

**Addendum No. 003**

January 18, 2022

**ADDENDUM TO PLANS AND SPECIFICATIONS FOR:  
ODOT - Eaton Outpost  
DOT-200023**

Prepared For: **Ohio Department of Transportation / Ohio Facilities Construction Commission**

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This Addendum is included in the work as noted in the Notice to Bidders and Form of Proposal. Each item refers to drawing sheet numbers, specification numbers, or general comments.

To All Bidders: This addendum supplements and amends the original bid documents dated December 17, 2021 and shall be taken into account in preparing proposals and shall become a part of the contract documents.

Receipt of this Addendum shall be acknowledged by inserting its number and date in the space provided on the Bid Form.

This Addendum consists of **12 pages (6-8.5x11 sheets and 6-24x36 sheets)** included herein.

**PROCUREMENT/CONTRACTING/SPECIFICATIONS:**

**Section 07 41 13 – Standing-Seam Metal Roof Panels**

Amend specification to include gutter and downspout sizes and profiles. Add Item 2.5-D-1 and 2.5-D-2 and amend Item 2.5 E to read as follows:

- D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces. Fabricate in minimum 96-inch- (2400-mm-) long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches (914 mm) o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match roof fascia and rake trim.
  - 1. *Box-Style*
  - 2. *Minimum 4" depth and 5" bottom width.*
  
- E. Downspouts: *3"x4" corrugated rectangular*, formed from same material as roof panels. Fabricate in 10-foot- (3-m-) long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match metal wall panels.

**Section 23 83 00.01 – Radiant Heating Units (Revised Specification Attached)**

Revised spec to remove vacuum pump system.

**DRAWINGS:**

**Revise Sheet H600 – HVAC Schedules (Revised Sheet Attached)**

Revise voltage for EF-1 and EF-2 as clouded.

**Revise Sheet ESU – Electrical Site Utility Plan (Revised Sheet Attached)**

Revise Plan Note S1 to underground feed as clouded.

**Revise Sheet E000 – Electrical Legends (Revised Sheet Attached)**

Add symbols for CO and NO2 detectors as clouded.

**Revise Sheet E101 – First Floor Lighting Plan (Revised Sheet Attached)**

Revise fixture identification to 'C1' as clouded to match Lighting Fixture Schedule.

**Revise Sheet E201 – First Floor Power Plan (Revised Sheet Attached)**

Add locations for CO and NO2 sensors as clouded.

Update symbology for disconnects as clouded.

Revise feeds for EF-1 and EF-2 as clouded.

Revise Plan Note E11 as clouded.

Add Plan Notes E27 and E28 as clouded.

**Revise Sheet E501 – Electrical Schedules (Revised Sheet Attached)**

Revise Equipment Starters and Disconnects schedule as clouded.

Revise feeds for EF-1 and EF-2 in Panel EL1 as clouded.

**BIDDER QUESTIONS AND ANSWERS:**

**Q1:** *“The venting material for the IRH units is called out to be sch 80 CPVC in spec section 238300.01, 2.01-D-3. When I checked the basis of design manufacturer’s installation manual, CPVC is not listed as one of the materials that they recommend using. Please confirm that single wall pipe (type-C) that the manufacturer recommends is an acceptable material to be used for venting material.”*

A. The portion of the specification referenced is in regard to vacuum pumps, which are not applicable to the system shown in the drawings. A revised specification has been included in this addendum for clarification.

**Q2:** *“Is concrete encasement required for all underground conduits or only conduits under paved areas?”*

A. Concrete encasement is required for all conduit under driveable surfaces. Sand may be used in non-driveable (i.e., grass) areas.

- Q3:** *“Are aluminum conductors allowed per the feeder schedule on E500?”*
- A. Yes. Aluminum conductors are permitted where wire sizes are provided on the feeder schedule.
- Q4:** *Sheet E201 – “The disconnect switches on this sheet for various equipment use the symbol for a fused disconnect switch. The notes and one-line call for non-fused. Are fused disconnect switches required?”*
- A. A fused disconnect is only required on the secondary of the transformer feed which feeds the pole barn panel. An updated drawing has been included in this addendum for clarification.
- Q5:** *Sheet E201 – “Are there locations for the CO and NO2 sensors for the gas detection system?”*
- A. See drawings included herein updated to show locations of CO & NO2 sensors; one of each just inside the wash bay and one of each at the gas detection control panel.
- Q6:** *Sheet E101 – “There is a type R5 light fixture shown but it is not on the fixture schedule.”*
- A. This is fixture C1 on the fixture schedule. This has been revised for clarification in the drawings included in this addendum.
- Q7:** *Sheet E201 – “There is a symbol marked NPBI-1. Can this be identified to what this is?”*
- A. This is a 24V in-duct air purifier – 120/24V transformer provided by manufacturer. Make final connections. See note H15 on Drawing H101 and revised drawing E201 included in this addendum for further information.
- Q8:** *Sheet E601 – “Fuel Station Grounding Plan – Is this work part of the contract or is it existing?”*
- A. Existing grounding is sufficient. Grounding diagram and associated notes are provided as reference when providing new feeders to existing equipment.

**END OF ADDENDUM NO. 003**

## SECTION 238300.01 - RADIANT HEATING UNITS

### PART 1 GENERAL

#### 1.01 DESCRIPTION

- A. Provide a gas-fired infrared tube heating system, including all required tubing, reflector, hangers, burners, combustion chambers, controllers, temperature sensors, etc.

