF SURFACE, OR MINIMUM CURB HEIGHT OF 18", WHICHEVER IS GREATER.

RADIANT HEATER SCHEDULE

			HEATING (NATURAL GAS)	CLEARAN	CE TO COME	BUSTIBLES							ELEC	TRICAL			
MARK	MANUFACTURER	MODEL	INPUT (MBH)	ENDS (IN.)	ABOVE (IN.)	BELOW (IN.)	NOTES	VOLT	PHASE	HZ	FLA	MCA	МОСР	DISCONNECT	CIRCUIT TO PANEL	BRANCH CIRCUIT TAG / SIZE	NOTE
GEH-1	SUNSTAR	SGL50-N7	50	14	17	48	1,2,3	120	1	60	0.4	1	15	20A/1P TOGGLE	P1	2 #12, #12G, 3/4"C	-
GEH-2	SUNSTAR	SGL50-N7	50	14	17	48	1,2,3	120	1	60	0.4	1	15	20A/1P TOGGLE	P1	2 #12, #12G, 3/4"C	-
GEH-3	SUNSTAR	SGL50-N7	50	14	17	48	1,2,3	120	1	60	0.4	1	15	20A/1P TOGGLE	P1	2 #12, #12G, 3/4"C	-
GEH-4	SUNSTAR	SGL50-N7	50	14	17	48	1,2,3	120	1	60	0.4	1	15	20A/1P TOGGLE	P1	2 #12, #12G, 3/4"C	-
GEH-5	SUNSTAR	SGL50-N7	50	14	17	48	1,2,3	120	1	60	0.4	1	15	20A/1P TOGGLE	P1	2 #12, #12G, 3/4"C	-
																	1

NOTES: 1. PROVIDE WITH MANUFACTURER'S MASTER CONTROLLER WITH 60 MINUTE TIMER AND ILLUMINATED NOTES: A.

3 POSITION FLUSH-MOUNT SWITCH. 2. PROVIDE WITH HEAT SHIELD FOR REDUCED CLEARANCE REQUIREMENTS.

3. PROVIDE WALL / CEILING TELESCOPIC ADJUSTABLE MOUNTING BRACKET KIT.

ı	INIIT	HEAT			II C
l	JINII	ПГА	Ω \Box	ロフィノ	JIГ

*HEATING KW IS NET CAPACITY AT VOLTAGE AND PHASE INDICATED.

					HEATING	(ELEC.)							ELE	CTRICAL			
MARK NO.	MANUFACTURER	MODEL	TYPE	AIRFLOW (CFM)	OUTPUT (MBH)	INPUT (KW*)	NOTES	VOLT	PHASE	HZ	FLA	MCA	МОСР	DISCONNECT	CIRCUIT TO PANEL	BRANCH CIRCUIT TAG / SIZE	NOTES
UH-1	BERKO	HUHAA527	HORIZONTAL	350	17	5	1,2,3	277	1	60	18.0	22.6	25	INTEGRAL	L	3/4" C. (4) #10, (1) #10 G.	-
UH-2	BERKO	HUHAA527	HORIZONTAL	350	17	5	1,2,3	277	1	60	18.0	22.6	25	INTEGRAL	L	3/4" C. (4) #10, (1) #10 G.	-
UH-3	BERKO	HUHAA527	HORIZONTAL	350	17	5	1,2,3	277	1	60	18.0	22.6	25	INTEGRAL	L	3/4" C. (4) #10, (1) #10 G.	-
NOTES:	 PROVIDE WITH DISC PROVIDE WITH INTE PROVIDE WITH WAL 	EGRAL THERI	MOSTAT.					NOTES:	A.								



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 DATE
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 0
 05/01/25
 ORIGINAL ISSUE

 1
 06/20/25
 ADDENDUM 1

FLOOR PLAN NOTES

- P01 PROVIDE NEW 2" RPZ BACKFLOW PREVENTER, WATTS LF009 OR EQUAL. ROUTE WASTE FROM AIR-GAP FITTING TO FLOOR DRAIN AND INDIRECT WASTE. P02 PROVIDE NEW 1" DOUBLE CHECK BFP, WATTS LF007 OR EQUAL. VALVE AND CAP FOR
- FUTURE CONNECTION TO IRRIGATION SYSTEM. P03 VALVE AND CAP 2" COLD WATER FOR FUTURE CONNECTION.
- P06 NEW GAS METER BY UTILITY. PROVIDE ALL FITTINGS AND ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION/CONNECTION PER UTILITY STANDARDS. COORDINATE FINAL GAS LOAD WITH UTILITY PRIOR TO CONSTRUCTION. P07 ROUTE GAS PIPING DOWN BELOW GRADE.
- P08 PROVIDE INLINE PRESSURE REGULATOR INLET: 2PSI, OUTLET: 8"WC.
- P09 CONNECT TO FIREPLACE WITH GAS COCK, DIRT LEG, AND UNION AND/OR APPLIANCE CONNECTOR IN ACCESSIBLE LOCATION. PROVIDE ELECTRONIC SOLENOID VALVE INTERLOCKED WITH EMERGENCY STOP BUTTON. RE: ELECTRICAL SHEETS FOR LOCATION. P10 ROUTE GAS PIPING OVER BELOW GRADE AND CONNECT TO FIRE TABLE WITH GAS COCK,

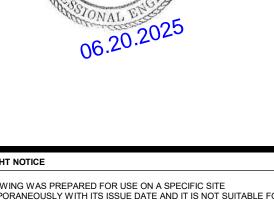


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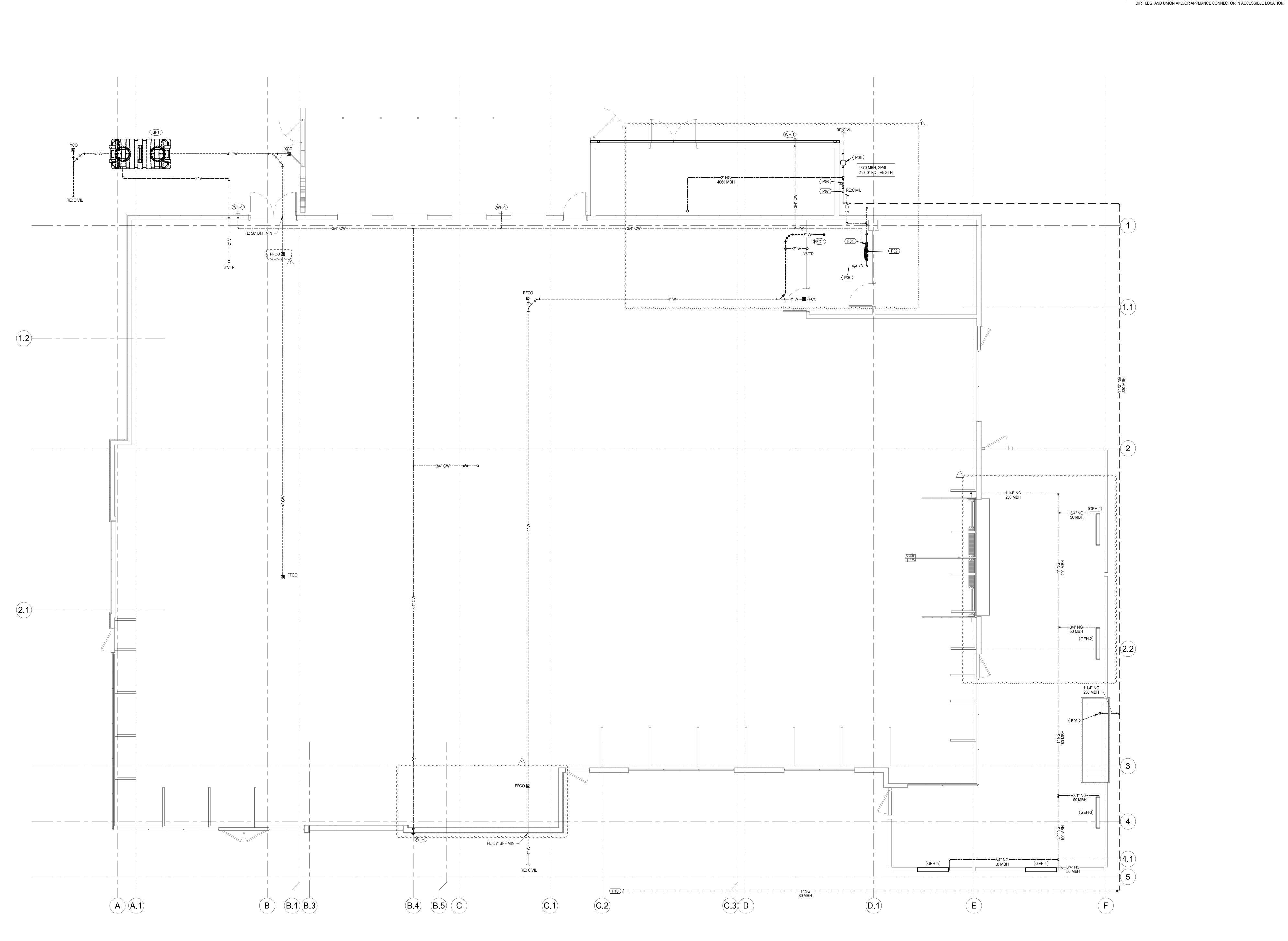


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FLOOR PLAN -PLUMBING

P100



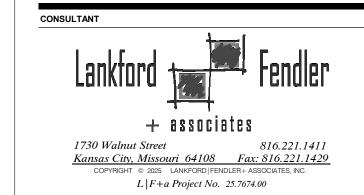
FLOOR PLAN - PLUMBING
SCALE: 1/4" = 1'-0"



P04 CONNECT TO MECHANICAL EQUIPMENT WITH GAS COCK, DIRT LEG, AND UNION. PROVIDE PRESSURE REGULATOR (INLET: 2PSI, OUTLET: 14" WC) WITHIN 10'-0" OF UNIT CONNECTION.

P05 VALVE AND CAP NATURAL GAS PIPING ON ROOF FOR FUTURE CONNECTION TO EQUIPMENT.





PROJECT TITLE

Q39 (SHELL)
EE'S SUMMIT, MO

JECT NUMBER
62910099
JECT MANAGER DRAWN BY CHECKED BY
Approver Author
FESSIONAL SEAL



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ISSUES AND REVISIONS

NUMBER DATE DESCRIPTION
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1 06/20/25 ADDENDUM 1

ROOF PLAN -PLUMBING

P2



			CHEDU		MINI	MUM CON	NECTION S	SIZE
MARK NO.	FIXTURE TYPE	MANUFACTURER	MODEL NO.	DESCRIPTION	CW	HW	WASTE	VENT
EFD-1	EQUIPMENT FLOOR DRAIN	J.R. SMITH	2210Y	MEDIUM CAPACITY, MEDIUM DUTY DUCO CAST IRON BODY, SEDIMENT BUCKET AND GRATE, NO HUB OUTLET. PROVIDE WITH 6" X 4" OVAL FUNNEL WHERE DRAIN RECEIVES INDIRECT WASTE [AND TRAP PRIMER CONNECTION].	-	-	3"	2"
WH-1	WALL HYDRANT	WOODFORD	67	EXPOSED, FREEZELESS WALL HYDRANT, CHROME PLATED BRASS, 3/4" INLET AND HOSE CONNECTION, INTEGRAL ASSE DOUBLE CHECK BACKFLOW PREVENTER, LOOSE KEY, STEM LENGTH AS REQUIRED.	3/4"	-	-	-
						-	1	
RH-1	ROOF HYDRANT	WOODFORD	SRH-MS	DRAINABLE, FREEZELESS BRASS ROOF HYDRANT, 3/4" INLET AND 3/4" HOSE CONNECTION, ASSE DOUBLE CHECK BACKFLOW PREVENTER, DIVERTER, AUTOMATIC DRAINING, PAIL HOOK, LEVER ACTUATOR WITH GALVANIZED STEEL ROD AND ONE PIECE PLUNGER, CAST IRON MOUNTING SUPPORT AND UNDER DECK FLANGE WITH WEATHER PROOF BOOT ASSEMBLY.	3/4"	-	-	-

GRI	EAS	SE INTERO	CEP	TOR SCHE	DULE							
MARK NO.		MANUFACTURER	MODEL NO.	MATERIAL	INSTALLATION	LIQUID CAPACITY (GAL)	GREASE CAPACITY (LBS)	FLOW RATE (GPM)	INLET/ OUTLET SIZE	COVER TYPE	MAX OPERATING TEMP (°F)	NOTES
GI-1		SCHIER	GB-500	ENGINEERED POLYETHYLENE	BELOW GRADE	510	3,048	100	4"	GAS/WATER TIGHT	140	1,2,3
NOTES:	1. 2. 3.	PROVIDE HIGH-WATER	ANCHOR KIT	RS AS REQUIRED TO MEET GRA WHERE INTERCEPTOR IS INSTA	LLED IN AREA SUSC		IGH WATER 1	ABLE.				

NATURAL GAS SCHEDULE

RTU-1

RTU-2

RTU-3

RTU-4

MAU-1

MAU-2

GEH-2

GEH-3

GEH-4

GEH-5

AND A SERVICE PRESSURE OF 2 PSI.

MECHANICAL EQUIPMENT

ROOF TOP UNIT

ROOF TOP UNIT

ROOF TOP UNIT

ROOF TOP UNIT

MAKEUP AIR UNIT

MAKEUP AIR UNIT

RADIANT HEATER

RADIANT HEATER

RADIANT HEATER

RADIANT HEATER

RADIANT HEATER

(FUTURE) WATER HEATER

(FUTURE) WATER HEATER

FUTURE

FIRE TABLE

FIREPLACE

TOTAL GAS LOAD

SET PRESSURE REGULATORS TO 8" W.C. OR AS REQUIRED BY EQMT MANUFACTURER.

