

PROJECT NAME: 20240312 BL072 – CHEMISTRY ADDITION – REPLACE AHU 1 THROUGH 4 – PHASE 1
OWNER NAME: INDIANA UNIVERSITY BOARD OF TRUSTEES
CES PROJECT NO. 2024-003.IUM
ADDENDUM NO. 2
DATED: 3/18/2025

This Addendum consists of four (4) Addendum page(s) and sixty-three (63) attachment pages totaling sixty-seven (67) pages. This Addendum shall supplement, amend, and become part of the Bid Documents. All Bids shall be based on these modifications. Bidders shall acknowledge the receipt of this addendum on their Bid Form.

PART 1 - CHANGES TO THE PROJECT MANUAL

Modifications described herein shall be incorporated in the Project Manual. All other Work shall remain unchanged.

1.1 DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

A. Section 230592 "HVAC INSTRUMENTATION AND CONTROLS"

1. INSERT Document
Siemens Drawings per the attached.

B. Section 232113 "HYDRONIC PIPING"

1. DELETE AND REPLACE Section 232113 in its entirety.

C. Section 232513 "WATER TREATMENT FOR CLOSED-LOOP HYDRONIC SYSTEMS"

1. MODIFY Subparagraph 1.7,A As follows:
 - A. HVAC Water-Treatment installation and services shall be performed by Weas Engineering Inc. 317-867-4477.

D. Section 237313.19 "INDOOR, FIELD BUILT, CUSTOM AIR-HANDLING UNITS"

1. ADD Subparagraph 2.5, l, 1, f as follows:
"f. Nortek"

PART 2 - CHANGES TO THE DRAWINGS

Modifications described herein shall be incorporated in the Drawings. All other Work shall remain unchanged.

2.1 A-SERIES DRAWINGS

A. Drawing Number A121 – ARCHITECTURAL SCOPE

1. DELETE AND REPLACE Drawing in its entirety.

2.2 M-SERIES DRAWINGS

A. Drawing Number M401 -MECHANICAL ENLARGED PLANS

- B. DELETE AND REPLACE Drawing in its entirety.

C. Drawing Number M501 – MECHANICAL DETAILS

1. DELETE AND REPLACE Drawing in its entirety.

D. Drawing Number M701 – TEMPERATURE CONTROLS SCHEMATICS

1. DELETE AND REPLACE Drawing in its entirety.

E. Drawing Number MP101 – MECHANICAL PIPING PARTIAL THIRD FLOOR PLAN

1. DELETE AND REPLACE Drawing in its entirety.

2.3 E-SERIES DRAWINGS

A. Drawing Number ED102 – ELECTRICAL DEMOLITION

1. DELETE AND REPLACE Drawing in its entirety.

B. Drawing Number EP102 – POWER PLAN FOURTH FLOOR NORTH AND SOUTH ELECTRICAL AND MECHANICAL ROOMS.

1. DELETE AND REPLACE Drawing in its entirety.

2.4 S-SERIES DRAWINGS

A. DRAWING NUMBER S101 – STRUCTURAL PLANS

1. DELETE AND REPLACE Drawing in its entirety.

PART 3 - AVAILABLE PROJECT INFORMATION

- 3.1** A dumpster will be permitted per the attached site plan (shown as a white rectangle) for the heavy demolition period, roughly from September 18 until December 31, 2025 – *Attachment A* (Site Photo) . Successful bidder will coordinate exact dumpster sizing and placement with Construction Manager and Building Manager. 6'FOOT temporary fence chain link fence and Pantone 201 privacy screen (per IU standard) - *Attachment B* - shall be provided around dumpster, and locked when not in use.

PART 4 - QUESTIONS AND ANSWERS

The following are questions submitted and answers provided. The questions and answers are to be considered as part of the Invitation to Bid.

| Question Number | Question | Response |
|-----------------|--|--|
| 1 | Is there a possibility of hazardous chemicals attached to or within the existing exhaust fan unit #1 that could be disturbed during demolition? If so, how should this be addressed? | The owner will evaluate the historical usage of chemicals in the spaces that are exhausted by this system and will conduct any testing required. Any remediation work needed will be addressed by the owner. |

PRE-BID ATTENDANCE

The following Pre-Bid Sign-In Sheet is being made available to Bidders for informational purposes only and is not a part of the Addendum.

ATTACHMENTS

SIEMENS CONTROL DRAWINGS

232113 HYDRONIC PIPING

A121 – ARCHITECTURAL SCOPE

M401 -MECHANICAL ENLARGED PLANS

M501 – MECHANICAL DETAILS

M701 – TEMPERATURE CONTROLS SCHEMATICS

MP101 – MECHANICAL PIPING PARTIAL THIRD FLOOR PLAN

ED102 – ELECTRICAL DEMOLITION

EP102 – POWER PLAN FOURTH FLOOR NORTH AND SOUTH ELECTRICAL AND MECHANICAL ROOMS

S101 – STRUCTURAL PLANS

ATTACHMENT A - SITE PHOTO / DUMPSTER LOCATION

ATTACHMENT B - CONSTRUCTION FENCE ALL CAMPUSES

PRE BID MEETING SIGN IN SHEET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES

PHONE: 317-293-8880
FAX: 317-293-0374

03/17/25

FOR INFORMATION CONTACT
ERIC HUGHES

ENGINEERING DATA FOR
BL072 CHEMISTRY ADD - REPL AH1
800 E KIRKWOOD AVE.
BLOOMINGTON
IU PROJECT #20240312, IN 47405
USA

44OP-394493

ARCHITECT

CREATIVE ENGINEERING SOLUTION
ENGINEER

CONTRACTOR

| DWG | DESCRIPTION |
|-------|-------------------------------|
| | GENERAL |
| CVRST | COVER SHEET |
| CIC | C.I.C CONTRACTOR NOTES |
| LEG | Legend & Abbreviations |
| ABAC | Anixter Building Auto. Cables |
| ALN | ALN WIRING SPECIFICATIONS |
| TTRM1 | TX-I/O Termination Spec. |
| TTRM2 | TX-I/O Termination Spec. 2 |
| TTRM3 | TX-I/O Termination Spec. 3 |
| | SCHEDULE |
| VLV | CONTROL VALVE SCHEDULE |
| | CONTROL DRAWINGS |
| R01 | SYSTEM RISER |
| R01A | SYSTEM RISER BOM |
| R02 | DEMOLITION |
| 200 | AHU-4 CONTROL |
| 200A | AHU-4 ELEC. WIRING 1 |
| 200B | AHU-4 ELEC. WIRING 2 |
| 200C | AHU-4 ELEC. WIRING 3 |
| 200D | AHU-4 ELEC. WIRING 4 |
| 200E | AHU-4 ELEC. WIRING 5 |
| 200F | AHU-4 ELEC. WIRING 6 |
| 200G | AHU-4 AUX. PANEL LAYOUT |
| 200H | AHU-4 BOM & SOO 1 |
| 200I | AHU-4 CONTROL SOO 2 |
| 210 | EF-4 CONTROL |
| 210A | EF-4 ELEC. WIRING 1 |
| 210B | EF-4 ELEC. WIRING 2 |
| 210C | EF-4 ELEC. WIRING 3 |
| 210D | EF-4 ELEC. WIRING 4 |
| 210E | EF-4 AUX. PANEL LAYOUT |
| 210F | EF-4 BOM & SOO |
| 400 | VVB3-23 WORK |

| DWG | DESCRIPTION |
|------|--|
| | DDC PANEL LAYOUTS |
| N07A | PXCM-7 AHU3&4 |
| N07B | PXCM-7p002 |
| N07C | PXCM-7p003 |
| N07D | PXCM-7p004 |
| N07E | PXCM-1 BOM |
| N08A | PXCM-8 EF-3&4 |
| N08B | PXCM-8p002 |
| N08C | PXCM-8p003 |
| N08D | PXCM-8p004 |
| N08E | PXCM-8 BOM |
| | DDC PANEL INSTALLATION DRAWINGS |
| N07 | PXCM-1 PANEL LAYOUT |
| N08 | PXCM-8 PANEL LAYOUT |

| REVISION HISTORY | | | | |
|------------------|-----------|----|---------------|--|
| 00 | 3/17/2025 | HB | SUBMITTAL SET | |
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| | |
|--|---|
| SIEMENS | 3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374 |
| SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION | |

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|--|---------------|------------|-----------------------------|----------------------------|
| BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | |
| ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 |
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GENERAL NOTES FOR CONTROLS INSTALLATION CONTRACTOR (CIC)

1. All work shall be performed in accordance with the contract documents and all applicable codes and standards.
2. Provide and install all wiring, conduit, circuit breakers, etc., and any needed mounting hardware to install control devices/panels (brackets, extensions, stands, etc.) for a complete installation.
3. Mount, wire and pipe (control pneumatics) all devices including panels, sensors, relays, actuators, switches, sensor covers/guards, etc. for a complete installation.
4. All installation of the energy management system and components is by the CIC unless noted otherwise.
5. IU, IUI, IUK, IUE, through Siemens Building Technologies, Inc., will provide all system controllers, relays, transformers, sensors, prefabricated auxiliary panels and switches unless otherwise noted. The CIC will provide all installation materials necessary to mount, install, and wire all controls devices.
6. All devices to be installed according to manufacturer's recommendations and the contract documents. Field verify exact locations of all devices/equipment. Coordinate with Siemens.
7. All routings for electrical installation are to be verified by the CIC.
8. C.I.C. shall be responsible for interlock wiring between VFDs and local disconnect switches, where applicable.
9. C.I.C. shall coordinate their work with Siemens, the Contractor, other Subcontractors, and the Owner.
10. All control devices and panels that require 120V power that are not powered by the division 26 contractor shall require a dedicated circuit from its own breaker. Provide circuit breakers and power wiring where required.
11. Mount panels on racks when wall space is not available. The engineer shows panel locations on HVAC drawings. Actual panel locations are to be coordinated with the contractors and owner.
12. All line voltage wiring shall be installed in conduit.
13. All wiring must be pulled in one length. Splicing is not allowed. All Control wiring shall be continuous.
14. All wiring in mechanical rooms, concealed and inaccessible places and/or where required by project plans and specifications shall be installed in conduit.
15. Any conductor carrying voltage greater than 24VAC shall not occupy the same conduit as low voltage wiring.
16. Conduits installed outdoors or encased in concrete shall be in rigid conduit.
17. Open cable shall be installed only where space is accessible and allowed by the project plans and specifications. In these cases, cable shall be rated for space they occupy. Provide plenum rated materials as required.
18. See specifications and IU PPA Control Design Standard document for conduit use & installation requirements.
19. Provide as-built record drawings of installation of the system.
20. Record drawings shall include routing and sizing of communications wiring, sensor wiring, power trunk wiring, transformer locations, field device locations, etc.
21. C.I.C. shall receive, handle, and store, as needed, all material to be installed under their contract. Subcontractor shall be responsible for verification of quantity received. The CIC will be responsible for verifying all received material. Discrepancies must be immediately documented with the shipping company prior to their leaving the delivery site and shall be reported in writing to Siemens Building Technologies, Inc. within 48 hours. The CIC is responsible for the security of all materials received and stored. The CIC will replace, at his expense, any materials missing or damaged.
22. Provide and install all tags and labels per plans and specifications for all control devices. Coordinate tag and label text, size and type with Siemens. Tag wiring at the field panel with the full point name. Tag wiring at the field device with the full point address.
23. Terminate all wiring. If necessary, CIC will make all cutover terminations under the supervision of Siemens Building Technologies at startup, unless otherwise directed by Siemens.
24. CIC is responsible for participating in the commissioning process to the extent that it involves their installation work.
25. For wire runs to devices that require 24 VAC such as electric valve actuators, electric damper actuators, sensing devices, etc., CIC shall use the following wiring arrangement:
 - a. For devices that use a three-wire arrangement per the control drawings for carrying the 24VAC power and signal to the device, install cable type 18-gauge 3 conductor (18-3C) unless otherwise noted on control wiring diagrams. Neutral is tied together at the auxiliary panel.
 - b. For devices that use a four-wire arrangement per the control drawings for carrying the 24VAC power and signal to the device, use the following cable types unless otherwise noted on control wiring diagrams.
 - i. Install cable type 14-gauge 2 conductor (14-2C) for the 24VAC powering the device.
 - ii. Install cable type 18-gauge 2 conductor (18-2C) for the signal controlling the device.
 - iii. Tie neutrals together at the device.
 - c. QPA and Q series sensors may be landed to the RTS port on the BACnet TEC controller and will have a pre-terminated wire in either 50- or 100-foot length. See individual drawing details for further information.
26. C.I.C. shall use control wire according to the following schedule. Purchase wire manufactured by one of the following three vendors or approved equal. If wire size is not specified coordinate with Siemens and plan on using 12 gauge.
27. Minimum conduit size: 3/4".
28. Control wiring concealed in walls will be in EMT conduit. Existing wall will be 3/4" flex if inaccessible.
29. Wire size for terminal equipment devices will be either 18 AWG – 2 conductor or 18 AWG – 3 conductor wire unless otherwise noted or providing power to the TEC.

Anixter

| Description | Part Number | Application |
|---------------------------------|--------------------|--|
| ETHERNET 23AWG, CAT6 | CMP-00424AVA-7-06 | Ethernet Network Communication cabling (verify type/color) |
| 24-1p (STR) SHD Cable-Plenum | H-B-TSP24LC-CMP | BLN trunks |
| 24-1p (STR) SDH Cable-Plenum | H-F-TSP24LC-CMP | FLN trunks |
| 24-1.5p (STR) FT-6 Cable-Plenum | H-F-1.5TSP24LC-CMP | MSTP FLN BACnet trunks |
| 20-2c (Solid) Cable-Plenum | KNX-TSP20LC-CMP | KNX Cable for DXR |
| 18-2c (STR) Cable-Plenum | H-TP18-CMP | Point/low voltage wiring |
| 18-3c (STR) Cable-Plenum | H-3C18-CMP | DXR/TEC actuators, transducers |
| 18-6c (STR) Cable-Plenum | 1806C-2-2N-01 | Point/low voltage wiring |
| 14-2c (STR) Cable-Plenum | H-2C14-CL3P | 24VAC power trunk/power for devices |

Anixter Contact: Gina Menolascino, Siemens Industry Account Manager
888-479-3830
2301 Patriot Blvd. Glenview, IL, 60026
sbt@anixter.com

Belden

| Description | Part Number | Application |
|---------------------------------|-----------------------|--|
| ETHERNET 23AWG, CAT6 | 2413F D151000 | Ethernet Network Communication cabling (verify type/color) |
| 24-1p (STR) SHD Cable-Plenum | YR48881 0031000 (CMP) | BLN trunks |
| 24-1p (STR) SDH Cable-Plenum | YR49243 2121000 (CMP) | FLN trunks |
| 24-1.5p (STR) FT-6 Cable-Plenum | SPECIAL ORDER WIRE | MSTP FLN BACnet trunks |
| 20-2c (Solid) Cable-Plenum | SPECIAL ORDER WIRE | KNX Cable for DXR |
| 18-2c (STR) Cable-Plenum | YM48514 0061000 | Point/low voltage wiring |
| 18-3c (STR) Cable-Plenum | YM48447 0061000 | DXR/TEC actuators, transducers |
| 18-6c (STR) Cable-Plenum | SPECIAL ORDER WIRE | Point/low voltage wiring |
| 14-2c (STR) Cable-Plenum | YM48515 0131000 | 24VAC power trunk/power for devices |

Belden Contact: Communications Supply Corporation
317-266-1600
1560 Indiana Avenue, Indianapolis, IN 46202
buybelden@gocsc.com

The Cable Company

| Description | Part Number | Application |
|---------------------------------|-----------------|--|
| ETHERNET 23AWG, CAT6 | 5652P66CMP1000 | Ethernet Network Communication cabling (verify type/color) |
| 24-1p (STR) SHD Cable-Plenum | 5200BLN | BLN trunks |
| 24-1p (STR) SDH Cable-Plenum | 5200FLN | FLN trunks |
| 24-1.5p (STR) FT-6 Cable-Plenum | 5201P67FLN1000 | MSTP FLN BACnet trunks |
| 20-2c (Solid) Cable-Plenum | 5212-P47KNX1003 | KNX Cable for DXR |
| 18-2c (STR) Cable-Plenum | 5041SBT | Point/low voltage wiring |
| 18-3c (STR) Cable-Plenum | 5043SBT | DXR/TEC actuators, transducers |
| 18-6c (STR) Cable-Plenum | 5046P33CMP | Point/low voltage wiring |
| 14-2c (STR) Cable-Plenum | 5061SBT | 24VAC power trunk/power for devices |

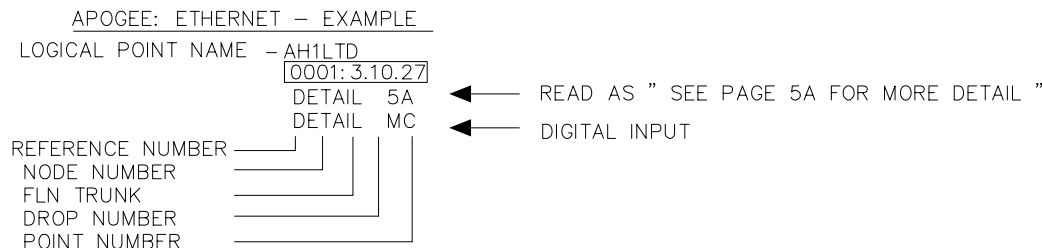
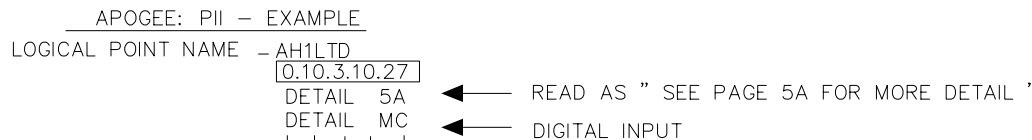
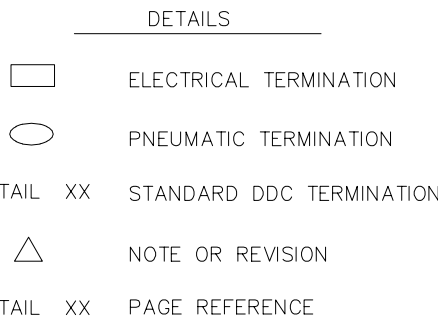
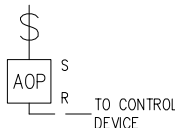
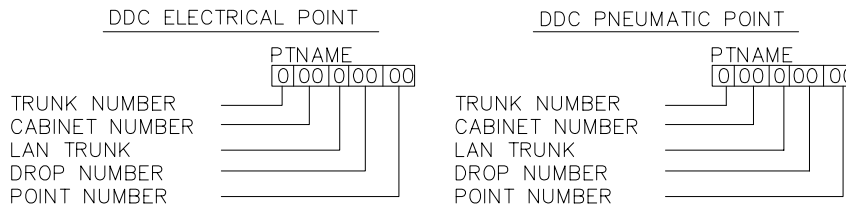
TCC Contact: Caitlin/Bart
800-677-9473
498 Bonnie Lane, Elk Grove Village, IL 60007
ilsales@tccwire.com

30. CIC shall create and keep an up to date list of DXR Bar Codes in a binder that is accessible to Siemens. CIC will create a list of terminal equipment that is controlled by DXR Controllers. CIC will remove the Bar Code from the DXR Controllers at the time of controls installation for each DXR and affix the Bar Code next to the associated Terminal Equipment Name in the DXR Bar Code Binder. CIC will scan the information and transmit in .pdf format to Siemens upon request.
31. CIC installation verification list. CIC shall create and keep an up to date list of the status of Mechanical System and Terminal Equipment controls installation in a binder that is accessible to Siemens. CIC will update Siemens weekly with the status of controls installation for each Mechanical System and each piece of Terminal Equipment.

| CONTROL SYMBOL | CONTROL SYMBOL DESCRIPTION |
|----------------|---------------------------------|
| AC | AIR COMPRESSOR |
| AD | AIR DRYER |
| ADXR | ACTUATOR DXR |
| AE | ACTUATOR ELECTRIC |
| AEM | APOGEE ETHERNET MICROSERVER |
| AF | AIR FILTER |
| AFS | AIR FLOW STATION |
| AOP | ANALOG OUTPUT, PNEUMATIC |
| AP | ACTUATOR PNEUMATIC |
| APS | AUX. POWER SUPPLY |
| AT | AUTOMATIC TRAP |
| ATD | AUTO TANK DRAIN |
| ATEC | ACTUATOR TEC |
| AZM | AUTOZERO MODULE |
| BCU | BUS COUPLING UNIT |
| BELL | BELL |
| BIM | BUS INTERFACE MODULE |
| BOIL | BOILER |
| BRT | BRIGHTNESS |
| BRTT | BRIGHTNESS AND TEMPERATURE |
| BTN | BUTTON |
| CBL | CABLES |
| CKV | CHECK VALVE |
| CM | CONSTRUCTION MATERIALS |
| CP | COMPONENT PANEL |
| CPU | CENTRAL PROCESSING UNIT |
| CRT | CATHODE RAY TUBE |
| CS | CURRENT SWITCH |
| CT | CURRENT TRANSDUCER |
| CTTE | CO2 TEMP TRANSMITTER ELEC |
| CVC | CONSTANT VOLUME CONTROLLER |
| D | DAMPER |
| DDC | DUAL DUCT CONTROLLER |
| DEM | DEMAND ENERGY MONITOR |
| DP | DEW POINT TRANSMITTER |
| DPR | DIFFERENTIAL PRESS. REGULATOR |
| DPS | DIFFERENTIAL PRESSURE SWITCH |
| DPTE | DIFF. PRESS. TRANSMITTER ELEC. |
| DPTP | DIFFERENTIAL PRESSURE PNEUMATIC |
| DPU | DIGITAL POINT UNIT |
| DXR | TERMINAL EQUIPMENT CONTROLLER |
| EC | ENTHALPY COMPARITOR |
| EP | ELECTRO-PNEUMATIC VALVE |
| ES | END SWITCH |
| ET | ENTHALPY TRANSMITTER |
| EXP | EXPANSION PANEL |
| FAN | FAN |
| FHC | FUME HOOD CONTROLLER |
| FM | FLOW MTR. (FLOW METER STATION) |
| FMS | FIRE MGMT. SYSTEM |
| FS | FLOW SWITCH |
| FTP | FLOW TRANSMITTER PNEU. |
| G | GAUGE |
| GD | GAS DETECTOR |
| H | HYGROSTATS |
| HE | HUMIDIFIER ELECTRIC |

| CONTROL SYMBOL | CONTROL SYMBOL DESCRIPTION |
|----------------|---------------------------------|
| HHC | HAND-HELD OPERATOR'S TERMINAL |
| HL | HIGH LIMIT |
| HMI | GAMMA TOUCH PANEL |
| HOA | HAND-OFF-AUTO SWITCH |
| HORN | HORN |
| HPC | HEAT PUMP CONTROLLER |
| HTD | HIGH TEMPERATURE DETECTOR |
| HTE | HUMIDITY TRANSMITTER ELECTRIC |
| HTP | HUMIDITY TRANSMITTER PNEUMATIC |
| INT | INTERCOM |
| KWM | ELECTRIC KILOWATT METER |
| LA | LIGHT ACTUATOR |
| LC | LIMIT CONTROLLER (LIMITEM) |
| LLS | LIQUID LEVEL SWITCH |
| LLT | LIQUID LEVEL TRANS. |
| LPR | POWER SUPPLY 24VAC/24VDC |
| LTDE | LOW TEMP. DETECTOR ELECTRIC |
| LTDP | LOW TEMP. DETECTOR PNEUMATIC |
| LUI | LOCAL USER INTERFACE |
| MBC | MODULAR BUILDING CONTROLLER |
| MDM | MODEM |
| ME | ELECTRONIC ACTUATOR |
| MEC | MODULAR EQUIPMENT CONTROLLER |
| MG | MAGNEHELIC GAUGE |
| MPU | MULTI-POINT UNIT |
| MS | MOTOR STARTER |
| OCC | OCCUPANCY |
| OCCB | OCCUPANCY AND BRIGHTNESS |
| OBS | OBSOLETE |
| ODP | OPERATOR DATA PANEL |
| P | PUMP |
| PA | PULSE ACCUMULATOR |
| PCT | PROGRAMMABLE CLOCK TIMER |
| PE | PRESSURE ELECTRIC SWITCH |
| PL | PILOT LIGHT |
| PM | POWER MONITOR |
| PNL | PANEL |
| PPM | POINT PICKUP MODULE |
| PRC | PRESSURE REG. CONTROLLER |
| PRV | PRESSURE REDUCING VALVE |
| PS | POSITIONING SWITCH |
| PSE | POSITION SENSOR ELECTRIC |
| PST | PULL STATION |
| PT | PITOT TUBE |
| PTE | PRESSURE TRANSMITTER ELECTRIC |
| PTP | PRESSURE TRANSMITTER PNEUMATIC |
| PTR | PRINTER |
| PV | PILOT VALVE |
| PXCC | PX COMPACT CONTROLLER |
| PXCM | PXC-MODULAR CONTROLLER |
| PXG3 | BACNET ROUTER ETHERNET/IP-MS/TP |
| RBC | REMOTE BUILDING CONTROLLER |
| RC | RECEIVER CONTROLLER |

| CONTROL SYMBOL | DESCRIPTION |
|----------------|-----------------------------------|
| RCU | REMOTE CONTROL UNIT |
| RE | RELAY ELECTRIC |
| RP | RELAY PNEUMATIC |
| RS | RESTRICTOR |
| RV | RELIEF VALVE |
| S/W | SOFTWARE |
| SA | SHADE ACTUATOR |
| SC | STEP CONTROLLER |
| SCU | STAND ALONE CONTROL UNIT |
| SD | SMOKE DETECTOR |
| SE | SWITCH ELECTRIC |
| SIO | SLX IO MODULES |
| SLX | APOGEE SLX CONTROLLER |
| SPKR | SPEAKER |
| SPP | STATIC PRESSURE PROBE |
| SPR | STATIC PRESSURE REGULATOR |
| SV | SOLENOID VALVE |
| SW | SWITCH PNEUMATIC |
| T | ROOM THERMOSTAT, PNEUMATIC |
| TBC | TERMINAL BOX CONTROLLER |
| TC | TEMPERATURE CONTROLLER(S200) |
| TCU | TERMINAL CONTROL UNIT |
| TDR | TIME DELAY RELAY |
| TE | THERMOSTAT, ELECTRIC |
| TEC | TERMINAL EQUIPMENT CONTROLLER |
| TH | THERMOMETER |
| TI | TRUNK INTERFACE |
| TIE | TRUNK ISOLATOR EXTENDER |
| TIU | TELCOM INTERFACE UNIT |
| TMR | TIMER, TIME CLOCK |
| TTE | TEMPERATURE TRANSMITTER ELECTRIC |
| TTP | TEMPERATURE TRANSMITTER PNEUMATIC |
| TXIO | TX-I/O FAMILY CONTROLLER MODULES |
| UC | UNITARY CONTROLLER |
| UCC | UNIT CONDITIONER CONTROLLER |
| UVC | UNIT VENT CONTROLLER |
| V | VALVE |
| V* | VALVE SERVICE PARTS |
| VA | TEC VALVE ACTUATOR |
| VAC | VARIABLE AIR VOLUME CONTROLLER |
| VB | VIBRATION ISOLATOR |
| VTE | VELOCITY TRANSMITTER ELECTRICAL |
| W | WELL |
| WST | WEATHER STATION |
| XDR | TRANSDUCER |
| XFMR | TRANSFORMER |



