Milnet Architectural Services, PLLC

ADDENDUM NUMBER: #2 - 190515 **Date: May 15, 2019**

Project Name: Fire Station #5 Milnet Project No.: 219003

Date: May 14, 2019

Bid Date: May 20, 2019

Architect: Milnet Architectural Services
608 S. 12th St.
McAllen, TX 78501

NOTICE TO ALL BIDDERS

This Addendum forms a part of the Contract Document and modifies the original Drawings issued for bid, to the extent noted herein.

Careful note of this Addendum shall be taken by all parties of interest so that proper allowance is made in all computations, estimates and contracts and so that all trades affected are fully advised in the performance of work that will be required by them. Acknowledge receipt of this addendum by inserting its number and date of issue in the place provided for same in the proposal.

Items revised on the Drawings are designated by a cloud line and triangle surrounding the corresponding revision number.

This Addendum supersedes all previous Drawings, Specifications and instructions pertaining to these items. It is imperative that this addendum be inserted INTO set of specifications.

2.01 CLARIFICATION: RFP submission: one original and three copies.

2.02 CLARIFICATION: Insulated Roof Panels to be installed only by manufacturer's approved installer.

2.03 Approved insulated metal roof panels manufacturer: Spec section 07 41 13 – PART 2 – 2.1 – B: Rigid Global Building. 18933 Aldine Westfield, Houston Texas, 77073. Ph 1-888-467-4443, Direct (713)550-5884. John.rodriguez@rigidbuilding.com. SR2 Standing seam roof panel. 4" panel thickness, 32 R Value, Exterior metal facing 22Ga., PVDF coating.

2.04 Refer to MEP Addendum

END OF ADDENDUM

SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

200 South 10th Street
Suite 901
McAllen, TX 78501
v 956.683.1640

Addendum

DATE
5/14/2019

ADDENDUM NO.
2

PROJECT 198001.000| Edinburg Fire Station No. 5

The work described herein shall be added to the scope of work defined by the contract documents or it shall modify the scope of work defined by the contract documents as described. This work shall become a part of the contract documents by addendum.

SPECIFICATIONS

Item 01 **Specification Section 26 32 00 – Diesel Engine Driven Standby Engine Generating System**

A. Replace specification with updated/revised specification section.

DRAWINGS

Item 02 **Sheet MEP2.2 – Roof Plan**

A. Omit flue vent through roof.
B. Disregard keyed note 1.

Item 03 **Sheet M2.1 – Mechanical Floor Plan**

A. Replace gas unit heaters in Garage 115 with electric unit heaters. Revised keyed note 9. Refer to M2.1 and M5.0for new schedule.
B. Omit flue vent through roof.

Item 04 **Sheet M5.0 – Mechanical Schedules**

A. **R**evised gas unit heater schedule to electric unit heaters. Typ. Of 4 in Garage 115.

Item 05 **Sheet E4.1 – Electrical One-Line Diagram**

A. Main disconnect switch, transfer switch and panel MDP shall be upsized to 800 amp.
B. Emergency generator shall be upsized to 230kw.
C. All associated conduit and wiring shall be resized as shown on attached drawing.

Item 06 **Sheet E5.1 – Electrical Schedules**

A. Provide new 60A/3P breaker in panel LB for new electric range.
B. Provide new 20A/2P breaker in panel LD for airvac 6.
C. Panel MDP shall be 800 amp.
D. Provide four new 60A/3P breakers in panel MDP for electric unit heaters.

Addendum No.

Item 07 **Sheet EP2.1 – Level 1 Power Plan**

A. Provide four new 60A/3P disconnect switches for electric unit heaters in vehicle bay.
B. Provide new 208V/3P outlet for electric range in kitchen. Coordinate Nema configuration of receptacle with furnished equipment.
C. Provide disconnect switch and circuit to airvac 6.

Item 08 **Sheet P2.1 – Plumbing First Floor Plan**

A. Natural gas system deleted completely.

Item 09 **Sheet P5.3 – Plumbing Risers**

A. Natural gas system deleted completely.

END OF ADDENDUM

SECTION 26 32 00

DIESEL ENGINE DRIVEN STANDBY

ENGINE GENERATING SYSTEM

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. SCOPE

1. Provide a standby electric generating system manufactured by Cummins rated for continuous standby service at 230 kW, 288 kVA at 0.8 power factor, 3-phase, 208Y/120 VAC, 60 cycle. The system shall be a package of new and current equipment consisting of:

   a. A diesel engine driven electric set installed outdoors to provide emergency electric power.

   b. Automatic transfer switch(es) to provide automatic starting and stopping of the plant and switching of the load for separate transfer switch section.

   c. Mounted accessories as specified.

   d. Control wiring.

   e. Alternator oversized as shown.

1.02 PERMITS, TEST INSPECTIONS

A. This system shall be completely built, tested and shipped by a manufacturer who has been regularly engaged in the production of such equipment for the past ten years and who has parts and service facilities locally available so there is one source of supply and responsibility. The performance of the electric plant shall be certified by an independent testing laboratory as to the plant's full power rating and voltage and frequency regulation. The complete system shall bear a seal showing that it is prototype test supported.

1.03 REQUIREMENTS

A. Level 1 applications are legally-required emergency systems.

B. The electric generating system must meet all requirements of NFPA 110 - latest edition including design specification, prototype tests, one-step full-load pickup, and installation acceptance. Engine-generator system to provide source of power for Level 1 applications.

1.04 STANDARDS

A. Equipment shall meet the latest versions of the following codes:

1. N.E.C.
2. NFPA 101, 110, 37, 99, 30
3. IEEE - 446, 587
4. NEMA - MG1, ICS
5. ANSI
6. UL – 1008

7. MIL-STD 461 C – Part 9, IEC 801.2, IEC 801.3, IEC 801.5, IEC 1000-4-2,3,6 – RFI and EMI Performance.

8. UL 2200

1.05 SUBMITTALS

A. Shop drawings shall include but not be limited to:

1. Catalog cut sheets with all equipment, fuel tank, accessories and devices including all ratings.

2. Interconnection wiring diagrams.

3. Complete bill of materials.

4. Certified performance tests.

B. Operation and Maintenance Data

1. Submit under provisions of Division One.

2. Furnish three copies of the manuals and books listed below in substantial three-ring binders for each unit:

a. Operating Instructions: Describe and illustrate all switchgear controls and indicators and engine and general controls. Include instructions for operating transfer switch equipment under normal and emergency conditions when engine generator is running.

b. Parts Books: Illustrate and list all assemblies, subassemblies and components, except standard fastening hardware (nuts, bolts, washers, etc.).

c. Preventative Maintenance Instructions: Describe the daily, weekly, monthly biannual and annual maintenance requirements and include a complete lubrication chart.

d. Routine Test Procedures: Describe procedure for engine, radiator, all electronic and electrical circuits, and the generator.

e. Troubleshooting Chart: Describe and list all troubles, probable causes, and suggested remedies.

f. Recommended Spare Parts List: List all consumables anticipated to be required during routing maintenance and testing. List special tools, maintenance materials and replacement parts.

g. Wiring Diagrams and Schematics: Show function of all electrical components.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division One.

B. Accept unit on site on skids. Inspect for damage.

C. Protect equipment from dirt and moisture by securely wrapping in heavy plastic.

1.07 ACCEPTABLE MANUFACTURERS

A. Provide products complying with these specifications and produced by one of the following:

1. Generator Manufacturers

a. Caterpillar

b. Cummins

2. Engines
    a. Cummins
    b. Caterpillar
3. Generators
    a. IEC – Baylor
    b. Kato
    c. Marathon
    d. Cummins Power Generation/Onan
4. Automatic Transfer Switches
    a. ASCO
    b. Russelectric
    c. Cummins Power Generation/Onan
    d. GE/Zenith

1.08 ACCEPTABLE SUPPLIERS

A. All equipment provided shall be supplied by an authorized distributor of the manufacturer who has been continuously engaged in the distribution of industrial grade Power System products for a minimum of 15 years. The supplier shall provide initial start-up services, conduct field acceptance testing, and warranty service. The supplier be authorized to perform warranty service on all products provided.

B. Within 50 mile of the job site, the supplier shall maintain; a minimum of 6 factory trained and qualified field technicians; a proper supply of spare parts for the supplied equipment; a shop with overhaul capabilities; and be able to provide 24 hour, 7 day per week, 365 day per year field service capability.

PART 2 - PRODUCTS

2.01 ENGINE

A. The engine shall be radiator cooled, diesel fueled, 4 cycle, 6 cylinder. It shall have a total piston displacement of not less than 543 cubic inches and develop not less than 464 brake horsepower at its operating speed. A radiator air discharge duct flange shall be provided for a connecting duct to allow all heated air and gases to be discharged out of the building or enclosure through one opening. The radiator cooling system shall be rated at 54 degrees C. ambient against an external restriction of 0.5 inch water column. Engine cooling air requirements shall not exceed 21,000 CFM.

B. The engine shall be of 1-piece cast alloy iron construction with cast alloy iron heads. Valves shall be overhead and free to rotate. Valves shall be hard chrome-cobalt alloy faced with replaceable valve seat inserts of solid chrome-cobalt alloy. The crankshaft shall be forged steel. main bearings between all cylinders. The connecting rods shall be forged steel with connecting rod bearings. Fuel injection system with automatic fuel shut-off, automatic positive head maintained on injectors, and a reusable air element air cleaner; mechanical fuel transfer pump with filters. Provide full-flow, replaceable, oil filter with bypass; oil pressure gauge shall be included.

C. 120/240 VAC thermostatically controlled water jacket heater system 1500 watts shall be provided. Contractor shall install normal power to the heater.

D. Provide the following safety shutdown fault devices:

    1. Low oil pressure

2. Over-speed

3. Over-crank

High temperature (with low water level)

E. Provide the following alarms:

1. Low engine temperature (indicating jacket heater malfunction)
2. Marginally high engine temperature
3. Marginally low oil pressure
4. Low fuel
5. Flashing for control switch in "Stop" position.

The engine shall be equipped with adjustable electronic governor isochronous (speed regulation 0.5 percent, no load to full load) with controls

F. Generator main circuit breaker: set-mounted and wired, UL listed, molded case type with electronic trip unit, (trip units less than 300 amp may be thermo-magnetic) rated at 400 amps, 3 pole, 48 volts. Submittals shall demonstrate that the circuit breaker provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Field circuit breakers shall not be acceptable for generator overcurrent protection. (Lugs on breaker shall match “ATS” lugs)

G. Provide 24 volt electrical system and starting shall be a 24 volt electric starter.

2.02 ALTERNATOR

A. Cummins UCDI274k.

B. The alternator shall be a single bearing revolving field type, 2/3 pitch, 4-pole and shall be completely brush less. No commutator or commutator brushes shall be allowed. The main alternator and exciter shall be vacuum impregnated. The alternator shall be directly connected to the engine through a rigid coupling to insure permanent alignment. Voltage regulation shall be within plus or minus 1% of rated voltage, from no load to full load. Voltage recovery to rated voltage after acceptance of 100% of rated load in one step shall occur within 10 seconds. Provide a permanent magnet generator (PMG) excitation system. Motor starting capability shall be a minimum of 1000 kVA. Rating for non-linear loads shall not be less than 320 kW at 0.8 power factor. The generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set. The instantaneous voltage dip shall be less than 10% of rated voltage when full load and rated power factor is applied to the alternator. Stable or study-state operation is defined as operation with terminal voltage remaining constant within plus or minus 1% of rated voltage. Temperature rise shall be within rating as defined by NEMA MG1-22.40. Radio interference reduction shall exceed requirements for general civilian or commercial applications with TIF less than 50 and waveform deviation less than 0.06 line to line.

C. Provide a 120 volt anti-condensation heater minimum (100 watts) to prevent condensation during non-operating periods. Heater shall be thermostatically controlled, or rated for continuous use for the frame. Provide normal power to the heater.

D. Overload Rating: Capable of withstanding a three phase load of 300% rated current for 10 seconds, 150% of rated current for 2 minutes and 110% rated current for 60 minutes with field set for normal rated load excitation, and capable of withstanding an overspeed of 125%.

E. Performance Criteria:

1. Waveform Deviation: Less than 5%.
2. Crest Factor: 1.41 +/- 0.07.

3. Form Factor: 1.11 +/-0.05.
4. Total Harmonic Distortion: 5%.
5. Single Harmonic Distortion: 3%.
6. Telephone Interference Factor: 50% maximum.
7. Dynamic Balance: Less than 1 mil displacement peak to peak.

F. Enclosure: NEMA MG1, open drip proof.

G. Neutral Ground: As shown on drawings.

2.03 CONTROLS AND INSTRUMENTS

A. Provide comprehensive monitoring and control system integral to the Generator Set control to guard the electrical integrity of the alternator and power system. Provide single and 3-phase fault current regulation, so that downstream protective devices have the maximum current available to quickly clear fault conditions, without subjecting the alternator to potentially catastrophic failure conditions. Include provisions to either prevent over voltage due to single phase faults, or to shut down the generator set if line to neutral voltage on any phase exceeds 115% for more than 0.5 seconds. Acceptable methods are a fully rated (100%) 600 volt Circuit Breaker, mounted in the generator enclosure, GE Programmable VersaTrip of size as indicated on drawings with handheld programmer or inherent protection provided by microprocessor-based GenSet AmpSentry protection. Submittals shall demonstrate that the protective device provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Field circuit breakers shall not be acceptable for generator overcurrent protection.