INTERIOR GAS PIPING SIZED PER TABLE 402.4(5) WITH A TOTAL DEVELOPED LENGTH OF 150'-0"

MECHANICAL EQUIPMENT TOTAL:

PLUMBING EQUIPMENT

PLUMBING EQUIPMENT TOTAL:

KITCHEN EQUIPMENT

KITCHEN EQUIPMENT TOTAL:

MISC EQUIPMENT

MISC EQUIPMENT TOTAL:

CONNECTED LOAD

360

260

260

360

336

336

50

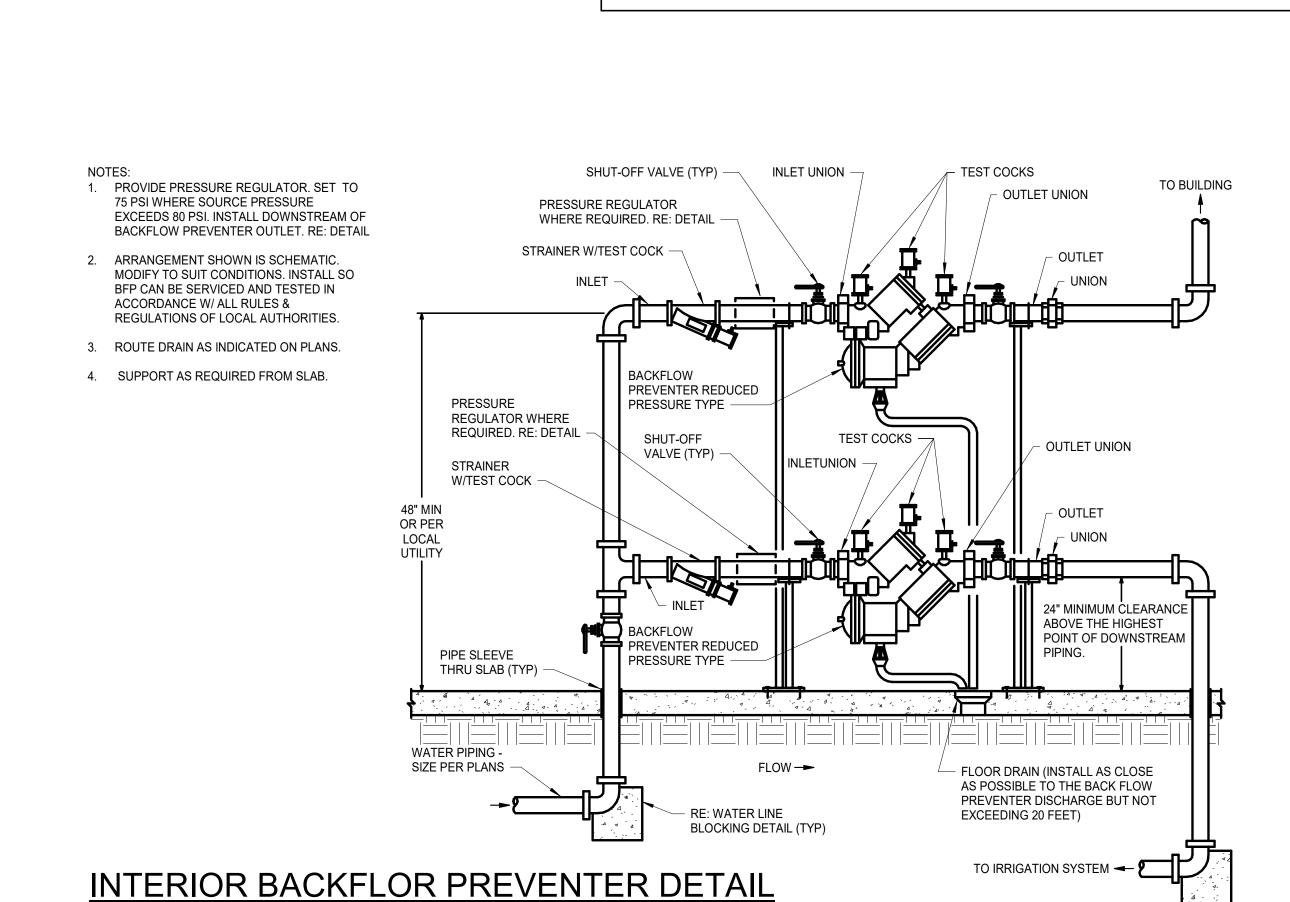
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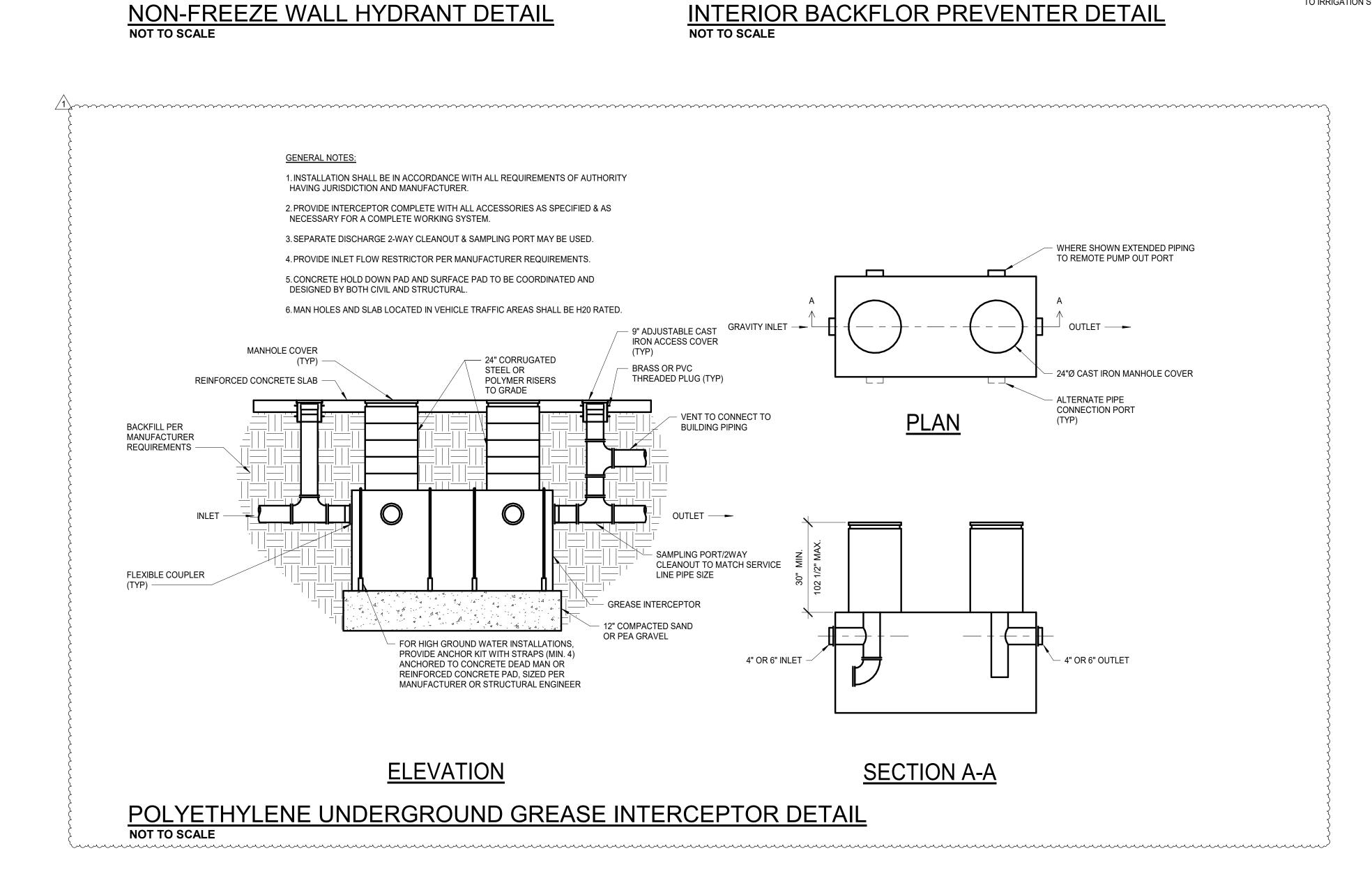
1500

1500

230

4370





FLASHING PER ROOF MFG. REQUIREMENTS -

VENT PIPING REF. PLANS FOR SIZE. (MIN. SIZE = 3") —

INSULATION -

PIPE SUPPORT AS REQUIRED (TYP) -

VENT THRU ROOF DETAIL NOT TO SCALE

BALL VALVE IN ACCESSIBLE

LOCATION ABOVE CEILING

INSULATED 3/4" WATER PIPE —

ANCHOR RISER TIGHT TO WALL

IF IT IS EXPOSED, OR INSTALL

WHERE AVAILABLE. REFER TO

RISER INSIDE PARTITION

ELBOWS AS REQUIRED -

VALVE INTERIOR TO WALL -

INTERIOR FLOOR —

LOCATE VTR A MINIMUM OF 10' FROM ANYBUILDING OPENINGS, MECHANICAL UNIT

INTAKES, RELIEF OR INTAKE HOODS.

EXTERIOR BUILDING WALL

REQUIRED BY WALL THICKNESS

- CUT OPENING AS REQUIRED. SEAL

OTHERWISE REPAIR WALL NEATLY AROUND FACE OF WALL HYDRANT

NON-FREEZE WALL-HYDRANT WITH

INTEGRAL VACUUM BREAKER AND 3/4"

HOSE CONNECTION, STYLE AS SPECIFIED

WATERTIGHT AND GROUT OR

INSTALL ± 24" ABOVE GRADE.

TO SUIT MASONRY SEAMS

PAVEMENT OR SIDEWALK

- EXTERIOR GRADE,

ADJUST HEIGHT IF/AS REQUIRED

- ROOF DECK

- INCREASER AS REQUIRED

- VENT PIPE (INSULATED IN

SPECIFIED OR REQUIRED)

CEILING SPACE WHERE

GENERAL NOTES (TYPICAL ALL SHEETS)

A. PLUMBING CONTRACTOR IS RESPONSIBLE TO SEE THAT WORK MEETS AND IS IN ACCORDANCE WITH ALL REQUIREMENTS OF FEDERAL, STATE, AND LOCAL LAWS AND CODES AND/OR REQUIREMENTS, INCLUDING HEALTH CODES AND BUILDING OWNER.

B. COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO INSTALLATION TO AVOID ROUTING C. INSTALL ELASTOMERIC JOINT SEALER AROUND ALL PIPES PASSING THRU INTERIOR NON- RATED

CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS. FOR FIRE RATED INTERIOR CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS SEAL ALL PIPES. INSTALL FIRESTOP MATERIALS IN ALL GAPS PRIOR TO SEALANT APPLICATION. INSTALL SEALER ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

D. PLUMBING CONTRACTOR SHALL MAKE FINAL CONNECTION TO ALL EQUIPMENT BY OTHERS. VERIFY CONNECTIONS SIZES AND REQUIREMENTS. E. PLUMBING CONTRACTOR SHALL PROVIDE PRO-SET SYSTEMS 'TRAP GUARD' IN ALL FLOOR DRAIN TRAPS WITHIN PROJECT SCOPE OF WORK.

F. PLUMBING CONTRACTOR SHALL VERIFY WALL THICKNESS WITH ARCHITECT PRIOR TO

ORDERING FREEZE PROOF WALL HYDRANTS. G. UPON REQUEST FOR ELECTRONIC FILES, CONTRACTOR SHALL FILL OUT, SIGN AND RETURN ELECTRONIC MEDIA RELEASE FORM FROM ENGINEER AND PROVIDE PAYMENT FOR FEES STIPULATED ON ELECTRONIC MEDIA RELEASE FORM. UPON RECEIPT OF COMPLETED RELEASE

H. ALL CABLE TIES FOR LOW VOLTAGE SYSTEMS LOCATED IN PLENUMS UTILIZED FOR AIR MOVEMENT THAT ARE NOT INSTALLED IN CONDUIT SHALL BE 25/50 FLAME AND SMOKE RATED, HELLERMANN TYTON T50 R2C2UL OR EQUIVALENT.

FORM AND PAYMENT, ELECTRONIC FILES WILL BE RELEASED.

FIRE STOPPING REQUIREMENTS

CONTRACTOR TO PROVIDE FIRESTOPPING AT ALL FIRE RATED ASSEMBLIES MEETING THE MANUFACTURER'S FIRESTOPPING U.L. LISTED DETAILS AND INSTRUCTIONS PER LOCAL CODES AND JURISDICTIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATIONS WITH ARCHITECTURAL FIRE RATINGS ON PLANS OR AS REQUIRED.