REVISION HISTORY

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SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

**3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374**

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

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| ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 |
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Legend & Abbreviations

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LEG

| Anixter Building Automation Cables | | |
|------------------------------------|---|--|
| Non-Plenum | | |
| SBT Part Number | Description | Print Legend |
| H-TP20-CM | 20AWG,STR,1TP,CM,BLUE JACKET | NORTHFLEX ® H-TP20-CM “DI, DO, AI, AO” (Mfg E#) 20AWG 1P 75°C CM (UL) C(UL) |
| H-3C20-CM | 20AWG,STR,3COND,CM,BLUE JACKET | NORTHFLEX ® H-3C20-CM “TEC V/D” (Mfg E#) 20 AWG 3C 75°C CM (UL) C(UL) |
| H-TP18-CMR | 18AWG,STR,1TP,CMR,BLUE JACKET | NORTHFLEX ® H-TP18-CMR “DI, DO, AI, AO” (Mfg E#) 18AWG 1P 75°C CMR (UL) C(UL) |
| H-3C18-CMR | 18AWG,STR,3COND,CMR,BLUE JACKET | NORTHFLEX ® H-3C18-CMR “TEC V/D” (Mfg E#) 18 AWG 3C 75°C CMR (UL) C(UL) |
| H-2C14-CL3R | 14AWG,STR,2COND,CL3R,DARK BLUE JACKET | H-2C14-CL3R “LV POWER” (Mfg E#) 14 AWG 2C 75°C CL3R (UL) C(UL) |
| H-B-TSP24LC-CM | BLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET | H-B-TSP24LC-CM “BLN” (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL) |
| H-F-TSP24LC-CM | FLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET W/ BLUE STRIPE | NORTHFLEX ® H-F-TSP24LC-CM “FLN” (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL) |
| H-3P24-CMR | 24AWG,SOL,3P,CMR,BLUE JACKET | NORTHFLEX ® H-3P24-CMR “TEC STAT” (Mfg E#) 24 AWG 3P 75°C CMR (UL) C(UL) |
| LON-1PS22-CM | 22AWG,STR,1PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-1PS22-CM “LON FLN” (Mfg E#) 22AWG 1P 75O C CM (UL) C(UL) |
| LON-2PS22-CM | 22AWG,STR,2PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-2PS22-CM “LON FLN” (Mfg E#) 22AWG 2P 75O C CM (UL) C(UL) |
| E-4TP24CAT5-CM | 24AWG,SOL,4TP,CAT5,CM | NORTHFLEX ® E-4TP24CAT5-CM “ETHERNET” (Mfg E#) 24AWG 4P 75O C CM (UL C(UL) |
| H-A-1.5TSP24LC-CM | ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM | NORTHFLEX ® H-A-1.5TSP24LC-CM “ALN485” 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) |
| H-F-1.5TSP24LC-CM | FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM | NORTHFLEX ® H-A-1.5TSP24LC-CM “FLN485” 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) |
| Plenum | | |
| SBT Part Number | Description | Print Legend |
| H-TP20-CMP | 20AWG,STR,1TP,CMP,BLUE JACKET | NORTHFLEX ® H-TP20-CMP “DI, DO, AI, AO” (Mfg E#) 20 AWG 2C 75°C CMP (UL) C(UL) |
| H-3C20-CMP | 20AWG,STR,3COND,CMP,BLUE JACKET | NORTHFLEX ® H-3C20-CMP “TEC V/D” (Mfg E#) 20 AWG 3C 75°C CMP (UL) C(UL) |
| H-TP18-CMP | 18AWG,STR,1TP,CMP,BLUE JACKET | NORTHFLEX ® H-TP18-CMP “DI, DO, AI, AO” (Mfg E#) 18 AWG 2C 75°C CMP (UL) C(UL) |
| H-3C18-CMP | 18AWG,STR,3COND,CMP,BLUE JACKET | NORTHFLEX ® H-3C18-CMP “TEC V/D” (Mfg E#) 18 AWG 3C 75°C CMP (UL) C(UL) |
| H-2C14-CL3P | 14AWG,STR,2COND,CL3P,DARK BLUE JACKET | NORTHFLEX ® H-2C14-CL3P “LV POWER” (Mfg E#) 14 AWG 2C 75°C CL3P (UL) C(UL) |
| H-B-TSP24LC-CMP | BLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET | NORTHFLEX ® H-B-TSP24LC-CMP “BLN” (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL) |
| H-F-TSP24LC-CMP | FLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET W/ BLUE STRIPE | NORTHFLEX ® H-F-TSP24LC-CMP “FLN” (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL) |
| H-3P24-CMP | 24AWG,SOL,3PAIR,CMP,BLUE JACKET | NORTHFLEX ® H-3P24-CMP “TEC STAT” (Mfg E#) 24 AWG 3P 75°C CMP (UL) C(UL) |
| KNX-TSP20LC-CMP | 20AWG,SOL,1TSP,CMP,ORNGE/GRN STRIPE | NORTHFLEX ® KNX-TSP20LC-CMP “KNX PL-LINK” 20AWG SOL 1TSP 75° C CM (UL) C(UL) E179333 |
| LON-1P22-CMP | 22AWG,STR,1PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-1P22-CMP “LON FLN” (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL) |
| LON-2P22-CMP | 22AWG,STR,2PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-2P22-CMP “LON FLN” (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL) |
| LON-1PS22-CMP | 22AWG,STR,1PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-1PS22-CMP “LON FLN” (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL) |
| LON-2PS22-CMP | 22AWG,STR,2PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE | NORTHFLEX ® LON-2PS22-CMP “LON FLN” (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL) |
| E-4TP24CAT5-CMP | 24AWG,SOL,4TP,CAT5,CMP | NORTHFLEX ® E-4TP24CAT5-CMP “ETHERNET” (Mfg E#) 24AWG 4P 75O C CMP (UL |
| H-A-1.5TSP24LC-CMP | ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP | NORTHFLEX ® H-A-1.5TSP24LC-CM “ALN485” 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) |
| H-F-1.5TSP24LC-CMP | FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP | NORTHFLEX ® H-A-1.5TSP24LC-CM “FLN485” 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) |
| Assemblies | | |
| Part Number | Description | Print Legend |
| 550-827 | CABLE ASSEMBLY TEC TO SSB 3 POS 10 FT | N |
| 550-828 | CABLE ASSEMBLY TEC TO SSC 3 POS 10 FT | N |

REVISION HISTORY

| | | | |
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

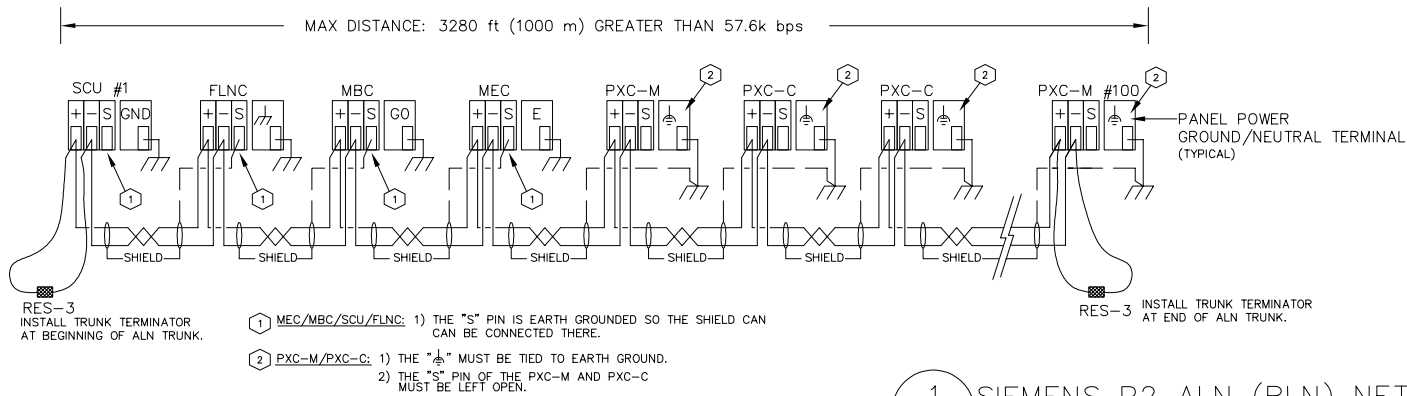
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| HB | HB | | 03/17/25 | 03/17/25 |

Anixter Building Auto. Cables

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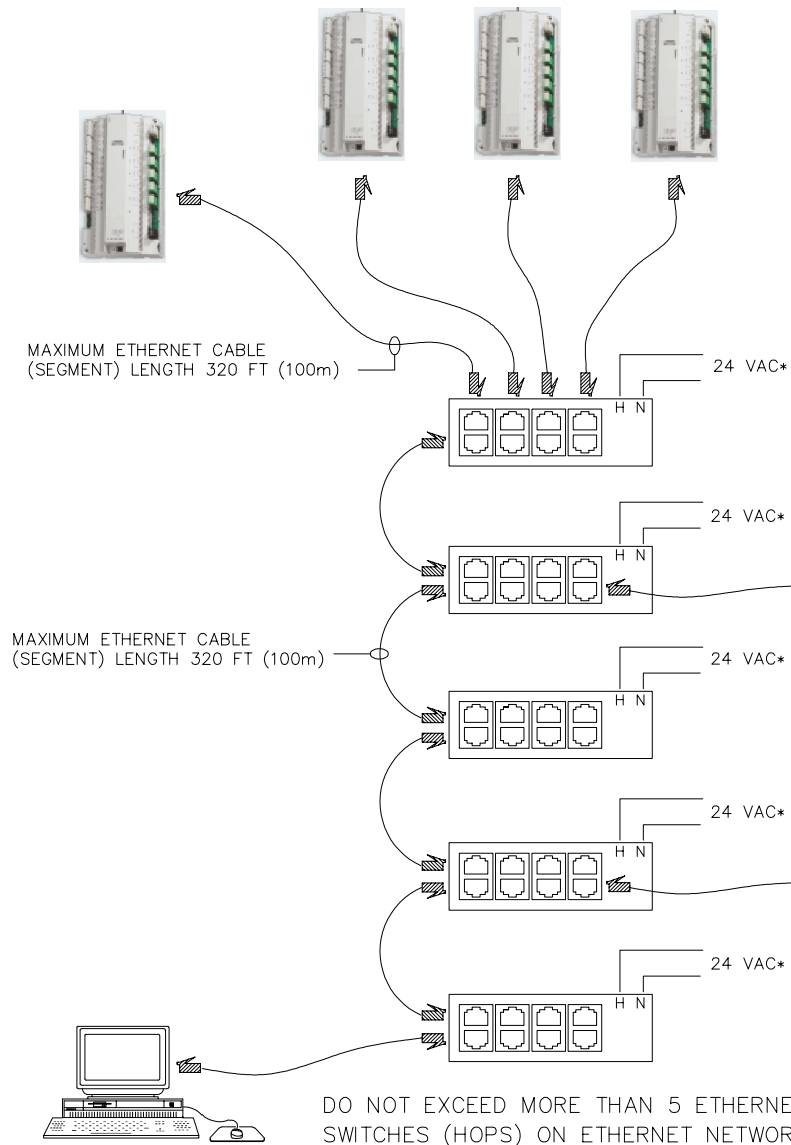
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RES-3
538-664
BLN TRUNK TERMINATOR

1
011 SIEMENS P2 ALN (BLN) NETWORK
SIEMENS P2 AUTOMATED LEVEL NETWORK (ALN)
COMMUNICATION PROTOCOL: RS-485



APPLICABLE TO:
MLN (WORKSTATION TO ETHERNET)
ALNs (ETHERNET, BACnet/IP, AEM)
HUBS, SWITCHES, ROUTERS
NETWORK INTERFACE CARD

NOTE: -
* CERTAIN MODELS MAY REQUIRE 24 VDC OR 120 VAC..

2
011 SIEMENS ETHERNET NETWORK
10Base-T/100Base-TX
COMMUNICATION PROTOCOL: ETHERNET TCP/IP

| ALN ETHERNET CABLE SPECIFICATIONS | |
|--|--|
| | TWISTED PAIR TWISTED PAIR TWISTED PAIR TWISTED PAIR |
| 4 UNSHIELDED TWISTED PAIR (UTP) 24 AWG (SOLID) 17 PICOFARAD/FT CAPACITANCE AT 1KHz, 1MHz IEEE802.3 CATEGORY 5 CERTIFIED OR BETTER | |
| SHIELD NONE | |
| PART NUMBERS | |
| PLEASE REFER TO CERCO AND ANIXTER CABLE PART NUMBERS (SEE DRAWINGS 6A & 6B). | |

| ALN TSP CABLE SPECIFICATIONS | |
|--|------------------------|
| | TWISTED PAIR SHIELD |
| TWISTED PAIR 24 AWG (STRANDED) 12 PICOFARAD/FT CAPACITANCE OR LESS 4 TWISTS PER FOOT. | |
| SHIELD 100% OVERALL FOIL | |
| PART NUMBERS | |
| PLEASE REFER TO CERCO AND ANIXTER CABLE PART NUMBERS (SEE DRAWINGS 6A & 6B). | |

NOTES:

NEVER RUN NETWORK CABLING CLOSER THAN 5 FEET TO A VARIABLE FREQUENCY DRIVE (VFD) EXCEPT AT THE POINT WHERE THE NETWORK MUST CONNECT TO THE VFD. NETWORK ENTRY INTO A VFD MUST BE THROUGH A SEPERATE CONDUIT AND ALL NETWORK WIRING MUST BE KEPT AS FAR AS POSSIBLE FROM HIGH POWER CABLING IN THE DRIVE.

NEVER RUN NETWORK CABLE CLOSER THAN 5 FEET FROM CONDUITS CARRYING 100KVA OR GREATER. ALWAYS CROSS HIGH POWER CABLES (AT A DISTANCE OF 5 FEET) AT A 90° ANGLE.

NETWORK RUN IN OPEN CABLE TRAYS WITH CIRCUITS CARRYING 20 AMPS SHOULD BE NO CLOSER THAN 26 INCHES TO THE HIGHER POWER CABLES.

NETWORK RUN IN ENCLOSED TRAYS WITH CONDUITS CARRYING OVER 20 AMPS SHOULD BE NO CLOSER THAN 18 INCHES TO THE HIGHER POWER CABLES.

REVISION HISTORY

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SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

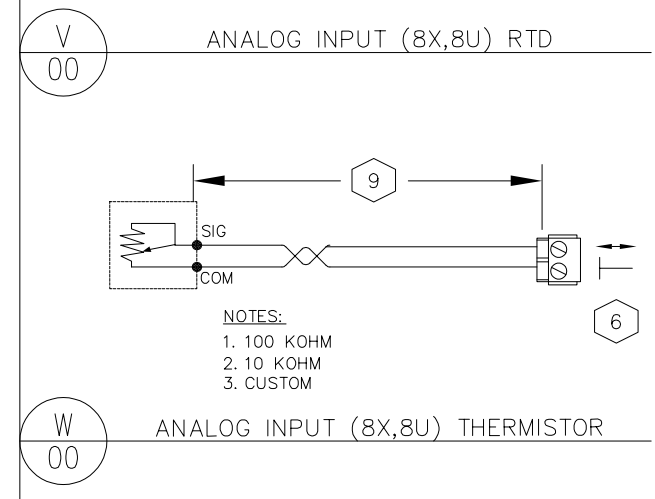
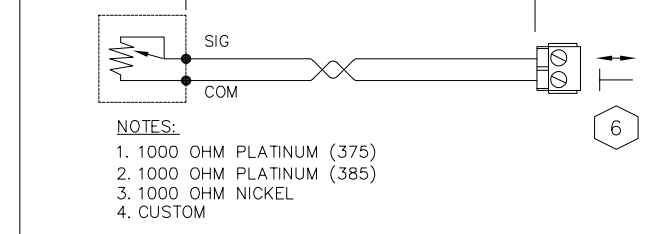
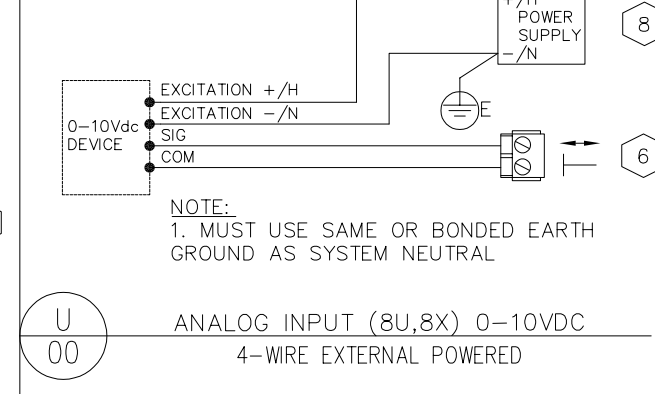
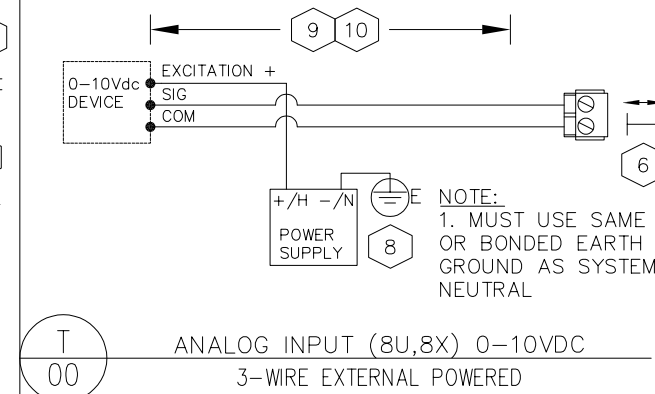
BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

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| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
| HB | HB | | 03/17/25 | 03/17/25 |

ALN WIRING SPECIFICATION

440P394493
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ALN



1. NEUTRAL CAN BE CONNECTED TO ANY NEUTRAL TERMINAL ON SAME MODULE AND SEVERAL CAN SHARE SAME NEUTRAL TERMINAL.

1. NO PULSE ACCUMULATOR

1. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

1. 4–20 mA OUTPUT AVAILABLE ON POINTS 5–8 ONLY.
2. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.
3. MAY POWER EXTERNAL SENSORS 0.6w (25mA) OR 1.2w (50mA) PER TERMINATION UP TO 2.4w (100mA) MAXIMUM FOR ALL TERMINATIONS.

1. COMMONS ARE NOT INTERNALLY CONNECTED.

NOTE: REFER TO TERMINATION SHEET #1 FOR
INSTALLATION DETAILS.

| | | | |
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| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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SMART INFRASTRUCTURE DIVISION

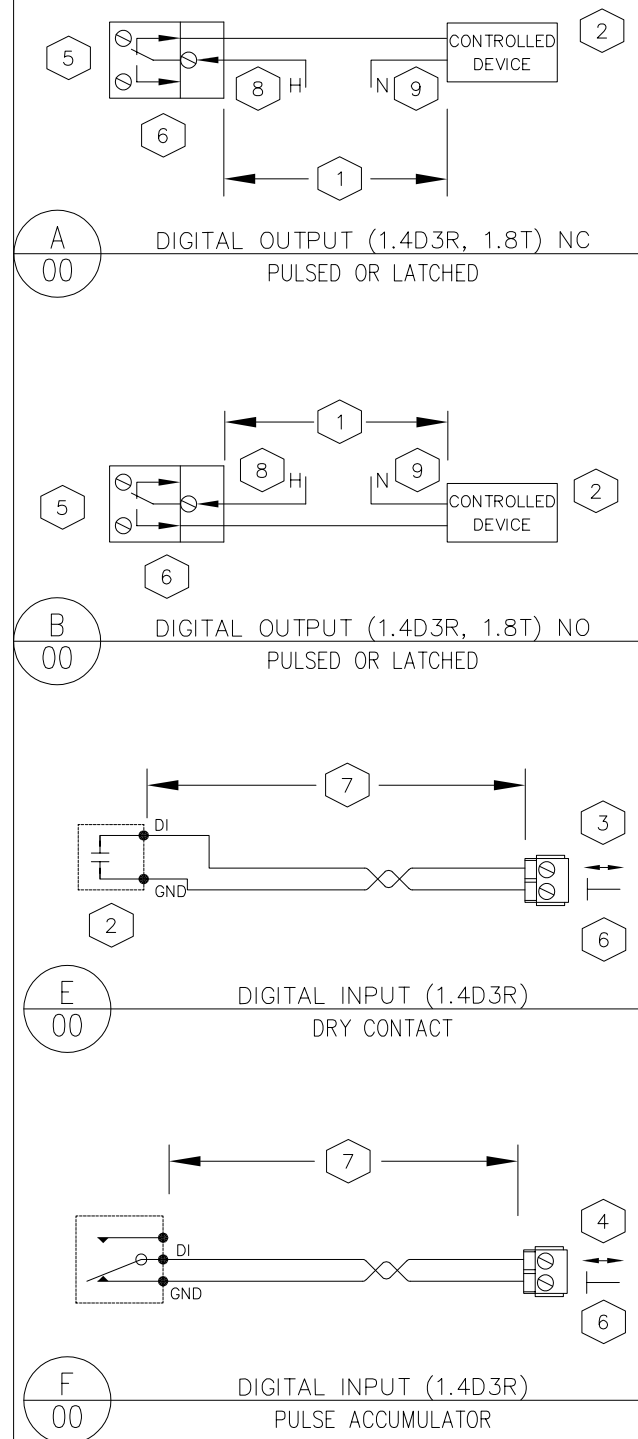
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SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
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| ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 |
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TX-I/O Termination Spec. 2

44OP394493
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TTRM2



NOTES:

- 1 MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAUGE. SEE DRAWING P7WIR.
 - 2 SEE CONTROL DRAWINGS FOR NORMAL DE-ENERGIZED CONTACT STATE
 - 3 MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
 - 4 1.4D3R MAXIMUM PULSE RATE UP TO 10Hz
 - 5 DO CONTACT RATINGS
AC OPERATION:
4A @ 250VAC (RESISTIVE)
3A @ 250VAC (INDUCTIVE)

DC OPERATION:
4A @ 30VDC (RESISTIVE), UL APPLICATIONS
3A @ 30VDC GENERAL PURPOSE
3A @ 30VDC (RESISTIVE)
 - 6 REFER TO PXC7 PANEL FOR ACTUAL POINT ADDRESSES. REFER TO TXM TERMINATION TABLES FOR ACTUAL TERMINALS FOR EACH PANEL ADDRESS. COMMON TERMINAL MAY BE SHARED BY 2 POINTS.