B. An instrument panel mounted on top of the alternator shall contain the following:

1. Run-stop-remote switch
2. Lighted charge rate ammeter
3. Lighted oil pressure gauge
4. Lighted coolant temperature gauge
5. Remote start-stop terminals
6. Running time meter
7. Full A.C. instrument panel (A.C. ammeter, A.C. voltage, phase selector switch, frequency meter, and voltage adjusting rheostat.) All parameters shall have a readout that is not less than 2.5% accuracy.
8. Red alarm lights shall be provided for each fault and alarm condition.
9. Two sets of spare terminals shall be provided for customer selected faults.
10. An Emergency Shutdown contact shall be provided through which customer's push button or other momentary-closing switch contacts shall shutdown the generator set engine.
11. A fault reset switch contacts shall shutdown the generator set engine.
12. A fault reset switch shall be provided to clear fault indications and allow restarting of the engine after shutdown faults.
13. The control design shall be such that the fault indication shall remain until reset. The fault indicator memory shall not be dependent on the presence of either A-C or D-C voltage and shall retain the fault status memory even through complete removal and replacement of the starting batteries.

14. A battery warning that included load testing the battery on each crank shall be provided.

15. The fault reset function shall operate only when the RUN-STOP-REMOTE switch is in the STOP position.

16. All devices for interconnection and compatibility with digital accuracy and response shall be provided. Digital panels shall comply with electromagnetic interference requirements of Minimum Standard 461C – Part 9, and IEC Standard 801.2, 801.3 and 801.4.indication of voltage level

17. Include a full wave rectified automatic digital voltage regulation system matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three-phase RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field.

18. The automatic voltage regulator shall be temperature compensated, solid-state design and include overvoltage and overexcitation protection functions. The voltage regulator shall be equipped with three phase RMS sensing. The regulator shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. Overvoltage protection shall sense the AC generator output voltage and in the event of regulator failure or loss of reference, shut down regulator output on a sustained overvoltage of one (1) second duration. Overexcitation protection shall sense regulator output and shutdown regulator output if overloads exceed ten (10) seconds in duration. Both overvoltage and overexcitation protection shutdowns shall be latched, requiring the AC generator to be stopped for reset.

19. The regulator shall include an under frequency rolloff torque-matching characteristics, which shall reduce output voltage in proportion to frequency below a threshold of 58-59 Hz). The torque-matching characteristic shall include differential rate of frequency change compensation to use maximum available engine torque and provide optimal transient load response. Regulators which use a fixed volts per hertz characteristic are not acceptable.

20. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions.

21. All analog and digital metering shall be true-RMS indicating, and shall not be disrupted by non-linear load generated waveform distortion.

22. Digital metering set shall indicate generator RMS voltage and current, frequency, output current, output kW, kW-hours, and power factor. Generator output voltage shall be available in line-to-line neutral voltages, and shall display all three phase voltages (line to neutral or line-to-line) simultaneously.

23. An under frequency sensing and protection system shall be provided which causes a shutdown of the generator set if true RMS frequency falls below 90% of rated for more than 20 seconds.

24. The control system provided shall withstand the surge voltage produced by a 70A DC battery charging alternator operating at full load when the battery bank is disconnected. The test shall be successfully completed without tripping protective circuit breakers or blowing fuse protective devices.

25. All switches, lamps and meters shall be oil-tight and dust-tight and the enclosure door shall be gasketed.

26. All switches shall be provided with fully illuminated back-lit labels and all metering shall be individually lighted to allow for easy reading of functions in a completely dark room.

27. The field connections shall be made on permanently labeled terminal blocks, which are designed and tested by the manufacturer of the generator set to be suitable for use without wire termination lugs. Provisions shall be made for future addition of DIN-rail mounted components.

28. Control panel and interconnection enclosures shall be UL508 listed as a unit assembly.

29. Communications:

    a. Alarm Relay Mode: Provide Form C alarm contacts that can be individually linked to alarm or status outputs from the generator set to external devices.

    b. Software: Provide software designed to operate on an IBM-compatible PC. Monitor and control the on-site power system either locally or from a remote location through a modem and dedicated telephone line or other communications link.

2.04 ELECTRIC PLANT MOUNTING

The plant shall be provided with shock or anti-vibration mounts with the plant. Provide Korfund LKD spring-type isolators or type EU pads. Vibration isolation may be integrally a part of the generator set to skid packaged from the set manufacturer. The plants integral base shall have forklift sockets. Battery rack shall be integral part of plant base.

2.05 ACCESSORIES

A. All accessories needed for the proper operation of each plant shall be furnished. These shall include but not limited to the following:

1. Critical rated side inlet silencers with installation attachments for mounting within the set housing, flexible exhaust connection. For sets over 500 kW mount silencer on top of set housing.

2. Belt driven battery charging alternator.

3. Lead acid starting batteries

4. Battery cables.

5. Fully automatic 10 amp battery charger 120 volt, 325 watts (Onan Series 305-0813-01).

6. Fuel/water separator.

7. Integral sub base double wall fuel storage tank size with 12 hours gallons capacity. Tank shall have 7 gauge steel walls and installed underneath the generator. The tank shall include the following features:
    a. Low level switch
    b. Low level fuel alarm
    c. Leak detection alarm
    d. Vent, drain
    e. Fuel gauge.
    f. High level switch.
    g. The tank shall be constructed of corrosion resistant steel and shall be UL 2085 listed. The equipment, as installed, shall meet all local and regional requirements for above ground integral tanks.

2.06 REMOTE ALARM ANNUNCIATOR

Onan no. 541-0814-02 shall be provided for flush mounting at inside locations remote from the generator set located by the fire alarm control panel.

2.07 AUTOMATIC TRANSFER SWITCH

A. Scope
    1. Furnish and install open transition automatic transfer switches (ATS) 4 poles, amperage, voltage and withstand current ratings as shown on the plans. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a control module interconnected to provide complete automatic operation.

B. Codes and Standards
    1. UL 1008 - Standard for Automatic Transfer Switches
    2. NFPA 70 - National Electrical Code
    3. NFPA 99 - Essential Electrical Systems for Health Care Facilities
    4. NFPA 110 - Emergency and Standby Power Systems

C. Acceptable Manufacturers
    1. Cummins Power Generation/Onan
    2. Russelectric
    3. GE/Zenith
    4. ASCO

D. Mechanically Held Transfer Switch
    1. The transfer switch unit shall be electrically operated and mechanically held. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.
    2. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction and be protected by separate arcing contacts.
    3. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance

purposes.

4. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof are not acceptable.

E. Microprocessor Control Panel

1. The control panel shall direct the operation of the transfer switch. The panel's sensing and logic shall be controlled by a built-in microprocessor.

F. Enclosure

1. The ATS shall be furnished in a NEMA type 1 enclosure.

G. Voltage and Frequency Sensing

1. The voltage of each phase of the normal source shall be monitored, with pickup adjustable from 85% to 100% of nominal and dropout adjustable from 75% to 98% of pickup setting.

2. Single-phase voltage sensing of the emergency source shall be provided, with pickup voltage adjustable from 85% to 100% of nominal and independent frequency sensing with pickup adjustable from 90% to 100% of nominal.

H. Time Delays

1. A time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Adjustable from 0 to 6 seconds.

2. A time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.

3. A time delay shall be provided on retransfer to normal, adjustable from 0 to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.

4. A time delay shall be provided on shutdown of engine generator for cool down, adjustable from 0 to 60 minutes.

I. Additional Features

1. A set of DPDT gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low-voltage engine start signal.

2. A momentary-type test switch shall be provided to simulate a normal source failure.

3. One set of auxiliary contacts, rated 10 amps, 250 VAC shall be provided.

4. Position indicating lights shall be provided.

5. An in-phase monitor or delayed transition shall be provided to allow decay of magnetic fields in transformers and motors.

J. Withstand and Closing Ratings

1. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 3 cycle, long-time ratings. ATS’s that are not tested and labeled with 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable unless the switch performance is guaranteed and UL listed for molded case circuit breakers or current limiting fuses. If current limiting fuses are utilized, provide current limiting fuses and disconnect switch mounted in or on Automatic Transfer Switch.

K. The ATS manufacturer shall maintain a national service organization of company-employed

personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

2.08 OUTDOOR WEATHER-PROTECTIVE HOUSING

A. Generator set housing shall be provided factory-assembled to generator set base and radiator cowling. Housing shall provide ample airflow for generator set operation at rated load in the ambient conditions previously specified. The housing shall have hinged side-access doors and rear control door. All doors shall be lockable. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color using a two step electro coating paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted. The painting process shall result in a coating that meets the following requirements:

1. Primer thickness, 0.5-2.0 mils. Top coat thickness, 0.8-1.2 mils.
2. Gloss, per ASTM D523-89, 80% plus or minus 5%. Gloss retention after one year shall exceed 50%.
3. Crosshatch adhesion, per ASTM D3359-93, 4B-5B.
4. Impact resistance, per ASTM D2794-93, 120-160 inch-pounds.
5. Salt spray, per ASTM B117-90, 1000+ hours.
6. Humidity, per ASTM D2247-92, 1000+ hours.
7. Water soak, per ASTM D2247-92, 1000+ hours.

B. Painting of hoses, clamps, wiring harnesses, and other non-metallic service parts shall not be acceptable. Fasteners used shall be corrosion resistant, and designed to minimize marring of the painted surface when removed for normal installation or service work.

C. A 120 VAC heater with thermostat shall be provided within the generator set control panel to eliminate condensation. Contractor shall provide 120 volt circuit from normal utility source as required.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install generator on a 6 inch high reinforced concrete housekeeping pad. Provide blackouts as required.

B. Provide all power wiring, control wiring, additional contacts and relays required for a complete installation. All conduit shall be in a two hour enclosure. Underground conduits shall be concrete encased. The wall mounted dual rate battery shall be taken off line during the starting of the generator. The generator belt driven alternator shall charge the batteries when the generator is running.

C. Install generator set and transfer switches in accordance with manufacturer's instructions.

D. Ground and bond transfer switches under provisions of Division 16.

E. Provide engraved plastic nameplates under the provisions of Section 16050.

3.02 WARRANTY

A. The complete standby electric power system, including engine-generator set equipped with set exerciser, running time meter, and automatic transfer switch, shall be warranted for a period of five years from the date of initial start-up. This shall include parts and labor. Multiple warranties for individual components (engine, alternator, controls, etc.) will not be acceptable. Satisfactory warranty documents must be provided. This warranty shall be as detailed in available written documents. In the judgement of the specifying authority, the manufacturer

supplying the warranty for the complete system must have necessary financial strength and technical expertise with all components supplied to provide adequate warranty support. All items of the engine, generator, and controls that are warranted in the first year shall be covered for the full five year term of the warranty.

B. Extensions of warranty term up to 10 years from start-up and inclusion of comprehensive terms shall be available for one year after start-up.

3.03 TESTS

A. Factory production model tests: Before shipment of the equipment, the generator sets shall be tested under rated load and power factor for performance and proper functioning of control and interfacing circuits. Testing at unity power factory only (resistance banks only) is not acceptable, since kW output is affected by the higher generator efficiency at unity power factor, and the kVAR for motor starting and regulation loads is not correlatable between unity and rated power factor. Other tests shall include:

1. Single step load pickup per NFPA 110.
2. Transient response and steady state governing.
3. Safety Shutdowns.
4. Prototype tests in accordance with NFPA 110 level 1 have been done on a complete and functional set, component level type tests will not substitute for this requirement.

The engineer shall be notified in advance of these test, and shall have the option of witnessing these tests. Certified copies of test results shall be forwarded to the engineer for review.

B. Field Test After Installation:

1. The complete installation shall be initially started and checked out for operational compliance by factory-trained representative(s) of the engine-generator set and transfer switch manufacturer. The engine lubrication oil and antifreeze, as recommended by the manufacturer for operation under environmental conditions specified shall be provided by the engine-generator set supplier.
2. Upon completion of initial start-up and system checkout, the supplier of the generator set shall perform a field test, with the engineer notified in advance, to demonstrate load carrying capability, stability, voltage, and frequency. The engineer shall be present during the field test.
3. The generator shall be run for four hours continuously with all available facilities emergency load connected to its output; in addition the generator set supplier must provide a portable load bank to supplement any existing load to enable full load testing. Generator shall be run with no load for first 1/2 hour, during first initial run for proper engine break-in. Records shall be maintained throughout this period to record water temperature, oil pressure, ambient air temperature, voltage, current, frequency, kilowatts, and power factor. The above data shall be recorded at 15 minute intervals throughout the test. [Generator set manufacturer shall confirm paralleling equipment is complete and performing properly.] There shall be a 10 minute unloaded run at the conclusion of the test to allow engine to cool before shutdown. Three copies of the field test data shall be furnished to the engineer. The contractor shall make all necessary hook-ups to accomplish field tests and shall furnish all fuel necessary for field test and start-up. The fuel oil tank shall be filled up at the completion of all testing and at the end of the project.