PLUMBING SYMBOLS

	EXISTING TO REMAIN
	NEW PIPING
	CW - COLD WATER
	NG - NATURAL GAS
	V - SANITARY VENT ABOVE GRD./FLOOR ABOVE
	V - SANITARY VENT BELOW GROUND
	W - SANITARY WASTE BELOW GROUND
	GW - GREASE WASTE ABOVE GRD./FLOOR ABOVE
	GW - GREASE WASTE BELOW GROUND
₩	GAS SHUT-OFF COCK
abla	SHUT-OFF VALVE
4	DDESCLIDE DECLILATOR

PRESSURE REGULATOR FLOOR DRAIN → PIPE DROP/ PIPE RISE WH O ||

TOP OUTLET TEE WALL HYDRANT WALL CLEANOUT FINISHED FLOOR CLEANOUT

VTR (© VENT THROUGH ROOF EQUIPMENT TYPE AND DESIGNATION PLUMBING FIXTURE TYPE AND DESIGNATION

ARCHITECT OF RECORD

1730 Walnut Street

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PLUMBING SCHEDULES, GEN. NOTES, & SYMBOLS

SITE PLAN NOTES

- 1. REFERENCE RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- 2. REFERENCE MANUFACTURER SPECIFICATIONS PRIOR TO INSTALLATION OF POLE MOUNTED LIGHT FIXTURE. REFERENCE LIGHT POLE BASE ON SHEET E003. CONFIRM FINISH COLOR WITH OWNER PRIOR TO ORDERING.
- 3. LIGHT FIXTURES SHALL BE INSTALLED IN GENERAL LOCATION SHOWN. COORDINATE WITH OTHER TRADES PRIOR TO INSTALL.
- 4. REFERENCE SHEET E200 FOR CIRCUITING OF BUILDING MOUNTED FIXTURES. 5. REFERENCE LIGHT FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.
- 6. ROUTE HOMERUN THROUGH LIGHTING CONTROL RELAY PANEL AS INDICATED. REFER TO SCHEDULES FOR ADDITIONAL INFORMATION.
- 7. PROVIDE NEMA 3R TOGGLE DISCONNECT SWITCH FOR MONUMENT SIGN. VERIFY EXACT
- LOCATION AND POWER REQUIREMENTS WITH SIGNAGE VENDOR PRIOR TO INSTALL. 8. VERIFY MONUMENT SIGN POWER REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN. CALCULATE PROPER CONDUCTOR SIZE REQUIRED TAKING VOLTAGE DROP INTO
- 9. PROVIDE POWER CONNECTION TO FIRE PIT. PROVIDE EPO AND CONTROL WIRING AS

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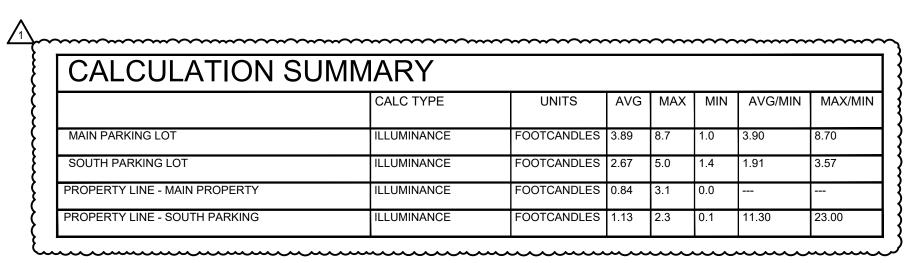


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SITE PLAN -ELECTRICAL

SITE PLAN NOTES

PHOTOMETRICS ARE CALCULATED REFERENCING IES FILES FROM SPECIFIED LIGHT FIXTURES. LIGHT FIXTURE ALTERNATES OR CHANGES TO MOUNTING HEIGHTS MAY DIFFER IN PHOTOMETRIC SUMMARY AND SHALL BE CALCULATED AS REQUIRED.



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	52910099
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SITE PLAN -PHOTOMETRIC

0.0

1.4₁ 4.7 4.3 4.1 3.4 2.7 2.2

1.1 1.1 1.5

2.8 <u>2</u>.6 <u>2</u>.5 <u>2</u>.5 <u>1</u>.8

3.2 3.4 3.2 2.5 2.4

4.9 4.1 3.8 3.3

4.5 4.4 3.9 3.1

5.3 5.2 4.0 2.9 7.9

2.3 2.7 3.1 3.3 2.6 1.8

 $\frac{1}{2.0}$ $\frac{1}{2.0}$ $\frac{1}{1.9}$ $\frac{1}{2.2}$ $\frac{3}{3.4}$ $\frac{1}{4.9}$ $\frac{4}{4.1}$ $\frac{4}{3.3}$ $\frac{1}{2}$

5.3 5.6 4.8 4.2 3.5 3.4 3.6 4.2 7

5.2 5.4 5.1 4.7 4.1 4.1 4.2 4.9 7.1

5.9 5.6 5.3 5.1 4.8 4.6 4.4 4.3 5.0 5.9

 $\frac{1}{3}.6$ $\frac{4}{4}.2$ $\frac{4}{4}.7$ $\frac{4}{4}.1$ $\frac{1}{2}.9$ $\frac{1}{2}$

4.5 4.6 5.3 4.4 3,0

5.1 4.2 3.6 3.2 2.6

3.0 3.0 5.0 6.8 6.2 5.3 3.8 2.8 1.9

4.6 4.0 3.9 3.3 2.4

[†]5.5 [†]4.6 [†]4.9 [†]4.2 [†]3.0 [†]2.3

3.9 3.7 3.0

SW OLDHAM CROSSING

2.3 2.7 3.5 4.1 3.4 2.9 2.7 2.5 2.5 2.7 2.9 3.0 3.5 4.2 3.4 2.8 2.6 2.3 2.1 2.1 2.2 2.6 2.8 3.3 4.3 4.1

2.7 3.3 3.6 3.3 2.8 2.4 2.2 2.1 2.3 2.5 3.0 3.8 4.1 3.7 2.8 2.3 2.0 1.8 1.8 2.0 2.3 2.6 3.2 4.2 4.0 2

2.4 2.5 2.5 2.3 2.1 1.9 1.9 2.0 2 2 2.6 2.9 3.0 2.8 2.5 2.0 1.7 1.6 1.6 1.7 2.0 2.4 2.9 3.2 3.1 2.1

5.6 4.5 3.7 2.9

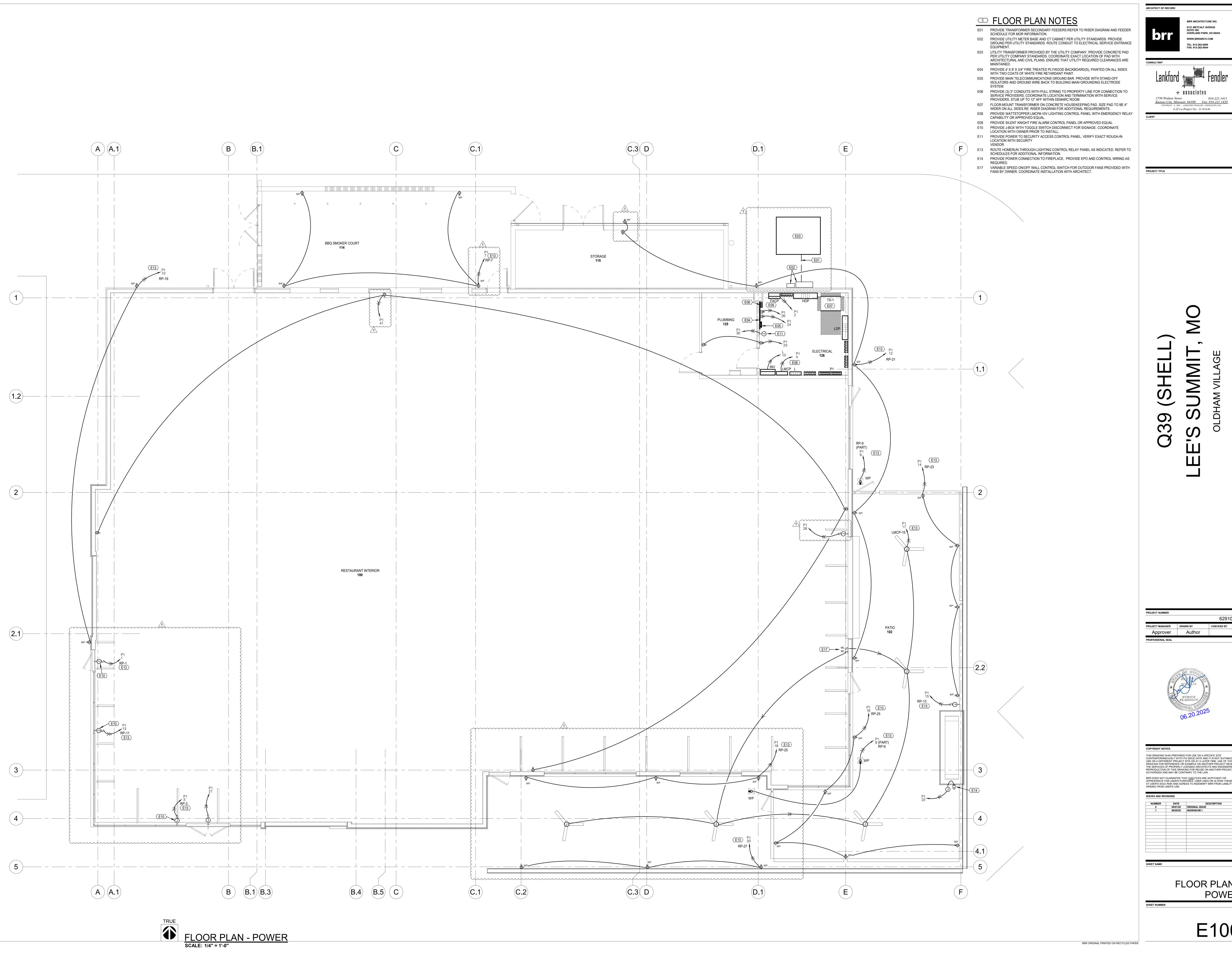
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ARKWAY

SITE PLAN-PHOTOMETRIC

SCALE: 1" = 20'-0"

 $\frac{1}{2}.6$ $\frac{1}{2}.9$ $\frac{1}{4}.0$ $\frac{1}{5}.0$ $\frac{1}{3}.9$ $\frac{1}{3}.1$ $\frac{1}{3}.0$ $\frac{1}{3}.0$ $\frac{1}{3}.2$ $\frac{1}{3}.4$



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FLOOR PLAN -POWER

E100

CONSULTANT

Lankford Fendler

+ associates

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CT TITLE

G39 (SHELL) E'S SUMMIT, MO

DECT NUMBER
62910099
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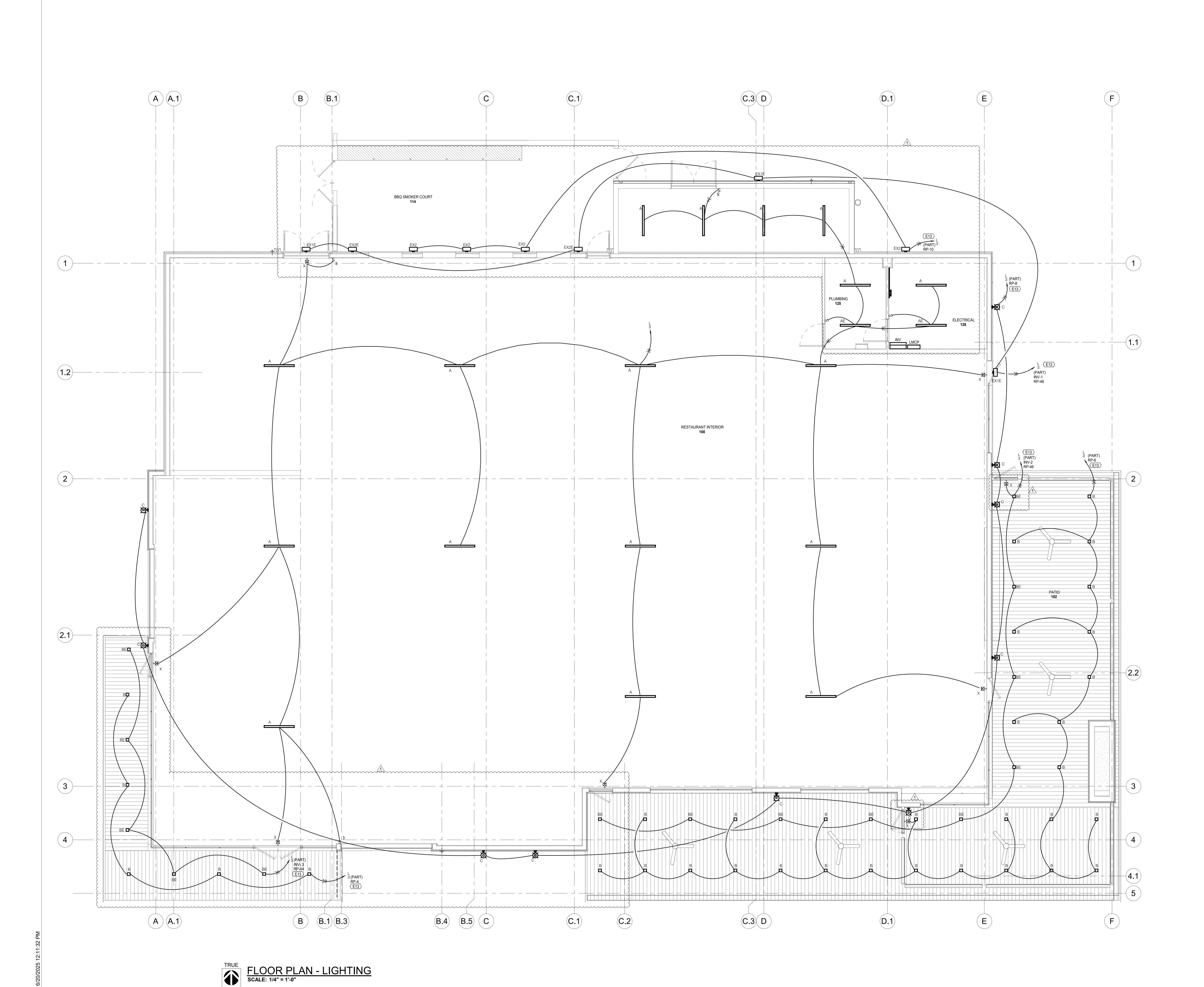
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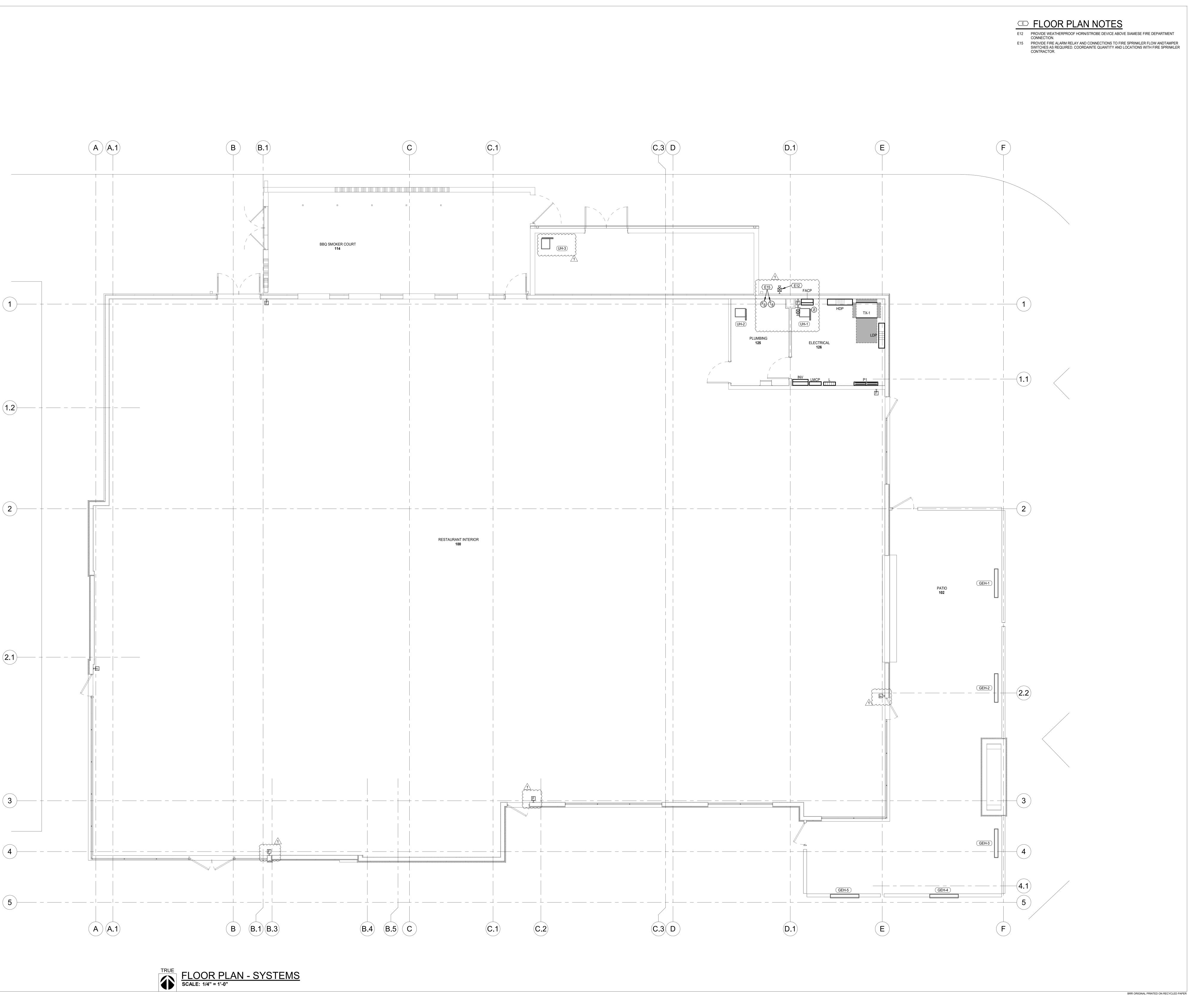
1 06/20/25 ADDENDUM 1