50mA OR LESS – 750ft/230m
50mA TO 100mA – 375ft/115m
 - 7
 - 8 WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY AN NEC APPROVED MEANS. NOT A FUSE.
 - 9 WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.

| | | TXM1.4D3R | | |
|-----------------|--------|-----------|-----|-----|
| I/O POINT | | (1) | (2) | (3) |
| SUPPLY | | 3 | 9 | 15 |
| NORMALLY OPEN | ↓ (NO) | 2 | 8 | 14 |
| NORMALLY CLOSED | ↱ (NC) | 4 | 10 | 16 |

| | | TXM1.4D3R | | | |
|-----------------------------|----------------|-----------|-----|-----|-----|
| I/O POINT | | (5) | (6) | (7) | (8) |
| SYSTEM NEUTRAL ¹ | \perp (-) | 26 | 28 | 30 | 32 |
| DIGITAL INPUT | \uparrow (+) | 27 | 29 | 31 | 33 |

1. TERMINALS 26, 28, 30, 32 ARE SYSTEM NEUTRAL TERMINALS.

THEY ARE INTERCONNECTED, NOT IN THE TERMINAL BASE BUT IN THE
PLUG-IN I/O MODULE. WHEN I/O MODULE IS REMOVED, THERE IS NO
CONNECTION.

THE SYSTEM NEUTRAL OF A DIGITAL INPUT CAN BE CONNECTED TO ANY SYSTEM NEUTRAL TERMINAL.

| | | | | | | | | | |
|-----------------------------|-------|---------|-----|-----|-----|-----|-----|-----|-----|
| | | TXM1.8T | | | | | | | |
| I/O POINT | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| SUPPLY ¹ | ~ | 2 | 6 | 10 | 14 | 19 | 23 | 27 | 31 |
| DIGITAL OUTPUT ² | ↑ (+) | 4 | 8 | 12 | 16 | 21 | 25 | 29 | 33 |

1. THE LOAD CAN BE CONNECTED DIRECTLY TO THE CORRESPONDING OUTPUT TERMINALS. NO SEPARATE 24VAC SUPPLY IS REQUIRED.

2. THE TRIAC CLOSES THE CONTACT TO \perp (SYSTEM NEUTRAL).

REVISION HISTORY

| | | | |
|----|-----------|----|---------------|
| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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SMART INFRASTRUCTURE DIVISION

**3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374**

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

| | | | | |
|----------|---------|------------|-----------------|----------------|
| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
| HB | HB | | 03/17/25 | 03/17/25 |

TX-I/O Termination Spec. 3

440P394493
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TTRM3

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SMART INFRASTRUCTURE DIVISION

Valve Submittal - Water

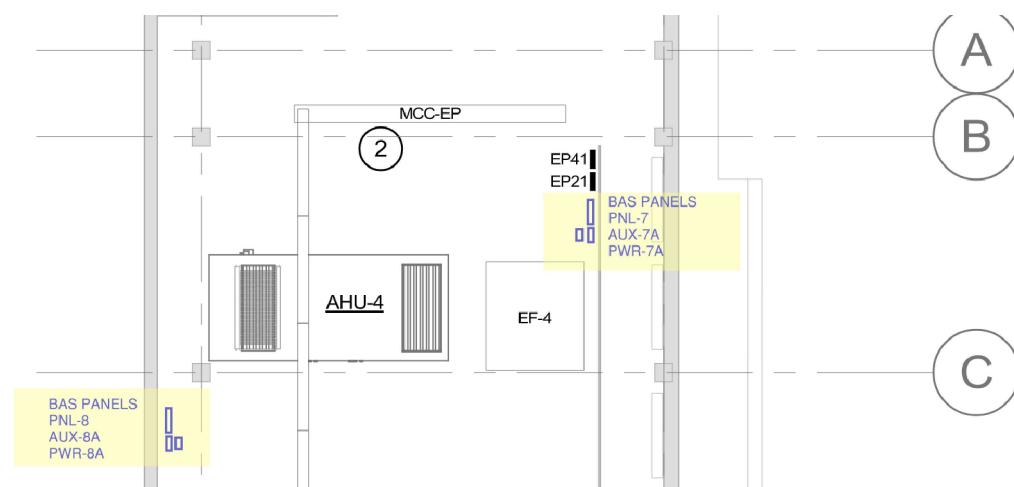
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|-----------|--------------------------|---------------|--------------------------------|-------|----------|
| LOCATION: | IU PROJECT #20240312, IN | PROJECT NAME: | BL072 CHEMISTRY ADD - REPL AH1 | DATE: | 03/03/25 |
| JOB NO: | 44OP394493 | | | PAGE: | 1 |
| ENGR: | HB | | | REV: | |

| | |
|--|--|
| GENERAL NOTES: | UNITS: |
| 1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends. | Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG. |
| 2. All control valves and wells shall be installed by the mechanical contractor. | |
| 3. Standard abbreviations used on control valves are: | |
| BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated; | ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting |

| Valve ID/ Location | Qty | Product Number | Valve Size | Body Type | Body Style | Actual Cv | Actuator Type | Design P. Drop (psi) | Required Flow (gpm) | Min (gpm) | Max (gpm) | Preset (gpm) | Steam Inlet | Press Drop (psi) | Valve Spec Sheet | Shut Off | ANSI Class | Comment |
|--------------------|-----|----------------|------------|-----------|------------|-----------|---------------|----------------------|---------------------|-----------|-----------|--------------|-------------|------------------|------------------|----------|------------|---------|
|--------------------|-----|----------------|------------|-----------|------------|-----------|---------------|----------------------|---------------------|-----------|-----------|--------------|-------------|------------------|------------------|----------|------------|---------|

| | | | | | | | | | | | | | | | | | | |
|--------------------|-------|---------------|------|----|-------|--------|-------|---|--------|-----|-----|-----|----|--------|---------|-----|-----|-----------|
| Mechanical System: | AHU-4 | AHU-4 CONTROL | | | | | | | | | | | | | | | | |
| V-1 | 1 | 291-05980 | 2.50 | 2W | Globe | 63.00 | NO-SR | 5 | 137.00 | N/A | N/A | N/A | -- | 4.7289 | 154 008 | 153 | 125 | AHU-4 PHV |
| V-2 | 1 | 294-05983 | 5.00 | 2W | Globe | 250.00 | NO-SR | 5 | 475.00 | N/A | N/A | N/A | -- | 3.61 | 154 008 | 42 | 125 | AHU-4 CCV |

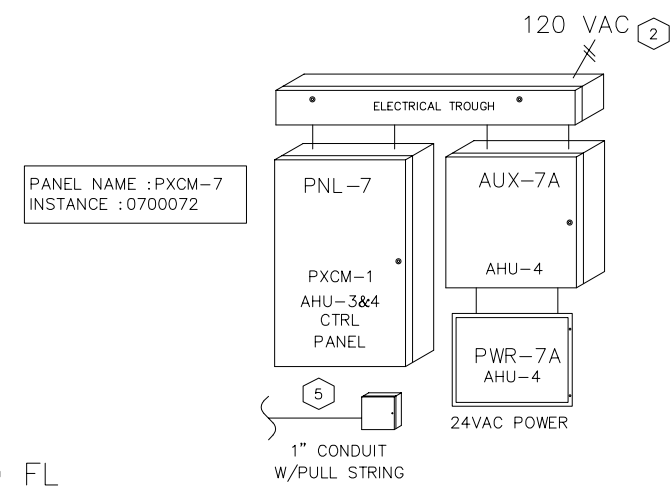
NOTES: All control valves and wells shall be installed by the heating contractor.



2
R01 BAS PANEL LOCATIONS

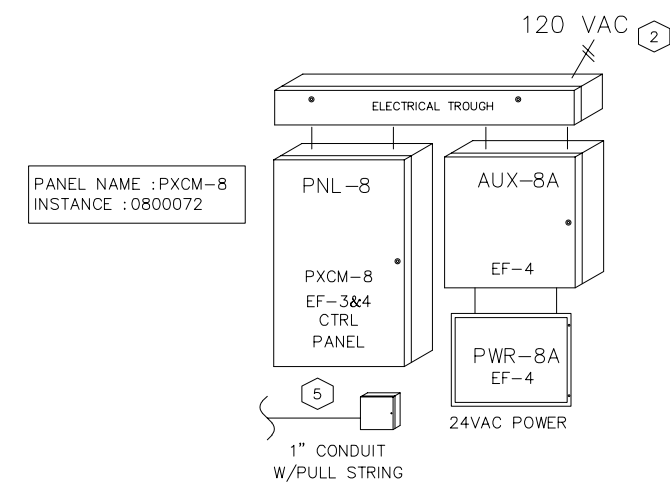
- INSTALLATION NOTES:
- 1 REFER TO PLANS FOR MORE DETAIL ON CONTROL PANEL LOCATIONS.
 - 2 POWER TO DDC PANELS BY DIVISION 26 ELECTRICAL AS STATED IN CONTRACT DOCUMENTS. POWER THAT IS NOT INDICATED IN CONTRACT DOCUMENTS BUT IS REQUIRED FOR BUILDING AUTOMATION SYSTEM (BAS) SHALL BE THE RESPONSIBILITY OF THE CONTROLS INSTALLATION CONTRACTOR (CIC).
 - 3 CIC TO PROVIDE BARRIER FOR SEPARATION WITHIN THE ELECTRIC TROUGH OF LOW VOLTAGE WIRE AND 120V POWER WIRING.
 - 4 REFER TO TX-I/O WIRING SPECIFICATION DRAWING TWR FOR PXC1 COMMUNICATION TERMINATION DETAILS.
 - 5 CIC TO PROVIDE A DEDICATED 1" CONDUIT WITH A PULL STRING FROM IDF/MDF ROOM TO A JUNCTION BOX (MINIMUM 6"x6"x4") LOCATED NEXT TO SIEMENS PANEL WITH A RACEWAY FOR PATCH CABLE CONNECTION TO PXC1 CONTROLLER. COORDINATE WITH IU FOR LOCATION OF IDF/MDF ROOM. IF 2-4 ETHERNET CABLES ARE NEEDED A 1 1/4" CONDUIT IS REQUIRED.
 - 6 TRANSFORMER PANELS TO BE LOCATED AS SHOWN ON ELECTRICAL DRAWINGS. MOUNTING AND FIELD WIRING BY CIC, POWER WIRING BY EC.

MECHANICAL ROOM



3RD FL

MECHANICAL ROOM



1
R01 SYSTEM NETWORK DIAGRAM
SERVES: BACNET IP

| | | | | | | | | | | | |
|------------------|-----------|----|---------------|---------|---|--|---------------|------------|-----------------------------|----------------------------|------------------------|
| REVISION HISTORY | | | | SIEMENS | 3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374 | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | | 440P394493 0 R01 |
| 00 | 3/17/2025 | HB | SUBMITTAL SET | | | ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 | |
| | | | | | | SYSTEM RISER | | | | | |
| | | | | | | | | | | | |

| Control Device | Qty | Product Number | Manufacturer | Document Number | Description |
|-----------------------|-----|-----------------|--------------|-----------------|-------------------------------------|
| Field Mounted Devices | | | | | |
| AUX1-2 | 2 | 567-352 | SIEMENS | 155 272 | #3 PNEU PANEL 24X24X9 |
| PNL1 | 1 | PXA-ENC34 | SIEMENS | 149475 | ENCLOSURE ASSY 34 |
| | 1 | PXA-SB115V192VA | SIEMENS | 588783 | SERVICE BOX 115V, 24VAC, 192VA |
| PNL2 | 1 | PXA-ENC34 | SIEMENS | 149475 | ENCLOSURE ASSY 34 |
| | 1 | PXA-SB115V192VA | SIEMENS | 588783 | SERVICE BOX 115V, 24VAC, 192VA |
| PWR1 | 1 | PSH500A-LVC | FUNCTIONAL | N/A | Power Supply HILO 100VAx5 multi-tap |
| PWR2 | 1 | PSH500A-LVC | FUNCTIONAL | N/A | Power Supply HILO 100VAx5 multi-tap |

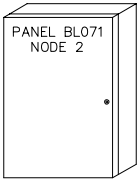
| REVISION HISTORY | | | | SIEMENS | 3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374 | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | | 440P394493 0 | | | | |
|------------------|-----------|----|---------------|---------|---|--|--|--|--|--|------------------|------------|-----------------------------|----------------------------|------|
| 00 | 3/17/2025 | HB | SUBMITTAL SET | | | ENGINEER HB | | | | | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 | R01A |
| | | | | | | SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION | | | | | SYSTEM RISER BOM | | | | |

DEMOLISH ALL CONTROL WRING, POINTS AND FIELD DEVICES WHICH ASSOCIATED WITH THE EXISTING AHU-4 AND EF-4

3RD FLOOR

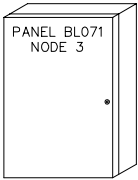
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EXISTING



MECH ROOM

EXISTING



EXISTING AHU-4 POINTS:

| Exisitng Panel | Name | Type | Description | Function | Address | NOTE |
|----------------|--------|------|--------------|----------|------------|--|
| BL071 node 2 | SD4072 | LAO | FAN SPEED | Value | 1.2.0.0.20 | |
| BL071 node 2 | CV4072 | LAO | CHW VALVE | Value | 1.2.0.0.21 | |
| BL071 node 2 | SH4072 | LAO | HUMID VALVE | Value | 1.2.0.0.22 | |
| BL071 node 2 | CC4072 | L2SL | CC PMP AHU4 | Proof | 1.2.0.0.23 | |
| BL071 node 2 | SF4072 | L2SL | SUPPLY FAN 4 | On/Off | 1.2.0.0.35 | |
| BL071 node 2 | SP4072 | L2SL | H COIL PUMP | On/Off | 1.2.0.0.36 | |
| BL071 node 2 | SA4072 | LDI | LOW LIMIT | Status | 1.2.0.1.13 | |
| BL071 node 2 | SP4072 | L2SL | H COIL PUMP | Proof | 1.2.0.1.3 | |
| BL071 node 2 | SZ4072 | LDI | SF VFD FAULT | Status | 1.2.0.1.6 | |
| BL071 node 2 | SF4072 | L2SL | SUPPLY FAN 4 | Proof | 1.2.0.1.7 | |
| BL071 node 2 | CC4072 | L2SL | CC PMP AHU4 | On/Off | 1.2.0.2.5 | |
| BL071 node 2 | SV4072 | LAO | HW VALVE | Value | 1.2.0.3.4 | |
| BL071 node 2 | ST4072 | LAI | DISCH TEMP | Value | 1.2.0.3.8 | |
| BL071 node 2 | PA4072 | LAI | PH4A TEMP | Value | 1.2.0.4.7 | FIELD VERIFY TO MAKE SURE THIS POINT NOT ASSOCITED WITH ANY EQUIPMENT, BUT AHU-4 PRIOR TO DEMO |
| BL071 node 2 | PB4072 | LAI | PH4B TEMP | Value | 1.2.0.4.8 | FIELD VERIFY TO MAKE SURE THIS POINT NOT ASSOCITED WITH ANY EQUIPMENT, BUT AHU-4 PRIOR TO DEMO |

EXISTING EF-4 POINTS:

| Exisitng Panel | Name | Type | Description | Function | Address |
|----------------|--------|------|------------------|----------|------------|
| BL071 node 3 | ES4072 | LAO | EF 4 SPEED | Value | 1.3.0.0.19 |
| BL071 node 3 | EF4072 | L2SL | EXHAUST FAN 4 | Proof | 1.3.0.0.28 |
| BL071 node 3 | EF4072 | L2SL | EXHAUST FAN 4 | On/Off | 1.3.0.0.32 |
| BL071 node 3 | EA4072 | LDI | EXH FAN 4 FAULT | Status | 1.3.0.1.4 |
| BL071 node 3 | ED4072 | LDI | EXH FAN 4 DAMPER | Status | 1.3.0.1.8 |



REVISION HISTORY

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| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

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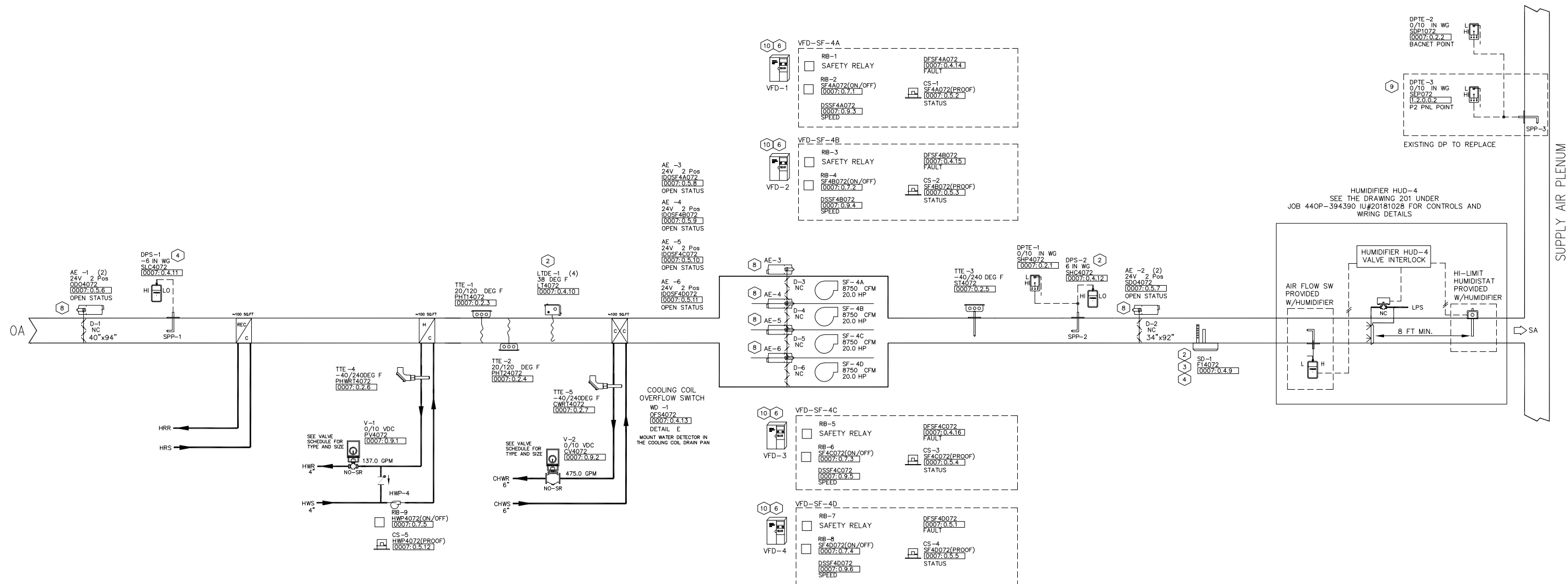
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R02

| PNL-7 / AUX-7A | |
|----------------|---------|
| RE -1 | RE -8 |
| RE -2 | RE -9 |
| RE -3 | RE -10 |
| RE -4 | RE -11 |
| RE -5 | RE -11A |
| RE -6 | RE -12 |
| RE -7 | RE -12A |

- 1 SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
- 2 WIRE INTO FAN SAFETY CIRCUIT. REFER TO WIRING DETAIL ON ELECTRICAL DRAWING.
- 3 SMOKE DETECTOR PROVIDED, MOUNTED, AND WIRED BY DIVISION 26.
- 4 THE DIVISION 26 CONTRACTOR SHALL PROVIDE (2) INDIVIDUALLY CONTROLLED RELAYS FOR EACH SMOKE DETECTOR. ONE RELAY SHALL BE FOR FAN SHUTDOWN, THE OTHER RELAY SHALL BE FOR BAS MONITORING. LOCATION OF THE FIRE ALARM RELAYS SHALL BE COORDINATED WITH IJ/SIEMENS.
- 5 ALL DAMPERS TO BE FURNISHED AND INSTALLED BY OTHERS.
- 6 FURNISHED BY UNIT MANUFACTURER / BY OTHERS.
- 7 FOR DAMPER SECTION 96" WIDE OR GREATER, MULTIPLE ACTUATORS MOUNTED ON EACH SIDE OF THE DAMPER ARE NEEDED TO APPLY SUFFICIENT TORQUE TO OPERATE THE DAMPER AND PREVENT TWISTING.
- 8 INTERLOCK ISOLATION DAMPER WITH RESPECTIVE FAN VFD.
- 9 REPLACE THE EXISTING SENSOR WITH NEW SENSOR.
WIRE TO THE EXISTING PANEL. RE-USE THE EXISTING WIRING WHERE APPLICABLE.
- 10 VFD IS CONFIGURED FOR OA+DA DAMPERS WITH PRE-PRESSURE ADVANCED DAMPER CONTROL AND THE VFD PROVIDED WITH THE OPTIONAL RELAY BOARD (CH0D-01) BY VFD MANUFACTURER.