#### 1.02 SUBMITTALS

- A. Submit Manufacturer's mechanical product data, including product description, technical data and installation instructions.
- B. Submit shop drawings showing complete details of installation of gas-fired radiant systems, including layout, suspension, connections, burners, heat exchangers and controls.
- C. Submit wiring diagrams indicating power and control wiring required for system. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.
- D. Submit copy of Manufacturer's current design certification from Canadian Standards Association International (CSA), covering all components approved for use as a gas-fired radiant system.
- E. Submit maintenance data and parts list for each type and size of radiant heaters, including troubleshooting guide. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual, in accordance with requirements of Schedule E, "Materials Approval Submittal."

#### 1.03 WARRANTY

- A. Provide a written Manufacturer's warranty agreeing to replace/repair, within warranty period, components of gas-fired radiant systems furnished by Manufacturer, which are defective in either material or workmanship, provided Manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to for (3) years from date of Contract Completion of entire radiant heating system, including electrical components. Minimum warranty period shall be Ten (10) years on the heater's burner core, heat exchanger, and combustion chamber tubes
- B. Burner combustion chambers shall have a warranty period of (15) years from date of Contract Completion.

#### 1.04 ACCEPTABLE MANUFACTURERS

- A. Roberts Gordon
- B. Detroit Radiant
- C. *Superior Radiant Products*

### PART 2 PRODUCTS

#### 2.01 RADIANT PIPE HEATING SYSTEM

- A. Burner Assemblies: Heavy-duty cast iron burner heads, pre-wired gas controls with direct spark ignition module, combustion air filters with MINIMUM filtering surface area of 106 sq. in., cast iron combustion chambers with 5/32 in. minimum thickness, and threaded 4 in. pipe fitting for upstream and downstream tubing connection. Steel combustion chambers are not acceptable.

System shall vent all products of combustion outdoors per unit manufacturer's recommendation. Provide minimum number of burners indicated:

1. To ensure proper heat distribution. Fewer burners of larger capacity will not be accepted. Design firing rate of burners shall be as stated on Drawings.
  2. To totally pre-mix air and gas required for combustion.
  3. To maintain constant proportion of fuel gas to filtered combustion air. Introduce both fuel gas and air at atmospheric pressure. If combustion air flow is impeded for any reason, ensure that gas flow rate will decrease in constant proportion to maintain proper gas/air mixture for complete combustion.
- B. Burner Controls: All burners shall be factory-wired for 115 volts AC with transformer for 24 volts AC direct spark ignition (DSI) module operation and supplied with a grounded 24 in. to 30 in. 3-wire pigtail located at rear of burner.
1. Fail-Safe Controls: To ensure a high degree of fail-safe operation, system shall shut off main flow of gas if any or all of the following abnormal conditions occur:
    - a. Power fails. (Gas valves in burners close in safe position.)
    - b. Main valve fails in open position.
  2. DSI Module: All gas vacuum-firing burner units shall be equipped with a DSI module with a (15) second flame response time per ignition trial before lockout occurs. DSI module shall be capable of a minimum of (3) trials for ignition. Spark shall shut off when burner flame is established.
- C. Radiant Piping Heat Exchanger: 4 in., 16 ga. heat-treated aluminized steel radiant pipe tubing. 4 in., 16 ga. steel tail pipe tubing with acid-resistant porcelain coating, and 0.92 or greater emissivity factor. All connections shall be made with stainless steel couplings. Each open-end combustion chamber shall have an approved end vent. Reflector shall terminate with an end cap. All piping must be supported in accordance with acceptable practices, local codes, seismic requirements, applicable standards, and as shown on Drawings. Pipe shall pitch down at least 1/2 in. in 20 ft. on radiant lines, and 1 in. in 20 ft. on tail pipe lines toward end vent.
- D. Reflectors: 0.024 1100 H18 mill finish aluminum, or other highly radiant reflective material reflectors, installed over complete exchanger, using a deep-dish design with lower edge of reflector extending beyond bottom of heat exchanger tube. Standard reflectors shall be installed on all radiant pipe and tail pipe over entire pipe network. Provide reflector joint pieces over heat exchanger fittings such as elbows, crosses, and tees, end vents, and pipe, so reflector covers heat exchanger continuously.
- E. Outside Air: Provide CSA-approved fresh outside air system to supply each burner and end vent for support of combustion, if required.
- F. Control Panel Indoor Electric Zone Temperature Sensors: Standard panel with 12 vdc. programmable sensor. Mount sensors 4 ft. above finished floor, or otherwise as noted. Provide insulated base where sensor is mounted on an exterior wall.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install gas-fired radiant pipe systems as indicated, in accordance with Manufacturer's installation instructions, in compliance with applicable codes and approvals, and as shown on Drawings.
- B. Suspend heat exchangers, burners, gas piping, conduit, and reflectors from building structure as specified elsewhere, in order to provide a durable and safe installation, in accordance with Manufacturer's installation instructions, and as shown on Drawings.

- C. Do not exceed minimum clearance to combustibles outlined and printed on burner nameplate, and in Manufacturer's product data. Measure clearance distance from surface of heat exchangers.
- D. Install vent piping as indicated. Terminate where indicated with bird screen cover.
- E. Plumbing Contractor shall install gas piping in accordance with Manufacturer's installation instructions.
  - 1. Connection from supply line to burner unit must be made in accordance with installation instructions.
  - 2. Gas shut-off cock, as supplied with unit, and controls in unit must not be subjected to more than 1/2 lb. or 14 in. W.C. pressure. If high pressure testing of gas supply line is required, this test must be made with a plug in 1/2 in. branch line to each burner. Never test gas line with shut-off cock installed or burner unit connected.
- F. Mount electronic zone temperature sensors 4 ft. above finished floor, if not otherwise indicated.