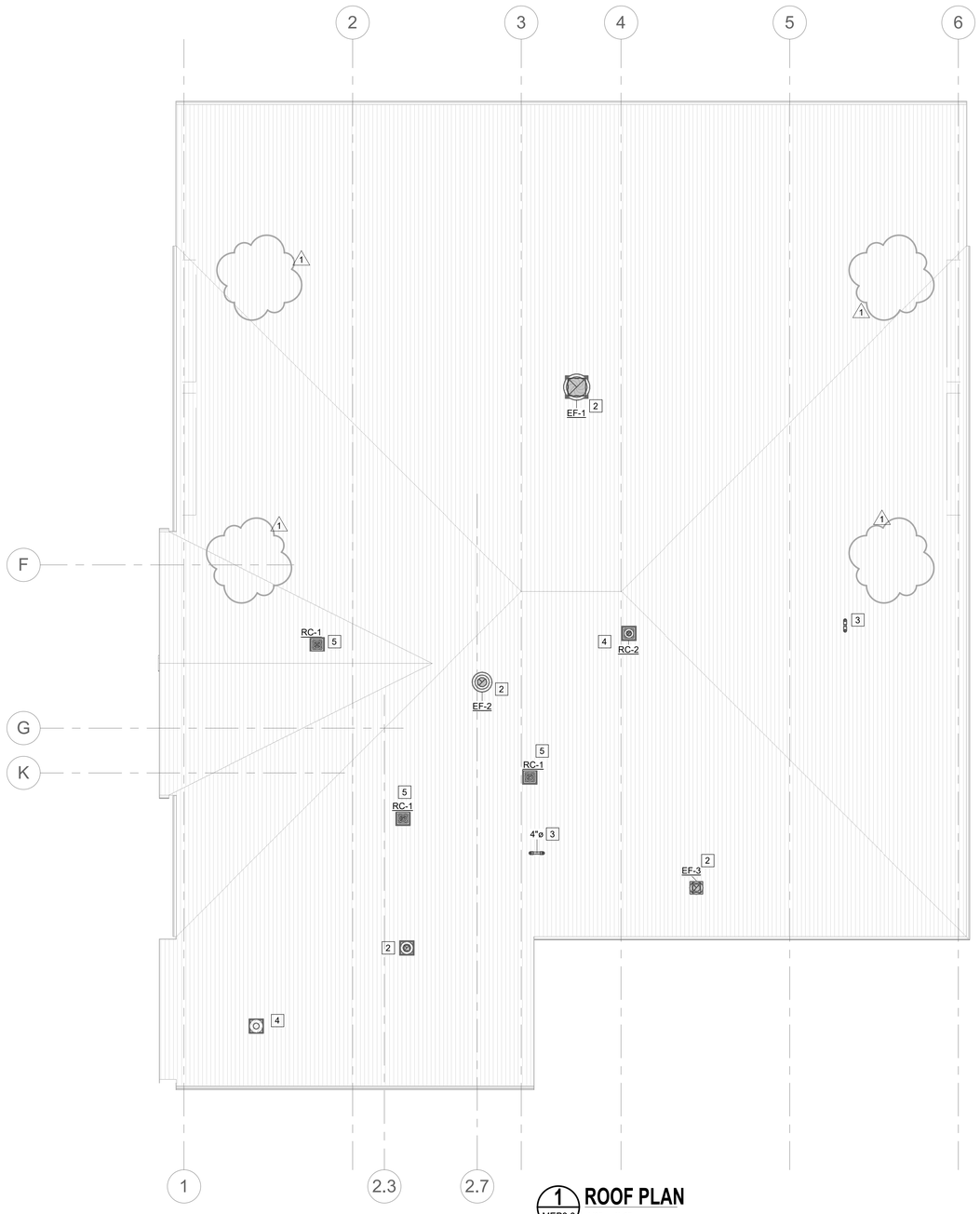
C. Training

1. Provide training designed for a minimum of four persons, to include:
2. Training in the system operation possible configurations.
3. Training in the maintenance of the system.
4. Minimum of four hours of instruction, but sufficient to cover all items specified.
5. Four sets of instruction materials.
6. Provide videotape (DVD format) of all owner training and instruction.

D. Exercising

1. Schedule for weekly non load running and monthly load running. Coordinate times with owner

END OF SECTION



1 MEP2.2 **ROOF PLAN**
1/8" = 1'-0"

GENERAL MECHANICAL NOTES - M1.0

A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF EQUIPMENT, DUCTS, AND GRILLES ETC. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT COMPLETE MECHANICAL SYSTEMS BE FURNISHED, INSTALLED, TESTED AND READY FOR OPERATION WHETHER OR NOT EVERY ITEM OF EQUIPMENT, ACCESSORY, DEVICE, ETC. IS SHOWN. REFERENCE SHALL BE MADE TO THE FULL DRAWING PACKAGE INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION AND POTENTIAL CONFLICTS. THE MECHANICAL SUBCONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICTS WITH OTHER TRADES, OR FOR PROPER EXECUTION OF THE WORK. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATING DUCTWORK.

B. DUCT DIMENSIONS INDICATED ON DRAWINGS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

C. ALL NEW A/C EQUIPMENT SHALL BE CLEANED AFTER THE FINISHING OF DRYWALL AND PRIOR TO THE RELEASE OF BUILDING TO OWNER. MECHANICAL CONTRACTOR TO PROVIDE DOCUMENTATION WITH DATE AND TIME OF UNIT CLEANING.

D. UPON THE COMPLETION OF THE MODIFICATIONS OF THE EXISTING HVAC SYSTEMS, COMPLETE TESTING, ADJUSTING, AND BALANCING OF THE AIR AND HYDRONIC SYSTEMS SHALL BE PERFORMED.

F. PROVIDE DUCT-MOUNTED SMOKE DETECTOR IN RETURN DUCT FOR ROOF TOP UNITS SUPPLYING 2000 CFM AND GREATER.

KEYED MECHANICAL NOTES - M1.0

1 NOTE NOT USED.

2 PROVIDE ROOF MOUNTED EXHAUST FANS AS SCHEDULED.

3 APPROXIMATE LOCATION FOR DRYER VENT.

4 PROVIDE ROOF CURB AND CAP FOR BUNKER EXHAUST FAN. SIMILAR TO COOK MODEL PR-8.

5 PROVIDE ROOF CURB AND CAP FOR OUTSIDE AIR INTAKE. SIMILAR TO COOK MODEL PR-12.

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DBR Project Number 198001.000

AS	MG	JB	TL	--

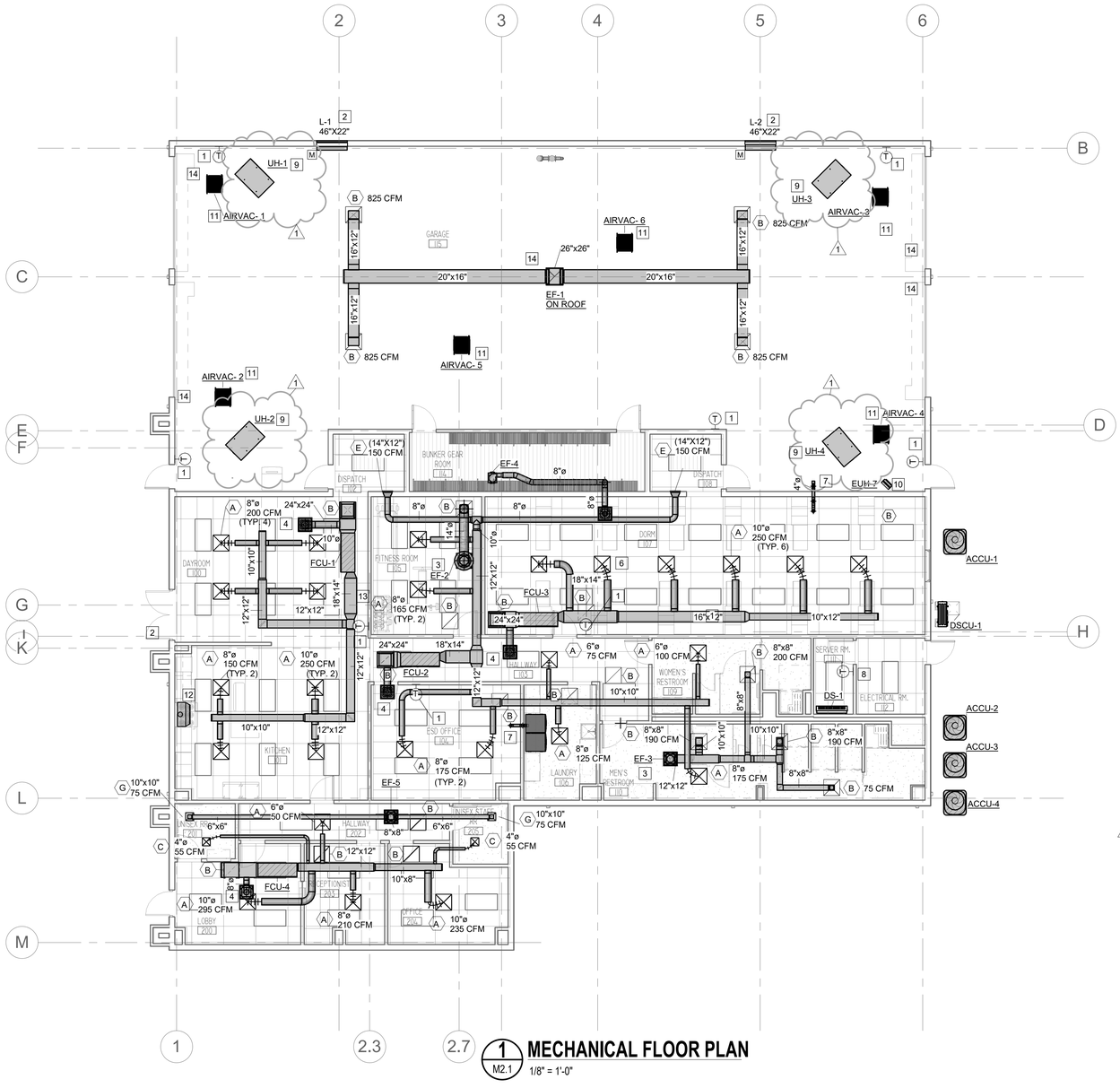
EDINBURG FIRE STATION #5
CITY OF EDINBURG
JASMAN RD & FM2812

PROJECT NUMBER
219003

DATE
FEBRUARY 28,2019

ISSUED FOR BID

SHEET
MEP2.2
OF



1 **MECHANICAL FLOOR PLAN**
M2.1
1/8" = 1'-0"

GENERAL MECHANICAL NOTES - M1.0

A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF EQUIPMENT, DUCTS, AND GRILLES ETC. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT COMPLETE MECHANICAL SYSTEMS BE FURNISHED, INSTALLED, TESTED AND READY FOR OPERATION WHETHER OR NOT EVERY ITEM OF EQUIPMENT, ACCESSORY, DEVICE, ETC. IS SHOWN. REFERENCE SHALL BE MADE TO THE FULL DRAWING PACKAGE INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION AND POTENTIAL CONFLICTS. THE MECHANICAL SUBCONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICTS WITH OTHER TRADES, OR FOR PROPER EXECUTION OF THE WORK. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATING DUCTWORK.

B. DUCT DIMENSIONS INDICATED ON DRAWINGS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

C. ALL NEW A/C EQUIPMENT SHALL BE CLEANED AFTER THE FINISHING OF DRYWALL AND PRIOR TO THE RELEASE OF BUILDING TO OWNER. MECHANICAL CONTRACTOR TO PROVIDE DOCUMENTATION WITH DATE AND TIME OF UNIT CLEANING.

D. UPON THE COMPLETION OF THE MODIFICATIONS OF THE EXISTING HVAC SYSTEMS, COMPLETE TESTING, ADJUSTING, AND BALANCING OF THE AIR AND HYDRONIC SYSTEMS SHALL BE PERFORMED.

KEYED MECHANICAL NOTES - M1.0

1 PROVIDE THERMOSTAT AND MOUNT 48" A.F.F. PROVIDE PROTECTIVE COVER. TYPICAL.

2 INSTALL LOUVER AS HIGH AS POSSIBLE. COORDINATE EXACT LOCATION WITH ARCHITECT. LOUVERS SHALL HAVE A MOTORIZED DAMPER INTERLOCKED WITH EF-1. DAMPERS SHALL OPEN WHEN FAN IS ACTIVATED. COORDINATE COLOR WITH ARCHITECT PRIOR TO INSTALLATION. REFER TO DETAIL SHEET M4.01.

3 PROVIDE ROOF MOUNTED EXHAUST FANS AS SCHEDULED. COORDINATE ROOF CURB WITH TYPE AND PITCH PRIOR TO ORDERING AND INSTALLATION. REFER TO DETAILS

4 PROVIDE 10" OUTSIDE AIR DUCT FROM ROOF CAP. CONNECT DUCT TO RETURN DUCT. PROVIDE OBD AND MOTORIZED DAMPER INTERLOCKED WITH UNIT.

5 PROVIDE DUCTLESS SPLIT SYSTEM AS ON SCHEDULE. INDOOR UNIT SHALL BE MOUNTED ON WALL WHERE INDICATED AS HIGH AS POSSIBLE. ROUTE REFRIGERANT PIPING CONCEALED ABOVE CEILING THROUGH THE ROOF WHERE THE CONDENSING UNIT IS MOUNTED. CONTRACTOR SHALL VERIFY EXACT REFRIGERANT PIPE ROUTING PRIOR TO ORDERING. PROVIDE 3/4" CONDENSATE DRAIN PIPE FROM INDOOR UNIT TO ADJACENT ROOM. PIPE SHALL BE ROUTE IN A NEAT AN DIRECT MANOR, FASTENED TO WALL TERMINATE 3/4" DRAIN 6" ABOVE TOP OF MOP SINK. VERIFY EXACT LOCATION OF MOP SINK.