FLOOR PLAN -LIGHTING

BRR ORIGINAL PRINTED ON RECYCLED PAPER

E200





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> FLOOR PLAN -SYSTEMS

CONSULTANT

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+ 8880ciates

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ISSUES AND REVISIONS

NUMBER DATE DESCRIPTION

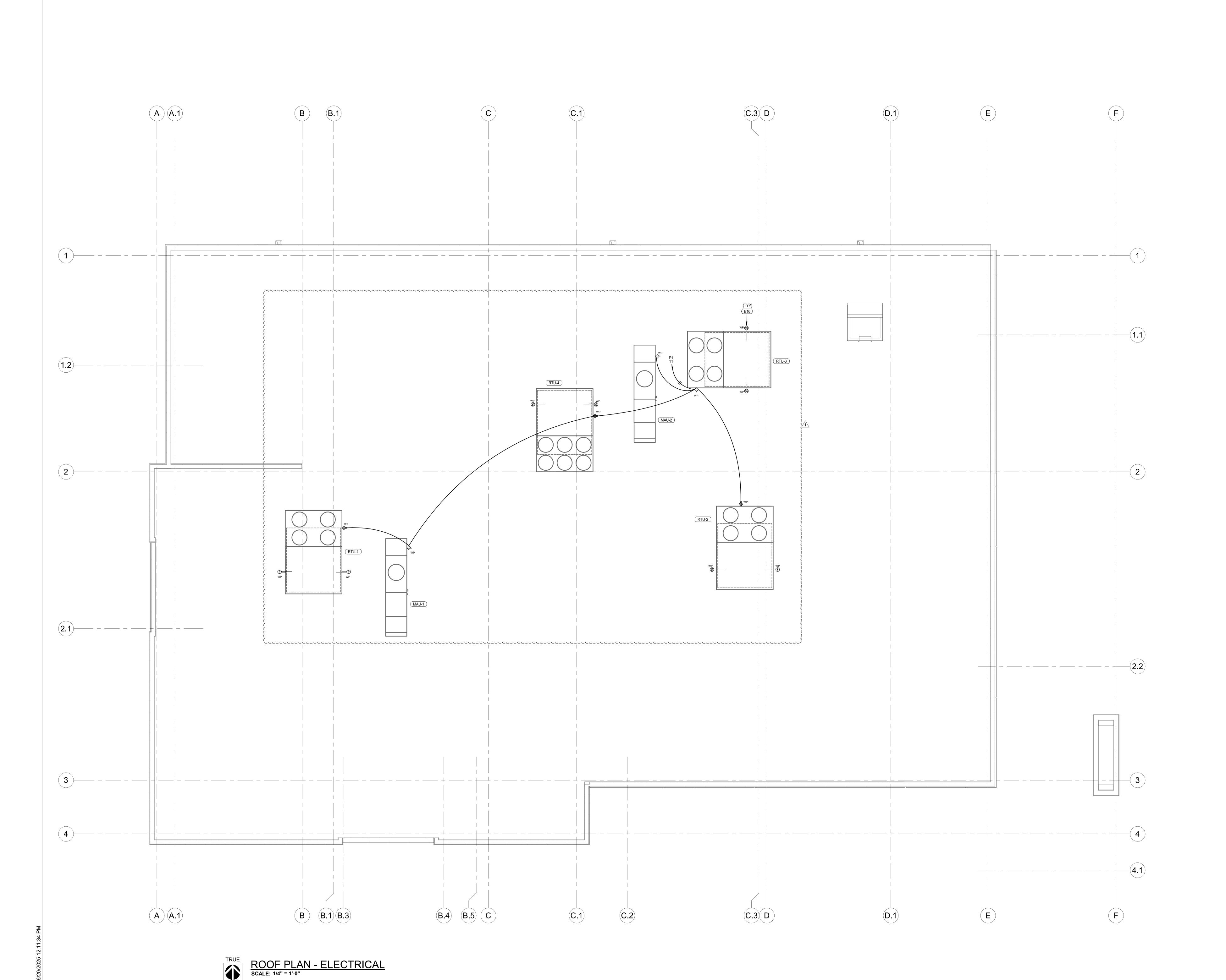
0 05/01/25 ORIGINAL ISSUE

1 06/20/25 ADDENDUM 1

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ROOF PLAN -ELECTRICAL

E400



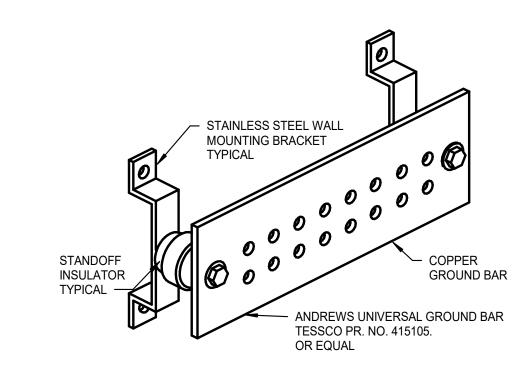
ARCHITECT OF RECORD

ELECTRICAL DETAILS

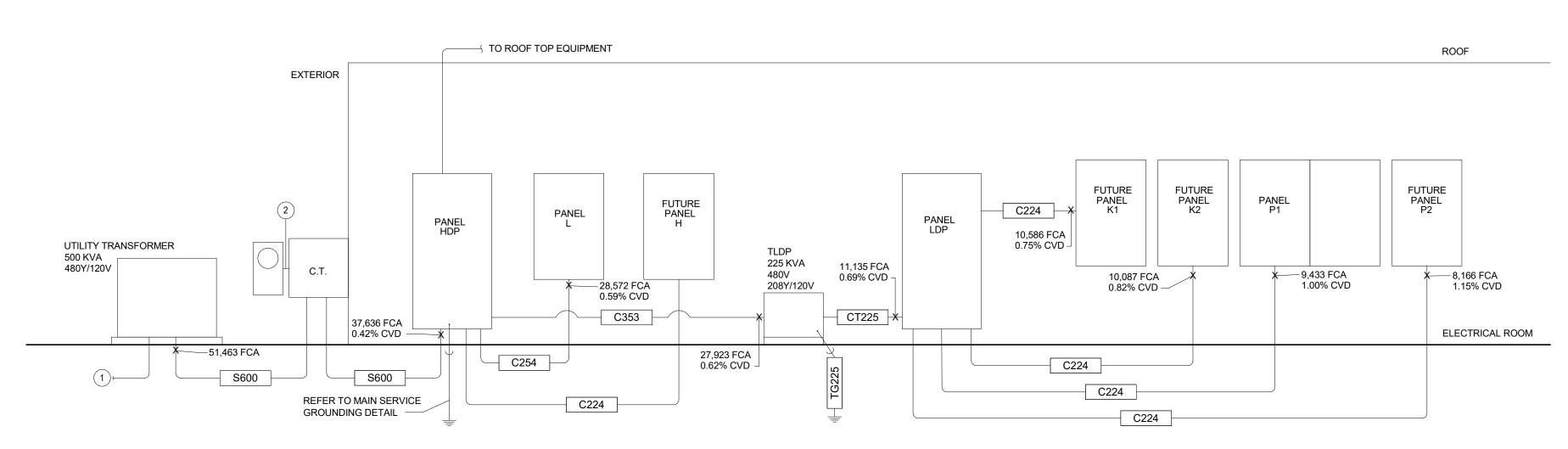
•, •••••• TO MAIN WATER PIPE.

CONNECT AHEAD OF MAIN
SHUT OFF VALVE ─ GROUNDING PLATE LOCATED IN CATV/TV ROOM PER PLAN TO BUILDING STEEL -- GROUNDING PLATE LOCATED
IN COMMUNICATION ROOM PER PLAN MAIN ELECTRICAL GROUND BUS GROUND WIRE SIZE PER NEC 250. (TYP) (3) COPPER CLAD -GROUND ROD TYPICAL, 5/8"x10' GROUND WIRE
TO PANELBOARD.
SIZE AS NOTED CONCRETE ENCASED ELECTRODE (UFER) NOTE:
1. ALL WIRING SHALL BE TYPE THHN/THWN.
2. MAIN GROUP RODS ARE TO BE LOCATED AT
SERVICE ENTRANCE WITH SIZE AND QUANTITY
PER SPECIFICATIONS. PER NEC 250-52(3)





MAIN TELECOMMUNICATIONS GROUND BAR DETAIL NOT TO SCALE



ELECTRICAL RISER DIAGRAM NOT TO SCALE

® RISER NOTES

PROVIDE 4" CONDUIT(S) FOR UTILITY PRIMARY AS REQUIRED BY THE UTILITY COMPANY. PRIMARY CONDUCTORS PROVIDED BY UTILITY. COORDINATE EXACT ROUTING WITH CIVIL AND UTILITY COMPANY.

2. 1-1/4" CONDUIT.