### 3.02 FIELD QUALITY CONTROL

- A. Start up and adjust gas-fired radiant heaters in accordance with Manufacturer's instructions and Gas Utility Company's requirements. Check and calibrate controls. Adjust burners for maximum efficiency.

### 3.03 TRAINING

- A. Provide services of Manufacturer's Technical Representative to instruct the Owner's operating personnel in operation and maintenance of gas-fired radiant heaters.

### 3.04 WIRING

- A. Electrical Contractor shall wire sensors using shielded cable, Belden 8451, or equivalent.

END OF SECTION 238300.01







## DOT-200023 ODOT - EATON OUTPOST

### CONSTRUCTION DOCUMENTS

5656 US-127 Eaton, Ohio 45320

INDEX OF ELECTRICAL DRAWINGS	
E000	ELECTRICAL LEGENDS
ESU	ELECTRICAL SITE UTILITY PLAN
E101	FIRST FLOOR LIGHTING PLAN
E201	FIRST FLOOR POWER PLAN
E500	SINGLE LINE DIAGRAM
E501	ELECTRICAL SCHEDULES
E601	ELECTRICAL DETAILS

4	01/17/22	Addendum 003
1	12/17/21	Revision 1 Permit/Bid Set
	12/10/21	Bid Set
	11/12/21	Permit Set

MARK	DATE	DESCRIPTION

PROJECT NO: DOT-200023

DATE: 12/17/2021

DRAWN BY: DEL

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SHEET TITLE

## ELECTRICAL LEGENDS

### ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SURFACE LIGHT (TYPE DENOTED)		SPECIAL RECEPT. OR CONN. (SEE SCHEDULE)		FIRE ALARM HORN W/STROBE (88" MH)
	RECESSED LIGHT (TYPE DENOTED)		CIRCUIT BREAKER PANEL		FIRE ALARM BELL (88" MH)
	POLE MOUNTED LIGHT (TYPE DENOTED)		TRANSFORMER (TYPE DENOTED)		FIRE ALARM BELL W/STROBE (88" MH)
	SURFACE LINEAR LIGHT (TYPE DENOTED)		MOTOR (SEE SCHEDULE)		FIRE ALARM STROBE (88" MH)
	SUSPENDED OR PENDANT LIGHT (TYPE DENOTED)		SAFETY DISC. SW. (NON-FUSED)		FIRE ALARM SPEAKER W/STROBE (88" MH)
	RECESSED LINEAR LIGHT (TYPE DENOTED)		SAFETY DISC. SW. (FUSED)		CEILING MTD AUDIO/VISUAL
	STRIP LIGHT (TYPE DENOTED)		CEILING DUAL TECH OCCUPANCY SENSOR		CEILING MTD AUDIBLE
	TRACK AND TRACK LIGHT (TYPES DENOTED)		CEILING PHOTOCCELL		FIRE ALARM REMOTE ANNUNCIATOR
	EMERGENCY BATTERY LIGHT (TYPE DENOTED)		TIME CONTROL SWITCH (TIME SWITCH)		KNOX BOX
	EXIT SIGN (TYPE DENOTED)		HALFTONE SYMBOL INDICATES EXISTING		FIRE ALARM CONTROL PANEL
	LIGHT FIXTURE ON (EM) LIGHT SAFETY BRANCH		DASHED SYMBOL INDICATES REMOVED		SMOKE DETECTOR (TYPE DENOTED)
	LIGHT FIXTURE ON (EM) CRITICAL BRANCH		SWITCHED CIRCUIT		HEAT DETECTOR (TYPE & TEMP DENOTED)
	SINGLE POLE SW. (46" MH, TYPICAL)		UNSWITCHED CIRCUIT		DUCT SMOKE DETECTOR (TYPE DENOTED)
	3-WAY SW.		CIRCUIT HOMERUN		F.A. PULLSTATION, (46" MH)
	4-WAY SW.		UNDERGROUND		F.A. RELAY
	KEYED SW.				F.A. DOOR HOLDER
	LOW VOLTAGE DIMMER SWITCH				SPRINKLER FLOW SWITCH
	PUSH BUTTON				SPRINKLER VALVE TAMPER SWITCH
	SINGLE RECEPT.				GENERATOR REMOTE ANNUNCIATOR
	DUPLEX RECEPT. (16" MH UNO)				KEYED NOTE (SEE SCHEDULE)
	SPLIT DUPLEX RECEPT.				RELAY OVERRIDE SWITCH, M IS MASTER
	QUADRAPLEX RECEPT.				CARBON MONOXIDE DETECTOR
	FLOOR RECEPT. (DUPLEX SHOWN)				
	RECEPT ON CORD REEL (DUPLEX SHOWN)				
	JUNCTION BOX				

RECEPTACLE SUBSCRIPTS:

AV	AV RECEPTACLE
CM	CEILING MTD
GFI	GROUND FAULT INTERRUPTER 5MA
PROJ	PROJECTOR, SEE TECH DWGS FOR LOCATION AND MH
T	TAMPER RESISTANCE
TO	TEACHERS RECEPTACLE
TV	TV RECEPTACLE, SEE TECH DWGS FOR LOCATION AND MH
USB	COMBINATION DUPLEX/USB RECEPTACLE, 3.1A AMP USB
WP	WEATHERPROOF "IN USE" WITH GFI