6 FOR ALL SPIRAL DUCT, GRILLES SHALL BE POINTING DOWN FROM HORIZONTAL POSITION 45 DEGREES. SPIRAL DUCT SHALL BE MOUNTED TIGHT TO STRUCTURE. SPIRAL DUCT SHALL BE PREP FOR PAINTING. COORDINATE DUCT COLOR WITH ARCHITECT.

7 ROUTE 4" DRYER VENT FROM DRYER UP THROUGH WALL THROUGH ROOF. CONTRACTOR SHALL VERIFY DRYER VENT SIZE WITH DRYER MANUFACTURER PRIOR TO PURCHASE/INSTALLATION. RE: DETAIL SHEET M4.01.

8 PROVIDE STAND ALONE HVAC CONTROLS PANELS. COORDINATE WITH ELECTRICAL AND CONTROLS CONTRACTOR PRIOR TO INSTALLATION.

1 9 INSTALL ELECTRIC UNIT HEATERS AS HIGH AS POSSIBLE AND AT A SLIGHT ANGLE DOWNWARD. HEATERS SHALL BE CONNECTED TO TSTATS WHICH WILL CONTROL WHEN THEY ARE ACTIVATED. TYPICAL FOR BAY.

10 INSTALL ELECTRIC UNIT HEATER IN RISER ROOM AND INTERLOCK WITH TSTAT FOR FREEZE PROTECTION.

11 PROVIDE AIRVAC911 SYSTEMS (QTY.6) AND INSTALL AS PER MANUFACTURES RECOMMENDATIONS. UNITS SHALL BE MODEL AIRVAC 911 EXHAUST REMOVAL SYSTEM WITH FILTER PACK, FILTER GAUGE, AVEC-8C/T3 CONTROL PANEL, ACTIVATION PACKAGE AND PRE FILTERS. COORDINATE FINAL LOCATION OF CONTROL PANEL WITH OWNER/ARCHITECT. CONTACT AIR VACUUM CORPORATION AT 1-800-540-7264 .

12 PROVIDE KITCHEN HOOD BY DENLAR FIRE PROTECTION HOOD MODEL D1036-I. 36" STAINLESS STEEL HOOD WITH FIRE SUPPRESSION SYSTEM AND INLINE FAN WITH ROOF CAP. INTERLOCK TO FACP AND FIRE SUPPRESSION SYSTEM SHALL BE PREINSTALLED WITH ALL CUTOFF/SHUT OFF VALUES. CONTACT TEXAS AIR PRODUCT AT 1-800-580-8100.

13 RETURN AND EXHAUST DUCTS SHALL HAVE AN ELBOW AND THE OPENINGS SHALL BE COVERED IN MECHANICAL MESH. SIZES ON PLAN. KEEP DUCTWORK IN STRUCTURE AND NOT BELOW.

14 EXHAUST FAN EF-1 SHALL BE INTERLOCKED WITH CARBON MONOXIDE SENSORS TO ACTIVATE EXHAUST FAN. FAN SHALL HAVE A MOTOR CONTROLLER/STARTER. COORDINATE EXACT LOCATION WHERE SENSOR SHALL BE INSTALLED AND THE MOTOR STARTER WITH OWNER AND ARCHITECT.

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AIR DEVICE SCHEDULE

MARK	MANUFACTURER/MODEL	TYPE	NC	REMARKS
A	TITUS/TMS-AA	24"X24" SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
B	TITUS/50F	24"X24" EGGCRATE RETURN	20	ALUMINUM CONSTRUCTION.EXHAUST GRILLES TO HAVE OBD'S.
C	TITUS/TMS	12"X12" SUPPLY	25	STEEL CONSTRUCTON. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
D	TITUS/350FL	RETURN/EXHAUST GRILLES	25	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE OBD'S.
E	TITUS/300FS	SIDEWALL SUPPLY	25	ALUMINUM CONTRUCTION.
F	TITUS/TMR-AA	ROUND CONE DIFFUSER	25	ALUMINUM CONSTRUCTION. SIZE ON PLAN
G	TITUS/50F	12"X12" EGGCRATE RETURN/EXHAUST	20	ALUMINUM CONSTRUCTION.EXHAUST GRILLES TO HAVE OBD'S.

NOTES:
1. PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.
2. PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLES FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK, AND STRUCTURAL MEMBERS.
3. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.
4. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE. FOR ROUND NECK DIFFUSERS:
   6" DIA: 0-120 CFM
   8" DIA: 125-220 CFM
   10" DIA: 225-380 CFM
   12" DIA: 385-600 CFM

ELECTRIC UNIT HEATER SCHEDULE

MARK	UH-1	UH-2	UH-3	UH-4
SERVES	BAY	BAY	BAY	BAY
CFM	800	800	800	800
KW / STAGES	15/1	15/1	15/1	15/1
VOLTS/PHASE/HERTZ	208/3/60	208/3/60	208/3/60	208/3/60
MCA	41.7	41.7	41.7	41.7
MANUFACTURER	REZNOR	REZNOR	REZNOR	REZNOR
MODEL NO.	F3FUH15CO3	F3FUH15CO3	F3FUH15CO3	F3FUH15CO3
NOTES	1	1	1	1

NOTES:
1. PROVIDE WITH SUMMER FAN SWITCH, DISCONNECT SWITCH, BUILT-IN THERMOSTAT, WALL/CEILING SUSPENSION KIT.

ENGINE EXHAUST REMOVAL SCHEDULE

MARK	AIRVAC - 1	AIRVAC - 2	AIRVAC - 3	AIRVAC - 4	AIRVAC - 5	AIRVAC - 6
SERVES	BAY	BAY	BAY	BAY	BAY	BAY
HP	3/4	3/4	3/4	3/4	3/4	3/4
VOLTS/PHASE/HERTZ	208/1/60	208/1/60	208/1/60	208/1/60	208/1/60	208/1/60
AMPS	13 FL	13 FL	13 FL	13 FL	13 FL	13 FL
MANUFACTURER	AIRVAC	AIRVAC	AIRVAC	AIRVAC	AIRVAC	AIRVAC
SIZE (LXWXH)	26"X25"X35"	26"X25"X35"	26"X25"X35"	26"X25"X35"	26"X25"X35"	26"X25"X35"
WEIGHT (LBS)	196	196	196	196	196	196
MODEL NUMBER	AIRVAC 911	AIRVAC 911	AIRVAC 911	AIRVAC 911	AIRVAC 911	AIRVAC 911
NOTES	1	1	1	1	1	1

NOTES:
1. PROVIDE 4-STAGE FILTER PACK, FILTER GAUGE, CONTROL PANEL ACTIVATION PACKAGE WITH PHOTO EYE SET AND TRACK MOUNTED DOOR SWITCHES AND 12 EXTRA FILTERS.

DUCTLESS SPLIT SYSTEM SCHEDULE

INDOOR UNIT	MARK	DS-1	
	SERVES	IDF ROOM	
	TYPE	HIGH WALL	
	AIRFLOW (CFM)	750	
	TOTAL COOLING (MBH)	36	
	HEATING (KW)	-	
	VOLTS/PHASE/HERTZ	208-230 / 1 / 60	
	MCA	1	
	MOCP	15	
	MANUFACTURER	MITSHIBISHI	
	MODEL NUMBER	PKA-A36	
OUTDOOR UNIT	MARK	DSCU-1	
	VOLTS/PHASE/HERTZ	208-230 / 1 / 60	
	MCA	25	
	MOCP	40	
	MANUFACTURER	MITSHIBISHI	
	MODEL NUMBER	PUY-36	
NOTES:		1, 2, 3, 4	

NOTES:
1. PROVIDE REFRIGERANT PIPING IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.
2. PROVIDE FULL SIZE CONDENSATE DRAIN TO NEAREST FLOOR DRAIN
3. PROVIDE WALL MOUNTED THERMOSTAT.
4. PROVIDE CONDENSATE PUMP.

ELECTRIC UNIT HEATER SCHEDULE

MARK	EUH-7	
SERVES	RISER RM	
CFM	350	
KW / STAGES	3.3 / 1	
VOLTS/PHASE/HERTZ	208/1/60	
MCA/MOCP	--/40	
MANUFACTURER	REZNOR	
MODEL NO.	EGEB	
NOTES	1	

NOTES:
1. SHALL INCLUDE FUSED CONTROL CIRCUIT, MANUAL RESET HIGH LIMIT, "FAN ONLY" SWITCH, AND WALL BRACKET AND WALL MOUNTED TSTAT.

LOUVER SCHEDULE

MARK	L-1	L-2
SERVICE	BAY	BAY
SIZE (WIDTH X HEIGHT)	42 X 22	42 X 22
CFM	1,150	1,150
MAX. FREE AREA VELOCITY (FPM)	850	850
MIN. FREE AREA (S.F.)	2.35	2.35
MAX. P.D. (IN. W.G.)	0.15	0.15
MANUFACTURER	RUSKIN	RUSKIN
MODEL NO.	EME420DD	EME420DD
NOTES	ALL	ALL

NOTES
1. WITH BIRD SCREEN
2. PERFORMANCE OF LOUVER SHALL BE VERIFIED BY AMCA PUBLICATION 511.
3. WIND DRIVEN RAIN RESISTANT LOUVER: 100% EFFECTIVE FOR 3 IN/HR RAIN WITH 29 MPH WIND.
4. COLOR BY ARCHITECT.
5. PROVIDE MOTORIZED DAMPER INTERLOCKED WITH EF-1 IN BAY. MORTORIZED DAMPERS SHALL OPEN WHEN EF-1 IS ACTIVATED.

GRAVITY HOOD SCHEDULE

MARK	IH-1	IH-2	IH-3	RH-1
SERVES	O.A	O.A	O.A	RELIEF
CFM	350	190	200	700
MAX. P.D. (IN. W.G.)	0.05	0.05	0.05	0.05
INTAKE/RELIEF	INTAKE	INTAKE	INTAKE	RELIEF
THROAT SIZE (IN.)	12"	12"	12"	16"
MANUFACTURER	COOK	COOK	COOK	COOK
MODEL NO.	PR-12	PR-12	PR-12	PR-16
NOTES	1	1	1	1, 2

NOTES:
1. PROVIDE ROOF CURB.
2. PROVIDE BAROMETRIC DAMPER SIMILAR TO RUSKIN CBD6 SET AT 0.05 IN. WG; 0.125" EXTRUDED AL FRAME; 0.070" BLADES W/ VINYL EDGE SEALS.

DX SPLIT SYSTEM SCHEDULE (ELECTRIC HEAT)

			FCU-1	FCU-2	FCU-3	FCU-4
INDOOR UNIT	GENERAL	MARK				
		SUPPLY AIR (CFM)	1,500	1,550	1,500	900
		OUTSIDE AIR (CFM)	350	190	200	105
		EXT. SP. (IN W.G.)	0.7	0.7	0.7	0.7
		FAN MOTOR HORSEPOWER	1	1	1	0.5
		BELT/DIRECT DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
	COOLING COIL	TOTAL COOLING (MBH)	56.7	56.7	56.7	33.4
		SENSIBLE COOLING (MBH)	46.0	46.0	46.0	28.9
		ENTERING AIR TEMP. DB/WB (F)	80/64.8	80/64.8	80/64.8	83/65
		LEAVING AIR TEMP. DB/WB (F)	55.8/54.4	55.8/54.4	55.8/54.4	52.4/51.8
	HEATING	TOTAL HEATING (KW) / STAGES	12.5/1	12.5/1	12.5/1	8/1
		ENTERING AIR TEMP. DB (F)	68	68	68	64
		LEAVING AIR TEMP. DB (F)	86.6	86.6	86.6	85
	ELECTRIC	VOLTS/PHASE/HERTZ	208/1	208/1	208/1	208/1
		MCA	66	66	66	41
		MOCP	70	70	70	45
	BASIS	MANUFACTURER	LENNOX	LENNOX	LENNOX	LENNOX
		MODEL	CBA27UHE-060-230	CBA27UHE-060-230	CBA27UHE-060-230	CBA27UHE-036-230
		NOMINAL TONS	5	5	5	3
		WEIGHT (LBS)	199	199	199	150
		NOTES	4, 5, 7	4, 5, 7	4, 5, 7	4, 5, 7
CONDENSING UNIT	GENERAL	MARK	ACCU-1	ACCU-2	ACCU-3	ACCU-4
		STEPS OF CAPACITY	2	2	2	2
		SEER/EER (ARI)	15.1	15.1	15.1	15
		AMBIENT AIR	100	100	100	100
	ELECTRIC	VOLTS/PHASE/HERTZ	208/1	208/1	208/1	208/1
		MCA	35.7	35.7	35.7	20.8
		MOCP	50	50	50	30
	BASIS	MANUFACTURER	LENNOX	LENNOX	LENNOX	LENNOX
		MODEL	16ACX-060-230	16ACX-060-230	16ACX-060-230	16ACX-036-230
		NOMINAL TONS	5	5	5	3
		WEIGHT (LBS)	280	280	280	243
		NOTES	1, 2, 3, 6	1, 2, 3, 6	1, 2, 3,6	1, 2, 3,6

NOTES:
1. PROVIDE CONDENSER COIL HAIL GUARDS.
2. PROVIDE LOW AMBIENT CONTROL TO 30F.
3. PROVIDE REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.
5. PROVIDE FACTORY TSTAT WITH HUMIDITY RELAY KIT FOR IMPROVED HUMIDITY CONTROL.
6. PROVIDE FACTORY APPROVED CONDENSER COATING PROVIDING 5,000 HOUR SALT SPRAY RESISTANCE PER ASTM B117-90.
7. PROVIDE SECONDARY DRAIN PAN WITH FLOAT SWITCH.