			3-WIRE W/ GROUND						4-WIRE W/ GROUND			
CIRCUIT	TAG	NUMBER	PHASE / NEUTRAL	EQUIPMENT	CONDUIT	NEC SIZE	TAG	NUMBER	PHASE / NEUTRAL	EQUIPMENT	CONDUIT	NEC SIZE
AMPS	NAME	SETS	CONDUCTORS	GROUND	SIZE	EMT/PVC/RGS	NAME	SETS	CONDUCTORS	GROUND	SIZE	EMT/PVC/RGS
225	C223	1	3 #4/0	#4	2"	2"/2"/2"	C224	1	4 #4/0	#4	2.5"	2.5"/2.5"/2.5"
250	C253	1	3 #250	#4	2.5"	2"/2"/2"	C254	1	4 #250	#4	2.5"	2.5"/2.5"/2.5"
350	C353	1	3 #500	#3	3.5"	2.5"/3"/3"	C354	1	4 #500	#3	3.5"	3"/3.5"/3"
	TRANSFORM	MER SECONDA	ARY FEEDERS									
700	CT225	3	4 #250	#2/0	3"	2.5"/2.5"/2.5"						
	SERVICE EN	ITRANCE CON	IDUCTORS									
600	S600	2	4 #350	-	4"	2.5"/3"/3"						
	MISC FEEDE	R DESCRIPTI	ONS									
	MISC FEEDE TG225	R DESCRIPTI	ONS N/A	#2/0	0.75"	0.75"/0.75"/0.75"	TRANSFOR	MER GROUND				
			<u> </u>	#2/0	0.75"	0.75"/0.75"/0.75"	TRANSFOR	MER GROUND				
			<u> </u>	#2/0	0.75"	0.75"/0.75"/0.75"	TRANSFOR	MER GROUND				
OTES:	TG225	1	<u> </u>				TRANSFOR	MER GROUND				
OTES: SIZE BRA	TG225	1 AND CIRCUIT	N/A				TRANSFOR	MER GROUND				
OTES: SIZE BRA TAG NAM	TG225 NCH FEEDER ME MAY BE US	1 AND CIRCUIT ED AS AN ADI	N/A S ACCORDING TO THE (CIRCUIT BREAKER	R / FUSE SIZE AN	ID THIS SCHEDULE.	TRANSFOR	MER GROUND				
OTES: SIZE BRA TAG NAM REFER TO	TG225 NCH FEEDER ME MAY BE US O THE SPECIF	AND CIRCUIT ED AS AN ADI	N/A S ACCORDING TO THE O	CIRCUIT BREAKER	R / FUSE SIZE AN	ID THIS SCHEDULE.	TRANSFOR	MER GROUND				
I <u>OTES:</u> . SIZE BRA TAG NAM . REFER TO MINIMUM	TG225 NCH FEEDER ME MAY BE US O THE SPECIF I SIZE REQUIR	AND CIRCUIT ED AS AN ADI ICATIONS ANI ED MAY BE LA	N/A S ACCORDING TO THE (DITIONAL REFERENCE. D GENERAL NOTES FOR	CIRCUIT BREAKER MINIMUM CONDU	R / FUSE SIZE AN	ND THIS SCHEDULE.		MER GROUND				
IOTES: . SIZE BRA TAG NAM . REFER TO MINIMUM . CONDUC	TG225 NCH FEEDER ME MAY BE US O THE SPECIF I SIZE REQUIR TOR SIZES AR	AND CIRCUIT ED AS AN ADI ICATIONS ANI ED MAY BE LA	N/A S ACCORDING TO THE (DITIONAL REFERENCE. D GENERAL NOTES FOR ARGER THAN SHOWN IN	CIRCUIT BREAKER MINIMUM CONDUTHIS SCHEDULE.	R / FUSE SIZE AN JIT SIZE REQUIR H EMT OR SCHE	ND THIS SCHEDULE.		MER GROUND				
OTES: SIZE BRA TAG NAM REFER TO MINIMUM CONDUCT VERIFY A	TG225 NCH FEEDER ME MAY BE US O THE SPECIF I SIZE REQUIR TOR SIZES AR AND ADJUST O	AND CIRCUIT ED AS AN ADI ICATIONS ANI ED MAY BE LA E BASED UPC	N/A S ACCORDING TO THE O DITIONAL REFERENCE. D GENERAL NOTES FOR RGER THAN SHOWN IN ON TYPE THHN/THWN CO	CIRCUIT BREAKER MINIMUM CONDU THIS SCHEDULE. DNDUCTORS WITH HER TYPES OF CO	R / FUSE SIZE AN JIT SIZE REQUIR H EMT OR SCHE DNDUIT.	ID THIS SCHEDULE. REMENTS. DULE 40 PVC CONDUI		MER GROUND				
OTES: SIZE BRA TAG NAM REFER TO MINIMUM CONDUCT VERIFY A	TG225 NCH FEEDER ME MAY BE US O THE SPECIF I SIZE REQUIR TOR SIZES AR AND ADJUST C	AND CIRCUIT ED AS AN ADI ICATIONS ANI ED MAY BE LA E BASED UPC CONDUIT SIZE RE BASED UPC	N/A S ACCORDING TO THE (DITIONAL REFERENCE. D GENERAL NOTES FOR ARGER THAN SHOWN IN DN TYPE THHN/THWN CO AS REQUIRED FOR OTH	CIRCUIT BREAKER MINIMUM CONDU THIS SCHEDULE. DINDUCTORS WITH HER TYPES OF COLLENGTH. IF ONE	R / FUSE SIZE AN JIT SIZE REQUIR H EMT OR SCHE DNDUIT.	ID THIS SCHEDULE. REMENTS. DULE 40 PVC CONDUI		MER GROUND				
OTES: SIZE BRA TAG NAM REFER TO MINIMUM CONDUC' VERIFY A CONDUC' INCREAS	TG225 NCH FEEDER ME MAY BE US O THE SPECIF I SIZE REQUIR TOR SIZES AR AND ADJUST OF TOR SIZES AR SE FEEDER SIZES	AND CIRCUIT ED AS AN ADI ICATIONS ANI ED MAY BE LA E BASED UPC CONDUIT SIZE RE BASED UPC ZES AS REQUI	N/A S ACCORDING TO THE (DITIONAL REFERENCE. D GENERAL NOTES FOR ARGER THAN SHOWN IN DIN TYPE THHN/THWN CO AS REQUIRED FOR OTH DIN 100 FEET OR LESS IN	CIRCUIT BREAKER MINIMUM CONDUTHIS SCHEDULE. DINDUCTORS WITH HER TYPES OF COLLENGTH. IF ONE	R / FUSE SIZE AN JIT SIZE REQUIR H EMT OR SCHE DNDUIT. E WAY CIRCUIT IS	ND THIS SCHEDULE. REMENTS. DULE 40 PVC CONDUI S OVER 100 FEET,		MER GROUND				

ELECTRICAL RISER DIAGRAM NOTE: UTILITY TRANSFORMER DESIGN CRITERIA: 500 KVA, PAD MOUNT UTILITY TRANSFORMER SECONDARY VOLTAGE: 480Y/277V, 3-PHASE, 4-WIRE UTILITY TRANSFORMER IMPEDANCE: 1.30% Z. MAXIMUM AVAILABLE FAULT CURRENT AT UTILITY TRANSFORMER SECONDARY IS 51,463 AMPS. FAULT CURRENT WAS OBTAINED BASED ON THE MAXIMUM LET THROUGH CURRENT OF A TRANSFORMER WITH THE ABOVE CRITERIA.

PANELBO	DARD LDP										
BUS AMPS: 8				SCCR:			FULLY RATED	1	TYPE:	BRANCH CIRCUIT PANELBOARD	
MAIN SIZE / TYPE: 7	00A MCB		ļ	NEMA TYPE:	1		MA	NUFA	CTURER:	SQUARE D	
VOLTS/PHASE: 2	08Y/120V, 3PH, 4W			MOUNTING:	SURFACE				MODEL:	I-LINE	
SECTION: 1				LOCATION:	ELECTRICAL	-			OPTIONS:		
CKT# CIRCUIT DECRIPTION	СВ	Р	LOAD	Α	В	С	LOAD	Р	СВ	CIRCUIT DECRIPTION	СКТ
	AMPS		VA	VA	VA	VA	VA		AMPS		
1			6,960	6,960			0				2
3 PANEL P1	200	3	5,960		5,960		0	3	200	PANEL K1	4
5			5,705		,	5,705	0				6
7 9 PANEL P2	200		0	0	0		0	١,	200	PANEL K2	8
9 PANEL P2	200	3	0		0	0	0	3	200	PANEL K2	10
13			0	0	1		0				14
15 SPACE ONLY	225	3	0		0		0	3	225	SPACE ONLY	16
17			0			0	0	1			18
19			0	0] '		0				20
21 SPACE ONLY	225	3	0		0		0	3	225	SPACE ONLY	22
23			0			0	0				24
25			0	0			0				26
27 SPACE ONLY	225	3	0		0		0	3	225	SPACE ONLY	28
29 31			0	0	ا ا	0	0				30
33 SPACE ONLY	225	3	0	0	0		0	3	225	SPACE ONLY	32
35 STACE ONE!	223		0			0	0	"	223	STAGE ONE!	36
37			0	0	1		0				38
39 SPACE ONLY	225	3	0		0		0	3	225	SPACE ONLY	40
41			0			0	0	1			42
	PER PHASE	CONN	ECTED - VA	6,960	5,960	5,705		-		TOTAL CONNECTED - VA 18,625	
	PER PHASE CO		_	58	50	48				TOTAL CONNECTED - AMPS 52	
NOTES:		_	- 1			-	_			TOTAL DEMAND - VA 20,800	

SPD = SURGE PROTECTIVE DEVICE

		BUS AMPS: 250A MAIN SIZE / TYPE: MLO VOLTS/PHASE: 480Y/2 SECTION: 1	277V, 3PH, 4W		1	SCCR: NEMA TYPE: MOUNTING:	1	F	FULLY RATED MA	NUFA MFG				
(KT#	CIRCUIT DECRIPTION	CB AMPS	Р	LOAD VA	A VA	B VA	C VA	LOAD VA	Р	CB AMPS	CIRCUIT DECRIPTION	CKT#	
RP	1	LTG - SITE POLES	20	1	688	1.376	1	•••	688	1	20	LTG - SITE POLES	2	RP
RP -	3	LTG - SMKRS / CANOPY / SCNCES	20	1	1,429	1,570	2,289		860	1	20	LTG - SITE POLES	4	RP
· -	5	LTG - RR / BOH / TEMP	20	1	495		2,200	1.011	516	1	20	LTG - SITE POLES	6	RP
RP	7	LTG - SITE POLES	20	1	516	696]	.,	180	1	20	LTG - SITE BOLLARDS	8	RP
	9	RELAY PANEL "RP"	20	1	200		950		750	1	20	LTG - INVERTER	10	1
	11	UH-1	25	1	5,000			5,000	0			SPACE ONLY	12	1
^ _	13	UH-2	25	1	5,000	5,000	L		0			SPACE ONLY	14	
1\(\)	15	ÜH-3	25	1.	5,000	~ ~ ~ ~ ~ 	5,000		0			SPACE ONLY	16	1
	17	SPARE	20	1	0			0	0			SPACE ONLY	18	
	19	SPARE	20	1	0	0			0			SPACE ONLY	20]
	21	SPARE	20	1	0		0		0			SPACE ONLY	22	
	23	SPARE	20	1	0			0	0			SPACE ONLY	24	
		SPACE ONLY			0	0			0			SPACE ONLY	26	
	27	SPACE ONLY			0		0		0			SPACE ONLY	28	
		SPACE ONLY			0		, L	0	0			SPACE ONLY	30	_
	-	SPACE ONLY			0	0			0			SPACE ONLY	32	4
		SPACE ONLY			0		0		0			SPACE ONLY	34	-
		SPACE ONLY			0		, L	0	0			SPACE ONLY	36	4
	37	SPACE ONLY			0	0			0			SPACE ONLY	38	-
		SPACE ONLY SPACE ONLY			0		0	0	0			SPACE ONLY SPACE ONLY	40 42	-
	41	SPACE UNLY			_				U			1	42	4
					NECTED - VA	7,072	8,239	6,011				TOTAL CONNECTED - VA 21,322		
			PER PHASE CO	NNEC	CTED - AMPS	26	30	22				TOTAL CONNECTED - AMPS 26	_	
		NOTES:										TOTAL DEMAND - VA 26,415		
		RP# = CONTROL LIGHTING CIRCUIT N SPD = SURGE PROTECTIVE DEVICE	WITH RELAY PANE	EL AS	INDICATED							NEC TOTAL DEMAND - AMPS 32		