### ELECTRICAL GENERAL NOTES

- GENERAL NOTES APPLY TO ALL SHEETS.
- THE PLANS ARE INTENDED TO COMPLY WITH FEDERAL, STATE, AND LOCAL CODES, GUIDELINES, AND REGULATIONS, AS WELL AS THE HEALTHCARE FACILITIES GUIDELINES AND JOINT COMMISSION STANDARDS (FOR HEALTHCARE PROJECTS). THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL OF THE PLANS AND SPECIFICATIONS, NOT SOLELY THOSE OF THEIR TRADE.
- SEE THE ARCHITECTURAL PLANS FOR A LEGEND OF WALL PARTITION TYPES. PROVIDE A UL RATED FIRESTOPPING ASSEMBLY TO MEET THE RATINGS OF THE WALLS REQUIRING SUCH. SEE DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- THE CONTRACTOR SHALL LAY OUT AND COORDINATE ALL LINES, LEVELS, ELEVATIONS, AND MEASUREMENTS FOR ALL THE WORK, AND NOTIFY THE ENGINEER OF DISCREPANCIES AND CONFLICTS BEFORE PROCEEDING WITH INSTALLATION OR EXCAVATION. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR THE EXACT LOCATIONS AND QUANTITIES OF DEVICES.
- IN THE EVENT OF INCONSISTENCY OR CONFLICT WITHIN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL PROVIDE THE BETTER QUALITY OR GREATER QUANTITY OF WORK AND COMPLY WITH THE STRICTER REQUIREMENT.
- REFER TO ARCHITECTURAL ELEVATIONS FOR DEVICE LOCATIONS AND MOUNTING HEIGHTS WHEN LOCATED AT OR ABOVE CASEWORK. COORDINATE EXACT DEVICE LOCATIONS PRIOR TO ROUGH-IN AND INSTALLATION. COORDINATE MOUNTING HEIGHTS WITH DEVICES OF OTHER TRADES IF NOT ELEVATED.
- SEE ARCHITECTURAL ELEVATIONS FOR ALL WALL MOUNTED DEVICES (I.E. HAND DRYERS, PHONES, ETC). COORDINATE LOCATIONS IN FIELD FOR EXACT PLACEMENT. RECEPTABLES IN ROOMS WITH SINKS ARE NOTED AS "GF" WHERE WITHIN SIX FEET OF A WATER SOURCE. IF RECEPTABLES SHOWN WITHOUT "GF" ARE LOCATED CLOSER TO SINK, GROUND FAULT MUST BE ADDED TO THE DEVICE. ARCHITECTURAL ELEVATIONS SHALL TAKE PRECEDENCE. EC TO COORDINATE ALL OUTLETS LOCATED ABOVE SINKS AND COUNTERTOPS WITH ARCHITECTURAL ELEVATIONS OF THE RESPECTIVE AREA AND ALL OTHER TRADES. IF NO ELEVATION EXISTS, LOCATE RECEPTABLES TO AVOID ALL MIRRORS, DEVICES, ETC. LOCATED ON BACK WALL OF SINK. DO NOT MOUNT ANY OUTLETS DIRECTLY OVER SINKS.
- COORDINATE EXACT LOCATIONS OF LIGHTING FIXTURES TO BE INSTALLED IN MECHANICAL ROOMS WITH OTHER TRADES AND BUILDING CONDITIONS.
- ALL FIRE ALARM STROBE LIGHTS SHALL BE SYNCHRONIZED (INCLUDING ROOMS WHERE THERE ARE OPERABLE PARTITIONS OR DOORS ON HOLD OPENS).
- FURNISH AND WIRE ALL DUCT SMOKE DETECTORS, INSTALL AS SHOWN ON DRAWINGS. FIA VENDOR SHALL COORDINATE WITH HC ON ALL LOCATIONS OF SMOKE DAMPERS PRIOR TO SUBMITTAL (AS LOCATIONS AND QUANTITIES MAY VARY DEPENDING ON HC ROUTING).
- FROM ALL FLUSH MOUNTED PANEL BOARDS, PROVIDE 1 SPARE 3/4" CONDUITS FOR EVERY 3 SPARE CIRCUIT BREAKERS OR PROVISIONAL SPACES OUT TO ABOVE ACCESSIBLE CORRIDOR CEILING SPACE. PROVIDE 1/4" THICK STEEL PLATE TO BACK OF ELECTRICAL PANELS. THE OVERALL DIMENSION OF THE PLATE IS TO BE THE SIZE OF THE ELECTRICAL PANEL. COORDINATE WALL THICKNESS FOR PANELBOARDS WITH ARCHITECT AND GC.