1 AHU-4 SYSTEM FLOW DIAGRAM
200 LOCATION: MECH ROOM

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SMART INFRASTRUCTURE DIVISION FAX: 317-293-0374

3502 WOODVIEW TRAC
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
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| BL072 CHEMISTRY ADD - REPL AH1 | | | |
| IU PROJECT #20240312, IN | | | |
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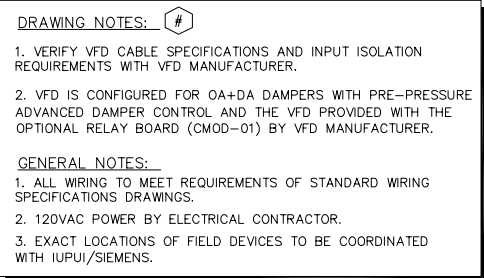
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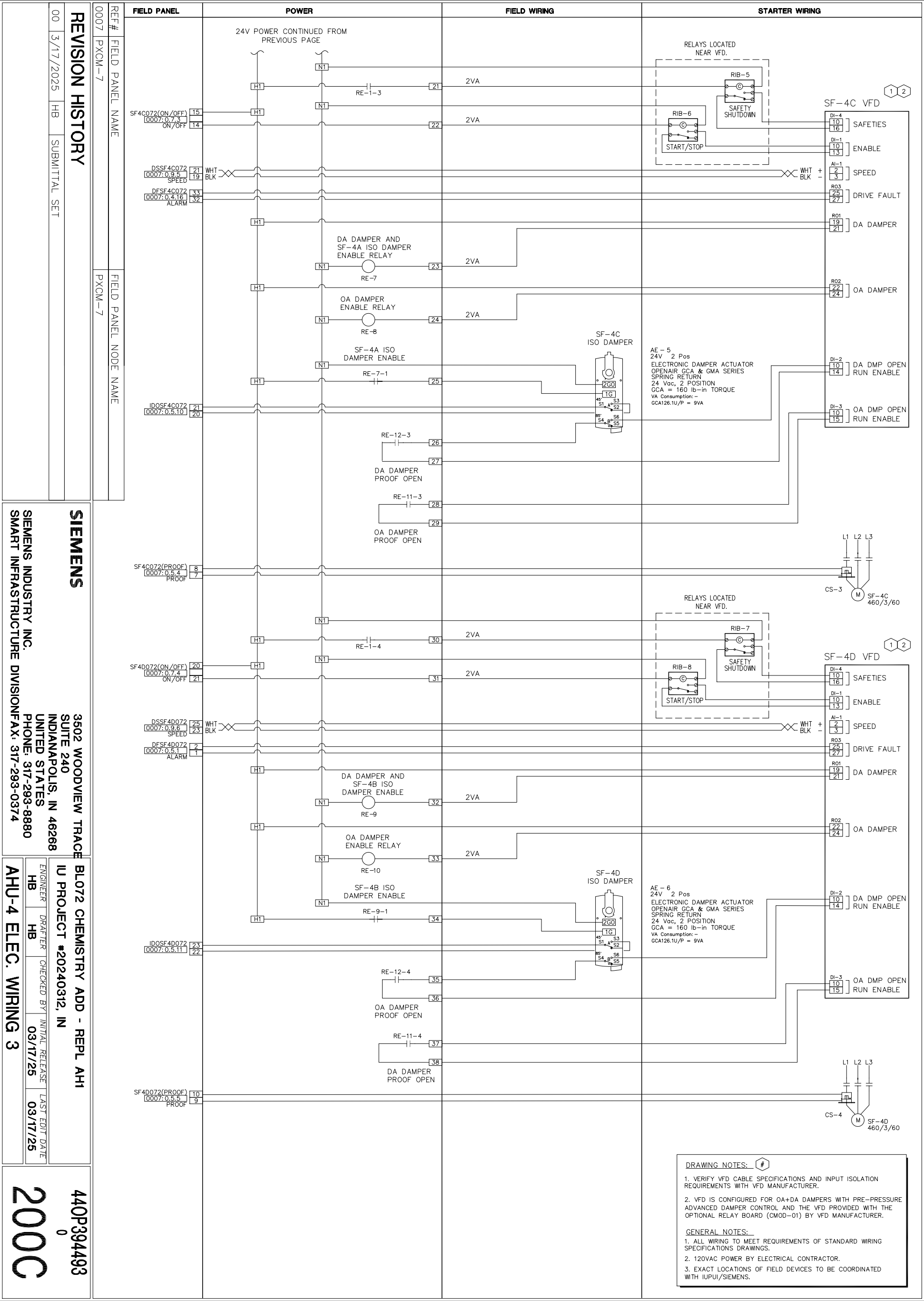
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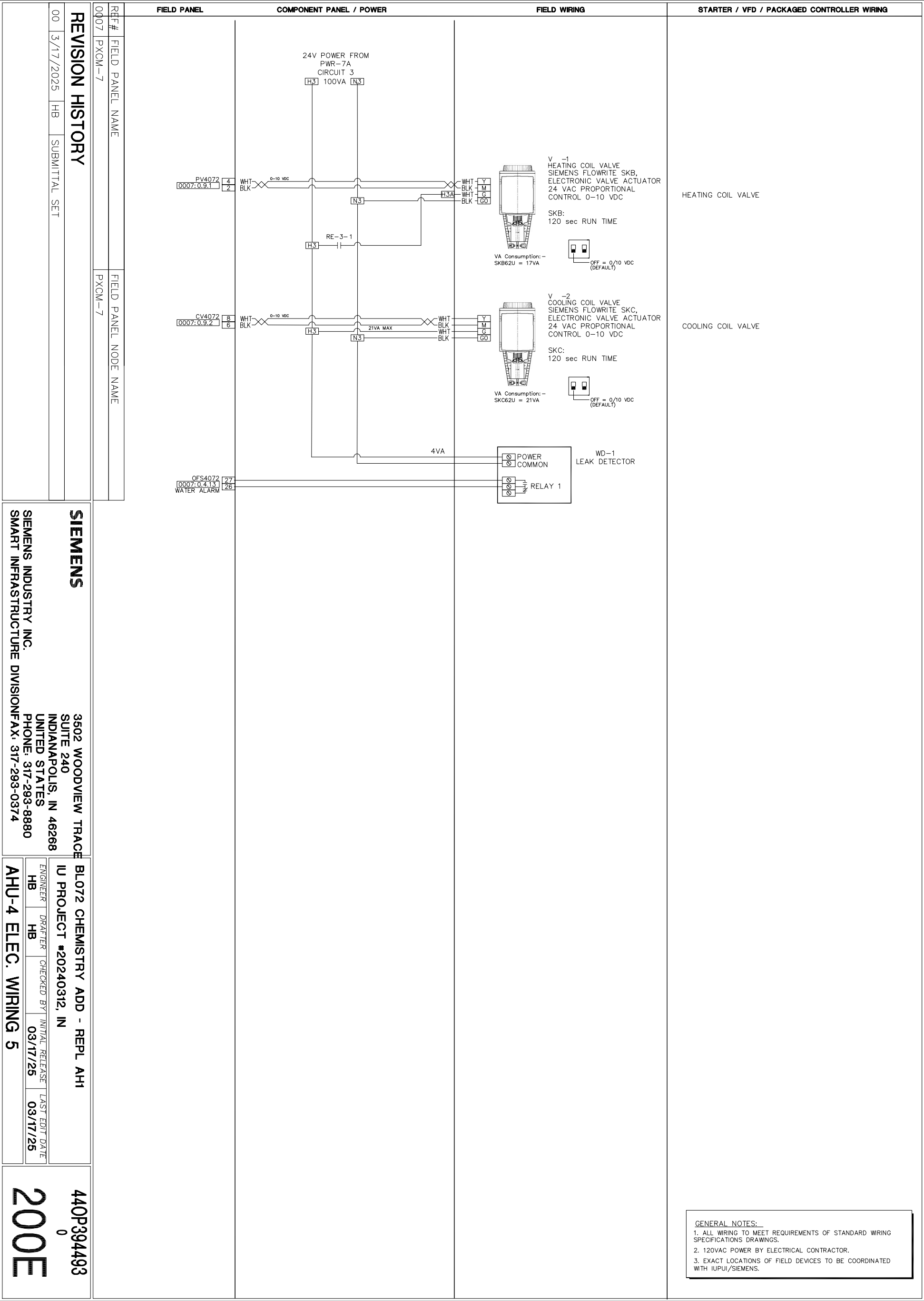
GENERAL NOTES:

1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

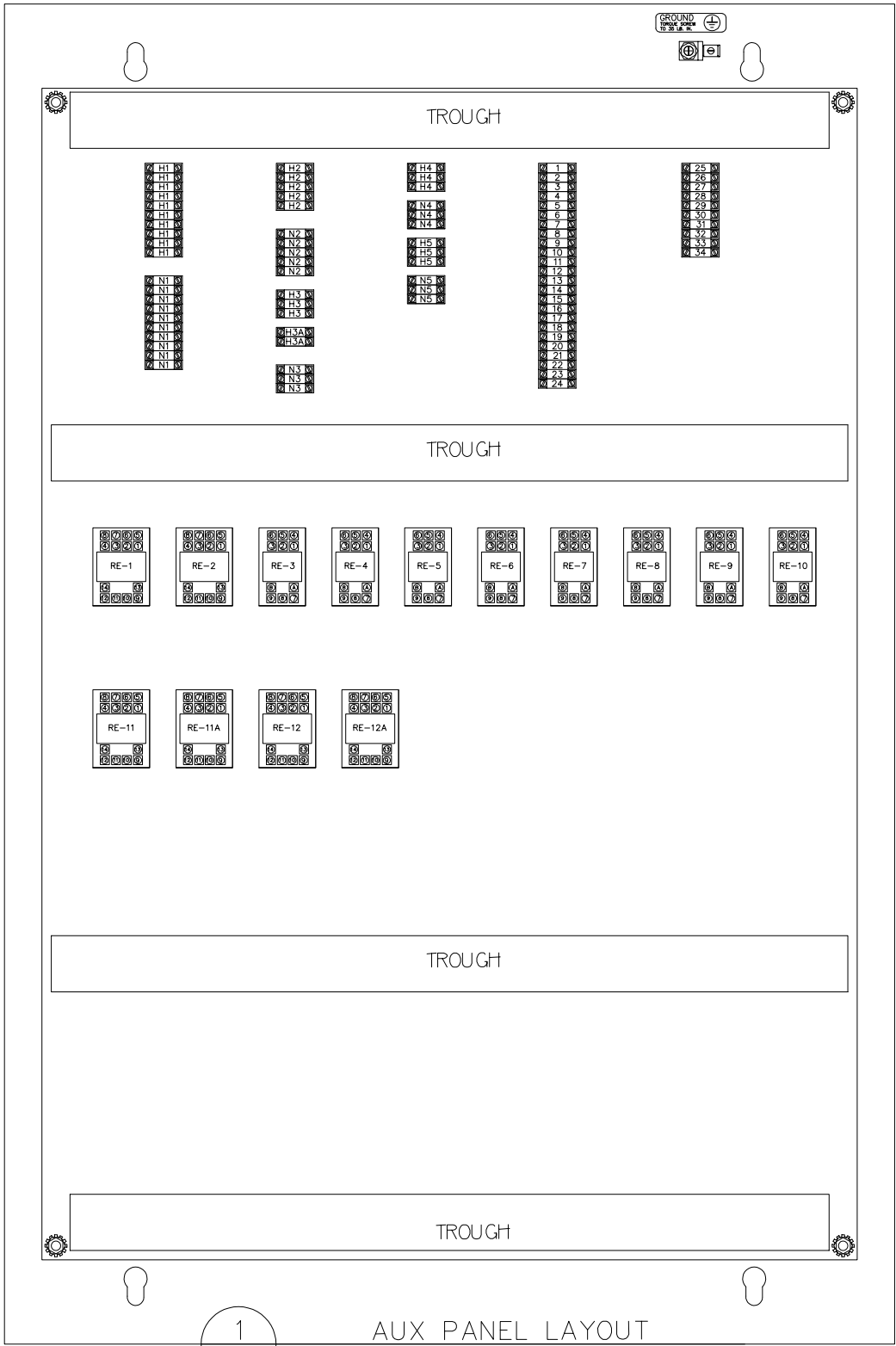




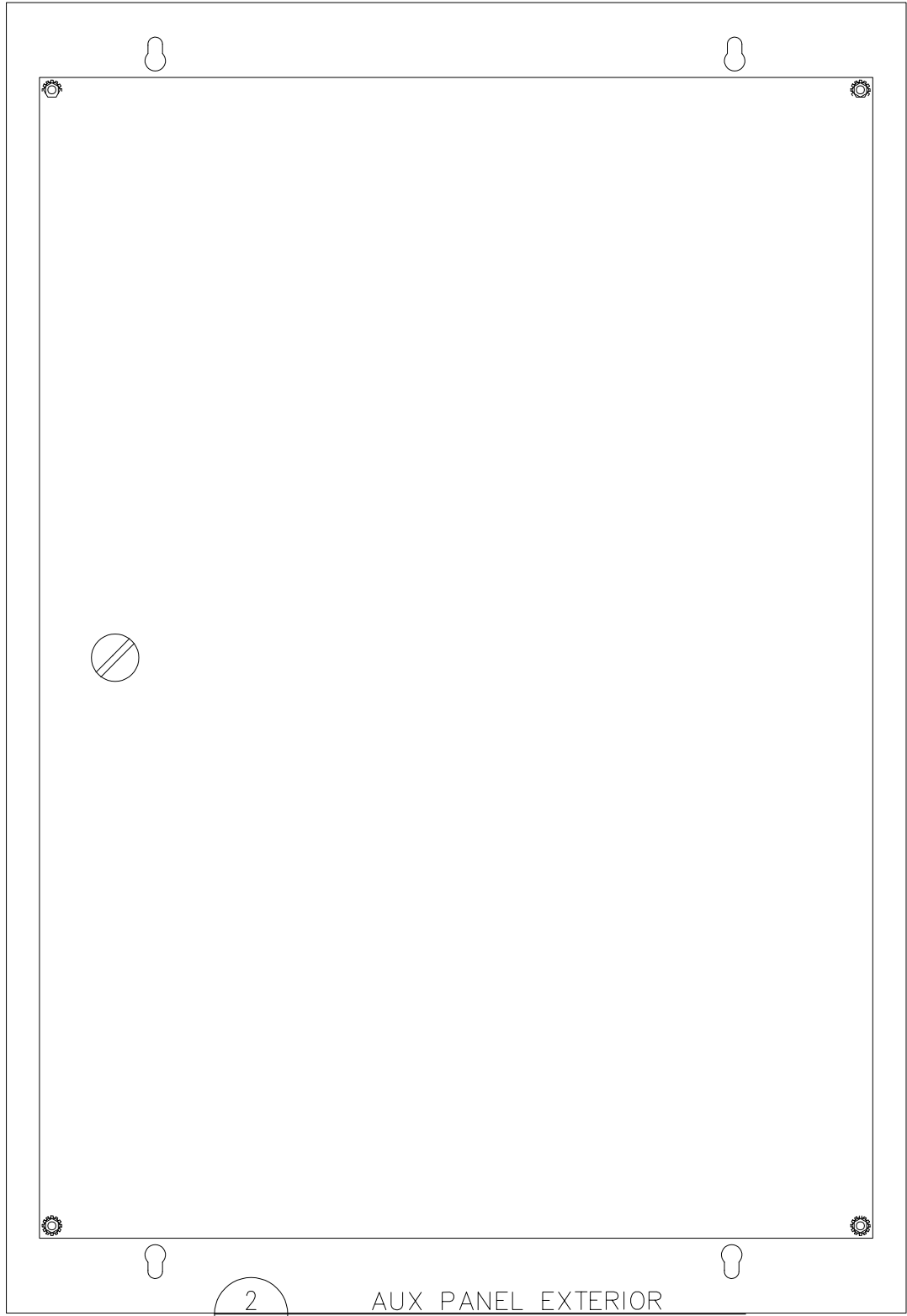
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| BLO72 CHEMISTRY ADD - REPL AH1 | | | |
| IU PROJECT #20240312, IN | | | |
| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE |
| HB | HB | | 03/17/25 |
| AHU-4 ELEC. WIRING 4 | | | |
| | | | 03/17/25 |



| REVISION HISTORY | | | | SIEMENS | | | |
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| 00 | 3/17/2025 | HB | SUBMITTAL SET | SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISIONFAX: 317-293-0374 | | | |
| 0007 | | | | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | |
| 0007 | | | | AHU-4 ELEC. WIRING 6 | | | |
| 0007 | | | | 440P394493 0 200F | | | |
| REF # | FIELD PANEL NAME | FIELD PANEL NODE NAME | FIELD PANEL | COMPONENT PANEL / POWER | FIELD WIRING | STARTER / VFD / PACKAGED CONTROLLER WIRING | |
| 0007 | PXCM-7 | PXCM-7 | <div><div>PHT14072 0007:0.2.3</div><div>12 10</div><div>WHT BLK</div></div> <div><div>PHT24072 0007:0.2.4</div><div>16 14</div><div>WHT BLK</div></div> <div><div>ST4072 0007:0.2.5</div><div>21 19</div><div>WHT BLK</div></div> <div><div>PHWRT4072 0007:0.2.6</div><div>25 23</div><div>WHT BLK</div></div> <div><div>CWRT4072 0007:0.2.7</div><div>29 27</div><div>WHT BLK</div></div> <div><div>SHP4072 0007:0.2.1</div><div>3 4</div><div>WHT BLK</div></div> <div><div>SDP1072 0007:0.2.2</div><div>3 8</div><div>WHT BLK</div></div> | | <div><div>WHT BLK</div><div>+</div><div>0000</div><div>~</div><div>TTE-1 20/120 deg F SIEMENS DUCT AVERAGING TEMP SENSOR PLAT 1K OHM</div></div> <div><div>WHT BLK</div><div>+</div><div>0000</div><div>~</div><div>TTE-2 20/120 deg F SIEMENS DUCT AVERAGING TEMP SENSOR PLAT 1K OHM</div></div> <div><div>WHT BLK</div><div>+</div><div>0000</div><div>+</div><div>TTE-3 -40/180DEG F SIEMENS DUCT POINT TEMP SENSOR PLAT 1K OHM</div></div> <div><div>WHT BLK</div><div>+</div><div>~</div><div>TTE-4 -40/240DEG F SIEMENS LIQUID IMMERSION TEMP SENSOR PLAT 1K OHM 385</div></div> <div><div>WHT BLK</div><div>+</div><div>~</div><div>TTE-5 -40/240DEG F SIEMENS LIQUID IMMERSION TEMP SENSOR PLAT 1K OHM 385</div></div> <div><div>WHT BLK</div><div>+</div><div>SETRA</div><div>DPTE-1 0/10 IN WC SETRA AIR DP SENSOR 2641 SERIES LOOP POWERED 4-20mA</div></div> <div><div>WHT BLK</div><div>+</div><div>SETRA</div><div>DPTE-2 0/10 IN WC SETRA AIR DP SENSOR 2641 SERIES LOOP POWERED 4-20mA</div></div> | | |
| EXISTING PANEL: BL071 node 2 | | | | <div><div>SEP072 1 2 0 0 2 EXISTING POINT</div><div>3 4</div><div>WHT BLK</div></div> <div>FIELD VERIFY REUSE EXISTING WIRING WHERE APPLICABLE</div> | <div><div>WHT BLK</div><div>+</div><div>SETRA</div><div>DPTE-3 0/10 IN WC SETRA AIR DP SENSOR 2641 SERIES LOOP POWERED 4-20mA</div></div> | | |
| <div>GENERAL NOTES: 1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS. 2. 120VAC POWER BY ELECTRICAL CONTRACTOR. 3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.</div> | | | | | | | |



AUX PANEL LAYOUT
TYPICAL OF ONE



AUX PANEL EXTERIOR
TYPICAL OF ONE

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| 01 | 7/20/2023 | HB | SUBMITTAL FOR APPROVAL |
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
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FAX: 317-293-0374

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

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| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
| HB | HB | | 03/17/25 | 03/17/25 |

AHU-4 AUX. PANEL LAYOUT

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| Control Device | Qty | Product Number | Manufacturer | Document Number | Description |
|-----------------------|-----|------------------|--------------------|-----------------|--|
| Field Mounted Devices | | | | | |
| AE 1 | 2 | GCA126.1U | SIEMENS | 154001 | 2 PT SR,24V,MED/S |
| | 1 | ASK73.1 | SIEMENS | | TANDEM MOUNT KIT |
| AE 2 | 2 | GCA126.1U | SIEMENS | 154001 | 2 PT SR,24V,MED/S |
| | 1 | ASK73.1 | SIEMENS | | TANDEM MOUNT KIT |
| AE 3-6 | 4 | GCA126.1U | SIEMENS | 154001 | 2 PT SR,24V,MED/S |
| CS 1-5 | 5 | H608 | VERIS | 1006cut016 | CUR SW SPLTCOR-ADJ SETPT W/LED |
| DPS 1-2 | 2 | AFS-460-DSS | KELE INC | | 2-12in SWITCH W/2 SPST CONTACTS |
| DPTE 1-3 | 3 | 2641010WD11A1C | SETRA | 0608cut003 | DP TRAN AIR,1%,10" ENC |
| LTDE 1 | 4 | 134-1504 | SIEMENS | 155 016 | T'STAT, LOW TEMP,15/55,MANUAL |
| | 10 | M-648-K | KELE INC | | CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE |
| RIB 1-9 | 9 | RIBU1C | FUNCTIONAL DEVICES | 1208cut013 | RIB 120VAC 24VAC/DC SPDT |
| SD 1 | 1 | FBO | | | FURNISHED BY OTHERS |
| SPP 1-3 | 3 | 269-062 | SIEMENS | | PR269 ACCESSORY, SENSING TUBE |
| TTE 1-2 | 2 | QAM2012.750 | SIEMENS | 149916 | DUCT AVG TEMP, PT 1K OHM(385), 24' FLEX |
| TTE 3 | 1 | QAM2012.045 | SIEMENS | 149915 | DUCT PNT TEMP, PT 1K OHM(385), 18" RIGID |
| TTE 4-5 | 2 | QAE2012.005 | SIEMENS | 149919 | IMMERSION TMP SNSR, PT 1K OHM(385) 2.5" |
| V | | | | | SEE VALVE SUBMITTAL |
| VFD 1-4 | 4 | FBO | | | FURNISHED BY OTHERS |
| WD 1 | 1 | WD-1B-C | KELE INC | | WATER DETECTOR SPDT W/DEENERGIZED RELAY |
| Panel Mounted Devices | | | | | |
| RE 1-2 | 2 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE 3-10 | 8 | RH2B-U-AC24V-KIT | IDEC | 1202cut016 | RELAY&SOC,GP DPDT AC24V 10A |
| RE 11-12 | 2 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE 11A | 1 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE 12A | 1 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |

SUPPLY AIR HANDLING UNITS SEQUENCE OF OPERATION.

AHU-4 OPERATES IN SEQUENCE WITH AHU-1, AHU-2, AND AHU-3 TO PROVIDE SUPPLY AIR TO A COMMON SUPPLY AIR PLENUM THAT SERVES VARIABLE AIR VOLUME TERMINAL BOXES WITH REHEAT SERVING SPACES ON GROUND, FIRST, AND SECOND FLOORS. AHU-4 IS 100% OA UNIT CONSISTING OF OA ISOLATION DAMPER, FILTRATION, HEAT RECOVERY COIL, PREHEAT COIL, COOLING COIL, SUPPLY FAN ARRAY, AND SA ISOLATION DAMPER. A DUCT MOUNTED HUMIDIFIER MOUNTED IN THE SUPPLY DUCT BETWEEN THE UNIT OUTLET AND COMMON SUPPLY AIR PLENUM PROVIDES SUPPLY AIR HUMIDITY CONTROL.

SYSTEM ENABLE/DISABLE: AHU-1, AHU-2, AHU-3, AND AHU-4 SHALL BE AUTOMATICALLY ENABLED/DISABLED VIA DDC SYSTEM, OR MANUALLY AT THE OPERATOR TERMINAL OR LOCALLY AT THE UNIT.

UNIT STAGING (AHU-1, AHU-2, AHU-3, AHU-4): AHU-1 THROUGH 4 OPERATE IN A LEAD-LAG-LAG-LAG SEQUENCE. THE LEAD AHU SHALL RUN CONTINUOUSLY, AND ITS ASSOCIATED VFD SHALL MODULATE FAN SPEED TO MAINTAIN THE SUPPLY PLENUM DUCT STATIC PRESSURE SETPOINT OF 3.0" WG (ADJ), AS SENSED BY EXISTING DUCT STATIC PRESSURE TRANSMITTER LOCATED IN THE COMMON SUPPLY AIR PLENUM. IF THE SUPPLY PENUM STATIC PRESSURE FALLS BELOW 2.2" WG (ADJ) FOR A PERIOD OF 10 MINUTES, A LAG AIR HANDLING UNIT SHALL BE ENABLED. IF THE SUPPLY PLENUM STATIC PRESSURE EXCEEDS 3.8" FOR A PERIOD OF 10 MINUTES, A LAG AIR HANDLING UNIT SHALL BE DISABLED. A 15 MINUTE TIME DELAY SHALL BE PROVIDED BETWEEN CONSECUTIVE ENABLE/DISABLE COMMANDS. THE LEAD AIR HANDLING UNIT DESIGNATION SHALL CHANGE AFTER 750 HOURS (ADJ) OF OPERATION.