FAN SCHEDULE

MARK	EF-1	EF-2	EF-3	EF-4	EF-5
SERVES	GARAGE	FITNESS	LOCKER RM	UNIFORM RM	UNISEX RR'S
CFM	3,300	150	600	200	150
E.S.P. (IN W.G.)	0.5	0.375	0.375	0.375	0.375
TYPE	ROOF	ROOF	ROOF	CEILING	ROOF
DIRECT/BELT DRIVE	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT
FAN RPM	1,075	1,550	1,550	1,400	1,550
MOTOR HORSEPOWER	3/4	1/8	1/8	168 W	1/8
VOLTS/PHASE/HERTZ	120/1/60	120/1/60	120/1/60	120/1/60	120/1/60
WEIGHT	155	51	54	17	51
MANUFACTURER	COOK	COOK	COOK	COOK	COOK
MODEL NO.	ACE-D	ACE-D	ACE-D	GC-182	ACE-D
NOTES	1, 2, 3	1, 2	1, 2	1	1, 2

NOTES:
1. PROVIDE WITH SPEED CONTROLLER, FACTORY MOUNTED DISCONNECT, AND BACKDRAFT DAMPER.
2. PROVIDE ROOF CURB FOR TYPE AND SLOPE OF ROOF. COORDINATE WARRANTY ISSUES WITH ROOFING CONTRACTOR.
3. INTERLOCK EXHAUST FAN WITH CARBON MONOXIDE SENSOR. INTERLOCK WITH MOTORIZED DAMPER ON LOUVERS TO OPEN WHEN FAN IS ACTIVATED. PROVIDE MOTOR SPEED CONTROL. EXHAUST FAN SHALL ENERGIZE WHEN CARBON MONOXIDE DETECTS A CONCENTRATION OF 50 PPM.

1 M5.0 MECHANICAL SCHEDULES
NOT TO SCALE

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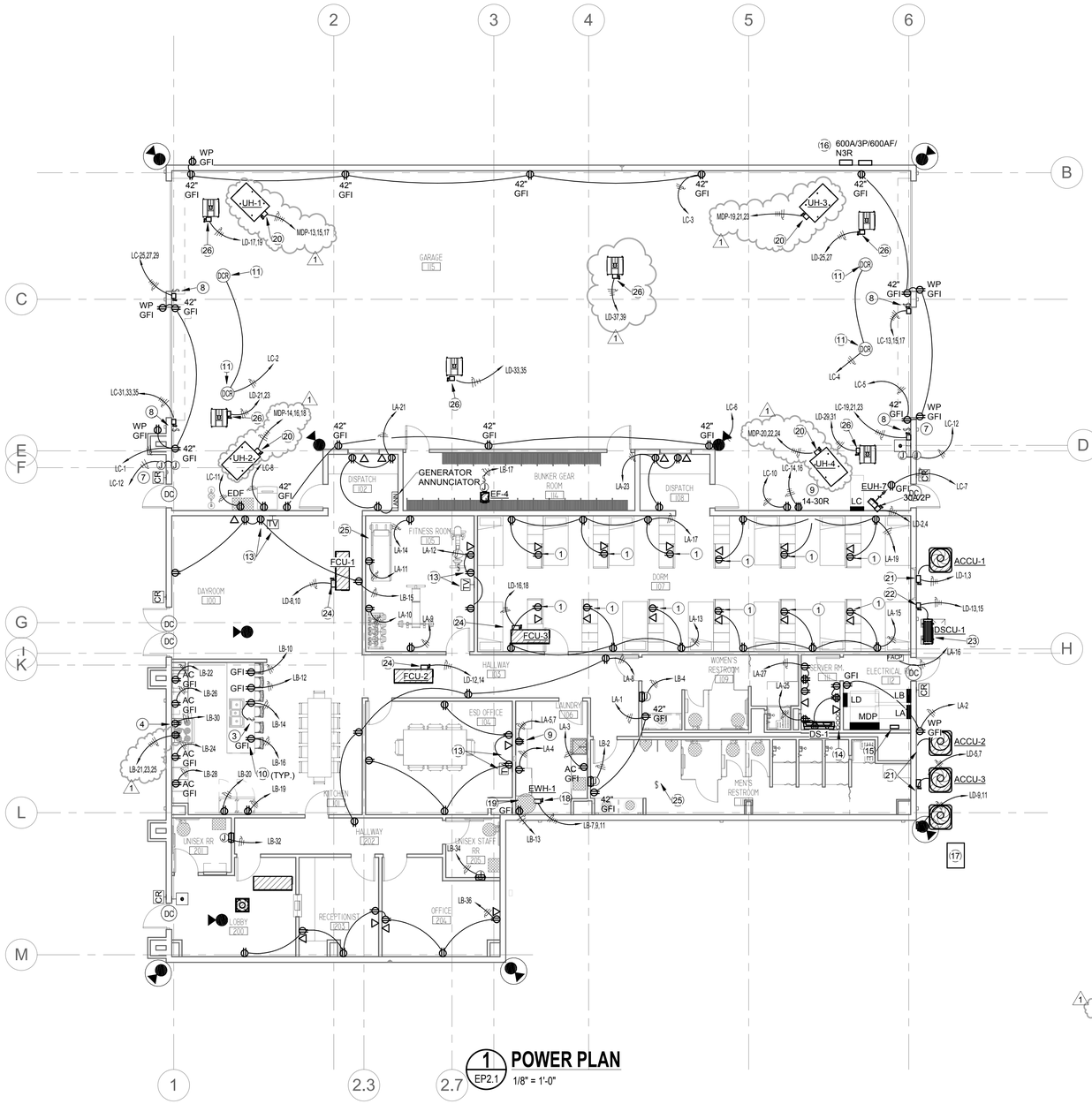

1 EP2.1 **POWER PLAN**

1/8" = 1'-0"

ELECTRICAL GENERAL NOTES:
APPLIES TO ALL SHEETS

A. SEE ALL OTHER PLANS FOR ADDITIONAL DEVICES. SOME POWER CIRCUITING MAY BE ON OTHER PLANS. COORDINATE THE LOCATIONS OF DATA/CATV JACKS WITH THE RECEPTACLES. MOUNT ADJACENT TO EACH OTHER.

B. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF.

C. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT FOR INDIVIDUAL CIRCUITS, 3/4" CONDUIT FOR MULTIPLE CIRCUITS. ALL CONDUCTORS SHALL BE 75 DEGREE (MINIMUM) COPPER THHN, COLOR CODED AS PER NEC AND LOCAL AMENDMENTS WITH SIZE, TEMPERATURE, AND VOLTAGE PERMANENTLY PRINTED ON THE JACKET. ALL JOINTS SHALL BE MADE UP USING SELF LOCKING, TWIST-ON, COLOR CODED, SQUARE WIRE SPRING GRAB, LONG SKIRT, WIRE CONNECTORS WITH SWEPT WINGS.

D. PROVIDE #10 AWG MIN NEUTRAL FOR ALL MUTLIWIRE BRANCH CIRCUITS AND PROVIDE HANDLE TIES FOR CIRCUIT BREAKERS AS REQUIRED BY NEC 210.4

E. CONDUCTOR SIZES INDICATED ASSUME NO MORE THAN (3) SINGLE POLE BRANCH CIRCUITS IN EACH CONDUIT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DE-RATE CONDUCTORS PER NEC TABLE 310.15(B)(2)(a) FOR CONDUITS WITH MORE THAN (3) CURRENT "CARRYING CONDUCTORS". THE NEUTRAL CONDUCTOR SHALL BE CONSIDERED "CURRENT CARRYING" FOR ALL BRANCH CIRCUITS SERVING MORE THAN (4) COMPUTERS.

F. REFER TO VOLTAGE DROP FEEDER SCHEDULE FOR BRANCH CIRCUITS EXCEEDING 100' IN LENGTH.

G. COORDINATE RECEPTACLE LOCATIONS WITH MILLWORK AND COUNTERS. DO NOT LOCATE RECEPTACLES BEHIND DRAWERS OR HIDDEN IN MILLWORK UNLESS SPECIFICALLY DIRECTED BY OWNER/ARCHITECT. REVIEW ARCHITECTURAL ELEVATIONS PRIOR TO RECEPTACLE ROUGH-INS. SEE ARCH. ELEVATIONS IN BREAKROOMS FOR APPLIANCES AND RECEPTACLE MOUNTING LOCATIONS.

H. MOUNT RECEPTACLES 18" AFF, 6" ABOVE BACKSPLASH AT COUNTERS, 4-2" IN TOILET ROOMS, AT EQUIPMENT ROUGH-IN LOCATIONS FOR APPLIANCES, AND 96" FOR TV'S. PROVIDE GFI RECEPTACLES AT/LOCATED ALL SINKS, ROOFTOP RECEPTACLES, KITCHEN RECEPTACLES, BATHROOM/TOLIT ROOMS, EXTERIOR RECEPTACLES, AND UNDERCOUNTER EQUIPMENT. ALSO, ALL RECEPTACLES SERVING DRINKING FOUNTAINS SHALL HAVE GFI.

I. ALL EQUIPMENT SHALL HAVE A LOCAL DISCONNECTING MEANS, EITHER CORDED PLUG AND RECEPTACLE OR SWITCHED DISCONNECT. VERIFY FROM EQUIPMENT SUBMITTED OR RELOCATED IF DIRECT CONNECT OR RECEPTACLE. IF DIRECT CONNECT, PROVIDE SWITCH AS PER NEC OTHERWISE, PROVIDE RECEPTACLE, CORD PLUG AS REQUIRED BY EQUIPMENT SUBMITTAL.

J. ON CIRCUITS GREATER THAN 20A, FEEDING MULTIPLE PIECES OF EQUIPMENT, PROVIDE FUSED DISCONNECTS (SIZED FOR EQUIPMENT PROTECTING).

K. PROVIDE INDIVIDUAL DISCONNECTS FOR ALL SMOKE FIRE DAMPERS AND VAV'S. NO EXCEPTIONS.

L. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET ROCK AND REPAIR.

M. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.

N. CONNECT NO MORE THAN 5 RECEPTACLES TO ANY CIRCUIT. VERIFY AND TRACE RECEPTACLE COUNT PRIOR TO CONNECTING TO EXISTING CIRCUITS.

O. ALL ISOLATED GROUND RECEPTACLES SHALL BE ORANGE IN COLOR AND HAVE ISOLATED GROUND FEEDER IG0020.

P. PROVIDE TAMPER PROOF RECEPTACLES FOR ALL TOILET ROOMS AND LOCKER ROOMS.

ELECTRICAL KEYED NOTES:

1. PROVIDE EMT RACEWAYS FOR RECEPTACLES AND DATA ROUGH-IN IN DORM CASEWORK/MILLWORK. MC CABLE NOT APPROVED. SECURE ALL CONDUIT EVERY 18" MINIMUM, IN LEAST VISIBLE SPACE OF MILLWORK. PROVIDE A SAMPLE ROUTING OF A SINGLE STATION AND HAVE SAMPE VERIFIED BY ARCHITECT PRIOR TO INSTALLING ROUGH-INS FOR REMAINING DORMS STATIONS.
2. (1) 3/4" CONDUIT FOR POWER, AND (1) 1-1/4" CONDUIT FOR DATA/AV, FROM FLOORBOX TO WALL CAVITY BEHIND TV ROUGH-IN.
3. ABOVE COUNTER SWITCH WITH BELOW COUNTER RECEPTACLE FOR DISPOSAL. CIRCUIT SUCH THAT SWITCH CONTROLS RECEPTACLE.
4. RECEPTACLE FOR RANGE HOOD FAN. VERITY MOUNTING HEIGHT WITH INSTALLATION INSTRUCTION OF RANGE HOOD. COORDINATE EXACT REQUIREMENTS WITH FURNISHED EQUIPMENT.
5. PROVIDE CONDUIT FOR CEILING MOUNTED PROJECTOR AND SCREEN. COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION.
6. COORDINATE WITH TECHNOLOGY FOR REQUIRED SPECIFICATIONS.
7. PROVIDE BACKBOX FOR KEYPAD. ROUTE 1" CONDUIT TO CONTROL BOX. COORDINATE WITH OWNER/ARCHITECT AT FIELD FOR EXACT LOCATION.
8. COORDINATE EXACT LOCATION FOR BIFOLD DOOR MOTOR WITH OWNER/ARCHITECT. PROVIDE CONTROL SWITCH AND RELAY AS REQUIRED FOR DOOR MOTOR CONTROL.
9. PROVIDE NEMA 14-30R RECEPTACLE FOR DRYER. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FURNISHED EQUIPMENT.
10. RECEPTACLES MOUNTED IN MILLWORK. COORDINATE EXACT LOCATION AND ROUTING OF CONDUIT WITH ARCHITECT IN FIELD.
11. PROVIDE DROP CORDS ON DRIVER'S SIDE LOCATION. GENERAL CONTRACTOR TO COORDINATE LOCATIONS WITH OWNER PRIOR TO INSTALLATION.
12. ROUTE (1) 3/4" CONDUIT TO DSCU-1 UNIT ON ROOF COORDINATE FIELD LOCATION WITH OWNER/ARCHITECT AT FIELD.
13. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF RECEPTACLE AND TV OUTLET WITH ARCHITECT IN FIELD BEFORE ROUGH-IN.
14. (4) 4" CONDUIT STUB-UPS. RE:MEP2.1.
15. APPROXIMATE LOCATION OF ATS FIELD VERIFY WITH ARCHITECT/OWNER FOR EXACT LOCATION.
16. APPROXIMATE LOCATION OF CT/METER AND SERVICE DISONNECT. FIELD VERIFY WITH ARCHITECT/OWNER FOR EXACT LOCATION.
17. APPROXIMATE LOCATION OF DIESEL GENERATOR. 6" CONCRETE PAD, VERIFY WITH ARCHITECT/OWNER FOR EXACT LOCATION. REFER TO SHEET MEP2.1 FOR DETAILS.
18. 208V, 60A/3P, N.F, NEMA 1 DISCONNECT SWITCH FOR WATER HEATER. MAKE CONNECTIONS TO EQUIPMENT. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
19. GFI, DUPLEX RECEPTACLE FOR CIRC. PUMP. EXTEND CIRCUIT TO TIME SWITCH. COORDINATE EXACT LOCATIONS OF EQUIPMENT AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
20. 208V, 60A/3P DISCONNECT SWITCH FOR UNIT HEATER. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL.
21. 208V, 60A/2P, NEMA 3R DISCONNECT SWITCH FUSED PER NAMEPLATE DATA OF FURNISHED EQUIPMENT. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL.
22. 208V, 30A/2P, NEMA 3R DISCONNECT SWITCH FUSED PER NAMEPLATE DATA OF FURNISHED EQUIPMENT. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL.
23. PROVIDE 3/4" CONDUIT FOR CONTROL WIRING FROM DSCU-1 OUTDOOR UNIT TO DS-1 INDOOR UNIT IN SERVER ROOM #111. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL.
24. 208V, 100A/2P, NEMA 1, N.F. DISCONNECT SWITCH. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL.
25. PROVIDE 120V, 20A/1P, MOTOR RATED DISCONNECT FOR EXHAUST FAN AS REQUIRED. EXHAUST FAN SHALL BE CONNECTED TO LIGHTING CIRCUIT AND CONTROLLED WITH LIGHTS IN ROOM. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL.
26. 208V, 30A/2P, NEMA 1, N.F. DISCONNECT SWITCH. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH MECHANICAL.