- ALL RECEPTABLES CIRCUITED TO "C", "E" AND "F" SERIES PANELS (ANY PANEL WITH DESIGNATION WHICH STARTS WITH THE LETTER "C", "E" AND "F" SHALL BE RED IN COLOR UNO IN SPECIFICATIONS).
- ALL EXTERIOR BUILDING-MOUNTED RECEPTABLES SHALL BE WEATHER RESISTANT, GROUND FAULT INTERRUPT UNLESS SPECIFIED OTHERWISE.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE ONE EXTRA EXIT SIGN AND 50' OF 3/4" CONDUIT AND WITH (2) #10'S AND #10 GND AS PART OF THEIR BID FOR ADDITIONAL EXIT SIGNS THAT MAY BE REQUIRED BY FIELD AHJ WALK-THRU.
- LIGHT FIXTURES SHOWN IN APPROXIMATE LOCATIONS. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT LOCATION OF FIXTURES. EXTERIOR MOUNTING HEIGHTS INDICATED ON PLANS ARE FOR REFERENCE ONLY. COORDINATE ALL HEIGHTS AND LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN.
- ALL EMERGENCY LIGHTING FIXTURES, NIGHT LIGHTS, EXITS SIGNS, AND GDS SHALL BE CONNECTED TO UNSWITCHED LEGS OR THROUGH AN EMERGENCY LIGHTING SPECIFIC RELAY CIRCUIT, UNLESS NOTED OTHERWISE. LIGHT FIXTURES CONNECTED TO A LIFE SAFETY BRANCH CIRCUIT ARE TO HAVE A "LFR" IN LINE FUSE UNO.
- ALL EMERGENCY LIGHTING FIXTURES, NIGHT LIGHTS, EXITS SIGNS, AND GDS SHALL BE CONNECTED TO UNSWITCHED LEGS OR THROUGH AN EMERGENCY LIGHTING SPECIFIC RELAY CIRCUIT, UNLESS NOTED OTHERWISE. LIGHT FIXTURES CONNECTED TO A LIFE SAFETY BRANCH CIRCUIT ARE TO HAVE A "LFR" IN LINE FUSE UNO.
- COORDINATE ALL TASK LIGHTING WITH CASEWORK CONTRACTOR PRIOR TO ROUGH-IN. SEE ARCHITECTURAL ELEVATIONS FOR FIXTURE LOCATIONS AND MOUNTING DETAILS.
- REFER TO POWER PLANS FOR ACTUAL PANEL LOCATION. GENERAL LOCATION OF PANELS MAY BE SHOWN ON LIGHTING PLAN FOR REFERENCE ONLY.
- ALL CABLE CONNECTIONS TO GROUND RODS, STRUCTURAL STEEL OR REINFORCING STEEL SHALL BE BY CADWELD, THERMOWELD OR HELIARC WELDING PROCESS. SEE DIV 26 GROUNDING SPECIFICATION.
- THIS CONTRACTOR SHALL COORDINATE WITH OTHER TRADES. SPACE EXITING BUILDING MAY HAVE STORMWATER AND POWER CONDUITS. COORDINATION DRAWINGS SHALL BE DONE AND APPROVED PRIOR TO INSTALLATION AND SHALL SHOW BUILDING FOOTERS, ALL PIPING, ETC.
- SEAL ALL CONDUITS AND AT FIRE WALLS. ALSO, SEAL CONDUITS BETWEEN EXTERIOR SPACES AND INTERIOR SPACES, CONDUITS THAT ENTER WALK-IN COOLERS/FREEZERS, OR CONDUITS BETWEEN SPACES THAT ARE JUST HEATED VS HEATED AND COOLED.
- PROVIDE 4" HOUSEKEEPING PADS FOR ALL EQUIPMENT THAT IS FLOOR SET UNO.
- VERIFY ALL EQUIPMENT CONNECTION LOCATIONS WITH SUPPLIER PRIOR TO ROUGH-IN AS EQUIPMENT MAY CHANGE. INTERLOCK CONTROL WIRING FOR EQUIPMENT SERVED (MOTORIZED LOUVERS AND SHAFT FANS WITH GENERATOR START CONTROLS) SHALL BE BY EC UNO.
- COORDINATE ALL MOUNTING HEIGHTS BETWEEN ALL TRADES. COORDINATE PANEL LOCATION WITH PCH/FP/PC TO ENSURE NO FOREIGN SYSTEMS ARE WITHIN 6" OF THE TOP OF THE PANEL PER NEC 110. AND PIPING BEYOND 6" ABOVE PANELS ARE REQUIRED TO BE SLEEVED.