FAN SPEED WOULD BE PREFERRABLE TO STAGE UP / DOWN EXHAUST FANS

SUPPLY FAN CONTROL: WHEN AHU-4 IS ENABLED (SF4A-C, SF4B-C, SF4C-C, SF4D-C), OA ISOLATION DAMPER (OA-DPR) AND SA ISOLATION DAMPER (SA-DPR) SHALL OPEN. ONCE PROVEN OPEN VIA END SWITCH, THE SUPPLY FANS SHALL BE ENERGIZED. IF SUPPLY FAN(S) STATUS (SF4A-S, SF4B-S, SF4C-S, SF4D-S) DOES NOT MATCH THE COMMANDED VALUE AFTER A PERIOD OF 30 SECONDS, AN ALARM SHALL BE GENERATED AT THE OPERATOR TERMINAL. WHEN FANS ARE ENERGIZED, THEY SHALL RUN CONTINUOUSLY, AND THE SUPPY FAN VFDs (VFD-SF4A, VFD-SF4B, VFD-SF4C, VFD-SF4D) SHALL MODULATE THE FAN SPEEDS IN UNISON, AND IN SEQUENCE WITH AHU-1, AHU-2, AND AHU-3, TO MAINTAIN THE SUPPLY AIR DUCT STATIC PRESSURE SETPOINT OF 3.0" WG (ADJ).

DISCHARGE AIR TEMPERATURE CONTROL· THE PREHEAT COIL AND COOLING COIL 2-WAY, TEMPERATURE CONTROL VALVES SHALL MODULATE IN SQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT OF 59F (ADJ) [ASSUMES COIL DISCHARGE OF 55F AND FAN HEAT OF 4F], AS SENSED BY DUCT MOUNTED TEMPERATURE SENSOR (DA-T), UPSTREAM OF DUCT MOUNTED HUMIDIFIER.

HUMIDIFIER CONTROL: HUMIDIFIER INSTALLATION AND CONTROLS PERFORMED UNDER IU PROJECT 20181028 CONTRACT. COORDINATE WITH ALL PARTIES TO PROVIDE THE INTENDED SEQUENCE OF OPERATION AND FULLY FUNCTIONAL SYSTEM. THE HUMIDIFIER STEAM SUPPLY CONTROL VALVE (HUM-VLV) SHALL MODULATE TO MAINTAIN A SUPPLY PLENUM HUMIDITY BETWEEN 45% (ADJ) MINIMUM AND 70% (ADJ) MAXIMUM.

FREEZE PROTECTION PUMP CONTROL· WHEN THE OUTSIDE AIR TEMPERATURE (AS SENSED BY EXISTING GLOBAL OA TEMPERATURE SENSOR) IS BELOW 50F, THE CIRCULATING PUMP HWP-4 SHALL BE ENERGIZED AND RUN CONTINUOUSLY AT CONSTANT SPEED. WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55F (ADJ), CIRCULATING PUMP HWP-4 SHALL BE DE-ENERGIZED. IF THE COMMANDED VALUE DOES NOT MATCH THE PUMP STATUS, AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

HEAT RECOVERY CONTROL: THE HEAT RECOVERY SYSTEM CONTROL IS INDEPENDENT OF AIR HANDLING UNIT AND SHALL REMAIN UNCHANGED.

SAFETIES·
-LOW TEMPERATURE SWITCH (LT-ALM): IF LOW TEMPERATURE SWITCH, WITH SERPENTINE TYPE SENSOR ON UPSTREAM FACE OF COOLING COIL, SENSES A TEMPERATURE BELOW 38F (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE, THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE, THE COOLING COIL CONTROL VALVE (CLG-VLV) SHALL CLOSE, THE HEATING COIL VALVE (HTG-VLV) SHALL OPEN, CIRCULATING PUMP HWP-4 SHALL BE ENERGIZED, AND AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. LOW TEMPERATURE SWITCH SHALL BE

REVISION HISTORY

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| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

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| ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 |
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AHU-4 BOM & SOO 1

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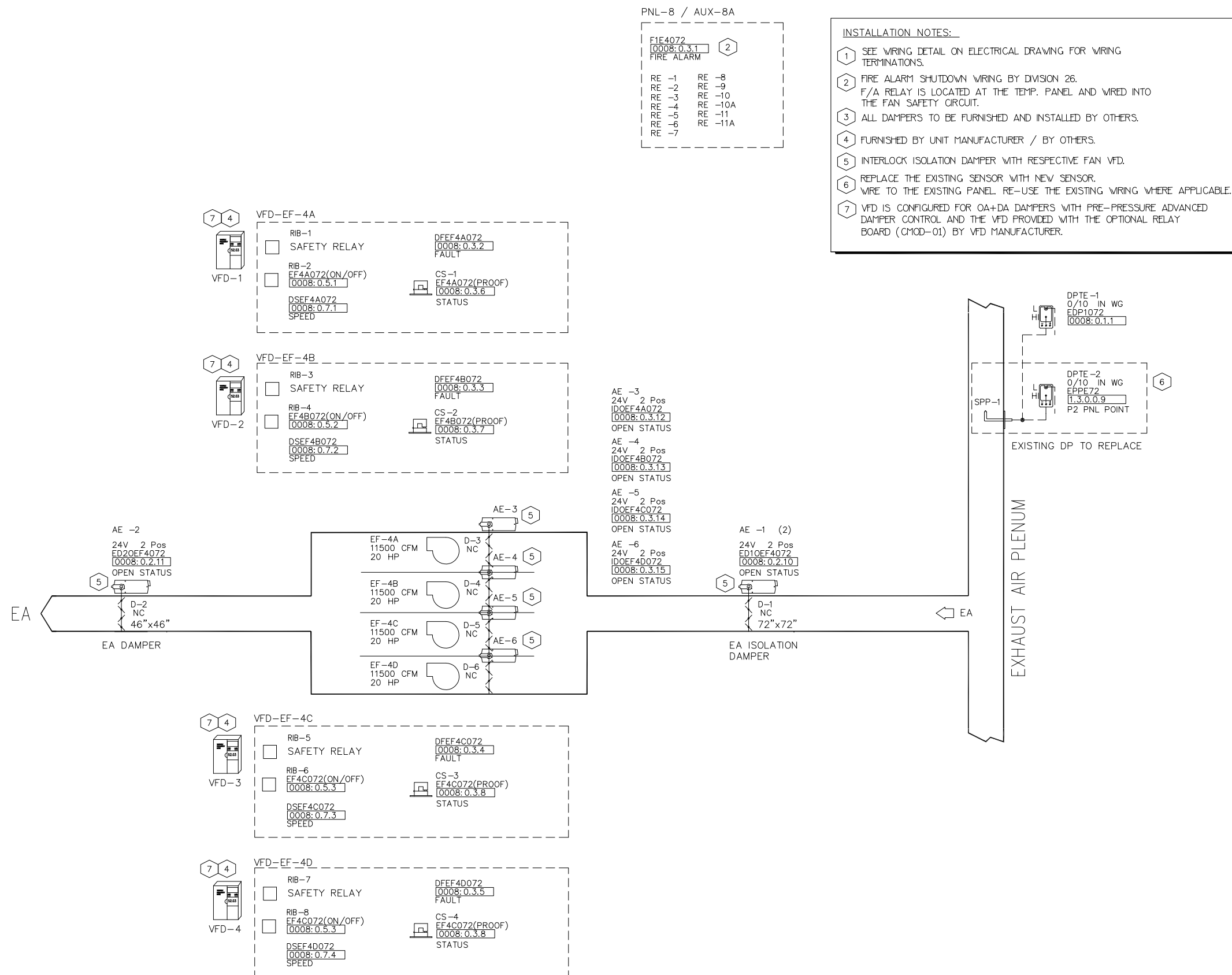
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MANUALLY RESET.

SUPPLY AIR HIGH PRESSURE SWITCH: (SP-HL): IF HIGH STATIC PRESSURE LIMIT SWITCH SENSES A STATIC PRESSURE EXCEEDING 6” WC (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE AND THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE. AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. HIGH STATIC PRESSURE SWITCH SHALL BE MANUALLY RESET.

OUTDOOR AIR LOW PRESSURE SWITCH: (SP-LL): IF LOW STATIC PRESSURE LIMIT SWITCH SENSES A STATIC PRESSURE BELOW -6” WC (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE AND THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE. AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. HIGH STATIC PRESSURE SWITCH SHALL BE MANUALLY RESET.

| REVISION HISTORY | | | | <div>SIEMENS</div> <div>SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION</div> | <div>3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374</div> | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | | <div>440P394493 0</div> <div>2001</div> |
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| | | | | | | AHU-4 CONTROL SOO 2 | | | | | |
| | | | | | | | | | | | |



PNL-8 / AUX-8A

| | |
|-------|---------|
| RE -1 | RE -8 |
| RE -2 | RE -9 |
| RE -3 | RE -10 |
| RE -4 | RE -10A |
| RE -5 | RE -11 |
| RE -6 | RE -11A |
| RE -7 | |

INSTALLATION NOTES:

440P394493

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BLO72 CHEMISTRY ADD - REPL AH1

IU PROJECT #20240312, IN

| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
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| HB | HB | 03/17/25 | 03/17/25 |
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EF-4 CONTROL

SIEMENS 3502 WOODVIEW TRACE

SUITE 240
INDIANAPOLIS IN 10000

UNITED STATES

PHONE: 317-293-8880

FAX: 317-293-0374

SIEMENS

SIEMENS INDUSTRY INC.

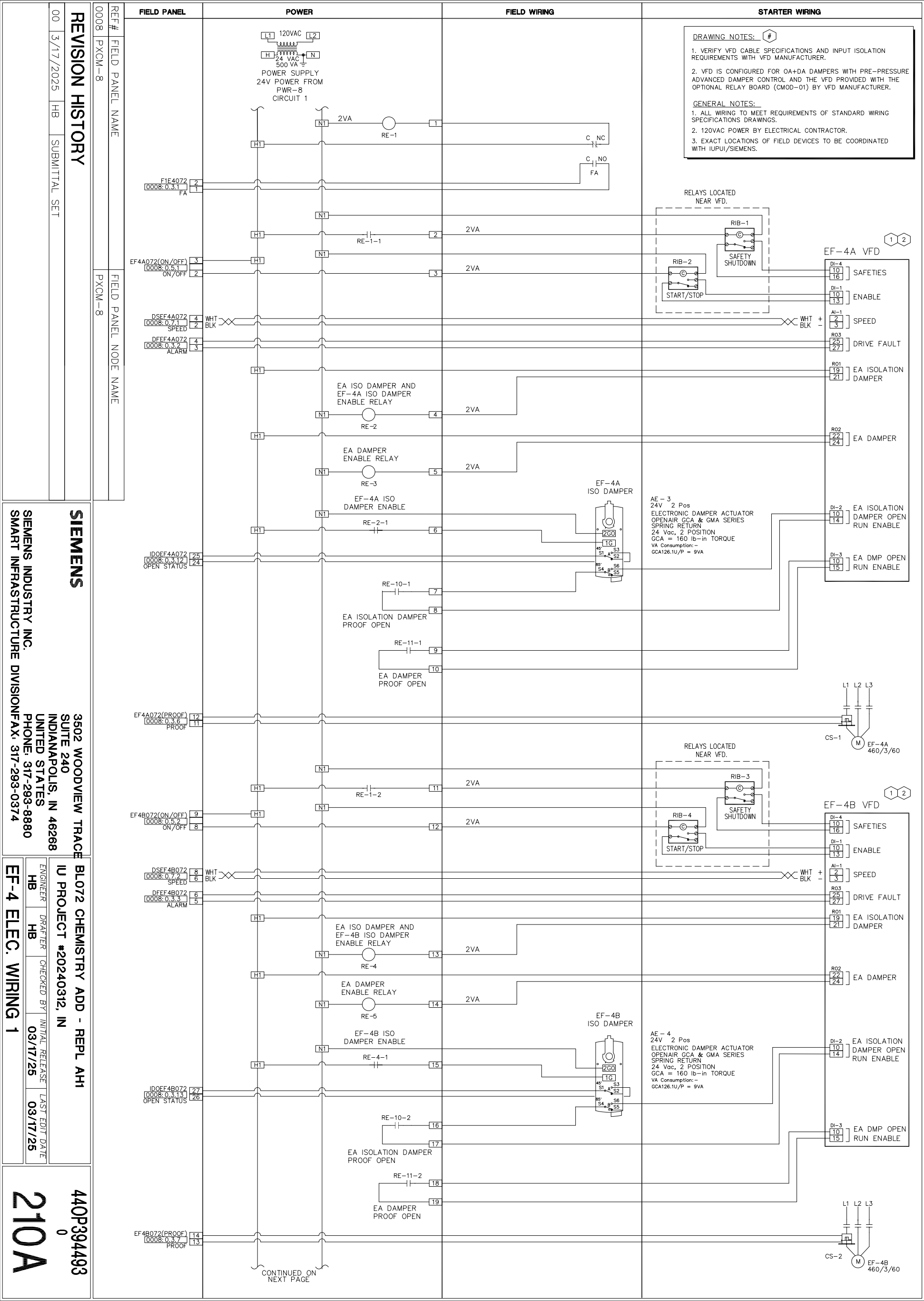
SMART INFRASTRUCTURE DIVISION

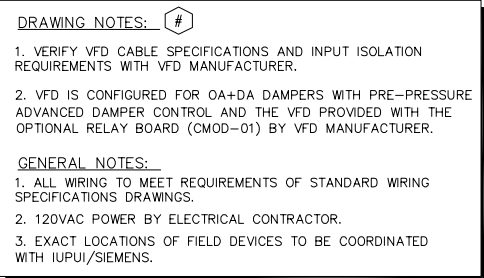
| REF# | FIELD PANEL NAME | FIELD PANEL NODE NAME |
|------|------------------|-----------------------|
| 0008 | PXCM-8 | PXCM-8 |

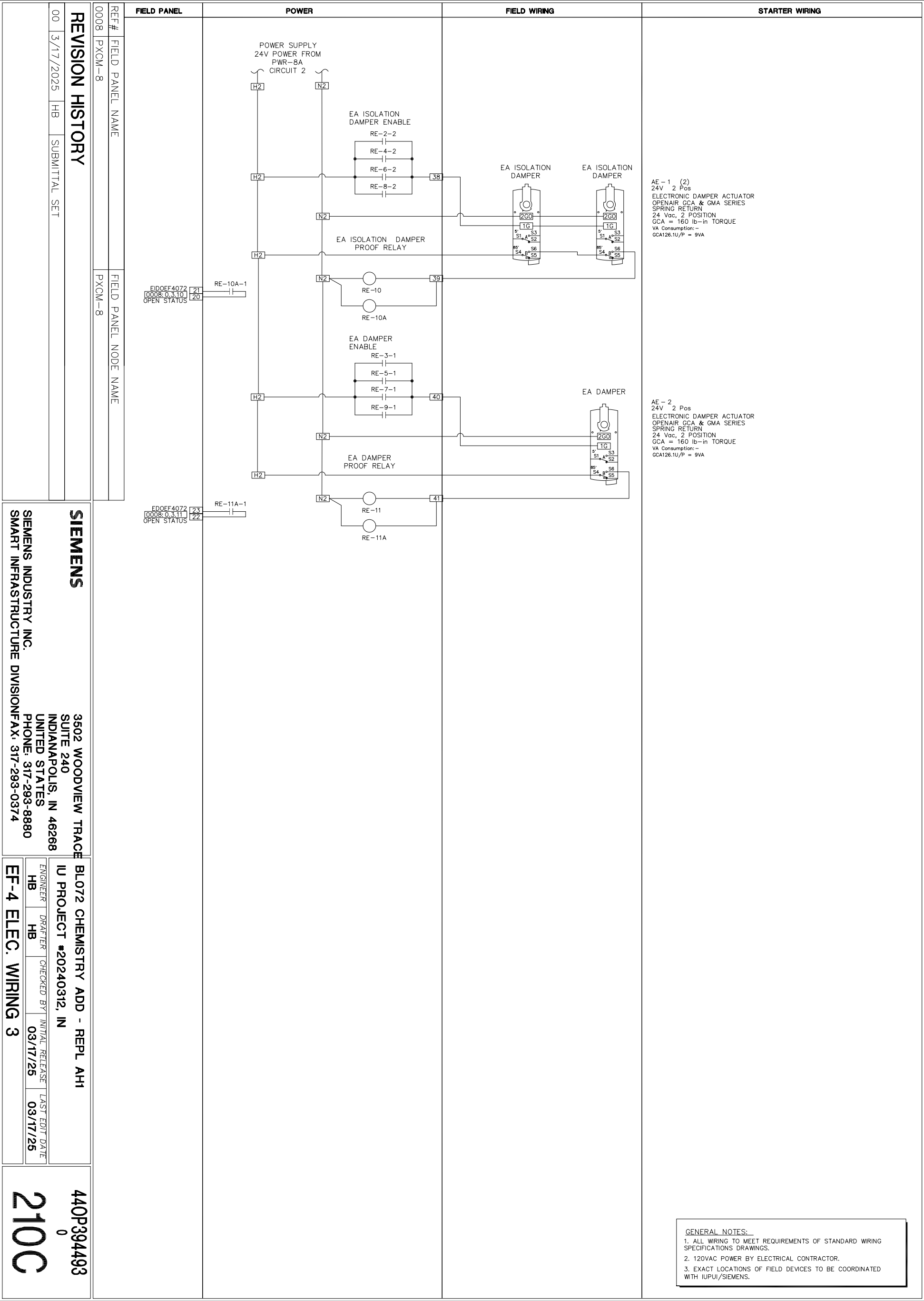
REVISION HISTORY



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| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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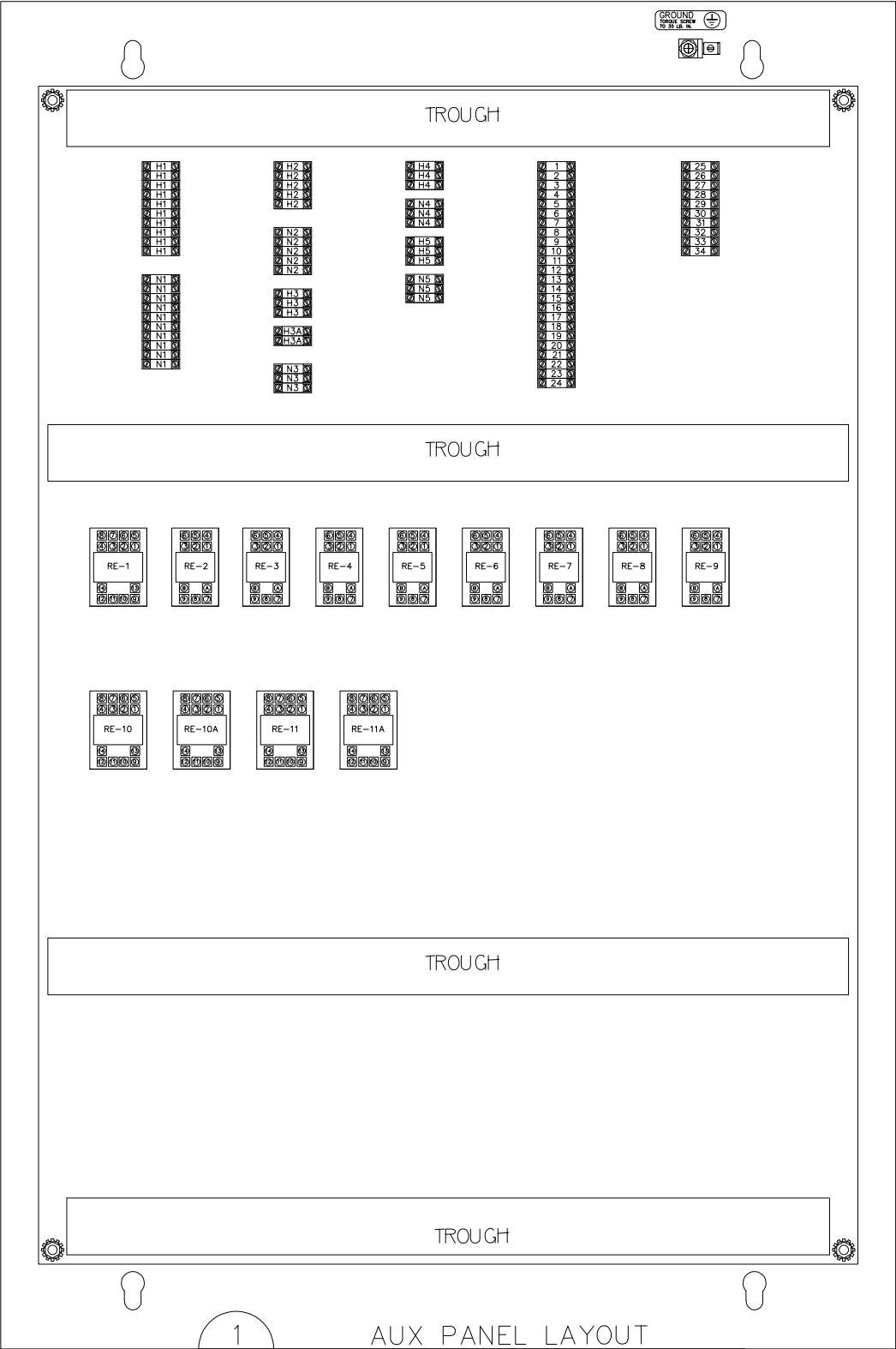
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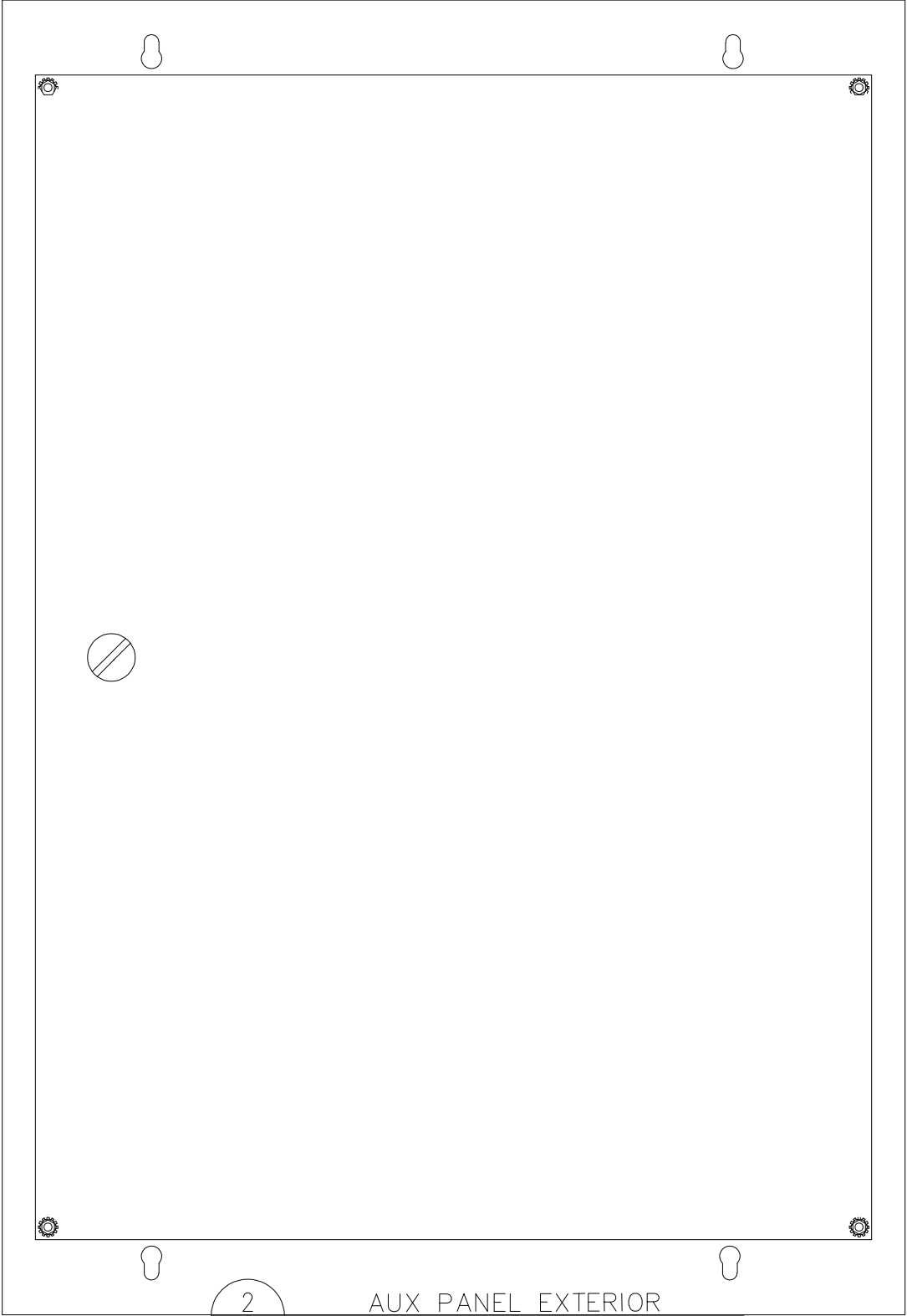
| STARTER / VFD / PACKAGED CONTROLLER WIRING | | | | FIELD WIRING | | | | COMPONENT PANEL / POWER | | | | FIELD PANEL | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | <div><div>DPTE-1 0/10 IN WC</div><div>SETRA AIR DP SENSOR 2641 SERIES LOOP POWERED 4-20mA</div></div> | | | | | | | | <div><div>EDP1072 0008:0.1.1</div><div>3 4</div><div>WHT BLK</div></div> | | | |
| | | | | <div><div>DPTE-2 0/10 IN WC</div><div>SETRA AIR DP SENSOR 2641 SERIES LOOP POWERED 4-20mA</div></div> | | | | <div>EXISTING PANEL: BL071 node 3</div> <div><div>EPPE72 1.3.0.0.9 EXISTING POINT</div><div>42 50</div><div>WHT BLK</div></div> <div>FIELD VERIFY REUSE EXISTING WIRING WHERE APPLICABLE</div> | | | | | | | |
| REVISION HISTORY | | | | | | | | | | | | | | | |
| 00 | | | | 3/17/2025 | | | | HB | | | | SUBMITTAL SET | | | |
| 0008 | | | | PXCM-8 | | | | PXCM-8 | | | | PXCM-8 | | | |
| REF # | | | | FIELD PANEL NAME | | | | FIELD PANEL NODE NAME | | | | FIELD PANEL NAME | | | |
| SIEMENS | | | | | | | | | | | | | | | |
| SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISIONFAX: 317-293-0374 | | | | | | | | | | | | | | | |
| 3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 | | | | | | | | | | | | | | | |
| BL072 CHEMISTRY ADD - REPL AH1 | | | | | | | | | | | | | | | |
| IU PROJECT #20240312, IN | | | | | | | | | | | | | | | |
| ENGINEER | | | | DRAFTER | | | | CHECKED BY | | | | INITIAL RELEASE | | | |
| HB | | | | HB | | | | | | | | 03/17/25 | | | |
| | | | | | | | | | | | | LAST EDIT DATE | | | |
| | | | | | | | | | | | | 03/17/25 | | | |
| EF-4 ELEC. WIRING 4 | | | | | | | | | | | | | | | |
| 440P394493 | | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | | |
| 210D | | | | | | | | | | | | | | | |
| <div>GENERAL NOTES:</div> <div>1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.</div> <div>2. 120VAC POWER BY ELECTRICAL CONTRACTOR.</div> <div>3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.</div> | | | | | | | | | | | | | | | |