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AMERICAN INSTITUTE OF ARCHITECTS

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THOMAS RAVENEY
128311
LICENSED
PROFESSIONAL ENGINEER
5/14/2019

EDINBURG FIRE STATION #5
CITY OF EDINBURG
JASMAN RD & FM2812

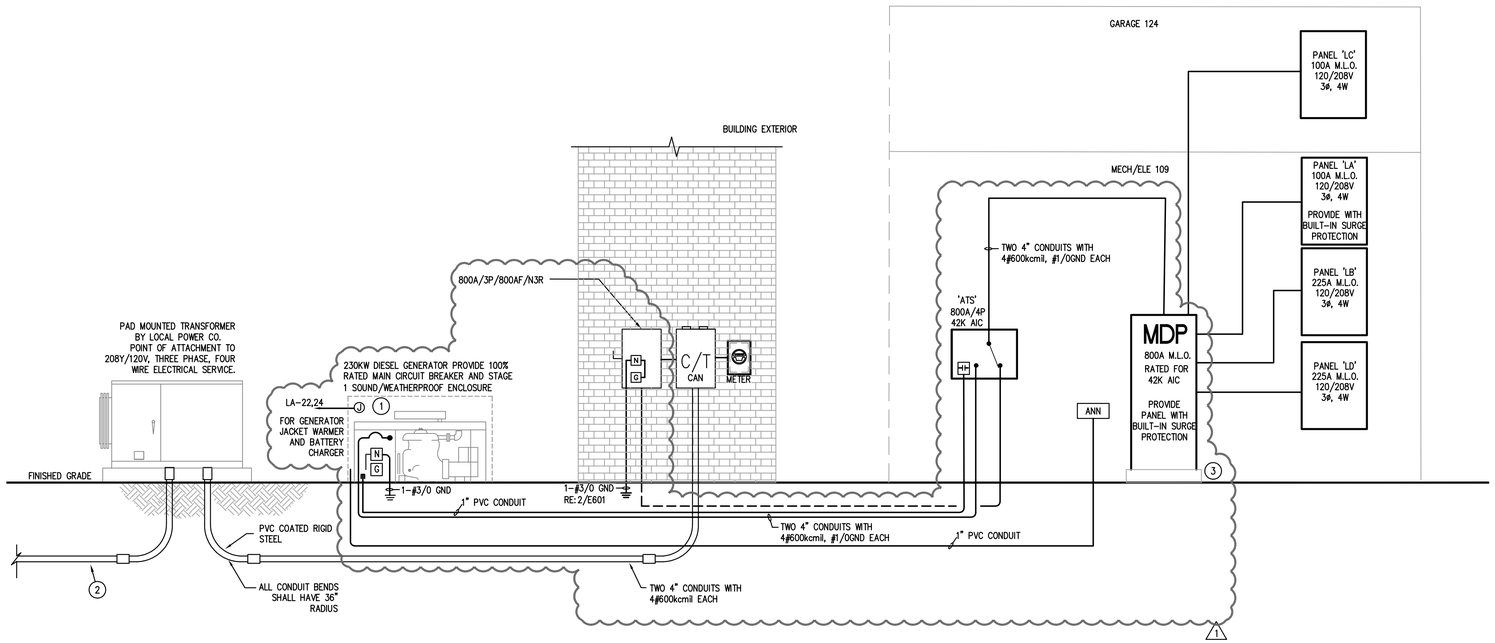
PROJECT NUMBER
219003

DATE
FEBRUARY 28,2019

ISSUED FOR BID

ADDENDUM#2 05-14-19

SHEET
EP2.1
OF



ONE-LINE GENERAL NOTES:

A. MANUFACTURER OF ELECTRICAL GEAR SHALL PROVIDE A COORDINATION STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SET BREAKERS. REFER TO SPECIFICATIONS. MANUFACTURER SHALL ALSO PROVIDE A FAULT CIRCUIT STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SELECT INTERRUPTING RATINGS OF ALL CIRCUIT BREAKERS, DISTRIBUTION PANELBOARDS, PANELBOARDS, ETC. A SERIES RATED SYSTEM SHALL BE USED. SUBMIT INTERRUPTING RATING FOR ALL ELECTRICAL GEAR IN SUBMITTALS. CONTRACTOR SHALL SUPPLY WITH THEIR SUBMITTALS ON ALL NEW EQUIPMENT THE MANUFACTURERS UL DATA LISTING THE SERIES RATING OF ALL EQUIPMENT. THIS SWITCHBOARD AND ALL NEW EQUIPMENT CONNECTED DOWNSTREAM SHALL BEAR LABELS INDICATING "SERIES RATED EQUIPMENT" ON THEIR EXTERIOR AS SPECIFIED IN THE SPECIFICATIONS. CONTRACTOR SHALL INSTRUCT MANUFACTURER TO INCLUDE IN THEIR SUBMITTALS ALL TRIP CURVES AND ALL LITERATURE INDICATING THE INTERRUPTING RATING CHARACTERISTICS OF EQUIPMENT BEING SUPPLIED.

B. CONTRACTOR SHALL PROVIDE AN ENGRAVED NAMEPLATE ON ALL NEW ELECTRICAL EQUIPMENT INDICATING EQUIPMENT VOLTAGE, AMPERAGE, AND AVAILABLE SHORT CIRCUIT RATING PER 2011 NEC.

C. ALL WIRING SHALL BE THHN/THWN COPPER UNLESS NOTED OTHERWSE.

D. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND CONDUIT AS REQUIRED BY UTILITY COMPANY FOR METERING PURPOSES.

E. REFER TO FLOOR PLAN FOR SIZES OF ALL DISCONNECTS AND STARTERS.

ONE-LINE DIAGRAM KEYED NOTES:

1. 208V JUNCTION BOX CONNECTION TO GENERATOR'S JACKET HEATER, FIELD COORDINATE EXACT LOCATION WITH INSTALLER AND ADDITIONAL MANUFACTURER'S REQUIREMENTS PRIOR TO ROUGH-IN.
2. SERVICE LATERAL CONDUCTOR FURNISHED AND INSTALLED BY AEP. EC SHALL PROVIDE TRENCH AND CONDUIT AS PER AEP SPECIFICATIONS.
3. CONTRACTOR WILL PROVIDE CONCRETE KEEPING PAD.

FEEDER SCHEDULE

	COPPER CONDUCTORS			ALUMINUM CONDUCTORS		
AMPERAGE	SETS	CONDUCTOR SIZE	CONDUIT (INCHES)	SETS	CONDUCTOR SIZE	CONDUIT (INCHES)
30A	1	4#10, 1#10 G.	3/4"C	1	N/A	N/A
40A	1	4#8, 1#10 G.	1"C	1	N/A	N/A
50A	1	4#8, 1#10 G.	1"C	1	N/A	N/A
60A	1	4#6, 1#10 G.	1"C	1	N/A	N/A
70A	1	4#4, 1#8 G.	1 1/4"C	1	N/A	N/A
80A	1	4#4, 1#8 G.	1 1/4"C	1	N/A	N/A
90A	1	4#3, 1#8 G.	1 1/4"C	1	N/A	N/A
100A	1	4#3, 1#8 G.	1 1/4"C	1	N/A	N/A
125A	1	4#1, 1#6 G.	1 1/2"C	1	N/A	N/A
150A	1	4#1/0, 1#6 G.	1 1/2"C	1	N/A	N/A
175A	1	4#2/0, 1#6 G.	2"C	1	N/A	N/A
200A	1	4#3/0, 1#6 G.	2"C	1	4#250KCMIL, 1#4G.	2 1/2"C
225A	1	4#4/0, 1#4 G.	2 1/2"C	1	4#300KCMIL, 1#2G.	3"C
250A	1	4#250KCMIL, 1#4 G.	2 1/2"C	1	4#350KCMIL, 1#2G.	3"C
300A	1	4#350KCMIL, 1#4 G.	3"C	1	4#500KCMIL, 1#2G.	4"C
350A	1	4#500KCMIL, 1#3 G.	3 1/2"C	2	4#4/0, 1#1G.	2 1/2"C
400A	1	4#500KCMIL, 1#3 G.	4"C	2	4#250KCMIL, 1#1G.	2 1/2"C
450A	2	4#4/0, 1#2 G.	2 1/2"C	2	4#300KCMIL, 1#1/0G.	3"C
500A	2	4#250KCMIL, 1#2G.	2 1/2"C	2	4#350KCMIL, 1#1/0G.	3"C
600A	2	4#350KCMIL, 1#1G.	3"C	2	4#500KCMIL, 1#2/0G.	3"C
700A	2	4#500KCMIL, 1#1/0G.	4"C	3	4#350KCMIL, 1#3/0G.	3"C
800A	2	4#600KCMIL, 1#1/0G.	4"C	3	4#400KCMIL, 1#3/0G.	3"C
1000A	3	4#500KCMIL, 1#2/0G.	4"C	4	4#350KCMIL, 1#4/0G.	4"C
1200A	4	4#350KCMIL, 1#3/0G.	3"C	4	4#500KCMIL, 1#250KCMIL G.	4"C

1. ALUMINUM CONDUCTORS SHALL BE COMPRESSION TYPE CONDUCTORS AND SHALL USE PENETROX WITH COMPRESSION TERMINATION FITTINGS.
2. ALUMINUM FEEDERS ARE NOT APPROVED FOR USE ON THE FOLLOWING:
   - CHILLERS
   - TRANSFORMER SECONDARY
   - ELEVATORS
   - VARIABLE FREQUENCY DRIVE
3. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
4. GROUND NOT REQUIRED AT SERVICE LATERAL.