- PROVIDE FACEPLATES FOR ALL OUTLET COVERS LISTED WITH PANEL AND CIRCUIT NUMBERS. ALL EMERGENCY OUTLETS SHALL BE SUPPLIED WITH RED COVER PLATE AND UPS SHALL BE BLUE. ALL NORMAL RECEPTABLES SHALL BE SUPPLIED WITH COVER PLATE MATCHING DEVICE COLOR. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- COORDINATE ALL LIGHT SWITCHES, ELECTRICAL PANELS, AND OTHER ELECTRICAL EQUIPMENT LOCATIONS WITH HVAC, FPC, AND PLUMBING CONTRACTORS PRIOR TO ROUGH-IN. VERIFY SPACE FOR EQUIPMENT THROUGH COORDINATION DRAWINGS. ALL WALLS THAT HAVE MULTIPLE DEVICES (RECEPTABLES, DATA, LIGHT SWITCHES, THERMOSTATS, FIRE ALARM DEVICES, ETC) SHALL BE ALIGNED. RECEPTABLES SHALL BE MOUNTED AT THE SAME HEIGHT AS DATA OUTLETS IF NOT SHOWN ON THE ARCHITECTURAL ELEVATIONS. MOUNT ALL DATA OUTLETS AND RECEPTABLES AT SAME HEIGHTS AND CLOSE TO ONE ANOTHER WHENEVER POSSIBLE (ALLOWING FOR SPACE FOR LARGER COVERPLATES).
- EC TO HARD PIPE ALL LIFE SAFETY CIRCUITS ("L" PREFIX PANELS). NO FLEXIBLE RACEWAY TO BE USED (EXCEPT TO CEILINGS AND MOVING EQUIPMENT WITHIN THE ROOM). CRITICAL BRANCH PANELS ("C" PREFIX) AND LIFE SAFETY CIRCUITS SHALL NOT SHARE WIRING WITH ANY EQUIPMENT, OPTIONAL, OR NORMAL POWER SYSTEMS. OUTPUT WIRING FROM 20A GDS SHALL BE CLASSIFIED AS LIFE SAFETY (FOR INTERIOR OR EXTERIOR LIGHTING CIRCUITS).
- OBTAIN SITE SPECIFIC CUT SHEETS FOR OWNER FURNISHED EQUIPMENT. PROVIDE POWER CIRCUIT AND CONNECTIONS AS SHOWN ON DRAWINGS.
- EC TO REFERENCE ARCHITECTURAL PLANS FOR RECEPTACLE HEIGHTS PRIOR TO ROUGH-IN.
- SPECIAL RECEPTABLES IN DATA ROOMS ARE TO BE NEMA 16-20R (UNO). VERIFY LAYOUT WITH RACKS AND EQUIPMENT. COORDINATE MOTORIZED DOOR OPERATORS WITH ARCHITECTURAL DRAWINGS.
- PROVIDE POWER TO ALL MECHANICAL/PLUMBING EQUIPMENT THAT REQUIRES POWER. THIS INCLUDES ANY VENDOR SPECIFIC ADDITIONAL EQUIPMENT THAT IS NOT SHOWN. POWER SHALL BE SOURCED TO MATCH THE REST OF THE SYSTEMS BRANCH REQUIREMENTS (FROM LIKE PANELS. IF "C" PANEL FED HEADEND, THEN "C" SHALL FEED ADDITIONAL EQUIPMENT). UNO. COORDINATE ALL EQUIPMENT LUGS WITH SAID CONTRACTOR PROVIDING EQUIPMENT. EQUIPMENT IS ASSUMED TO BE PROVIDED WITH LUGS TO CONNECT TO WIRING PROVIDED ON THESE DRAWINGS.
- ANY DAMAGE CAUSED BY THIS CONTRACTOR'S SCOPE OF WORK SHALL BE THE CONTRACTOR'S RESPONSIBILITY. DO NOT SCALE PLANS WHEN DIMENSIONS EXIST OF EQUIPMENT. ANY DISCREPANCIES IN DIMENSIONS SHALL BE NOTED AT IN SUBMITTALS. PROVIDE RFI WHEN SPACE DOES NOT ALLOW FOR INSTALLATION (AT TIME OF SUBMITTAL).
- ALL EQUIPMENT LOCATIONS ARE APPROXIMATE. COORDINATE EXACT LOCATION IN FIELD.
- THIS CONTRACTOR SHALL BE REQUIRED TO COORDINATE ALL LOCATIONS OF ALL DEVICES, PIPING, CONDUITS, DUCTS, CLEARANCES, ETC. WITH ALL OTHER TRADES. HVAC, STORM AND SANITARY PIPING SHALL HAVE RIGHT OF WAY FOR SLOPE AND SPACE REQUIREMENTS. ALL DEVICES THAT REQUIRE WORK FROM OTHER TRADES (THE FOLLOWING IS AN EXAMPLE BUT NOT A COMPLETE LIST) EQUIPMENT, DEVICES, SMOKE DETECTORS, SMOKE DAMPERS, ETC. SHALL BE COORDINATED WITH OTHER TRADES PRIOR TO INSTALLATION. SEE SPECIFICATIONS FOR PHASING REFERENCES.