1
210E

AUX PANEL LAYOUT
TYPICAL OF ONE

1



2
210E

AUX PANEL EXTERIOR
TYPICAL OF ONE

| REVISION HISTORY | | | | |
|------------------|-----------|----|------------------------|--|
| 01 | 7/20/2023 | HB | SUBMITTAL FOR APPROVAL | |
| | | | | |

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FAX: 317-293-0374

BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
|----------|---------|------------|-----------------|----------------|
| HB | HB | | 03/17/25 | 03/17/25 |

EF-4 AUX. PANEL LAYOUT

440P394493
0

210E

| Control Device | Qty | Product Number | Manufacturer | Document Number | Description |
|-----------------------|-----|------------------|--------------------|-----------------|--|
| Field Mounted Devices | | | | | |
| AE1 | 2 | GCA126.1U | SIEMENS | 154001 | 2 PT SR,24V,MED/S |
| | 1 | ASK73.1 | SIEMENS | | TANDEM MOUNT KIT |
| AE2-6 | 5 | GCA126.1U | SIEMENS | 154001 | 2 PT SR,24V,MED/S |
| CS1-4 | 4 | H608 | VERIS | 1006cut016 | CUR SW SPLTCOR-ADJ SETPT W/LED |
| DPTE1-2 | 2 | 2641010WD11A1C | SETRA | 0608cut003 | DP TRAN AIR,1%,10" ENC |
| RIB1-8 | 8 | RIBU1C | FUNCTIONAL DEVICES | 1208cut013 | RIB 120VAC 24VAC/DC SPDT |
| SPP1 | 1 | 269-062 | SIEMENS | | PR269 ACCESSORY, SENSING TUBE |
| VFD1-3 | 3 | FBO | | | FURNISHED BY OTHERS |
| VFD4 | 1 | FBO | | | FURNISHED BY OTHERS |
| Panel Mounted Devices | | | | | |
| RE1 | 1 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE2-9 | 8 | RH2B-U-AC24V-KIT | IDEC | 1202cut016 | RELAY&SOC,GP DPDT AC24V 10A |
| RE10-11 | 2 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE10A | 1 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |
| RE11A | 1 | RH4B-UAC24V-KIT | LECTRO COM | | (1) RH4B-UAC24V and (1) SH4B-05 socket |

EXHAUST AIR HANDLING UNITS SEQUENCE OF OPERATION.

EF-4 OPERATES IN SEQUENCE WITH EF-1, EF-2, AND EF-3 TO EXHAUST AIR FROM A COMMON EXHAUST PLENUM FOR BUILDING PRESSURIZATION CONTROL. EF-4 IS A CUSTOM EXHAUST AIR HANDLING UNIT CONSISTING OF AN EXHAUST AIR ISOLATION DAMPER AND EXHAUST FAN ARRAY.

SYSTEM ENABLE/DISABLE: EF-1, EF-2, EF-3, AND EF-4 SHALL BE AUTOMATICALLY ENABLED/DISABLED VIA DDC SYSTEM, OR MANUALLY AT THE OPERATOR TERMINAL OR LOCALLY AT THE UNIT.

UNIT STAGING (EF-1, EF-2, AHU-3, AHU-4): EF-1 THROUGH 4 OPERATE IN A LEAD-LAG-LAG-LAG SEQUENCE. THE LEAD EXHAUST UNIT SHALL RUN CONTINUOUSLY, AND ITS ASSOCIATED VFD SHALL MODULATE THE FAN SPEED TO MAINTAIN THE EXHAUST AIR PLENUM DUCT STATIC PRESSURE SETPOINT OF -3.3" WG (ADJ), AS SENSED BY EXISTING DUCT STATIC PRESSURE TRANSMITTER LOCATED IN THE COMMON EXHAUST AIR PLENUM. IF THE EXHAUST AIR PENUM STATIC PRESSURE INCREASES ABOVE -2.9" WG (ADJ) FOR A PERIOD OF 10 MINUTES, A

LAG EXHAUST UNIT SHALL BE ENABLED. IF THE EXHAUST AIR PLENUM STATIC PRESSURE FALLS BELOW -4.3" WG (ADJ) FOR A PERIOD OF 10 MINUTES, A LAG EXHAUST UNIT SHALL BE DISABLED. A 15 MINUTE TIME DELAY SHALL BE PROVIDED BETWEEN CONSECUTIVE ENABLE/DISABLE COMMANDS. THE LEAD EXHAUST UNIT DESIGNATION SHALL CHANGE AFTER 750 HOURS (ADJ) OF OPERATION.

EXHAUST FAN CONTROL: WHEN EF-4 IS ENABLED (EF4A-C, EF4B-C, EF4C-C, EF4D-C), EA ISOLATION DAMPER (EA-DPR) SHALL OPEN. ONCE PROVEN OPEN VIA END SWITCH, THE EXHAUST FANS SHALL BE ENERGIZED. IF EXHAUST FAN(S) STATUS (EF4A-S, EF4B-S, EF4C-S, EF4D-S) DOES NOT MATCH THE COMMANDED VALUE AFTER A PERIOD OF 30 SECONDS, AN ALARM SHALL BE GENERATED AT THE OPERATOR TERMINAL. WHEN FANS ARE ENERGIZED, THEY SHALL RUN CONTINUOUSLY, AND THE EXHAUST FAN VFDs (VFD-EF4A, VFD-EF4B, VFD-EF4C, VFD-EF4D) SHALL MODULATE THE FAN SPEEDS IN UNISON, AND IN SEQUENCE WITH EF-1, EF-2, AND EF-3, TO MAINTAIN THE EXHAUST AIR DUCT STATIC PRESSURE SETPOINT OF -3.3" WG (ADJ).

| REVISION HISTORY | | | |
|------------------|-----------|----|---------------|
| 00 | 3/17/2025 | HB | SUBMITTAL SET |
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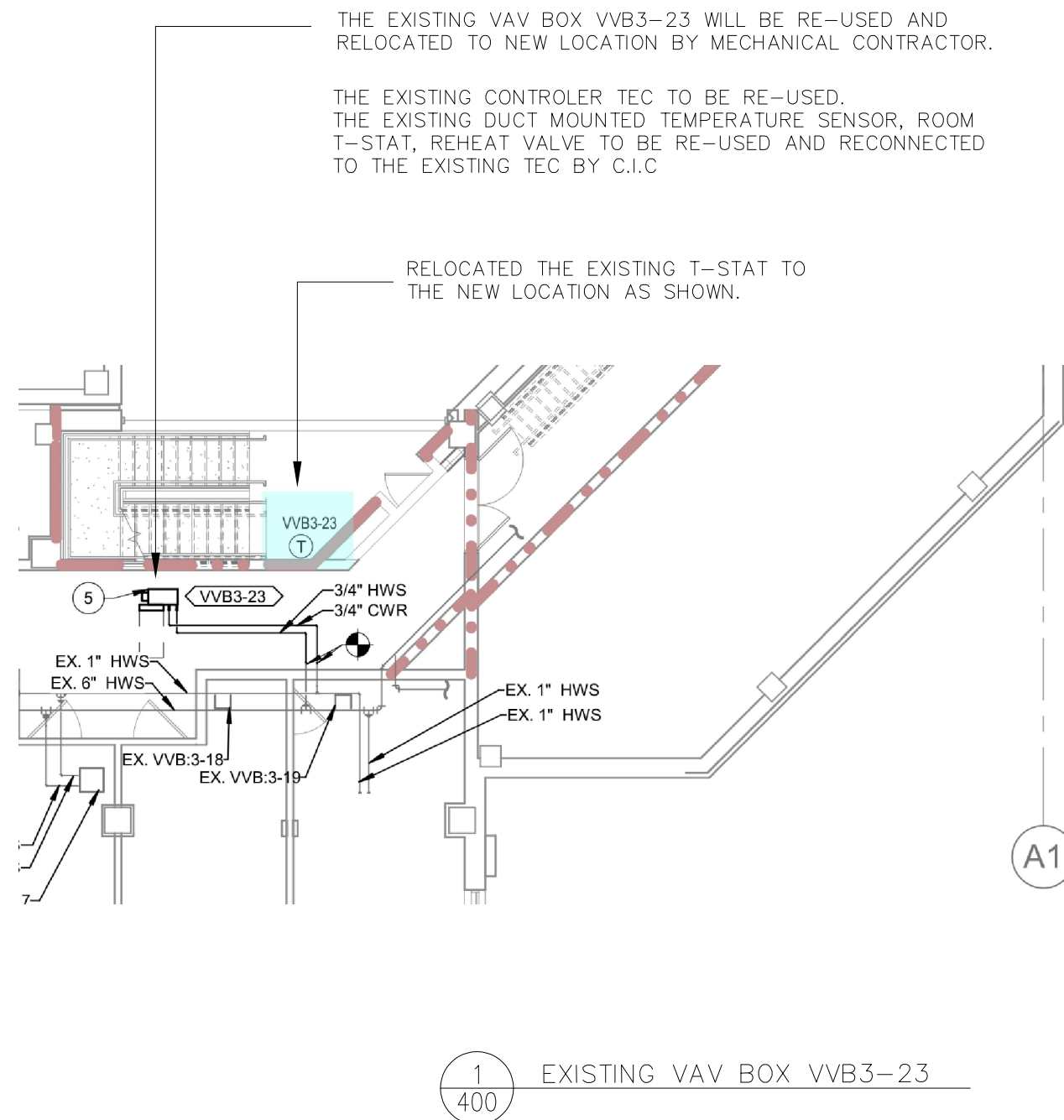
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| BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | |
| ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 |
| EF-4 BOM & SOO | | | | |

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REVISION HISTORY

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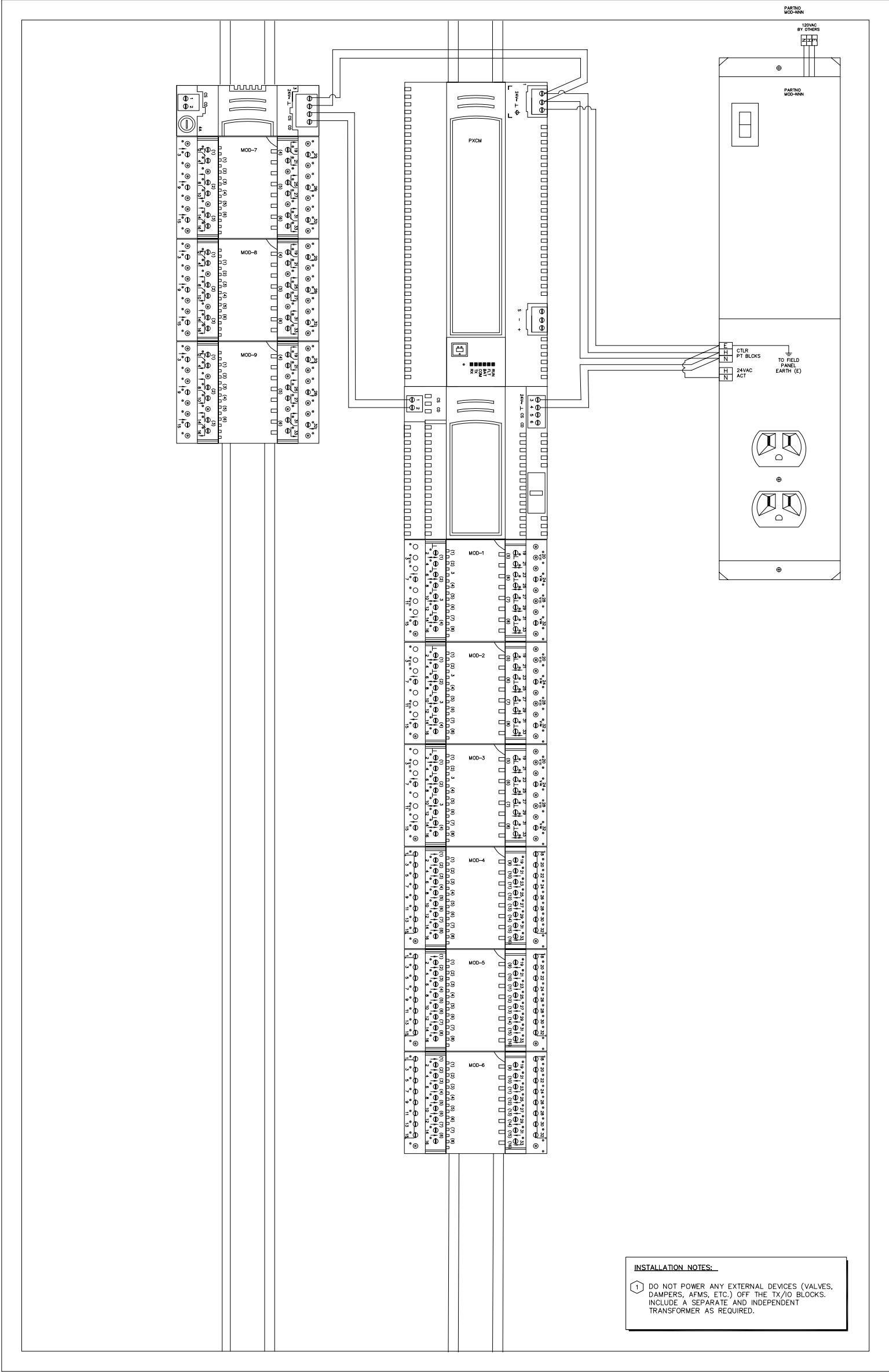
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IU PROJECT #20240312, IN

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| HB | HB | | 03/17/25 | 03/17/25 |

VVB3-23 WORK

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IU PROJECT #20240312, IN

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| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE | LAST EDIT DATE |
| HB | HB | HB | 03/17/25 | 03/17/25 |

PXCM-1 PANEL LAYOUT

440P394493
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REVISION HISTORY

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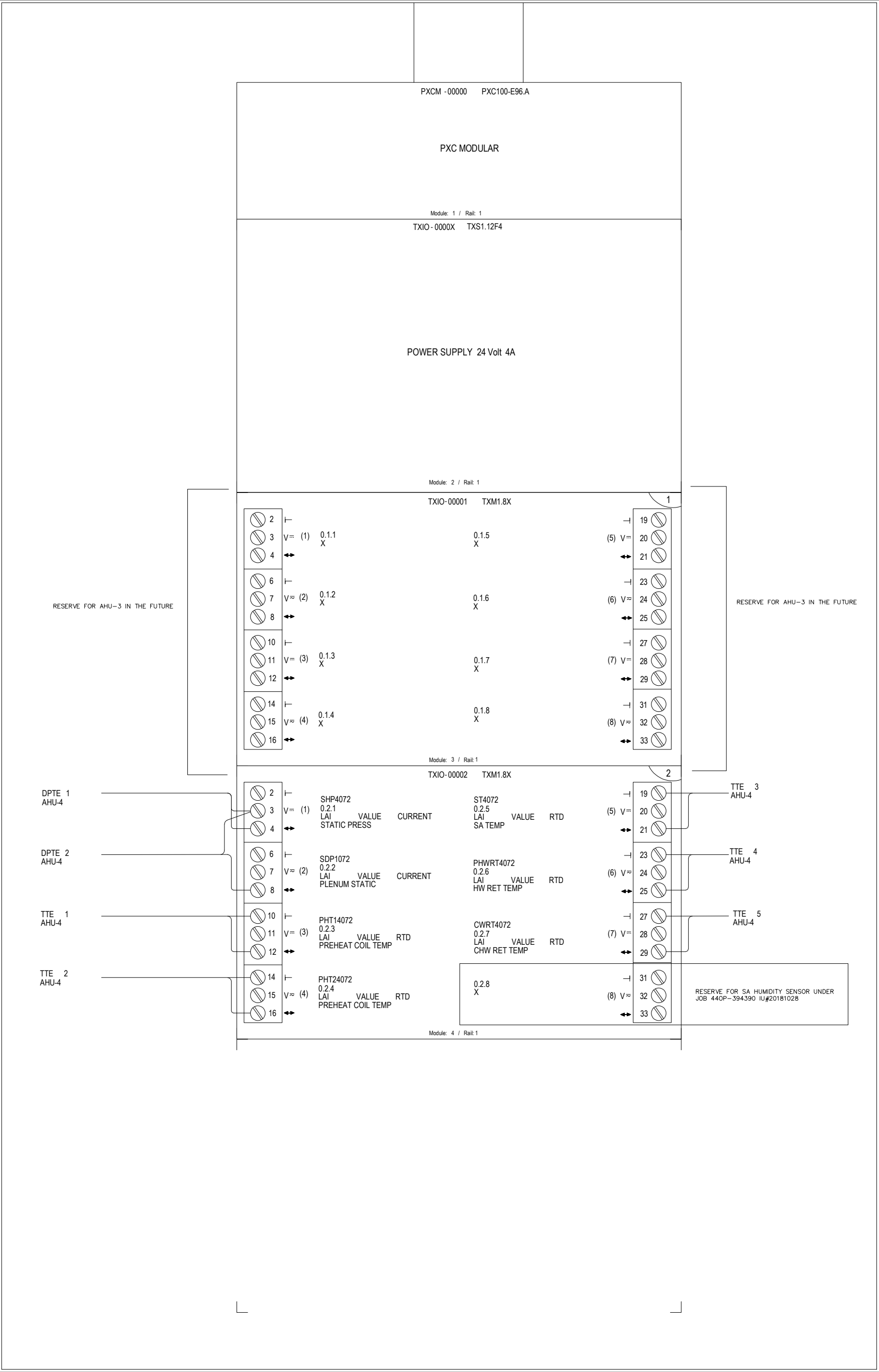
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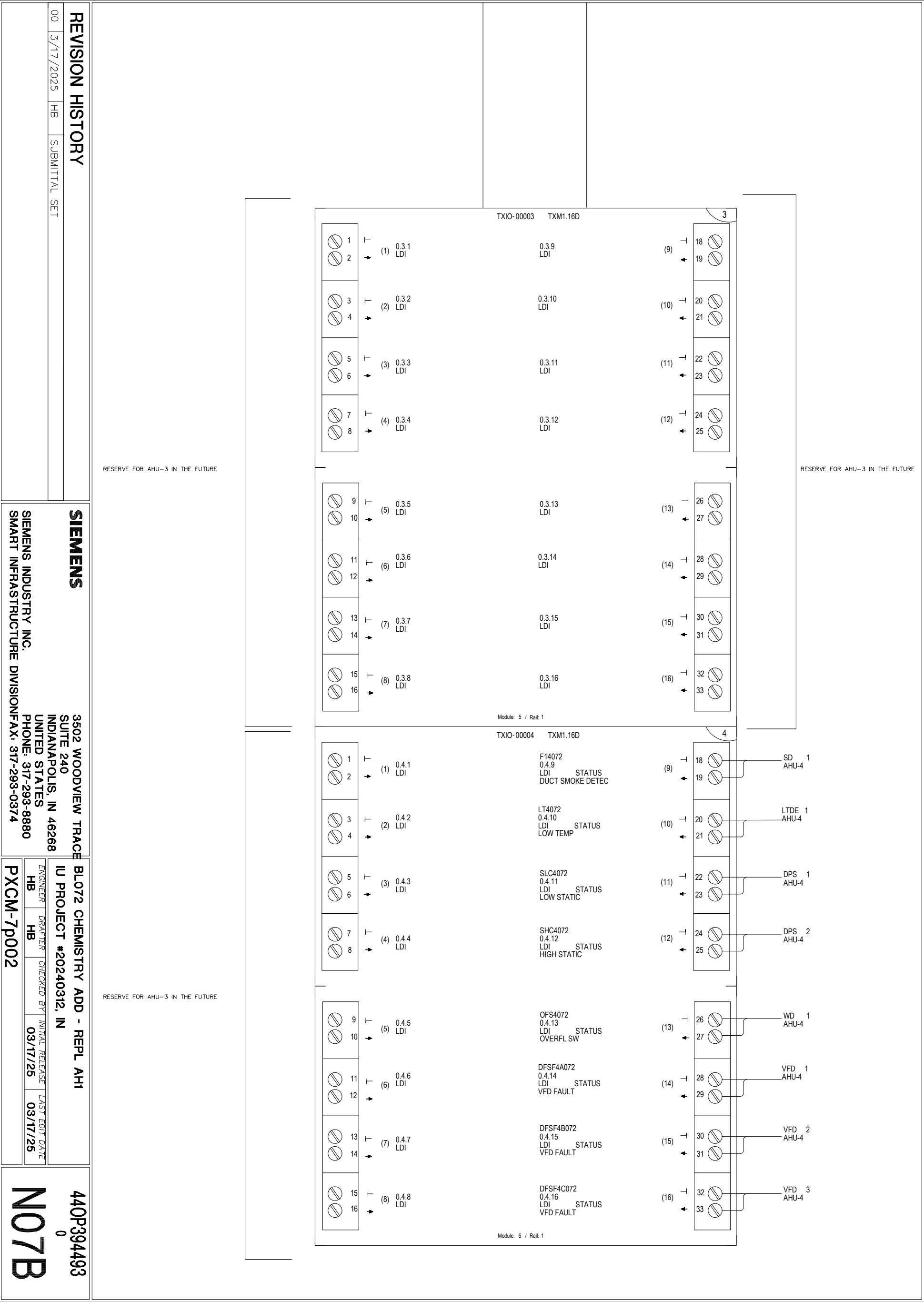
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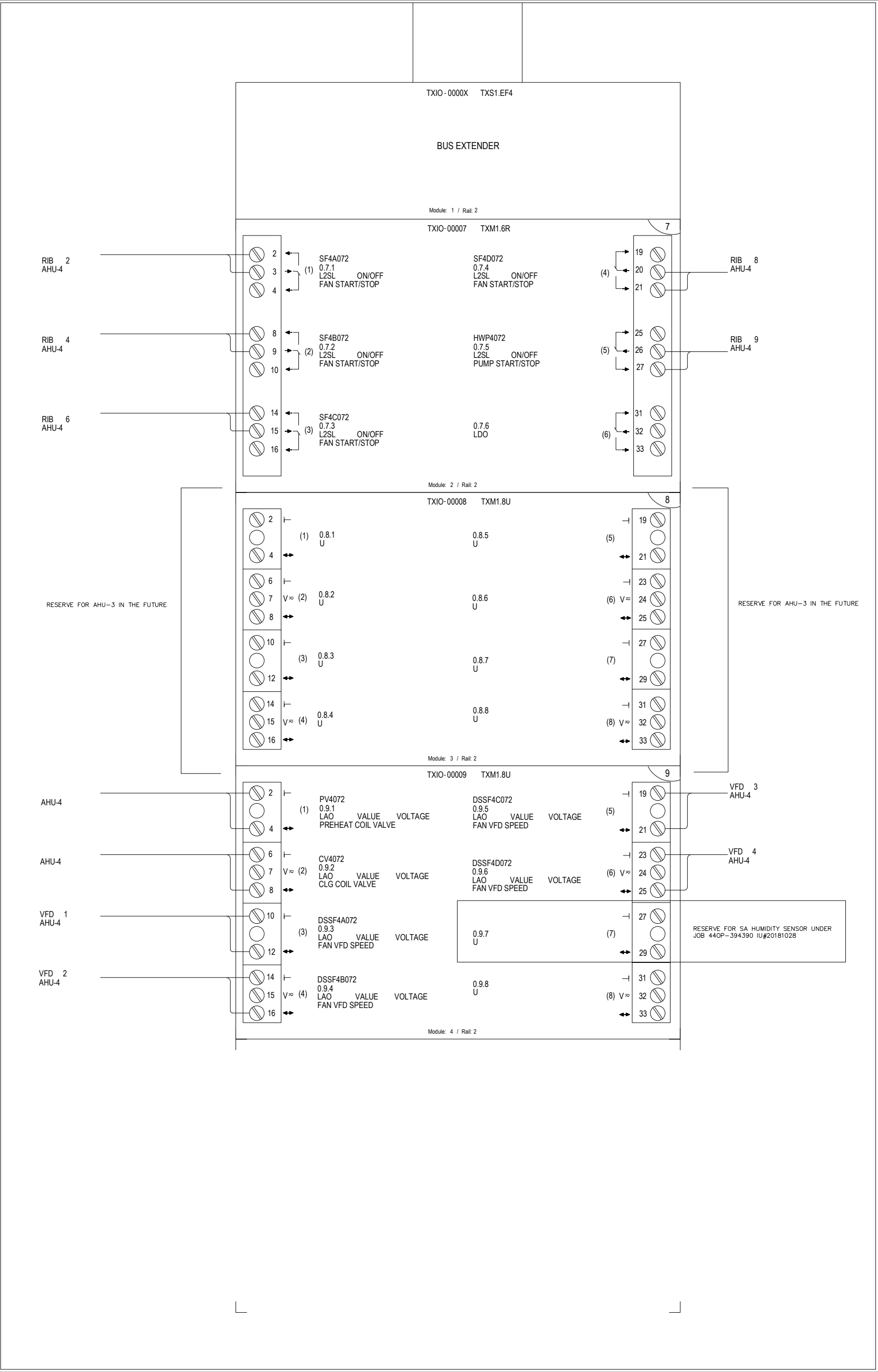
PXCM-7 AHU3&4