ESTIMATED ELECTRICAL LOAD

SERVICE = 800A, 120/208V, 3ø

DESCRIPTION	CONNECTED LOAD	DEMAND FACTOR	NEC DEMAND
LIGHTING	7122	125%	8903
RECEPTACLES	25360	(1st 10KVA-100%) (REMAINDER-50%)	17680
H.V.A.C. (COOLING)	27415	(100% OF LARGEST OF HEATING OR COOLING 0% OF SMALLEST)	–
H.V.A.C. (HEATING)	104484		104484
FANS	16224	100%	16224
KITCHEN	30000	65%	19500
WATER HEATERS	18000	100%	18000
MISC. SINGLE PHASE LOADS	20696	100%	20696
TOTAL VOLT-AMPERES	249301		205487
TOTAL LOAD (AMPS) @ 208V, 3ø	692A		570A

1

1 E4.1 ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE

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DBR Project Number 198001.000

AS	MG	JB	TL	--

Milnet
Architectural
Services
AMERICAN INSTITUTE OF ARCHITECTS

STATE OF TEXAS
THOMAS RAVENEY
128311
LICENSED
PROFESSIONAL ENGINEER
5/14/2019

EDINBURG FIRE STATION #5
CITY OF EDINBURG
JASMAN RD & FM2812

PROJECT NUMBER
219003

DATE
FEBRUARY 28, 2019
ISSUED FOR BID

REVISIONS:
ADDENDUM #2 05-14-19

SHEET
E4.1
OF

Panelboard LA

14000 AIC Rating
X New
Existing

120/208 Wye Volt, 3 Phase, 4 Wire, 1 Section, Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB, 100 A BUS (Copper), - | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	Load (VA)	Type	Description	Wire	CB	CKT		CB	Wire	Description	Type	Load (VA)	NOTE
	360 VA	R	R Space 109E	12	20 A	1	2	20 A	12	R Mech./Elec 109	R	360 VA	
	180 VA	R	R Space 109D	12	20 A	3	4	20 A	12	M Space 109D	M	1500 VA	
	2400 VA	M	DRYER	10	30 A	5	6	20 A	12	R Space 109C	R	900 VA	
						7	8	20 A	12	R Space 109G	R	720 VA	
	1000 VA	M	FITNESS CENTER	12	20 A	9	10	20 A	12	FITNESS CENTER	M	1000 VA	
	1000 VA	M	FITNESS CENTER	12	20 A	11	12	20 A	12	FITNESS CENTER	R	720 VA	
	1080 VA	R	R Dorm 119	12	20 A	13	14	20 A	12	FITNESS CENTER	M	1000 VA	
	1080 VA	R	R Dorm 119	12	20 A	15	16	20 A	12	FACP	M	500 VA	
	1080 VA	R	R Dorm 119	12	20 A	17	18	20 A	12	R Day Rm. 110	R	360 VA	
	1080 VA	R	R Dorm 119	12	20 A	19	20	20 A	12	R Office 114	R	180 VA	
	1040 VA	R; M	DISPATCH 102	12	20 A	21	22	20 A	12	GENERATOR BASE HEATER	M	1200 VA	
	540 VA	R	DISPATCH 108	12	20 A	23	24	20 A	12	GENERATOR BATTERY...	M	1200 VA	
	1080 VA	R	R IDF ROOM	12	20 A	25	26	20 A	--	SPARE	--	--	--
	720 VA	R	R IDF ROOM	12	20 A	27	28	20 A	--	SPARE	--	--	--
--	--	--	SPACE	--	--	29	30	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	31	32	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	33	34	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	35	36	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	37	38	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	39	40	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	41	42	--	--	SPACE	--	--	--

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle	10980 VA	95.54%	10490 VA	210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	11300 VA	100.00%	11300 VA		(SP)Sub Pnl.			
630.00	(W)Welder								

Total Connected Load: 22280 VA VA = 62 A
Total Load (Diversified): 21790 VA VA = 60 A

Location of Panel: ELECTRICAL RM. 112

Panelboard LB

14000 AIC Rating
X New
Existing

120/208 Wye Volt, 3 Phase, 4 Wire, 1 Section, Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB, 225 A BUS (Copper), - | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	Load (VA)	Type	Description	Wire	CB	CKT		CB	Wire	Description	Type	Load (VA)	NOTE
	995 VA	L	OFF/R.R./KITCHEN LIGHTING	12	20 A	1	2	20 A	12	HAND DRYER	R	1800 VA	
	1038 VA	L	DORM/DAYROOM LIGHTING	12	20 A	3	4	20 A	12	HAND DRYER	R	1800 VA	
	822 VA	L	EXTERIOR LIGHTING	12	20 A	5	6	20 A	12	DRIVEWAY LIGHTING	L	791 VA	
						7	8						
	18000 VA	WH	EWH-1	6	60 A	9	10	20 A	12	KITCHEN COUNTER	K	1200 VA	
						11	12	20 A	12	DISHWASHER	K	1000 VA	
	180 VA	R	CIRC. PUMP/TIME SWITCH	12	20 A	13	14	20 A	12	DISPOSAL	Ot...	1200 VA	
	720 VA	R	DAY ROOM RECEPTS	12	20 A	15	16	20 A	12	KITCHEN COUNTER	K	1200 VA	
	0 VA	Ot...	EF-5	12	20 A	17	18	20 A	12	L Space 120	L	444 VA	
	1200 VA	K	K KITCHEN 101	12	20 A	19	20	20 A	12	K KITCHEN 101	K	1200 VA	
	17000 VA	K	RANGE	6	60 A	21	22	20 A	12	KITCHEN COUNTER	K	1200 VA	
						23	24	20 A	12	KITCHEN COUNTER	K	1200 VA	
						25	26	20 A	12	KITCHEN COUNTER	K	1200 VA	
--	--	--	SPARE	--	20 A	27	28	20 A	12	KITCHEN COUNTER	K	1200 VA	
	742 VA	L	PARKING LOT/FLAG POLE LIGHTING	12	20 A	29	30	20 A	12	RANGE HOOD	R	180 VA	
						31	32	20 A	12	HAND DRYER	R	1800 VA	
--	--	--	SPARE	--	20 A	33	34	20 A	12	HAND DRYER	R	1800 VA	
--	--	--	SPARE	--	20 A	35	36	20 A	12	R Room 120, 119, 116	R	1260 VA	
--	--	--	SPARE	--	20 A	37	38	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	39	40	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	41	42	--	--	SPACE	--	--	--

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle	9540 VA	100.00%	9540 VA	210.20(a)	(L)Lighting	4832 VA	125.00%	6040 VA
220.56	(K)Kitchen	28800 VA	65.00%	18720 VA		(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.	18000 VA	100.00%	18000 VA
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.					(SP)Sub Pnl.			
630.00	(W)Welder								

Total Connected Load: 61172 VA VA = 170 A
Total Load (Diversified): 52300 VA VA = 145 A

Location of Panel: ELECTRICAL RM. 112

Panelboard LC

14000 AIC Rating
X New
Existing

120/208 Wye Volt, 3 Phase, 4 Wire, 1 Section, Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB, 100 A BUS (Copper), - | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	Load (VA)	Type	Description	Wire	CB	CKT		CB	Wire	Description	Type	Load (VA)	NOTE
	720 VA	R	GARAGE RECEPTS	12	20 A	1	2	20 A	12	GARAGE DROP CORDS	R	360 VA	
	900 VA	R	GARAGE RECEPTS	12	20 A	3	4	20 A	12	GARAGE DROP CORDS	R	360 VA	
	900 VA	R	GARAGE RECEPTS	12	20 A	5	6	20 A	12	GARAGE RECEPTS	R	720 VA	
	180 VA	R	RISER ROOM	12	20 A	7	8	20 A	12	ICE MAKER	K	1200 VA	
						9	10	20 A	12	WASHER GARAGE 124	M	1500 VA	
	600 VA	R	EDF	12	20 A	11	12	20 A	12	R GARAGE 124	Po...	100 VA	
	1332 VA	M	GARAGE DOOR	12	20 A	13	14	30 A	10	DRYER GARAGE 124	M	2400 VA	
						15	16						
	1332 VA	M	GARAGE DOOR	12	20 A	17	18	20 A	12	LIGHTING GARAGE	L	760 VA	
						19	20	20 A	12	LIGHTING GARAGE	L	760 VA	
	1332 VA	M	GARAGE DOOR	12	20 A	21	22	20 A	12	LIGHTING GARAGE	L	770 VA	
						23	24	--	--	SPACE	--	--	--
	1500 VA	M	GARAGE DOOR	12	20 A	25	26	--	--	SPACE	--	--	--
						27	28	--	--	SPACE	--	--	--
	1332 VA	M	GARAGE DOOR	12	20 A	29	30	--	--	SPACE	--	--	--
						31	32	--	--	SPACE	--	--	--
						33	34	--	--	SPACE	--	--	--
						35	36	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	37	38	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	39	40	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	41	42	--	--	SPACE	--	--	--

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle	4840 VA	100.00%	4840 VA	210.20(a)	(L)Lighting	2290 VA	125.00%	2863 VA
220.56	(K)Kitchen	1200 VA	100.00%	1200 VA		(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.5	(MT)Lrg. Motor			
	(M)Misc.	9396 VA	100.00%	9396 VA		(SP)Sub Pnl.			
630.00	(W)Welder								

Total Connected Load: 17726 VA VA = 49 A
Total Load (Diversified): 18299 VA VA = 51 A

Location of Panel: Space 115

Lighting Fixture Schedule

TYPE	MANUFACTURER	CATALOG #	MOUNTING	# LAMPS	INPUT WATTS	Count
A1	METALUX	24FR-LD4-40-UNV-L835-CD-1	LAY-IN	LED	36 VA	52
B	METALUX	4SLWP3940ND-120V	SURFACE	LED	40 VA	2
C	METALUX	4SNLED-30SL-LC-UNV-L835-CD-1-WG/SNF-4FT-AYC CHAIN SET	SUSPENDED	LED	29 VA	3
D	HALO	PD6-20-ED010-835	RECESSED	LED	21 VA	23
EX1	SURELITES	LPX-6	UNIVERSAL	LED	5 VA	3
EX2	SURELITES	LPX-6-WG10	UNIVERSAL	LED	5 VA	2
F	HALO	SLD405-8-35-WH	SURFACE	LED	12 VA	5
G	METALUX	HBLED-LD4-18-W-AI-UNV-L840-CD-2-U-WG/HBL6-4FT-B	SUSPENDED	LED	152 VA	15
W	LUMARK	XTOR9ARL	SURFACE	LED	82 VA	9

Panelboard LD

14000 AIC Rating
X New
Existing

120/208 Wye Volt, 3 Phase, 4 Wire, 1 Section, Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB, 225 A BUS (Copper), - | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	Load (VA)	Type	Description	Wire	CB	CKT		CB	Wire	Description	Type	Load (VA)	NOTE
	7405 VA	C	ACCU-1	8	50 A	1	2	20 A	12	EUH-7	H	3300 VA	
						3	4						
	7405 VA	C	ACCU-2	8	50 A	5	6	20 A	--	SPARE	--	--	--
	7405 VA	C	ACCU-3	8	50 A	7	8	20 A	12	FCU-1	H	13728 VA	
						9	10						
	5200 VA	C	DSCU-1	12	20 A	11	12	20 A	12	FCU-2	H	13728 VA	
						13	14						
	2704 VA	F	AIRVAC 1	12	20 A	15	16	20 A	12	FCU-3	H	13728 VA	
						17	18						
	2704 VA	F	AIRVAC 2	12	20 A	19	20	--	--	SPACE	--	--	--
						21	22	--	--	SPACE	--	--	--
	2704 VA	F	AIRVAC 3	12	20 A	23	24	--	--	SPACE	--	--	--
						25	26	--	--	SPACE	--	--	--
	2704 VA	F	AIRVAC 4	12	20 A	27	28	--	--	SPACE	--	--	--
						29	30	--	--	SPACE	--	--	--
	2704 VA	F	AIRVAC 5	12	20 A	31	32	--	--	SPACE	--	--	--
						33	34	--	--	SPACE	--	--	--
	2704 VA	F	AIRVAC 6	12	20 A	35	36	--	--	SPACE	--	--	--
						37	38	--	--	SPACE	--	--	--
						39	40	--	--	SPACE	--	--	--
--	--	--	SPARE	--	20 A	41	42	--	--	SPACE	--	--	--

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle				210.20(a)	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling	27415 VA	100.00%	0 VA	620.14	(E)Elevators			
220.60	(H)Heating	44484 VA	100.00%	44484 VA		(WH)Wat. Htr.			
220.60	(F)Fans	16224 VA	100.00%	16224 VA	220.5	(MT)Lrg. Motor			
	(M)Misc.					(SP)Sub Pnl.			
630.00	(W)Welder								

Total Connected Load: 88123 VA VA = 245 A
Total Load (Diversified): 60708 VA VA = 169 A

Location of Panel: ELECTRICAL RM. 112

Panelboard MDP

42000 AIC Rating
X New
Existing

120/208 Wye Volt, 3 Phase, 4 Wire, 1 Section, Type 1 -Nema Rating | Mains Type: MLO | 0 A MCB, 800 A BUS (Copper), - | X Single, Double, Feed - Thru | Mounting: X Surface, Flush

NOTE	Load (VA)	Type	Description	Wire	CB	CKT		CB	Wire	Description	Type	Load (VA)	NOTE
						1	2						
	22280 VA	R; M	PANEL 'LA'	3	100 A	3	4	225 A	4/0	PANEL 'LB'	Other; L; R;...	61172 VA	
						5	6						
						7	8						
	17726 VA	Power; L; R; ...	PANEL 'LC'	3	100 A	9	10	225 A	4/0	PANEL 'LD'	F; C; H	60708 VA	
						11	12						
	15000 VA	H	UH-1	6	60 A	13	14	60 A	6	UH-2	H	15000 VA	
						15	16						
						17	18						
	15000 VA	H	UH-3	6	60 A	19	20	60 A	6	UH-4	H	15000 VA	
						21	22						
						23	24						
--	--	--	SPACE	--	--	25	26	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	27	28	--	--	SPACE	--	--	--
--	--	--	SPACE	--	--	29	30	--	--	SPACE	--	--	--

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R)Receptacle	25360 VA	69.72%	17680 VA	210.20(a)	(L)Lighting	7122 VA	125.00%	8903 VA
220.56	(K)Kitchen	30000 VA	65.00%	19500 VA		(EL)Ext. Ltg.			
220.60	(C)Cooling	27415 VA	100.00%	0 VA	620.14	(E)Elevators			
220.60	(H)Heating	104484 VA	100.00%	104484 VA		(WH)Wat. Htr.	18000 VA	100.00%	18000 VA
220.60	(F)Fans	16224 VA	100.00%	16224 VA	220.5	(MT)Lrg. Motor			
	(M)Misc.	20696 VA	100.00%	20696 VA		(SP)Sub Pnl.			
630.00	(W)Welder								

Total Connected Load: 249301 VA VA = 692 A
Total Load (Diversified): 205487 VA VA = 570 A

Location of Panel: ELECTRICAL RM. 112

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TBPE Firm Registration No. 2234