*REFER TO THE BRANCH CIRCUIT COPPER CONDUCTOR AND CONDUIT SIZING CHART FOR SIZING BRANCH CIRCUITS OF 100A OR LESS

*REFER TO THE BRANCH CIRCUIT COPPER CONDUCTOR AND CONDUIT SIZING CHART FOR SIZING BRANCH CIRCUITS OF 100A OR LESS

RELAY PANEL: RP

	BUS AMPS: 225A MAIN SIZE / TYPE: MLO VOLTS/PHASE: 208Y/120V, 3F	PH, 4W			SCCR: NEMA TYPE: MOUNTING:	1	F	ULLY RATED MA	NUFA		BRANCH CIRCUIT PANELBOARD SQUARE D NQ	
	SECTION: 1				LOCATION:	ELEC ROOM		I	(OPTIONS:	SPD	
CKT#	CIRCUIT DECRIPTION	CB AMPS	P	LOAD VA	A VA	B VA	C VA	LOAD VA	Р	CB AMPS	CIRCUIT DECRIPTION	CKT
1	PWR - WEST DOOR SIGN	20	1	1,200	1,200			0	1	20	PWR - FACP	2
3	PWR - S. MAIN ENTRANCE SIGN	20	1	1,200	,	1,200]	0	1	20	PWR - LMCP	4
5	PWR - MONUMENT SIGN SOUTH	20	1	1,200		,	1,700	500	1	20	PWR - FIRE PIT	6
7	RCPT - SMOKER CONV.	20	1	720	960			240	1	15	GEH-1,2,3,4,5	8
9	RCPT - EXTERIOR CAFÉ LIGHTS	20	1	540		1,260]	720	1	20	RCPT - FRONT BUILDING CONV.	10
11	RCPT - ROOF TOP	20	1	900			1,800	900	1	20	RCPT - NE BLDG CONV.	12
13	PWR - WEST WALL SIGN	20	1	1,200	1,920			720	1	20	RCPT - PATIO CONV. 1	14
15	PWR - FIRE PLACE SIGN	20	1	1,200		2,100]	900	1	20	RCPT - PATIO CONV. 2	16
17	RCPT - PATIO FANS	20	1	25			565	540	1	20	RCPT - PATIO CONV. 3	18
19	PWR - MONUMENT SIGN NORTH	20	1	1,200	1,920			720	1	20	RCPT - PATIO CONV. 4	20
21	PWR - AUTO DOOR	20	1	600		800		200	1	20	PWR - FIRE PLACE	22
23	RCPT - ELEC/MECH CONV.	20	1	360			720	360	1	20	RCPT - PHONEBOARD 1	24
25	PWR - GARAGE DOOR	20	2	7600	960	hunny		360	1	20	RCPT - PHONEBOARD 2	26
27				600		600		0	1	20	SPARE	28
29	SPARE	20	1	~~~~			200	200	1	20	PWR - SECURITY	30
31	SPARE	20	1	0	0			0	1	20	SPARE	32
33	SPARE	20	1	0		0		0	1	20	SPARE	34
35	SPARE	20	1	0			0	0	1	20	SPARE	36
37	SPARE	20	1	0	0			0	1	20	SPARE	38
39	SPARE	20	1	0		0		0	1	20	SPARE	40
41	RCPT - TEMP	20	1	720			720	0	1	20	SPARE	42
SECTIO 43	N: 2 SPARE	20	1	0	0			0	1	20	SPARE	44
45	SPARE	20	1	0		0]	0	1	20	SPARE	46
47	SPARE	20	1	0			0	0	1	20	SPARE	48
49	SPARE	20	1	0	0			0	1	20	SPARE	50
51	SPARE	20	1	0		0]	0	1	20	SPARE	52
53	SPARE	20	1	0			0	0	1	20	SPARE	54
55	SPARE	20	1	0	0			0	1	20	SPARE	56
57	SPARE	20	1	0		0		0	1	20	SPARE	58
59	SPARE	20	1	0			0	0	1	20	SPARE	60
61	SPARE	20	1	0	0			0	1	20	SPARE	62
63	SPARE	20	1	0		0		0	1	20	SPARE	64
65	SPARE	20	1	0			0	0	1	20	SPARE	66
67	SPARE	20	1	0	0			0	1	20	SPARE	68
69	SPARE	20	1	0		0		0	1	20	SPARE	70
71	SPARE	20	1	0		1	0	0	1	20	SPARE	72
73	SPARE	20	1	0	0			0	1	20	SPARE	74
75	SPARE	20	1	0		0		0	1	20	SPARE	76
77	SPARE	20	1	0			0	0	1	20	SPARE	78
79	SPARE	20	1	0	0			0	1	20	SPARE	80
81	SPARE	20	1	0		0		0	1	20	SPARE	82
83	SPARE	20	1	0		`	0	0	1	20	SPARE	84
				ECTED - VA	6,960	5,960	5,705				TOTAL CONNECTED - VA 18,62	
		PHASE CO	NNEC.	TED - AMPS	58	50	48				TOTAL CONNECTED - AMPS 52	
	NOTES:		-1 401	NDICATED							TOTAL DEMAND - VA 20,80	
	RP# = CONTROL LIGHTING CIRCUIT WITH R HL = HANDLE LOCK ON/OFF	ELAY PANI	EL AS I	NDICATED							NEC TOTAL DEMAND - AMPS 58	
	SPD = SURGE PROTECTIVE DEVICE											

<u>E</u>		CIRCUIT C D CONDUIT			TOR	
OVERCURRENT PROTECTION DEVICE RATING (AMPS)	REQUIRED CONDUCTOR SIZE	EQUIPMENT GROUNDING CONDUCTOR SIZE	SINGLE PHASE 2 WIRE + GND. CONDUIT SIZE	* SINGLE PHASE 3 WIRE + GND. CONDUIT SIZE	THREE PHASE 3 WIRE + GND. CONDUIT SIZE	THREE PHASE 4 WIRE + GND. CONDUIT SIZE
15	12 AWG	12 AWG	3/4"	3/4"	3/4"	3/4"
20	12 AWG	12 AWG	3/4"	3/4"	3/4"	3/4"
25	10 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
30	10 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
35	8 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
40	8 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
45	6 AWG	10 AWG	3/4"	3/4"	3/4"	1"
50	6 AWG	10 AWG	3/4"	3/4"	3/4"	1"
60	4 AWG	10 AWG	1"	1"	1"	1-1/4"
70	4 AWG	8 AWG	1"	1"	1"	1-1/4"
80	3 AWG	8 AWG	1"	1-1/4"	1-1/4"	1-1/4"
90	2 AWG	8 AWG	1"	1-1/4"	1-1/4"	1-1/4"
100	1 AWG	8 AWG	1-1/4"	1-1/2"	1-1/2"	1-1/2"

- * = UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- * = UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL BRANCH CIRCUITS AND FEEDERS TO BE PROVIDED WITH A NEUTRAL WIRE. * = ALL CONDUCTORS SIZED ON THE POWER RISER DIAGRAM OR IN BRANCH CIRCUIT CONDUCTOR TABLE ARE BASED ON 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY OR CABLE. CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE NEC IF 4 OR MORE CONDUCTORS ARE PLACED IN A RACEWAY OR CABLE.

		INVERTER: INV					
		POWER RATING (VA/W): 750					
		INPUT VOLTAGE (V): 277					
		OUTPUT VOLTAGE (V): 277					
	MA	NUFACTURER / MODEL: MULE - CE	PS-M				
	А	PPROVED EQUIVALENT MYERS - II	LLUMINATOR LV				
		LOCATION: ELECTRIC	AL ROOM				
	NO	RMAL POWER SOURCE: L-20					
CKT				СВ		LOAD	
#		LOAD DESCRIPTION	LOAD TYPE	AMPS	P	VA	NO
1	LTG - WALL PAG	CKS	NORMALLY ON	10	1	224	İ
2	LTG - PATIO CA	NOPY	NORMALLY ON	10	1	200	
3	LTG - FRONT CA	NOPY	NORMALLY ON	10	1	100	
4	SPARE		NORMALLY ON	10	1		
5	SPARE		NORMALLY ON	10	1		
6	SPARE		NORMALLY ON	10	1		
			TOTAI	L CONNECT	ED LOAD	524	VA
				SPARE (CAPACITY	226	VA
					SPARE %	30	%
	GENERAL:	UL 924 LISTED, INPUT FUSE AND BATTERY FU FIELD SELECTABLE VOLTAGE 90 MINUTE RUNTUME STANDARD WARRANTY 3 YEAI					
		SELF TEST AND DIAGNOSTICS WALL MOUNTED CABINET MANUFACTURER STARTUP AN OUTPUT CIRCUIT BREAKERS					

ELECTRICAL SYMBOLS

	11 0 / 12 0 11112 0 10
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL, ARROWS INDICATED HOMERUNS TO PANEL, ALL CONDUCTORS ARE NOTED IN PANEL SCHEDULE PHASE CONDUCTORS NEUTRAL CONDUCTORS GROUND CONDUCTORS
LP1-10	PANEL - BREAKER NUMBER (IDENTIFICATION)
1,3 OR 1,3,5	INDICATES X,X= 2-POLE C.B. OR X,X,X= 3-POLE C.B.
→ ►►► 5 3 1	HOMERUN INDICATED LIKE THIS INDICATES THREE SEPARATE CIRCUITS
· · · · · · · · · · · · · · · · · · ·	CONDUIT CONCEALED IN CEILING OR WALL WITH THREE CONDUCTORS: 1-PHASE, 1-NEUTRAL, 1-GROUND WIRE, MINIMUM NO.12 WIRE UNLESS OTHERWISE SPECIFIED ON PLANS
	CONDUIT RUN UNDERGROUND OR CONCEALED IN FLOOR SLAB
	GROUNDING CONDUCTOR, MINIMUM NO. 12 WIRE EXCEPT AS NOTED
† ⋈ OR † ⋈	EXIT SIGN, SINGLE FACED, ARROWS AS SHOW ON PLANS, SHADED

SIDE(S) INDICATES FACE SIDE(S) OF EXIT EXIT SIGN, DOUBLE FACED, ARROWS AS SHOW ON DRAWING, SHADED SIDE(S) INDICATES FACE SIDE(S) OF EXIT OR CEILING OR WALL MOUNTED EMERGENCY LIGHTING UNIT WITH INTEGRAL BATTERY AND UNIT MOUNTED HEADS

208Y/120V OR 120/240V PANELBOARD (SURFACE), TOP MOUNTED 6'-0" AFF

SINGLE POLE SWITCH, +3'-10" AFF TO CENTERLINE OF DEVICE BOX THREE-WAY SWITCH, +3'-10" AFF TO CENTERLINE OF DEVICE BOX

INDICATES RECEPTACLE ABOVE COUTERTOP. RE: PLANS

DUPLEX RECEPTACLE W/GROUND FAULT PROTECTION,+

DOUBLE DUPLEX RECEPTACLE, +1'-6" AFF OR AS NOTED

FIRE ALARM EXTERIOR/INTERIOR BELL, SIZE AND TYPE AS NOTED

THERMOSTAT OUTLET BOX WITH 3/4"C STUBBED UP OUT OF BOX TO

XX-X ELECTRICAL EQUIPMENT PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR

ABOVE ACCESSIBLE CEILING, THERMOSTAT AND WIRING BY

GFI DUPLEX RECEPTACLE WITH WEATHERPROOF PLATE, HEIGHT AS NOTED

DUPLEX RECEPTACLE, +1'-6" AFF OR AS NOTED

FIRE ALARM MANUAL PULL STATION, +3'-10" AFF SPRINKLER ALARM SYSTEM FLOW SWITCH

SPRINKLER ALARM SYSTEM TAMPER SWITCH

INDICATES WIRING DEVICE ABOVE, RE: DRAWING

+3'-10" HEIGHT TO CENTERLINE OF OUTLET BOX ABOVE FINISHED FLOOR

FIRE AND SMOKE DAMPER; 120V, 1PH

OTHERS, +4'-0" AFF OR AS NOTED

MECHANICAL EQUIPMENT CALL OUT

ROOFTOP UNIT DESIGNATION EXHAUST FAN DESIGNATION

PUMP DESIGNATION

FIRE ALARM

ABOVE GRADE

ABOVE FINISHED FLOOR

PHOTO CELL, SIZE AND TYPE AS NOTED

SWITCH DESIGNATION

1'-6" AFF OR AS NOTED

CEILING MOUNTED RECEPTACLE

⊢ U OR U WALL OR CEILING MOUNTED JUNCTION BOX

├── LED STRIP FIXTURE RECESSED CEILING LIGHT FIXTURE

WALL MOUNTED LIGHT FIXTURE, SIZE AND TYPE AS NOTED L. CONTRACTOR SHALL PROVIDE FIRE RATED ENCLOSURES AROUND ALL ROUGH-IN POLE MOUNTED LIGHT FIXTURE, SIZE AND TYPE AS NOTED BOXES, PANELS ETC. THAT ARE LOCATED IN FIRE RATED WALLS AND SHALL FIRE CAULK ALL OPENING IN RATED ASSEMBLES PER MANUFACTURERS RECOMMENDATIONS PER

480/277V PANELBOARD (SURFACE), TOP MOUNTED 6'-0" AFF N. INSTALL FIRE ALARM DEVICES THAT COMPLY WITH APPLICABLE CODES. INCLUDING BUT NOT LIMITED TO THE NFPA, UL, ADA, IBC OR ANY OTHER AUTHORITIES HAVING DISTRIBUTION PANEL (SURFACE OR FLOOR MOUNTED) SURFACE MOUNTED EQUIPMENT, TYPE AS INDICATED ON PLANS O. CONTRACTOR MAY WIRE SO FIRST GFI OUTLET PROTECTS ALL DOWN STREAM OUTLETS. DISCONNECT SWITCH, SIZE AND TYPE AS NOTED, TOP MOUNTED 5'-0" AFF

P. WHERE THE DRAWINGS INDICATE DEDICATED CIRCUITRY WITH NO SHARED NEUTRALS, THE CONTRACTOR SHALL NOT INSTALL MULTI-WIRE BRANCH CIRCUITS WITH A COMMON

Q. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR REQUIREMENTS AND LOCATIONS. ELECTRICAL SYSTEMS SHALL BE DESIGNED TO TAKE ADVANTAGE OF UTILITY COMPANY'S REBATE PROGRAM.

GENERAL NOTES (TYPICAL ALL SHEETS)

B. REFER TO ARCHITECTURAL PLANS FOR DETAIL OF ALL CONDUIT THRU ROOF

OF ALL WIRING DEVICES BEFORE ROUGH-IN OF J-BOXES.

WHICH CIRCUITS HAVE BEEN ADDED TO OR MODIFIED.

STRUCTURE ABOVE.

NOTED OTHERWISE.

ILLUMINATION PER IBC 1006.1.

FIRE RATED ASSEMBLES.

HORIZONTAL DISTANCE OF NOT LESS THAN 24".

OTHER LOADS.

A. REFER TO ARCHITECTURAL DETAILS AND ELEVATIONS FOR COORDINATION OF LOCATION

C. PROVIDE UPDATED, TYPEWRITTEN PANELBOARD DIRECTORY FOR EACH PANELBOARD

D. CONTRACTOR TO REFERENCE BRANCH CIRCUIT COPPER CONDUCTOR AND CONDUIT SIZING CHART FOR SIZING OF BRANCH CIRCUITS AND OR FEEDERS AT OR BELOW

E. SUPPORT ALL LIGHT FIXTURES WITH A MINIMUM OF (4) 12 GA. HANGER WIRES TO

G. DISCONNECTS FOR MECHANICAL EQUIPMENT ARE PROVIDED BY OTHERS. UNLESS

H. THE FOLLOWING FACTORS SHALL BE USED TO DETERMINE PANELBOARD CAPACITY:

I. LIGHTING INDICATED ABOVE EXIT DISCHARGE DOOR IS FOR MEANS OF EGRESS

J. CONDUIT SHALL BE USED FOR CONDUCTORS WHERE REQUIRED BY N.E.C.

M. PROVIDE HOUSE KEEPING PAD FOR ALL FLOOR MOUNTED EQUIPMENT.

K. OUTLETS INSTALLED IN FIRE RATED ASSEMBLES SHALL BE SEPARATED BY A

100% LIGHTING, 100% MOTOR LOADS, 100% OF FIRST 10,000 & 50% THERE AFTER FOR ALL

F. CONNECT EXIT AND EMERGENCY LIGHTS TO HOT LEG, NOT SWITCH LEG.

FIRE STOPPING REQUIREMENTS CONTRACTOR TO PROVIDE FIRESTOPPING AT ALL FIRE RATED ASSEMBLIES MEETING THE MANUFACTURER'S FIRESTOPPING U.L. LISTED DETAILS AND INSTRUCTIONS PER LOCAL CODES AND JURISDICTIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATIONS WITH ARCHITECTURAL FIRE RATINGS ON PLANS OR AS REQUIRED.