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NO7A







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IU PROJECT #20240312, IN

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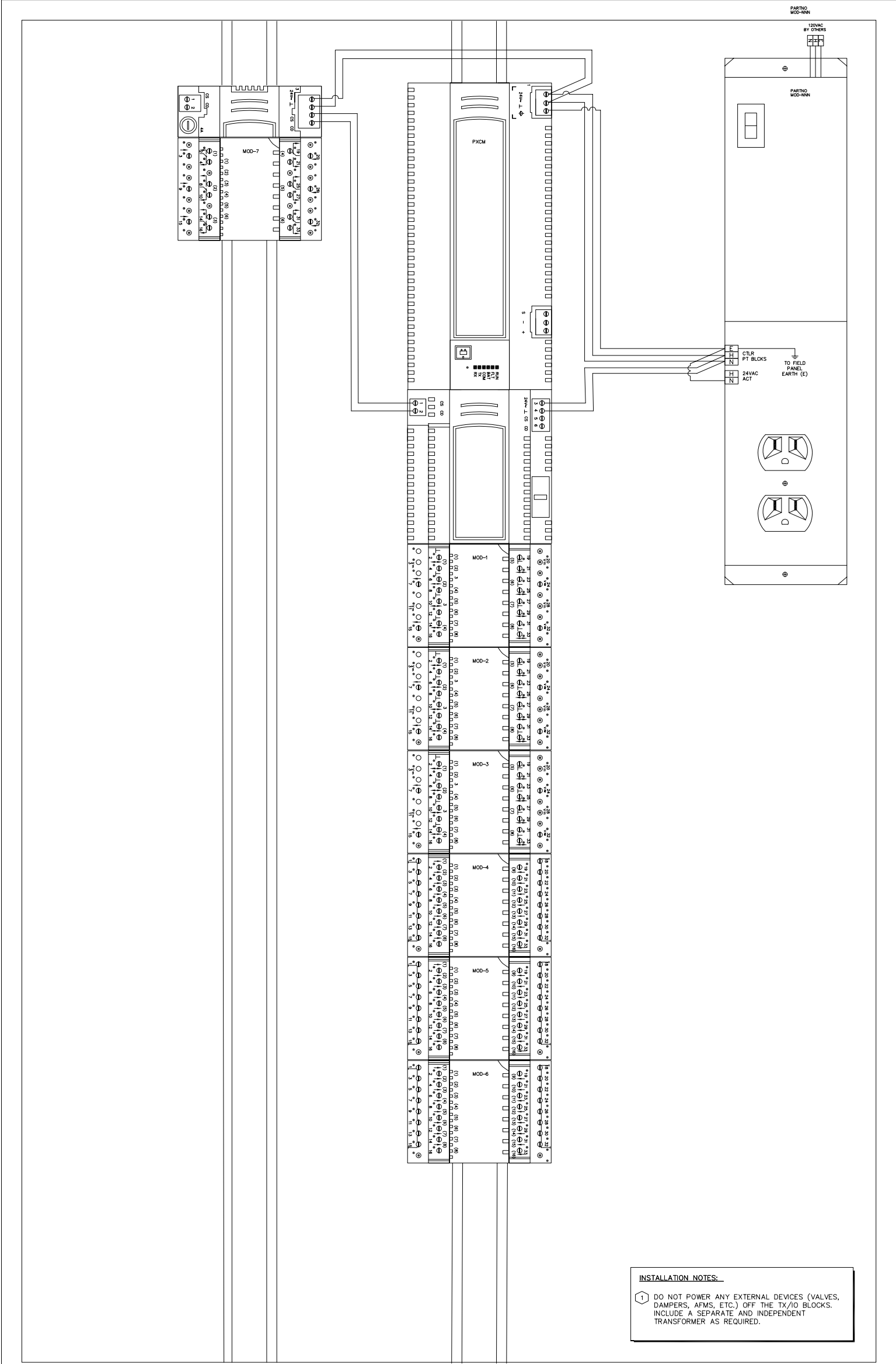
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NO7D

| Control Device | Qty | Product Number | Manufacturer | Document Number | Description |
|-----------------------|-----|----------------|--------------|-----------------|--|
| Panel Mounted Devices | | | | | |
| PXCM 07 | 1 | PXC100–E96.A | SIEMENS | 149478 | PXC MOD, BACNET, TX–I/O, 96 NODE, APOGEE |
| | 1 | TXA1.K24 | SIEMENS | 149476 | @ADDRESS KEY 1–24 |
| | 1 | TXS1.12F4 | SIEMENS | 149476 | 24VDC SUPPLY 1200MA, 4 A FUSE |
| | 2 | TXM1.8X | SIEMENS | 149476 | 8 UNIV I/O MODULE W/ 4–20MA |
| | 3 | TXM1.16D | SIEMENS | 149476 | 16 DIGITAL INPUT MODULE |
| | 2 | TXM1.6R | SIEMENS | 149476 | 6 RELAY OUTPUT MODULE |
| | 1 | TXS1.EF4 | SIEMENS | 149476 | BUS CONNECTION MODULE, 4A FUSE |
| | 2 | TXM1.8U | SIEMENS | 149476 | 8 UNIVERSAL I/O MODULE |

| REVISION HISTORY | | | | <div>SIEMENS</div> <div>SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION</div> | <div>3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374</div> | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | | <div>440P394493 0</div> <div>N07E</div> |
|------------------|-----------|----|---------------|---|---|--|---------------|------------|-----------------------------|----------------------------|---|
| 00 | 3/17/2025 | HB | SUBMITTAL SET | | | ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 | |
| | | | | | | PXCM-1 BOM | | | | | |
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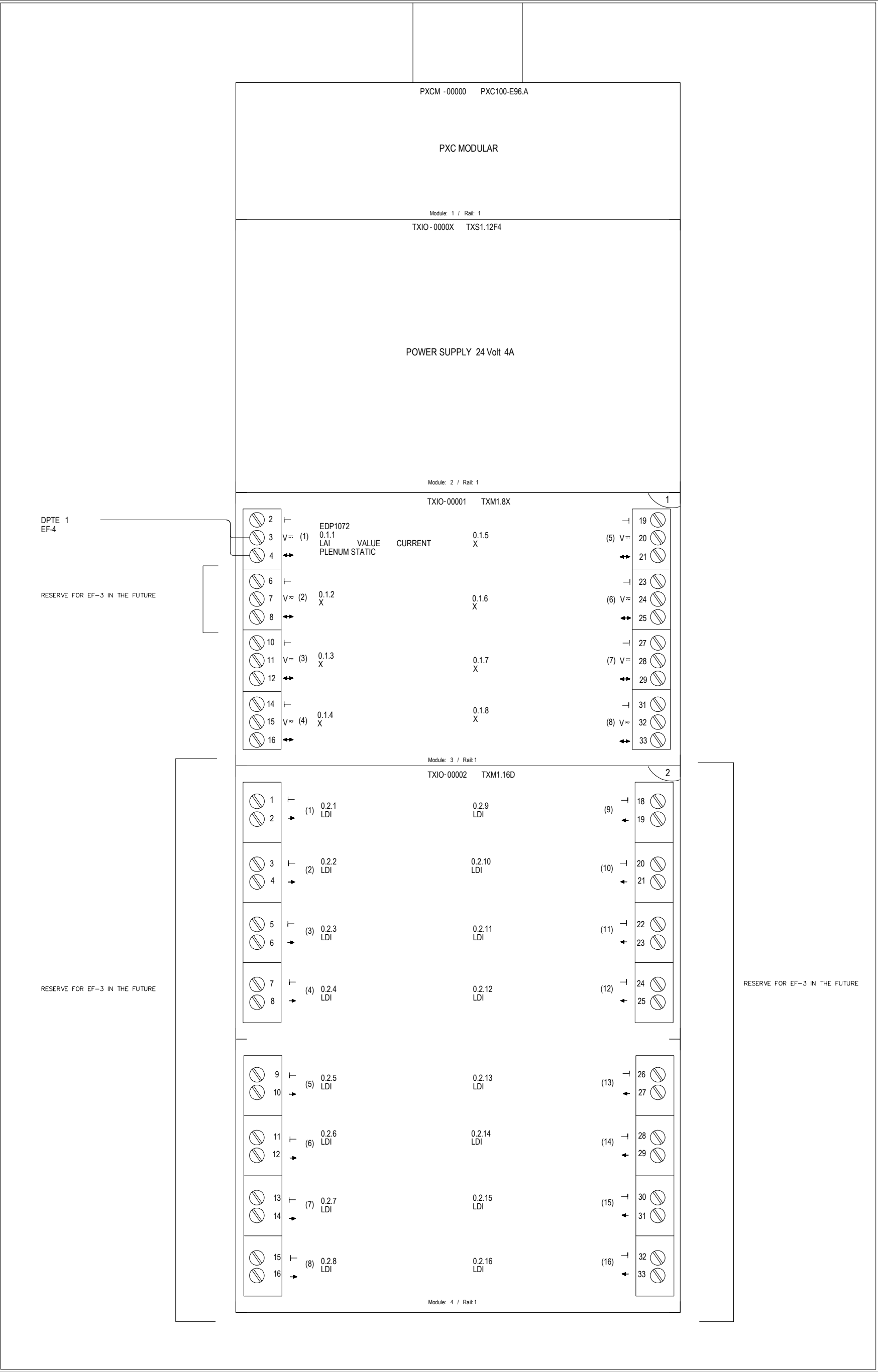
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IU PROJECT #20240312, IN

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PXCM-8 PANEL LAYOUT

440P394493
0

N08



DPTE 1

EF-4

RESERVE FOR EF-3 IN THE FUTURE

RESERVE FOR EF-3 IN THE FUTURE

RESERVE FOR EF-3 IN THE FUTURE

REVISION HISTORY

00

3/17/2025

HB

SUBMITTAL SET

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BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

ENGINEER

HB

DRAFTER

HB

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N08A

PXCM-8 EF-3&4

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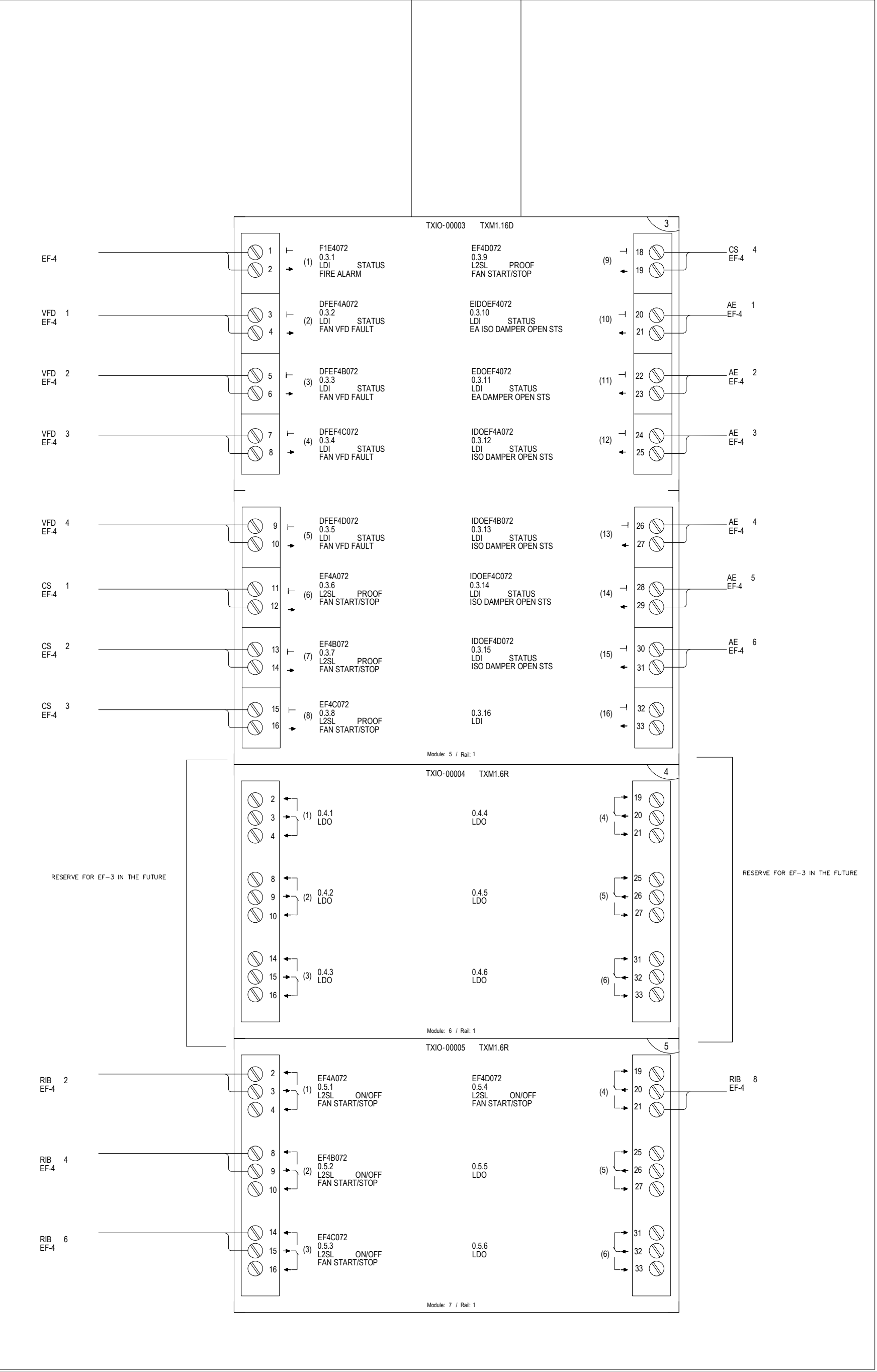
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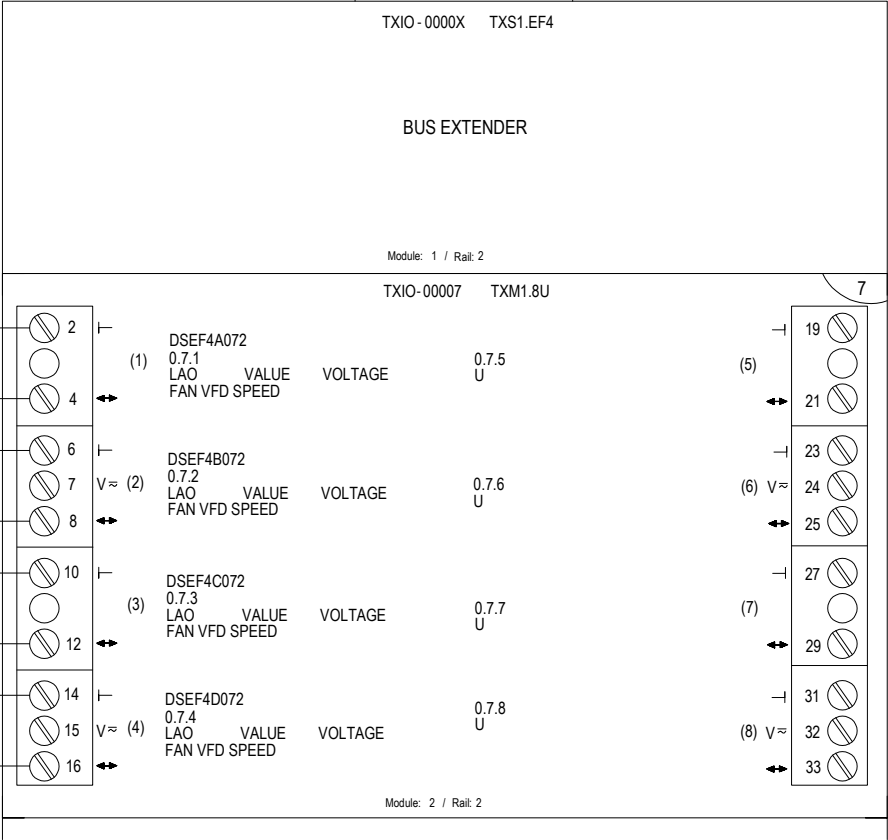
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| ENGINEER | DRAFTER | CHECKED BY | INITIAL RELEASE DATE | LAST EDIT DATE |
| HB | HB | | 03/17/25 | 03/17/25 |

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| <div>RESERVE FOR EF-3 IN THE FUTURE</div> | | | | | | | | | | <div>RESERVE FOR EF-3 IN THE FUTURE</div> | | | | | | | | | |
| <div>TXIO-00006 TXM1.8U</div> | | | | | | | | | | <div>Module: 8 / Rail: 1</div> | | | | | | | | | |
| <div>2 4 6 7 8 10 12 14 15 16</div> | | | | | | | | | | <div>19 21 23 24 25 27 29 31 32 33</div> | | | | | | | | | |
| <div>(1) 0.6.1 U</div> | | | | | | | | | | <div>(5)</div> | | | | | | | | | |
| <div>(2) 0.6.2 U</div> | | | | | | | | | | <div>(6) V</div> | | | | | | | | | |
| <div>(3) 0.6.3 U</div> | | | | | | | | | | <div>(7)</div> | | | | | | | | | |
| <div>(4) 0.6.4 U</div> | | | | | | | | | | <div>(8) V</div> | | | | | | | | | |
| <div>0.6.5 U</div> | | | | | | | | | | <div>0.6.6 U</div> | | | | | | | | | |
| <div>0.6.7 U</div> | | | | | | | | | | <div>0.6.8 U</div> | | | | | | | | | |
| <div>6</div> | | | | | | | | | | <div>6</div> | | | | | | | | | |
| <div>REVISION HISTORY</div> | | | | | | | | | | <div>REVISION HISTORY</div> | | | | | | | | | |
| <div>00 3/17/2025 HB SUBMITTAL SET</div> | | | | | | | | | | <div>00 3/17/2025 HB SUBMITTAL SET</div> | | | | | | | | | |
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| <div>3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374</div> | | | | | | | | | | <div>3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374</div> | | | | | | | | | |
| <div>BL072 CHEMISTRY ADD - REPL AH1</div> | | | | | | | | | | <div>BL072 CHEMISTRY ADD - REPL AH1</div> | | | | | | | | | |
| <div>IU PROJECT #20240312, IN</div> | | | | | | | | | | <div>IU PROJECT #20240312, IN</div> | | | | | | | | | |
| <div>ENGINEER HB DRAFTER HB CHECKED BY INITIAL RELEASE DATE 03/17/25 LAST EDIT DATE 03/17/25</div> | | | | | | | | | | <div>ENGINEER HB DRAFTER HB CHECKED BY INITIAL RELEASE DATE 03/17/25 LAST EDIT DATE 03/17/25</div> | | | | | | | | | |
| <div>PXCM-8p003</div> | | | | | | | | | | <div>PXCM-8p003</div> | | | | | | | | | |
| <div>440P394493 0 N08C</div> | | | | | | | | | | <div>440P394493 0 N08C</div> | | | | | | | | | |



VFD 1
EF-4

VFD 2
EF-4

VFD 3
EF-4

VFD 4
EF-4

REVISION HISTORY

00 3/17/2025 HB SUBMITTAL SET

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BL072 CHEMISTRY ADD - REPL AH1
IU PROJECT #20240312, IN

ENGINEER HB DRAFTER HB CHECKED BY INITIAL RELEASE LAST EDIT DATE
03/17/25 03/17/25

PXCM-8p004

440P394493
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N08D

| Control Device | Qty | Product Number | Manufacturer | Document Number | Description |
|-----------------------|-----|----------------|--------------|-----------------|--|
| Panel Mounted Devices | | | | | |
| PXCM 07 | 1 | PXC100–E96.A | SIEMENS | 149478 | PXC MOD, BACNET, TX–I/O, 96 NODE, APOGEE |
| | 1 | TXA1.K24 | SIEMENS | 149476 | @ADDRESS KEY 1–24 |
| | 1 | TXS1.12F4 | SIEMENS | 149476 | 24VDC SUPPLY 1200MA, 4 A FUSE |
| | 1 | TXM1.8X | SIEMENS | 149476 | 8 UNIV I/O MODULE W/ 4–20MA |
| | 2 | TXM1.16D | SIEMENS | 149476 | 16 DIGITAL INPUT MODULE |
| | 2 | TXM1.6R | SIEMENS | 149476 | 6 RELAY OUTPUT MODULE |
| | 2 | TXM1.8U | SIEMENS | 149476 | 8 UNIVERSAL I/O MODULE |
| | 1 | TXS1.EF4 | SIEMENS | 149476 | BUS CONNECTION MODULE, 4A FUSE |

| REVISION HISTORY | | | | <div>SIEMENS</div> <div>SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION</div> | <div>3502 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-293-8880 FAX: 317-293-0374</div> | BL072 CHEMISTRY ADD - REPL AH1 IU PROJECT #20240312, IN | | | | | <div>440P394493 0</div> <div>N08E</div> |
|------------------|-----------|----|---------------|---|---|--|---------------|------------|-----------------------------|----------------------------|---|
| 00 | 3/17/2025 | HB | SUBMITTAL SET | | | ENGINEER HB | DRAFTER HB | CHECKED BY | INITIAL RELEASE 03/17/25 | LAST EDIT DATE 03/17/25 | |
| | | | | | | PXCM-8 BOM | | | | | |
| | | | | | | | | | | | |

SECTION 232113 - HYDRONIC PIPING

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Copper tube and fittings.
 - 2. Steel pipe and fittings.
 - 3. Joining materials.
 - 4. Transition fittings.
 - 5. Dielectric fittings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Pipe and tube.
 - 2. Fittings.
 - 3. Joining materials.
 - 4. Transition fittings.
 - 5. Bypass chemical feeder.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Piping layout, or BIM model, drawn to scale, showing the items described in this Section, and coordinated with all building trades.
- B. Qualification Data: For Installer.
- C. Welding certificates.
- D. Field quality-control reports.
- E. Preconstruction Test Reports:
 - 1. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:

- B. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
 - 1. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
 - 1. Dual Temperature -Water Piping: 150 psig at 200 deg F.
 - 2. Makeup-Water Piping: 80 psig at 73 deg F.
 - 3. Condensate-Drain Piping: 150 deg F at 180 deg F.
 - 4. Air-Vent Piping: 180 deg F 200 deg F.
 - 5. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

2.2 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tube: ASTM B88, Type L (ASTM B88M, Type B).
- B. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, pressure fittings.
- C. Wrought Copper Unions: ASME B16.22.