DBR Project Number 198001.000

AS	MG	JB	TL	--

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THOMAS RAVENEY
128311
LICENSED
PROFESSIONAL ENGINEER
5/14/2019

EDINBURG FIRE STATION #5
CITY OF EDINBURG
JASMAN RD & FM2812

PROJECT NUMBER
219003

DATE
FEBRUARY 28,2019

ISSUED FOR BID

ADDENDUM#2 05-14-19

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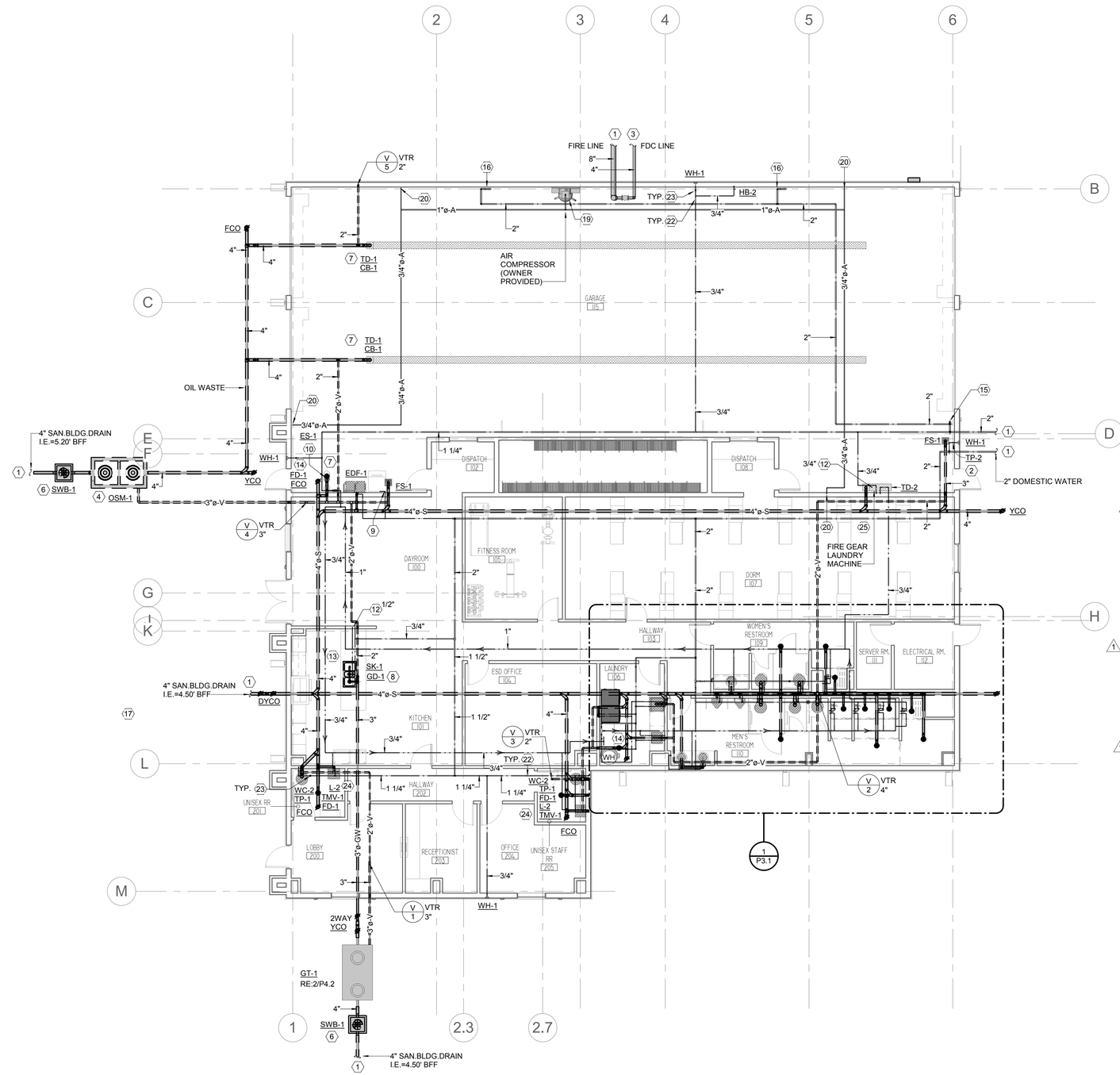
OF



1 PLUMBING FLOOR PLAN
P2.1 — 1/8" = 1'-0"

GENERAL NOTES:

A. DRAWING IS DIAGRAMMATIC ONLY. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF PIPING, DEVICES AND EQUIPMENT WITH BUILDING ELEMENTS AND THE WORK OF OTHER TRADES. REFER TO RISER DIAGRAMS FOR MORE SIZING INFORMATION AND REQUIREMENTS.

B. PROVIDE ROUGH-INS AS REQUIRED FOR ALL FIXTURES AND EQUIPMENT PROVIDED BY SEPARATE DIVISION AND/OR OWNER. PROVIDE ALL MATERIALS AND LABOR TO INSTALL AND MAKE FINAL CONNECTIONS TO ALL EQUIPMENT. ALL CONNECTIONS FOR EQUIPMENT TO BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF HEALTH DEPARTMENT AND PLUMBING CODES.

PLUMBING KEYED NOTES:

1. REFER TO CIVIL SITE UTILITY PLAN FOR CONTINUATION. CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION AND CONNECTION OF ALL UTILITIES TO SITE UTILITY STUB-OUTS.
2. DOMESTIC WATER ENTRY. RE: DETAIL 1/P4.2
3. FIRE SPRINKLER SYSTEM BY FIRE PROTECTION CONTRACTOR. PROVIDE FIRE SPRINKLER CONTROL/ALARM VALVE ASSEMBLY RISERS AND REMOTE FIRE DEPARTMENT CONNECTION (FDC). REFER TO CIVIL SITE PLAN FOR LOCATION OF ROADSIDE VALVE AND FDC. CONTRACTOR IS RESPONSIBLE FOR FINAL SIZING OF PIPES AND COMPONENTS BASED ON THEIR HYDRAULIC CALCULATIONS RE: DETAIL 19/P4.2 AND 20/P4.2.
4. PROVIDE SAND/OIL INTERCEPTOR EQUAL TO PARK MODEL NO. SOCMP-750 GALLON PRE-CAST, DIRECT BURIAL INTERCEPTOR. RE: DETAIL 1/P4.3
5. PROVIDE HUB DRAIN IN MEZZANINE FLOOR FOR CONDENSATE FROM COMPRESSED AIR SYSTEM. ROUTE SANITARY DOWN THROUGH WALL.
6. PROVIDE SAMPLE WELL BASIN EQUAL TO PARK MODEL SWB-154, SEE DETAIL 3/P4.3.
7. COORDINATE LOCATION OF TRENCH DRAINS, CATCH BASIN AND ALL FLOOR DRAINS/SINKS WITH STRUCTURAL PRIOR TO SLAB CONSTRUCTION.
8. ISLAND KITCHEN SINK, RE: 4/P4.3.
9. 1/2" CW DROP FOR SERVICE TO ICE MACHINE, PROVIDE RPZ BFP DEVICE EQUAL TO WATTS LF009 .RE: DETAIL 13/P4.2.
10. EMERGENCY SHOWER AND EYEWASH UNIT. RE: SCHEDULE AND DETAIL 16/P4.2.
11. NOT USED.
12. COLD AND HOT WATER DROPS TO FIXTURE(S) OR EQUIPMENT; SIZES AS NOTED. REFER TO PLUMBING RISER DIAGRAM FOR CONTINUATION IN WALL OR CHASE.
13. CONTRACTOR TO PROVIDE ALL PLUMBING CONNECTIONS TO DISHWASHER .
14. PROVIDE "TRAP GUARD" SEWER GAS EMISSION PROTECTION IN THIS FLOOR/HUB DRAIN/FLOOR SINK. RE: DETAIL 14/P4.2.
15. 2" CW RISER FOR FIRE TRUCK FILLING AND NON-POTABLE USE. RE: 21/P4.2.
16. 2" CW (NON-POTABLE) DROP, ANCHOR TO WALL AND PROVIDE 2" BALL VALVE WITH 2" THREADED FITTING FOR "QUICK FILLING" OF FIRE TRUCKS. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH OWNER/ARCHITECT.
17. NOT USED.
18. NOT USED.
19. AIR COMPRESSOR PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR. CONTRACTOR TO COORDINATE EXACT LOCATIONS OF CA OUTLETS WITH OWNEER/ARCHITECT. PROVIDE ALL FINAL CONNECTIONS.
20. 1/2" CA DROP TO COMPRESSED AIR OUTLET . PROVIDE REGULAR AUTOMOTIVE AIR HOSE,HIB FEMALE CONNECTOR AND UNIVERSAL TWIST LOCK CONNECTOR WITH 1/4 TURN GATE VALVE.
21. NOT USED.
22. BALL VALVE ABOVE CEILING. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH CEILING. PROVIDE MARKING OF VALVE LOCATION ALONG THE CEILING TILE.
23. WATER HAMMER ARRESTOR, SIZE AS NOTED. PROVIDE PROPERLY SIZED WATER HAMMER ARRESTOR FOR EACH GROUP OF FIXTURES WHETHER SHOWN OR NOT ON PLANS.
24. PROVIDE ALL LAVATORIES WITH POINT OF USE ASSE 1070 LISTED TMV-1.
25. PROVIDE PLUMBING LINES FOR FIRE GEAR WASHER. TRENCH DRAIN DETAIL 6/P4.3. PROVIDE HOT AND COLD WATER HOSE BIBS. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT.

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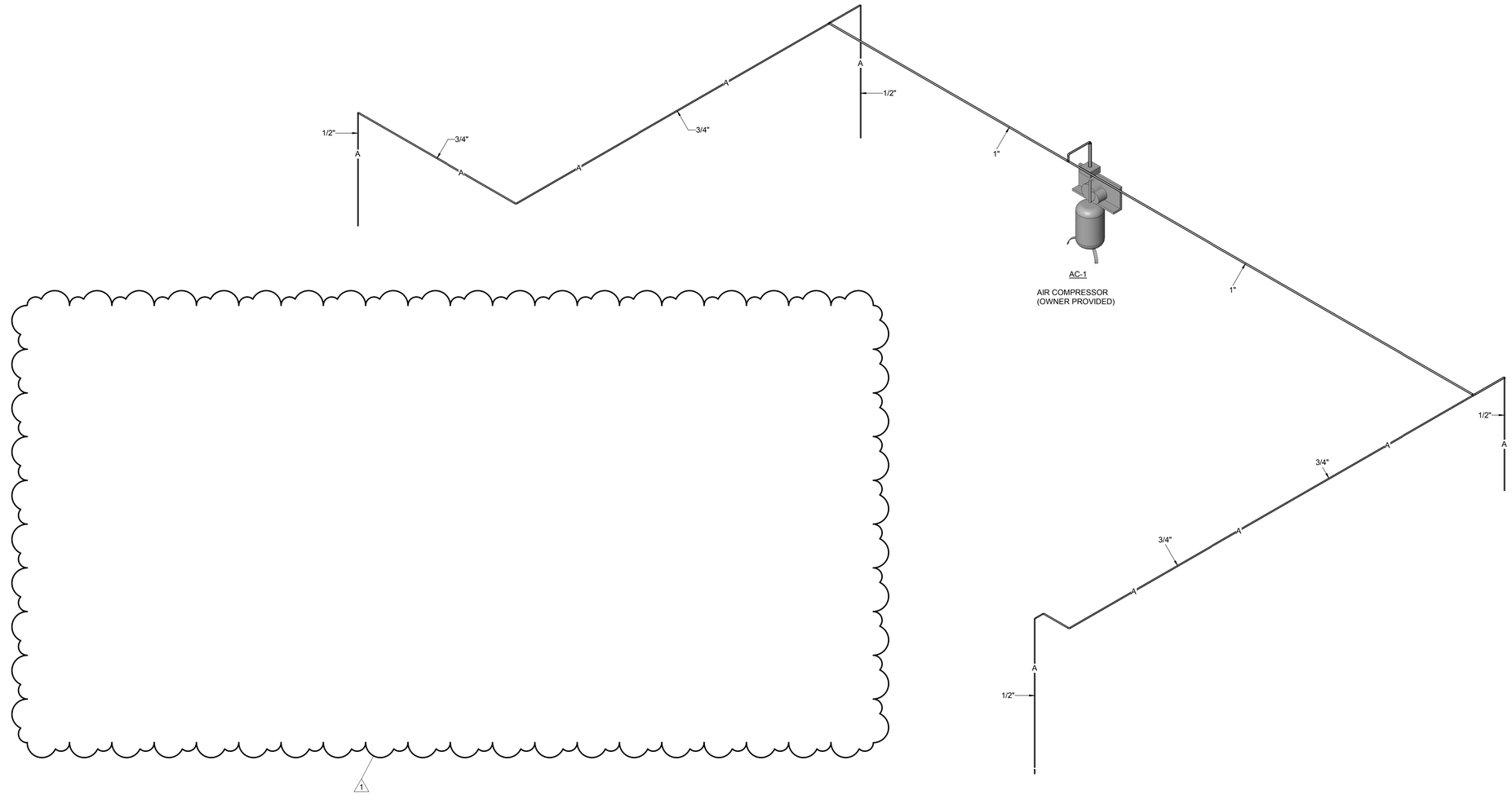

1 P5.3 PLUMBING RISERS - COMPRESSED AIR SYSTEMS

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