	INVERTER: INV					
	POWER RATING (VA/W): 750 INPUT VOLTAGE (V): 277 OUTPUT VOLTAGE (V): 277					
	MANUFACTURER / MODEL: MULE - CF APPROVED EQUIVALENT MYERS - I					
	LOCATION: ELECTRIC NORMAL POWER SOURCE: L-20	CAL ROOM				
CKT #	LOAD DESCRIPTION	LOAD TYPE	CB AMPS	Р	LOAD VA	NO
1	LTG - WALL PACKS	NORMALLY ON	10	1	224	
2	LTG - PATIO CANOPY	NORMALLY ON	10	1	200	
3	LTG - FRONT CANOPY	NORMALLY ON	10	1	100	
4	SPARE	NORMALLY ON	10	1		
5	SPARE	NORMALLY ON	10	1		
6	SPARE	NORMALLY ON	10	1		
		TOTA	L CONNECT	- 1	524	VA
			SPARE C	- L	226	VA
			5	SPARE %	30	%
	GENERAL: UL 924 LISTED, INPUT FUSE AND BATTERY FU FIELD SELECTABLE VOLTAGE 90 MINUTE RUNTUME STANDARD WARRANTY 3 YEA SELF TEST AND DIAGNOSTICS WALL MOUNTED CABINET MANUFACTURER STARTUP AF OUTPUT CIRCUIT BREAKERS	ARS S.				
	NOTES:					
	*REFER TO THE BRANCH CIRCUIT COPPER CONDI		ADT			

PROJECT NUMBER		
		629
PROJECT MANAGER	DRAWN BY	CHECKED BY
Approver	Author	

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NUMBER	DATE	DESCRIPTIO
0	05/01/25	ORIGINAL ISSUE
1	06/20/25	ADDENDUM 1

ELECTRICAL SCHEDULES, GEN.

		CONTROL POWER SOURCE	i. ELEC : 1-9							MODEL:	LMCP				
	SOURCE	OCH THE TOWER OCCINCE	CONTROL							WODEL	LINIOI	CONTROL		SOURCE	
#	PANEL - CKT	LOAD DESCRIPTION	SCHEDULE	LOAD TYPE	DIMMING	VOLTAGE	Р	Р	VOLTAGE	DIMMING	LOAD TYPE	SCHEDULE	LOAD DESCRIPTION	PANEL - CKT	#
1	P1-1	PWR - WEST DOOR SIGN	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	b	LTG - SITE POLES	L-1	2
3	P1-3	PWR - S. MAIN ENTRANCE SIGN	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	f	LTG - CANOPY ENTRANCE	L-3	4
5	P1-5	PWR - MONUMENT SIGN SOUTH	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	g	LTG - CANOPY PATIO	L-3	6
7	P1-7	RCPT - SMOKER CONV.	е	NORMAL	NO	120	1	1	277	0-10V	NORMAL	h	LTG - SCONCES	L-3	8
9	P1-9	RCPT - EXTERIOR CAFÉ LIGHTS	С	NORMAL	NO	120	1	1	277	0-10V	NORMAL	j	LTG - WALL PACKS	L-3	10
11	P1-13	PWR - WEST WALL SIGN	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	b	LTG - SITE POLES	L-2	12
13	P1-15	PWR - FIRE PLACE SIGN	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	b	LTG - SITE POLES	L-4	14
15	P1-17	RCPT - PATIO FANS	d	NORMAL	NO	120	1	1	277	0-10V	NORMAL	b	LTG - SITE POLES	L-6	16
17	P1-19	PWR - MONUMENT SIGN NORTH	а	NORMAL	NO	120	1	1	277	0-10V	NORMAL	b	LTG - SITE POLES	L-7	18
19	P1-10	RCPT - FRONT BUILDING CONV.	е	NORMAL	NO	120	1	1	277	NO	NORMAL	b	LTG - SITE BOLLARDS	L-8	20
21	P1-12	RCPT - NE BLDG CONV.	е	NORMAL	NO	120	1	1	277	NO	NORMAL		SPACE ONLY		22
23	P1-14	RCPT - PATIO CONV. 1	е	NORMAL	NO	120	1	1	277	NO	NORMAL		SPACE ONLY		24
												h	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mm	VB
25	P1-16	RCPT - PATIO CONV. 2	е	NORMAL	NO	120	1	1	277	NO	NORMAL	\	SPACE ONLY	}	26
27	P1-18	RCPT - PATIO CONV. 3	е	NORMAL	NO	120	1	1	277	NO	NORMAL	{	SPACE ONLY	3	28
29	P1-20	RCPT - PATIO CONV. 4	е	NORMAL	NO	120	1	1	277	NO	NORMAL	}	SPACE ONLY	}	30
31		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	}	SPACE ONLY	}	32
33		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	}	SPACE ONLY		34
35		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	\	SPACE ONLY		36
37		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	\$	SPACE ONLY	3	38
39		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	}	SPACE ONLY	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	40
41		SPACE ONLY		NORMAL	NO	120	1	1	277	NO	NORMAL	}	SPACE ONLY		42
43		SPACE ONLY		NORMAL	NO	120	1	1	277	0-10V	EMERGENCY	†	LTG - CANOPY ENTRANCE	L-3 }	44
45		SPACE ONLY		NORMAL	NO	120	1	1	277	0-10V	EMERGENCY	₹ g	LTG - CANOPY PATIO	L-3	46
4-				NORMAL	NO	120	1	1	277	0-10V	EMERGENCY	()	LTG - WALL PACKS	L-3 \(\frac{1}{2}\)	48
47		SPACE ONLY GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN	- / -	- ,			, -			- /			· · · · · · · · · · · · · · · · · · ·		
47	F NOTES: \		MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P OCOLS AS INDICATED ATS-1 EMERGENCY (INTO EMERGENCY LI	ROGAMMING, LOC), GENERATOR SOUF	AL MANUAL ON/	, -			- /					
	F NOTES: \ F T DNTROL SCHEDULE: a	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE LOAD CONTROLLED VIA PHOTOCELL OF TO THE LOAD CONTROLLED VIA TIMECLOCK OF THE RESTRICT OF THE PROVIDE SIGNAGE	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY O INTO EMERGENCY LI OWER CIRCUITS	ROGAMMING, LOC D, GENERATOR SOUF GHTING MODE	AL MANUAL ON/	OFF OVE	ERRIDE V	VITH POSITION	INDICATION,	CLOSES CONFIRM WI				
	F NOTES: \ F DNTROL SCHEDULE: a	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTOI PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF A PROVIDE VOLTAGE BARRIER BETWEEN NORMAPC = LOAD CONTROLLED VIA PHOTOCELL ICC = LOAD CONTROLLED VIA TIMECLOCK	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY O INTO EMERGENCY LI OWER CIRCUITS	ROGAMMING, LOC D, GENERATOR SOUR GHTING MODE	AL MANUAL ON/ RCE "ON" T FIXTURES DIM	TO 30%	ERRIDE V	VITH POSITION	INDICATION, AFTER BUSINESS (CLOSES. CONFIRM WI				
	NOTES: \ NOTES: \ F T DNTROL SCHEDULE: a	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE LOAD CONTROLLED VIA PHOTOCELL OF THE LOAD CONTROLLED VIA TIMECLOCK 1. EXTERIOR - SIGNAGE 2. EXTERIOR - SITE LIGHTING	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY O INTO EMERGENCY LI OWER CIRCUITS TC/PC TC/PC, PROGRAM C	ROGAMMING, LOC D, GENERATOR SOUR GHTING MODE	AL MANUAL ON/ RCE "ON" T FIXTURES DIM	TO 30%	ERRIDE V	VITH POSITION	INDICATION, AFTER BUSINESS (CLOSES. CONFIRM WI				
	NOTES: \ NOTES: \ F T DNTROL SCHEDULE: a	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE LOAD CONTROLLED VIA TIMECLOCK 1. EXTERIOR - SIGNAGE 1. EXTERIOR - SITE LIGHTING 1. EXTERIOR - CAFÉ LIGHTS	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY (INTO EMERGENCY LI OWER CIRCUITS TC/PC TC/PC, PROGRAM C TC/PC, PROGRAM C	ROGAMMING, LOC D, GENERATOR SOUR GHTING MODE	AL MANUAL ON/ RCE "ON" T FIXTURES DIM	TO 30%	ERRIDE V	VITH POSITION	INDICATION, AFTER BUSINESS (CLOSES. CONFIRM WI				
	NOTES: \ NOTES: \ F T DNTROL SCHEDULE: a b c c c c c c	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMAT OF THE LOAD CONTROLLED VIA PHOTOCELL OF THE LOAD CONTROLLED VIA TIMECLOCK 1. EXTERIOR - SIGNAGE 1. EXTERIOR - SITE LIGHTING 2. EXTERIOR - CAFÉ LIGHTS 3. EXTERIOR - PATIO FANS	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY (INTO EMERGENCY LI OWER CIRCUITS TC/PC TC/PC, PROGRAM C TC/PC, PROGRAM C TC	ROGAMMING, LOC D, GENERATOR SOUF GHTING MODE SIRCUIT SUCH THA SIRCUIT SUCH THA	AL MANUAL ON/ RCE "ON" T FIXTURES DIM T FIXTURES TUF	OFF OVE TO 30% RN OFF 1	ERRIDE V OR TUR 1 HOUR A	N OFF 1 HOUR A	AFTER BUSINESS (S CLOSES.	CLOSES. CONFIRM WI				
	NOTES: \ NOTES: \ F T ONTROL SCHEDULE: a b c c c f	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE LOAD CONTROLLED VIA TIMECLOCK 1. EXTERIOR - SIGNAGE 1. EXTERIOR - SITE LIGHTING 1. EXTERIOR - CAFÉ LIGHTS 1. EXTERIOR - PATIO FANS 1. EXTERIOR - CONV.	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY (INTO EMERGENCY LI OWER CIRCUITS TC/PC TC/PC, PROGRAM C TC TC TC	ROGAMMING, LOC D, GENERATOR SOUF GHTING MODE SIRCUIT SUCH THA SIRCUIT SUCH THA	AL MANUAL ON/ RCE "ON" T FIXTURES DIM T FIXTURES TUF	TO 30% RN OFF 1	OR TUR 1 HOUR A	N OFF 1 HOUR AFTER BUSINES	AFTER BUSINESS (S CLOSES.	CLOSES. CONFIRM WI				
	NOTES: \ NOTES: \ F T DNTROL SCHEDULE: a b c c c f f	GRAPHIC DISPLAY WITH LED BACKLIGHT, BUTTON IN PROGRAMMABLE SCHEDULE PER RELAY OR CUSTON PHYSICALLY SEPARATED LOW VOLTAGE COMPARTMUL 924 LISTED EMERGENCY CONTROL BYPASS, CONFIRE ALARM SYSTEM CONTACTS TO FORCE LIGHTIN OF THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE PROVIDE VOLTAGE BARRIER BETWEEN NORMATED TO THE LOAD CONTROLLED VIA TIMECLOCK 1. EXTERIOR - SIGNAGE 1. EXTERIOR - SITE LIGHTING 1. EXTERIOR - CAFÉ LIGHTS 1. EXTERIOR - PATIO FANS 1. EXTERIOR - CONV. 1. EXTERIOR - CANOPY ENTRANCE	MIZABLE GROUPS, LC MENT, DIMMING PROT ITACTS MONITORING G CONTROL SYSTEM	CAL OR NETWORK P DCOLS AS INDICATED ATS-1 EMERGENCY (INTO EMERGENCY LI OWER CIRCUITS TC/PC TC/PC, PROGRAM CITC/PC, PROGRAM CITC TC TC TC TC/PC, PROGRAM CITC	ROGAMMING, LOC. D, GENERATOR SOUR GHTING MODE EIRCUIT SUCH THA EIRCUIT SUCH THA EIRCUIT SUCH THA EIRCUIT SUCH THA	AL MANUAL ON/ RCE "ON" T FIXTURES DIM T FIXTURES DIM T FIXTURES DIM T FIXTURES DIM	TO 30% RN OFF 1	OR TUR 1 HOUR A 1 HOUR 1 HOUR	N OFF 1 HOUR AFTER BUSINES AFTER BUSINE AFTER BUSINE	AFTER BUSINESS (S CLOSES. SS CLOSES. SS CLOSES.	CLOSES. CONFIRM WI				

* CONTROL SCHEDULES ARE FOR REFERENCE ONLY. CONFIRM CONTROL SCHEDULE FOR EACH RELAY WITH OWNER PRIOR TO PROGRAMMING. EXTERIOR LIGHTING CONTROLS SHALL BE PROGRAMMED PER IECC 2018 AS