- COORDINATE ALL CEILING INSTALLATIONS DEVICES WITH CEILING TILE SUPPLIER. INSTALL DEVICES ON QUARTER POINTS IF SCORE TILE IS INSTALLED. INSTALL MULTIPLE DEVICES IN ONE TILE WHERE POSSIBLE (TO LIMIT THE NUMBER OF INACCESSIBLE TILES) AND SHALL BE COORDINATED IN FIELD WITH VENDORS. THIS SHALL INCLUDE, BUT NOT LIMITED TO: SPRINKLER HEADS, SPEAKERS, FIA DEVICES, LIGHTING CONTROLS, ETC.
- REFER TO SPECIFICATIONS FOR VOLTAGE DROP REQUIREMENTS AS THEY ARE DIFFERENT FROM THE NEC MINIMUMS.
- CABLE TRAY SHALL BE USED FOR VOICE AND DATA CABLING ONLY. CENTRAL SOUND, VIDEO, AND ALL OTHER CABLING SHALL BE RUN IN SEPARATE AND INDEPENDENT J-HOOK STRAPS AND NOT IN THE CABLE TRAY.
- PROVIDE TWO (2) 2" CONDUIT SLEEVES ABOVE THE ENTRY DOOR OF EACH ROOM FOR VOICE, DATA, AND ALL OTHER CABLING.
- EC IS REQUIRED TO WALK THRU WITH OWNER TO VERIFY ALL DEVICE LOCATIONS AFTER INSTALLATION OF STUDS BEFORE ANY CONDUIT OR BOXES INSTALLED (PER ROOM TYPE).
- REFER TO VIDEO IMAGING SITE SPECIFIC DRAWINGS FOR ALL CLIENT CONTRACTOR WORK REQUIRED, RACEWAY BOXES, CABLES, ETC.
- SEE SITE SPECIFIC DRAWINGS FOR ALL CLIENT CONTRACTOR WORK REQUIRED, RACEWAY BOXES, CABLES, ETC.
- VERIFY ALL OWNER PROVIDED AND RELOCATED ITEMS/EQUIPMENT IN FIELD. REFER TO SITE SPECIFIC DRAWINGS WERE POSSIBLE.
- ALL TRENCH WIDTHS ARE SHOWN FOR ITEMS ONLY. ANY REQUIREMENTS FOR SLOPING WALLS OR TO MAKE WIDER FOR CODES/WORKING SAFETY ARE BY THE CONTRACTOR.
- MAINTAIN 18" SEPARATION BETWEEN CONDUITS OF MEDIUM VOLTAGE AND LOW VOLTAGE.
- THE ELECTRICAL CONTRACTOR SHALL ALSO INCLUDE ROUGH-INS (CONDUIT WITH PULL-STRINGS) FOR THERMOSTATS AND OTHER HVAC WALL MOUNTED CONTROL DEVICES. REFER TO MECHANICAL PLANS AND COORDINATE WITH THE CONTROLS CONTRACTOR.
- PROVIDE ROUGH IN OF ALL TECHNOLOGY DEVICES SHOWN ON THE POWER AND TECHNOLOGY PLANS.
- WHERE ROOMS ARE PRESSURE SENSITIVE, INTERIOR OF CONDUITS SHALL BE SEALED AS WELL AS EXTERIOR PENETRATIONS THRU WALL.
- LIGHTING CONTROL SYSTEM STARTUP AND COMMISSIONING SHALL BE BY THE LIGHTING CONTROL MANUFACTURER. ANY DAYLIGHT HARVESTING SYSTEMS (WHEN INSTALLED), SHALL BE PROVIDED TO SPECIFICATIONS. ANY CHANGES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR A COMPLETE AND FUNCTIONING SYSTEM MATCHING EXISTING DESIGN INTENT.
- THE EC SHALL COORDINATE NEW SERVICE WITH UTILITY(S) ONCE THE CONTRACTOR HAS BEEN AWARDED. A SCHEDULE SHALL BE SET TO DETERMINE THE WORK REQUIRED BY THE UTILITY(S). NEW/CHANGE OF SERVICE SHALL BE FILED BY THE CONTRACTOR. THE ARCHITECT/OWNER/ENGINEER SHALL PROVIDE LOAD BREAKDOWNS, ACCOUNT INFORMATION, ETC AS REQUIRED TO APPLY FOR NEW/CHANGE OF SERVICE AS NOTED ON DRAWINGS. ANY UTILITY INFORMATION SHOWN ON DRAWINGS IS APPROXIMATE AND SUBJECT TO CHANGE. ENGINEER MAY COORDINATE INTENT WITH UTILITY (DUE TO MOST UTILITIES HAVING A 6 MONTH EXPIRATION ON ANY REQUESTS).

### ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)	DCP	DOMESTIC WATER CIRCULATING PUMP	HT	HEIGHT	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION	SWBD	SWITCHBOARD
A	AMPERE	DEPT	DEPARTMENT	HTG	HEATING	NFDS	NON-FUSED SAFETY DISCONNECT SWITCH	SYS	SYMMETRICAL SYSTEM
AC	ABOVE COUNTER OR AIR CONDITIONER	DET	DETAIL	HTR	HEATER	NIC	NOT IN CONTRACT	TEL	TELEPHONE
ACLG	ABOVE CEILING	DIA	DIAMETER	HV	HIGH VOLTAGE	NL	NIGHT LIGHT	TERM	TERMINAL
ADO	AUTOMATIC DOOR OPENER	DISC	DISCONNECT	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	NO	NORMALLY OPEN	TL	TWIST LOCK
AF	AMP FRAME	DIST	DISTRIBUTION	HWP	HYDRONIC WATER PUMP	NPF	NORMAL POWER FACTOR	T	TAMPER RESISTANT
AFG	ABOVE FINISHED FLOOR	DN	DOWN	IC	INTER interrupting CAPACITY	NTS	NOT TO SCALE	T-STAT	THERMOSTAT
AFB	ABOVE FINISHED GRADE	DPR	DAMPER	IG	ISOLATED GROUND	OH	OVERHEAD	TTC	TELEPHONE TERMINAL CABINET
AFI	ARC FAULT CIRCUIT INTERRUPTER	DS	SAFETY DISCONNECT SWITCH	IC	ISOLATED GROUND	PA	PUBLIC ADDRESS	TV	TELEVISION
AHJ	AIR HANDLING UNIT	DT	DOUBLE THROW	IMC	INTERMEDIATE METAL CONDUIT	PE	PNEUMATIC ELECTRIC	TYC	TELEVISION TERMINAL CABINET
AL	ALUMINUM	DW	DRAWING	INCAND	INCANDESCENT	PF	POWER FACTOR	UE	UNDERGROUND ELECTRICAL
ALT	ALTERNATE	EM	EXISTING TO REMAIN	IR	INFRARED	PH	PHASE	UH	UNDERGROUND
AMP	AMPERE	EC	ELECTRICAL CONTRACTOR	IW	INTERLOCK WITH	PIV	POST INDICATING VALVE	UNO	UNLESS NOTED OTHERWISE
AMPL	AMPLIFIER	ELEC	ELECTRIC, ELECTRICAL	J-BOX	JUNCTION BOX	PNL	PANEL	UT	UTILITY
ANNUN	ANNUNCIATOR	ELEV	ELEVATOR	KV	KILOVOLT	PP	POWER POLE	UV	UNIT VENTILATOR OR ULTRAVIOLET
APPROX	APPROXIMATELY	EM	EMERGENCY	KVA	KILOVOLT-AMPERE	PR	PAIR	V	VOLT
AQ-STAT	AQUASTAT	EMS	ENERGY MANAGEMENT SYSTEM	KVAR	KILOVOLT-AMPERE REACTIVE	PRI	PRIMARY	VA	VOLT-AMPERES
ARCH	ARCHITECT, ARCHITECTURAL	EMT	ELECTRICAL METALLIC TUBING	KW	KILOWATT	PROJ	PROJECTION	VDI	VIDEO DISPLAY TERMINAL
AS	AMP SWITCH	EP	ELECTRIC PNEUMATIC EQUIPMENT	KWH	KILOWATT HOUR	PRV	POWER ROOF VENTILATOR	VERT	VERTICAL
AT	AMP TRIP	EQUIP	EQUIPMENT	LOC	LOCATE OR LOCATION	PT	POTENTIAL TRANSFORMER	VFD	VARIABLE FREQUENCY DRIVE
AUTO	AUTOMATIC TRANSFER SWITCH	EWC	ELECTRIC WATER COOLER	LT	LIGHT	PVC	POLYVINYL CHLORIDE (CONDUIT)	VOL	VOLUME
AUTOMATIC	AUTOMATIC	EX	EXISTING	LTG	LIGHTING	PWR	POWER	W	WATT
AUX	AUXILIARY	EXH	EXHAUST	LTNG	LIGHTNING	QUAN	QUANTITY	W	WITH
AV	AUDIO VISUAL	EXP	EXPLOSION PROOF	LV	LOW VOLTAGE	R	RELOCATE	WG	WIRE GUARD
AWG	AMERICAN WIRE GAUGE	FA	FIRE ALARM	MAX	MAXIMUM	RCPT	RECEPTACLE	WH	WATER HEATER
BATT	BATTERY	FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL	MAG.S	MAGNETIC STARTER	R	RELOCATED	WO	WITHOUT
BD	BOARD	FACP	FIRE ALARM CONTROL PANEL	MC	MENTORY CONTACT	REQD	REQUIRED	WP	WEATHERPROOF
BLDG	BUILDING	FCU	FAN COIL UNIT	MCB	MECHANICAL CONTRACTOR	RM	ROOM	XFRM	TRANSFORMER
BMS	BUILDING MANAGEMENT SYSTEM	FIXT	FIXTURE	MCC	MOTOR CONTROL CENTER	RSC	RIGID STEEL CONDUIT	XFR	TRANSFER
C	CONDUIT	FLR	FLOOR	MCC	MAIN DISTRIBUTION CENTER	RTU	ROOF TOP UNIT	@	AT
CAB	CABINET	FLUR	FLUORESCENT	MDP	MAIN DISTRIBUTION PANEL	SC	SURFACE CONDUIT	#	FEET
CAT	CATALOG	FU	FUSE	MFR	MANUFACTURER	SEC	SECONDARY	#	INCHES
CATV	CABLE TELEVISION	FUDS	FUSED SAFETY DISCONNECT SWITCH	MIS	MISCELLANEOUS	SHT	SHEET	#	NUMBER
CB	CIRCUIT BREAKER	GAL	GALLON	MIC	MICROPHONE	SIM	SIMILAR	Ø	PHASE
CCTV	CLOSED CIRCUIT TELEVISION	GALV	GALVANIZED	MIN	MINIMUM	SIN	SOLID NEUTRAL	C	CENTER LINE
CKT	CIRCUIT	GC	GENERAL CONTRACTOR	MISC	MISCELLANEOUS	SPKR	SPEAKER	P	PLATE
CLG	CEILING	GEN	GENERATOR	MLO	MAIN LUGS ONLY	SP	SPARE		
COMB	COMBINATION	GFI	GROUND FAULT CIRCUIT INTERRUPTER	MMS	MANUAL MOTOR STARTER	SR	SURFACE RACEWAY		
COMP	COMPRESSOR	GA	GAUGE	MH	MOUNTING HEIGHT, CENTERLINE	SS	STAINLESS STEEL		
CONN	CONNECTION	GALV	GALVANIZED	MIC	MICROPHONE	SSW	SELECTOR SWITCH		
CONST	CONSTRUCTION	GFP	GROUND FAULT PROTECTOR	MSP	MOTOR STARTER PANELBOARD	SIS	STOP/START PUSHBUTTONS		
CONT	CONTINUATION OR CONTINUOUS	GND	GROUND	MSBD	MAIN SWITCHBOARD	STA	STATION		
CONTR	CONTRACTOR	GRS	GALVANIZED RIGID STEEL (CONDUIT)	MT	MOUNT	STD	STANDARD		
CONV	CONVECTOR	GYP BD	GYP/STUM BOARD	MT C	EMPTY CONDUIT	SURF	SURFACE MOUNTED		
CP	CIRCULATING PUMP	HDA	HANDS-OFF-AUTOMATIC SWITCH	MTC	MANUAL TRANSFER SWITCH	SW	SWITCH		
CR	CATHODE-RAY TUBE	HORIZ	HORIZONTAL	MTR	MOTOR, MOTORIZED				
CTR	CENTER	HP	HORSEPOWER	N.C.	NORMALLY CLOSED				
CU	COPPER	HPF	HIGH POWER FACTOR	NEC	NATIONAL ELECTRICAL CODE				