MANFACTURER: WATTSTOPPER

YPE	MANUFACTURER MODEL #	LAMPS	WATTS VOLTS	VA	DIMMING PROTOCOL	_ DESCRIPTION	NOTES
		150	VOLIS		PROTOCOL	ALCHEDENDED LED CEDID DIE FORMED O D.C. HOLICING, WHITE DOLVECTED DOMEDED COAT, DAINTED AFTER FARRICATION	
	HE WILLIAMS	LED	22	20.7	NI/A	4' SUSPENDED LED STRIP. DIE FORMED C.R.S. HOUSING, WHITE POLYESTER POWEDER COAT. PAINTED AFTER FABRICATION.	
` ′	75-4-L50/835-VBY-2-DRV-UNV	3500K	33	36.7	N/A	Y-HANGERS WITH CHAINS.	
	(-EM/10WLP) OR EQUAL BY LITHONIA	5,000 LUMENS	120/277		N/A	E = 10 WATT EMERGENCY BATTERY CAPABLE OF 90 MINUTE RUN TIME.	
	LITHONIA	LED	10	00.0	40/	6" SQUARE DOWNLIGHT. BLACK SEMI-SPECULAR TRIM WITH BLACK FLANGE. STEEL MOUNTING/PLASTER FRAME.	
	LDN6SQ-27/15-LS6-BR-LSS-TRBL-MVOLT-GZ1	2700K	18	20.0	1%	HINGED ACCESS COVERS AND SPRING LATCHES.	
	OR EQUAL BY COOPER LIGHTING HALO	1500 LUMENS	277		0-10V	E = EMERGNCY INVERTER POWER	
С	VISUAL COMFORT	LED				17" ALUMINUM AND BRASS EXTERIOR CYLINDER WALL SCONCE WITH UP/DOWN LIGHTING.	
E)	SLOWS290-27-NB	2700K	10.6	11.8	1%	0-10V DIMMING, 2700K COLOR TEMPERATURE, 887 LUMEN OUPUT, 90 CRI.	
,		887 LUMENS	277		0-10V		
		90CRI					
ВІ	DECORATIVE LIT COLUMN/BOLLARD	LED				LED SITE DECORATIVE COLUMN OR BOLLARD LIGHT FIXTURE.	
;	SELECTED BY ARCHITECT/OWNER	4000K	30	33.3	10%	0-10V DIMMING, 4000K COLOR TEMPERATURE, 90 CRI.	
		2,000 LUMENS	277		0-10V		
		_,=====================================				CONFIRM FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.	
_1 (COOPER LIGHITNG	LED				LED SITE LIGHTING FIXTURE. TYPE T3 DISTRIBUTION.	
	PRV-XL-PA3A-740-H-T3-SA-XX	4000K	172	191.1	10%	PROVIDE WITH 20' TALL, 5" SQUARE STEEL POLE. UNITED LIGHTING STANDARDS "RPSQ-20-5-11" OR EQUAL.	
	OR EQUAL BY LITHONIA	24,621 LUMENS	277		0-10V	CONFIRM POLE WIND RATING WITH POLE MANUFACTURER PRIOR TO ORDERING.	
	5	2.,62. 262.16			0.00	CONFIRM FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.	
.2	COOPER LIGHITNG	LED				LED SITE LIGHTING FIXTURE. TYPE T4W DISTRIBUTION.	
	PRV-XL-PA3A-740-H-T4W-SA-XX	4000K	172	191.1	10%	PROVIDE WITH 20' TALL, 5" SQUARE STEEL POLE. UNITED LIGHTING STANDARDS "RPSQ-20-5-11" OR EQUAL.	
	OR EQUAL BY LITHONIA	24,325 LUMENS	277		0-10V	CONFIRM POLE WIND RATING WITH POLE MANUFACTURER PRIOR TO ORDERING.	
						CONFIRM FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.	
.3	COOPER LIGHITNG	LED				DOUBLE HEAD LED SITE LIGHTING FIXTURE. TYPE T4W DISTRIBUTION.	
	PRV-XL-PA3A-740-H-T4W-SA-XX	4000K	172	191.1	10%	PROVIDE WITH 20' TALL, 5" SQUARE STEEL POLE. UNITED LIGHTING STANDARDS "RPSQ-20-5-11" OR EQUAL.	
	OR EQUAL BY LITHONIA	24,325 LUMENS	277	10	0-10V	CONFIRM POLE WIND RATING WITH POLE MANUFACTURER PRIOR TO ORDERING.	
						CONFIRM FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.	
_4 (COOPER LIGHITNG	LED				LED SITE LIGHTING FIXTURE. TYPE 5WQ DISTRIBUTION.	
	PRV-XL-PA3A-740-H-5WQ-SA-XX	4000K	172	191.1	10%	PROVIDE WITH 20' TALL, 5" SQUARE STEEL POLE. UNITED LIGHTING STANDARDS "RPSQ-20-5-11" OR EQUAL.	
	OR EQUAL BY LITHONIA	25,453 LUMENS	277		0-10V	CONFIRM POLE WIND RATING WITH POLE MANUFACTURER PRIOR TO ORDERING.	
		20,100 202.12				CONFIRM FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.	
Χ1 I	HE WILLIAMS	LED				EXTERIOR WALL PACK. DIE CAST ALUMINUM ENCLOSURE IN DARK BRONZE POWDER COAT FINISH WITH TFT DISTRIBUTION	
	VWPH-L60/740-TFT-DBZ-CGL-DIM-UNV	3500K	49	54.4	10%	AND CLEAR GLASS LENS.	
· /	OR EQUAL BY LITHONIA	6,000 LUMENS	277	J 1	0-10V	E = EMERGNCY INVERTER POWER	
	5 245. E 51 EIII 1011111	0,000 EDIVIEI40			0-10V		
K2 I	HE WILLIAMS	LED				EXTERIOR WALL PACK. DIE CAST ALUMINUM ENCLOSURE IN DARK BRONZE POWDER COAT FINISH WITH T2 DISTRIBUTION	
(2E)	VWPH-L30/740-T2-DBZ-CGL-DIM-UNV	3500K	27	30.0	10%	AND CLEAR GLASS LENS.	
	OR EQUAL BY LITHONIA	3,000 LUMENS	277		0-10V	E = EMERGNCY INVERTER POWER	
x 1	MULE	LED				UNIVERSAL MOUNT INJECTION MOLDED, UV-STABLE THERMOPLASTIC, IMPACT, SCRATCH, FADE, AND CORROSION	
	MX-B-R-U		5	5.6	N/A	RESISTANT UNIBODY HOUSING. WHITE FINISH WITH RED LETTERING. FACES AND DIRECTIONS PER PLAN WITH TOOL-LESS,	
	WIX-D-IX-O		120/277	3.0	N/A	SNAP-IN DESIGN. BATTERY BACK UP.	
	MULE	N/A				750 VA/W EMERGENCY LIGHTING INVERTER SYSTEM. (3) 10 AMP CIRCUIT BREAKERS. UL 924.	
-	CEPS-M-4-W-1-B-10-03		5	5.6	N/A		
			277		N/A		

SPECIFIC NOTES:

THE LIGHTING DESIGN FOR THIS PROJECT IS BASED UPON THE MANUFACTURERS SPECIFIED. IF AN ADDITIONAL SUBSTITUTION IS DESIRED BY THE CONTRACTOR, A SUBSTITUTION REQUEST SUBMITTAL MUST BE PROVIDED AS FOLLOWS: S1. SUBSTITUTION REQUEST MUST BE RECEIVED BY THE ENGINEER IN WRITING 10 DAYS PRIOR TO BID. FAILURE TO SUBMIT CONSTITUTES

A GUARANTEE TO SUPPLY THE SPECIFIED FIXTURES. S2. INFORMATION IS TO BE SUPPLIED COMPARING PHOTOMETRY, (WITH FLOOR PLANS INDICATING POINT BY POINT CALCULATIONS)

DIMENSIONS, MATERIAL COMPOSITION, FINISH, VISUAL APPEARANCE AS WELL AS THE "CONTRACTOR NET" PRICING. SAMPLES ARE TO BE PROVIDED UPON REQUEST. S3. GREAT CARE, TIME AND EXPENSE HAVE BEEN USED TO PROVIDE OUR CLIENT WITH THE LIGHTING AND CONTROLS SYSTEM. THEREFORE, FOR EACH AND EVERY TYPE OF FIXTURE OFFERED AS AN UNSOLICITED ALTERNATE, A \$500.00 FEE WILL BE CHARGED TO THE CONTRACTOR FOR REVIEW OF THE ALTERNATE FIXTURE. THIS CHARGE IS IN NO WAY A GUARANTEE OF APPROVAL, BUT IS SOLELY TO COMPENSATE

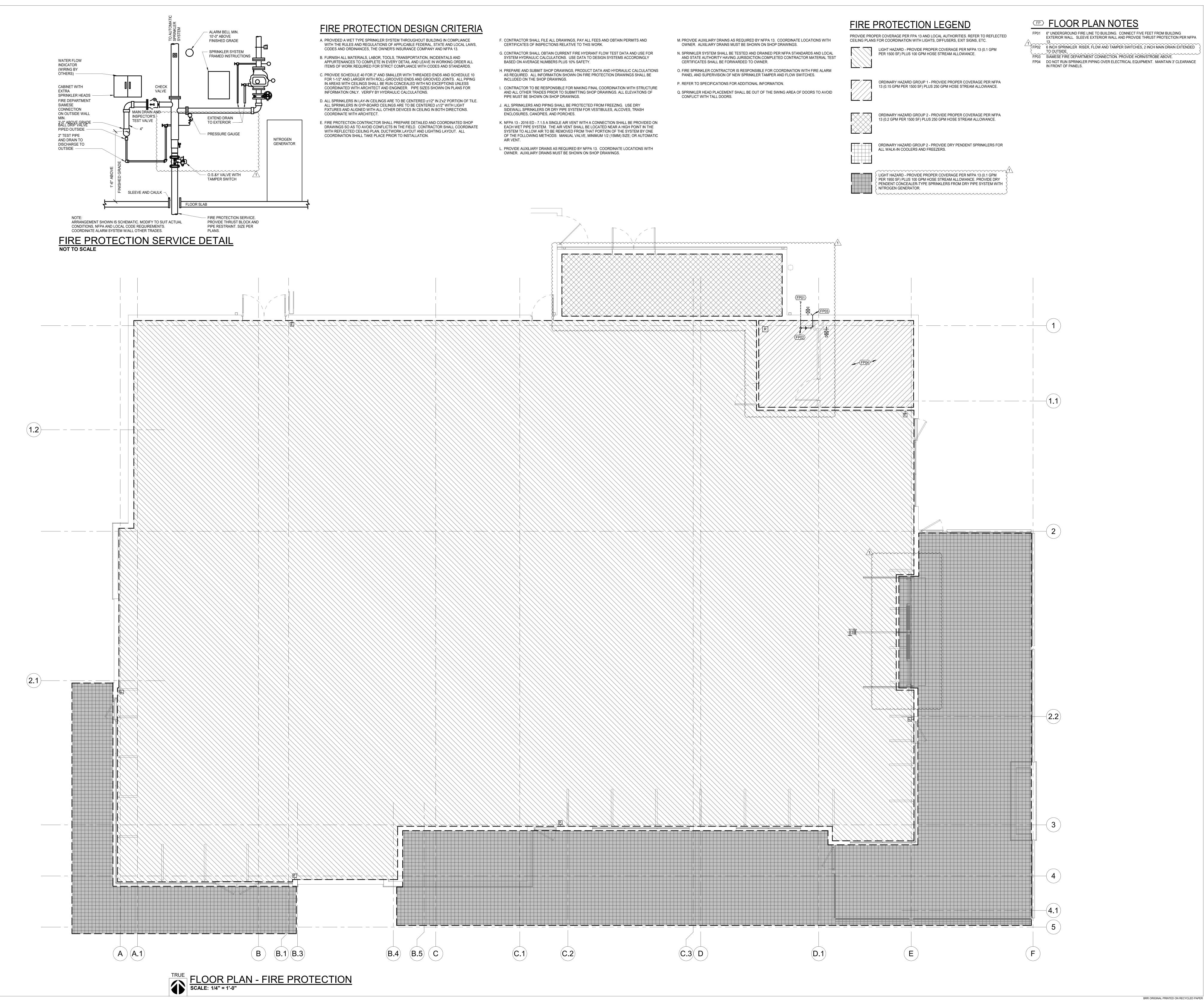
THE ENGINEER FOR TIME SPENT VALIDATING EQUALITY AND COMPATIBILITY WITH THE PROJECT REQUIREMENTS. THIS REIMBURSEMENT MUST BE RECEIVED BY THE ENGINEER PRIOR TO ANY REVIEW COMMENCING. S4. PACKAGING OF LIGHT FIXTURES WILL NOT BE CONSIDERED OR APPROVED. S5. MANUFACTURER'S REPRESENTATIVE AGENTS SHALL BE ALLOWED TO OFFER MINI-LOT PRICING FOR SPECIFIED LIGHTING FIXTURES.

G1. ELECTRICAL CONTRACTOR SHALL VERIFY CEILING TYPE PRIOR TO ORDERING ANY LIGHT FIXTURES.

LIGHTING FIXTURE SCHEDULE

S6. LIGHTING CONTROLS PRICING SHALL BE COMPLETELY SEPARATE OF ANY LIGHT FIXTURE PRICING. ANY LIGHTING CONTROLS PRICING THAT IS SUBMITTED WITH LIGHT FIXTURE PRICING (UNIT OR MINI-LOT) WILL BE IMMEDIATELY REJECTED IN ITS ENTIRETY.

G2. ELECTRICAL CONTRACTOR SHALL COORDINATE DIMMING DRIVERS/BALLASTS WITH DIMMING SWITCHES/SYSTEMS AND SHALL INCLUDE ALL REQUIRED CONTROL WIRING.



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FLOOR PLAN - FIRE PROTECTION

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