2.3 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A53/A53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.
- B. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in "Piping Applications" Article.
- C. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in "Piping Applications" Article.
- D. Steel Pipe Nipples: ASTM A733, made of same materials and wall thicknesses as pipe in which they are installed.
- E. Solder Filler Metals: ASTM B32, lead-free alloys. Include water-flushable flux according to ASTM B813.
- F. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions:
 - 1. Description:
 - a. Standard: ASSE 1079.
 - b. Pressure Rating: 150 psig.
 - c. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges:
 - 1. Description:
 - a. Standard: ASSE 1079.
 - b. Factory-fabricated, bolted, companion-flange assembly.
 - c. Pressure Rating: 150 psig.
 - d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric Nipples:
 - 1. Description:
 - a. Standard: IAPMO PS 66.
 - b. Electroplated steel nipple, complying with ASTM F1545.
 - c. Pressure Rating: 300 psig at 225 deg F.
 - d. End Connections: Male threaded or grooved.
 - e. Lining: Inert and noncorrosive, propylene.

2.5 PIPING APPLICATIONS

- A. Chilled water piping, aboveground, NPS 2-1/2 and larger shall be the following:
 - 1. Schedule 40 steel pipe, wrought-steel fittings, and welded and joints.
- B. Makeup-water piping installed aboveground shall be the following:
 - 1. Type L (Type B) drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- C. Condensate-Drain Piping, Copper: Type DWV, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- D. Air-Vent Piping:
 - 1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.
- E. Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-

plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.

2.6 INSTALLATION OF PIPING

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- L. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- O. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- P. Install valves according to the following:
 - 1. Section 230523.12 "Ball Valves for HVAC Piping."
 - 2. Section 230523.13 "Butterfly Valves for HVAC Piping."
 - 3. Section 230523.14 "Check Valves for HVAC Piping."

- Q. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- R. Install shutoff valve immediately upstream of each dielectric fitting.
- S. Comply with requirements in Section 230516 "Expansion Fittings and Loops for HVAC Piping" for installation of expansion loops, expansion joints, anchors, and pipe alignment guides.
- T. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for identifying piping.
- U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- V. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- W. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

2.7 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Soldered Joints: Apply ASTM B813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B32.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

2.8 INSTALLATION OF DIELECTRIC FITTINGS

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.

2.9 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hangers, supports, and anchor devices.
- B. Install hangers for copper tubing and steel piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
- C. Support horizontal piping within 12 inches of each fitting and coupling.
- D. Support vertical runs of copper tubing and steel piping to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

2.10 TERMINAL EQUIPMENT CONNECTIONS

- A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.
- B. Install control valves in accessible locations close to connected equipment.
- C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.
- D. Install ports for pressure gauges and thermometers at coil inlet and outlet connections. Comply with requirements in Section 230519 "Meters and Gages for HVAC Piping."

2.11 IDENTIFICATION

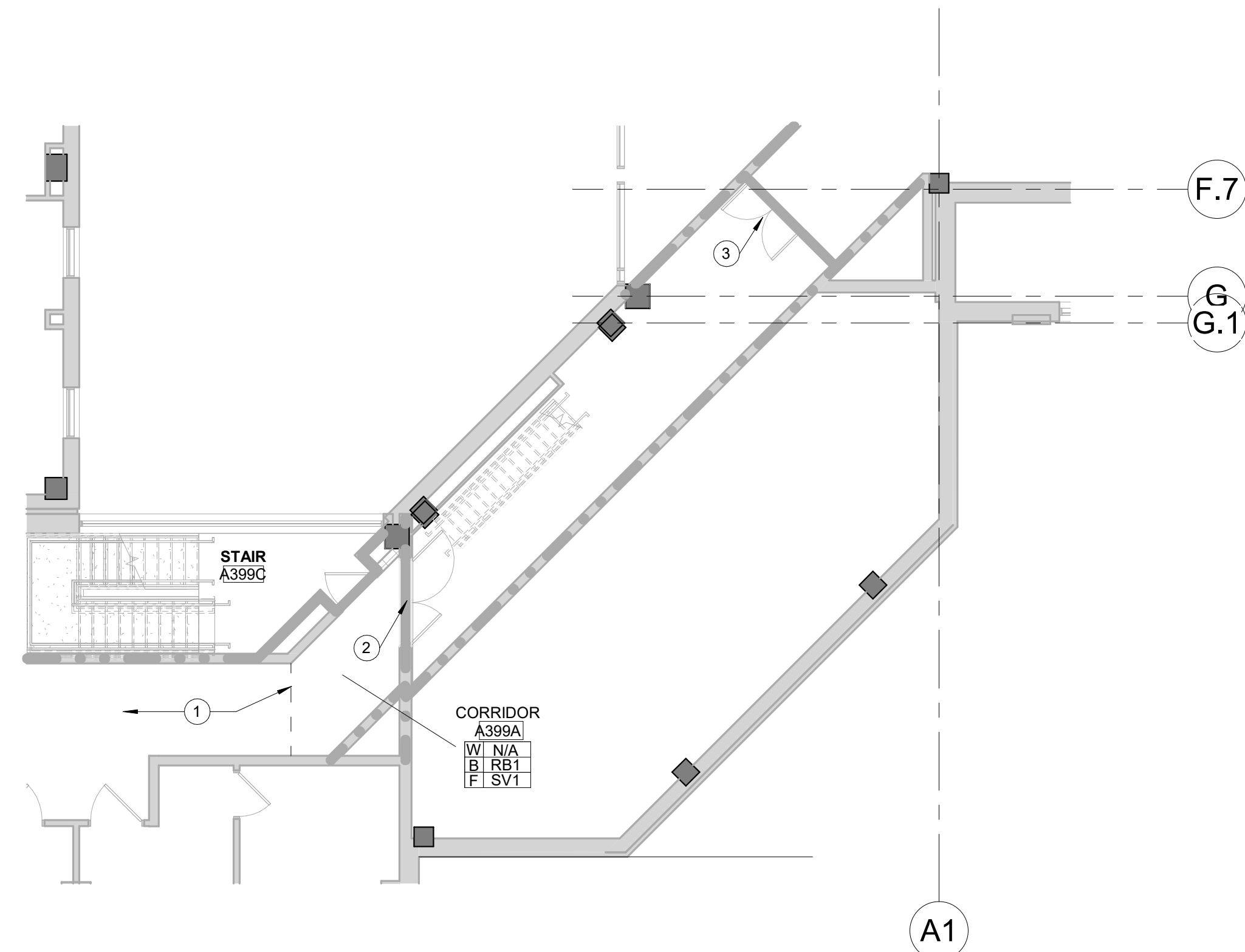
- A. Identify system components. Comply with requirements for identification materials and installation in Section 230553 "Identification for HVAC Piping and Equipment."

2.12 FIELD QUALITY CONTROL

- A. Prepare hydronic piping according to ASME B31.9 and as follows:
 - 1. Leave joints, including welds, uninsulated and exposed for examination during test.
 - 2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
 - 3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
 - 4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
 - 5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
- B. Perform the following tests on hydronic piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
 2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
 3. Isolate expansion tanks and determine that hydronic system is full of water.
 4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
 5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
 6. Prepare written report of testing.
- C. Perform the following before operating the system:
1. Open manual valves fully.
 2. Inspect pumps for proper rotation.
 3. Set makeup pressure-reducing valves for required system pressure.
 4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
 5. Set temperature controls so all coils are calling for full flow.
 6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
 7. Verify lubrication of motors and bearings.

END OF SECTION



6 LEVEL 03 - INTERIOR FINISH PLAN
1/8" = 1'-0"

FINISH SCHEDULE

NOTE: VERIFY ALL COLORS AND FINISHES WITH EXISTING IN FIELD BEFORE ORDERING.

PAINT/WALL FINISH

| | | |
|-----|-----------|---|
| PT1 | MFG: | SHERWIN WILLIAMS |
| | TYPE: | PROMAR 200 ZERO VOC INTERIOR LATEX |
| | COLOR: | SW7051 ANALYTICAL GRAY |
| | FINISH: | EGGSHELL |
| | LOCATION: | STANDARD PAINT (DRYWALL, IF NEEDED) |
| PT2 | MFG: | SHERWIN WILLIAMS |
| | TYPE: | PRO INDUSTRIAL PRE-CATALYZED WATERBASED EPOXY |
| | COLOR: | SW7675 SEALSKIN |
| | FINISH: | SEMI-GLOSS |
| | LOCATION: | HOLLOW METAL DOORS/FRAMES |

FLOOR COVERING

HOMOGENEOUS VINYL SHEET

| | | |
|-----|----------|---|
| SV1 | MFG: | USE OWNER'S ATTIC STOCK |
| | TYPE: | ROLL, 2MM THICKNESS |
| | PATTERN: | USE OWNER'S ATTIC STOCK |
| | COLOR: | USE OWNER'S ATTIC STOCK |
| | INSTALL: | ALIGN WITH EXISTING PATTERN, HEAT WELDED SEAMS TO MATCH FIELD COLOR |

WALL BASE

RUBBER BASE

| | | |
|-----|--------|------------------------------|
| RB1 | MFG: | JOHNSONITE |
| | TYPE: | 4" RUBBER COVE BASE (COILED) |
| | COLOR: | 40 BLACK |

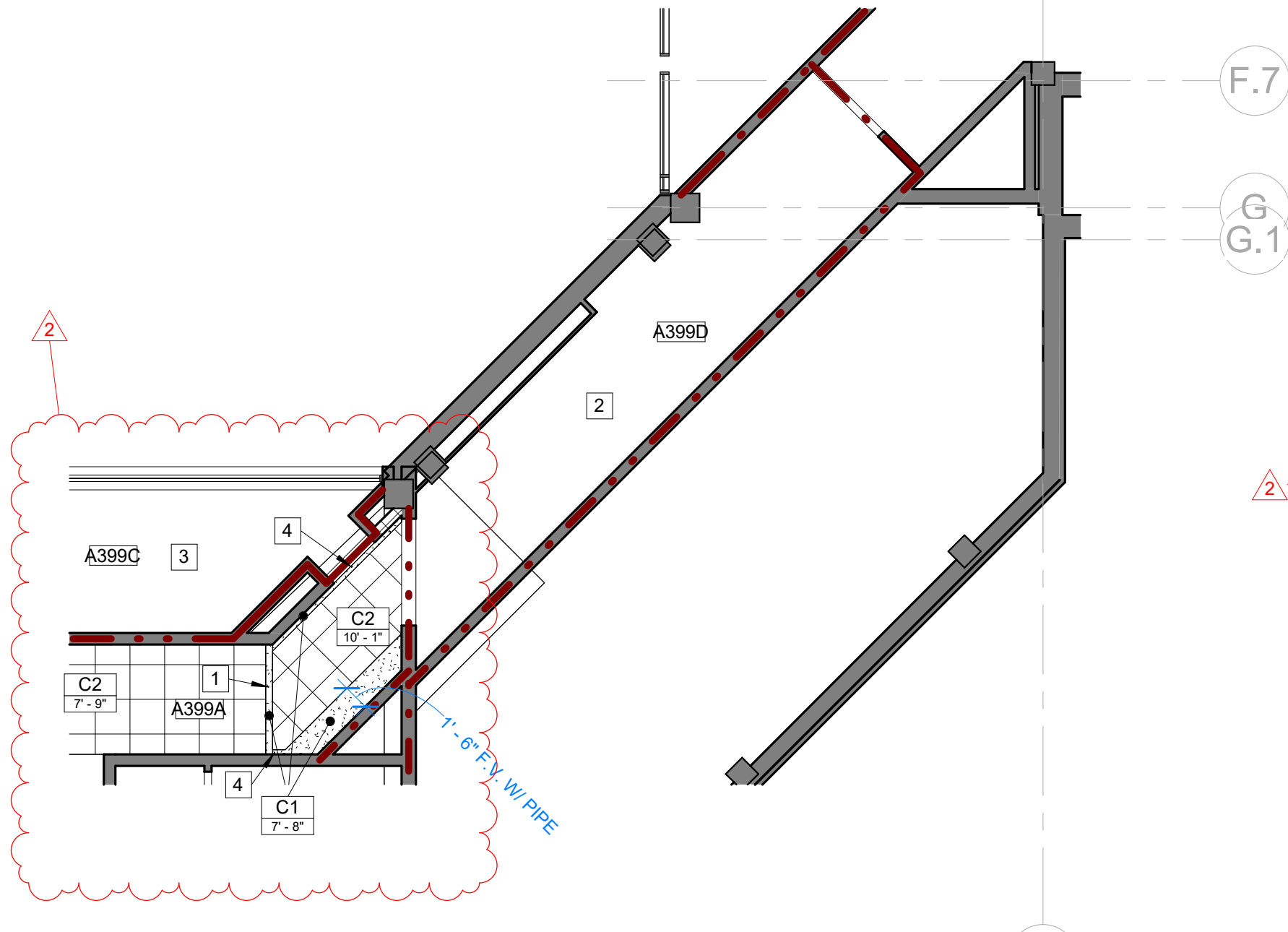
CEILING TILES

LAY-IN ACOUSTICAL CEILING TILES

| | | |
|------|--------|--|
| ACT1 | MFG: | USG |
| | STYLE: | 131 FISSURED |
| | COLOR: | WHITE |
| | SIZE: | 2' X 2' X 5/8" |
| | EDGE: | SQUARE |
| | GRID: | STANDARD 15/16", CHARCOAL (FIELD VERIFY) |

FINISH PLAN KEYNOTES ①

- EXISTING FINISHES TO REMAIN
- PAINT DOOR FRAME COLOR PT2.
- PAINT DOOR AND FRAME COLOR PT2.



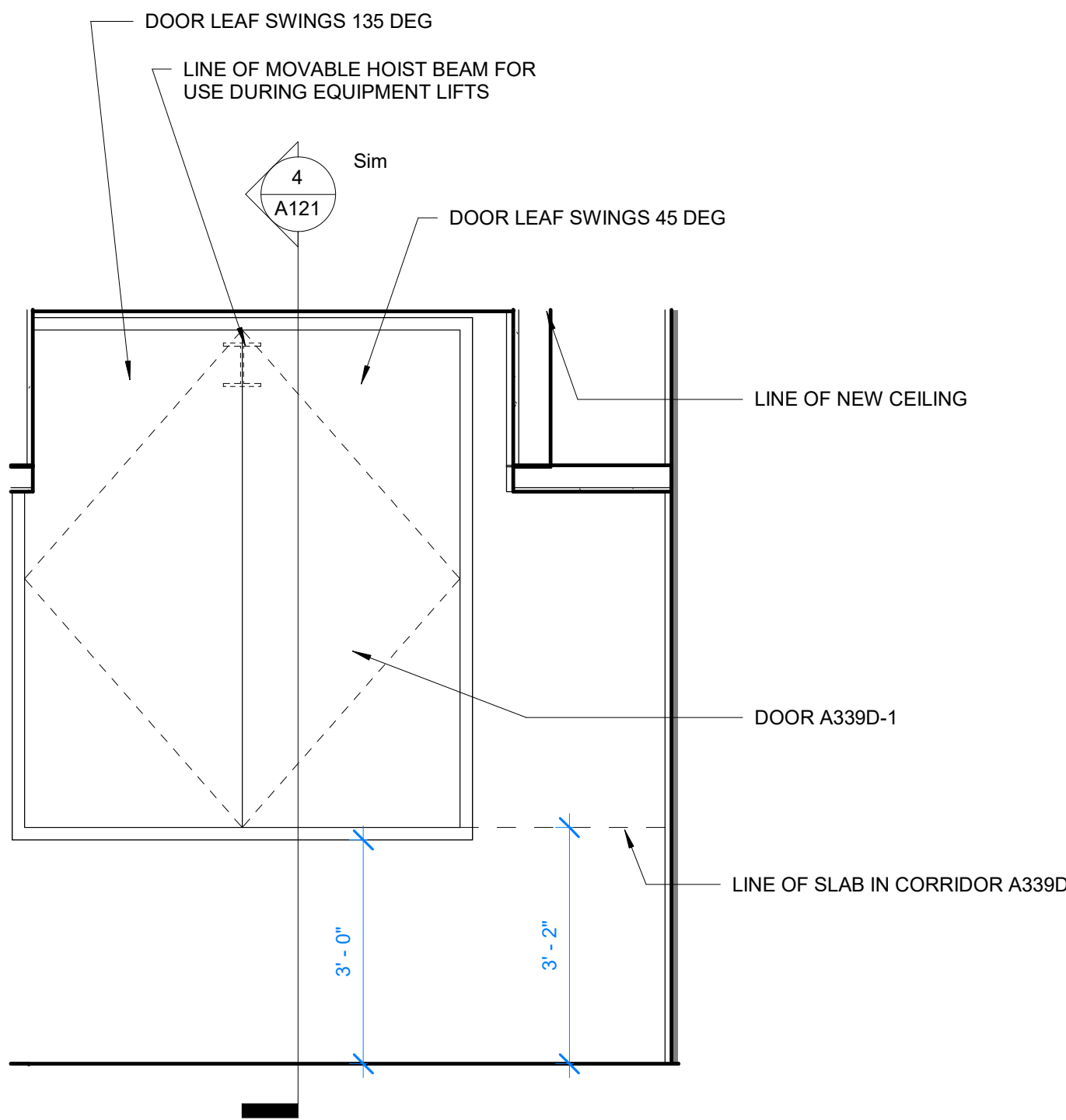
3 LEVEL 03 - REFL CEILING PLAN
1/8" = 1'-0"

CEILING PLAN KEYNOTES ①

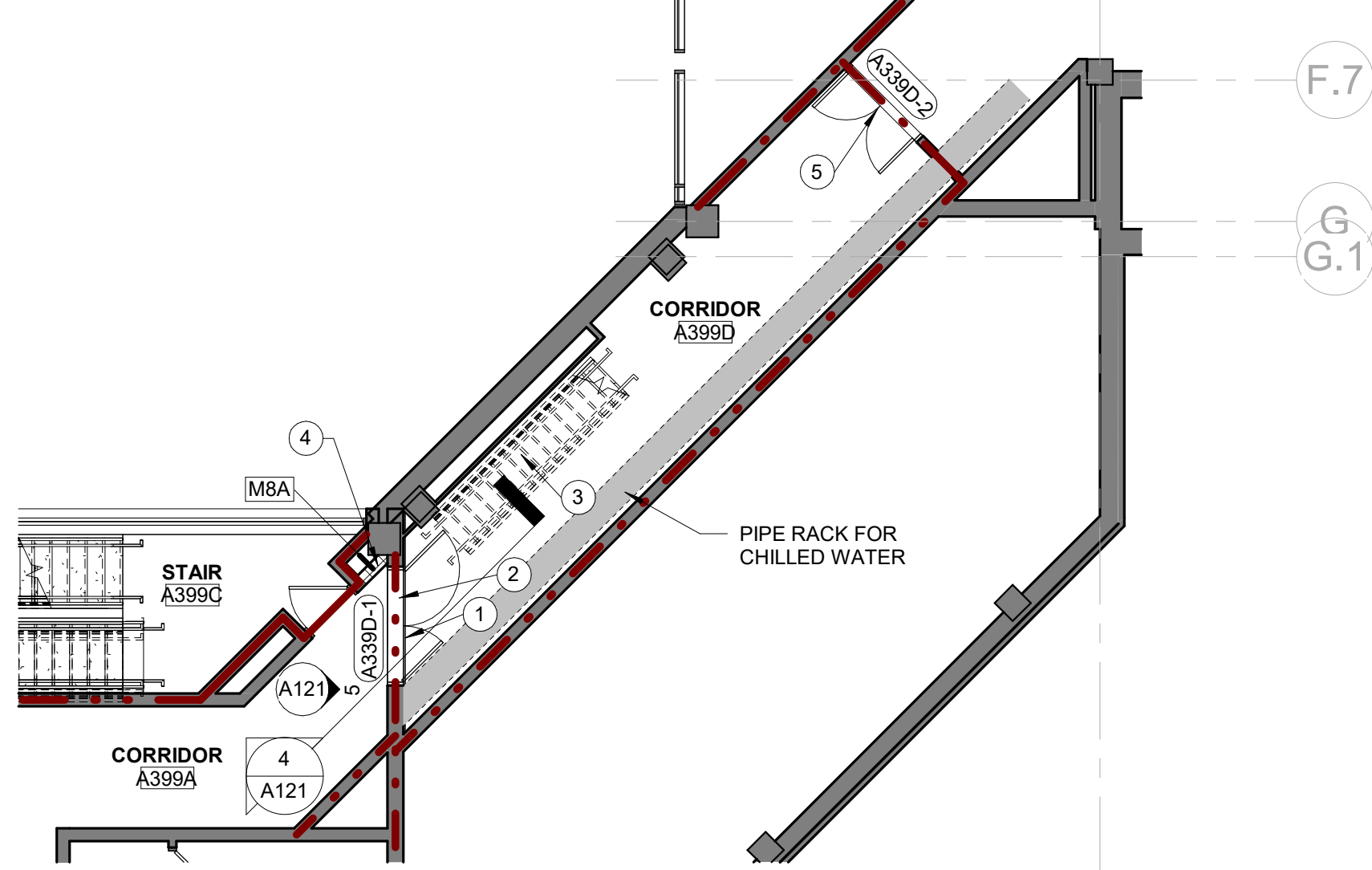
- CEILING STEPS AT THIS LOCATION. FRAME BULKHEAD W/ 3-5/8" METAL STUDS AND WRAP ALL EXPOSED SIDES WITH 5/8" DRYWALL.
- NO CEILING IN THIS LOCATION.
- EXISTING WOOD SLAT CEILING TO BE REINSTALLED AFTER UTILITY CONFIGURATIONS ARE COMPLETE.
- BULKHEAD ALONG WALL TO BE FRAMED W/ 2-1/2" METAL STUDS AND WRAPPED IN DRYWALL.

CEILING TYPE LEGEND

- C1 GYPSUM BOARD (W/ METAL STUDS) - PAINT CEILING/BULKHEAD FLAT WHITE AND PROVIDE LEVEL 4 FINISH UNLESS NOTED OTHERWISE
- C2 TYPE: ACT1 (SEE FINISH SCHEDULE)



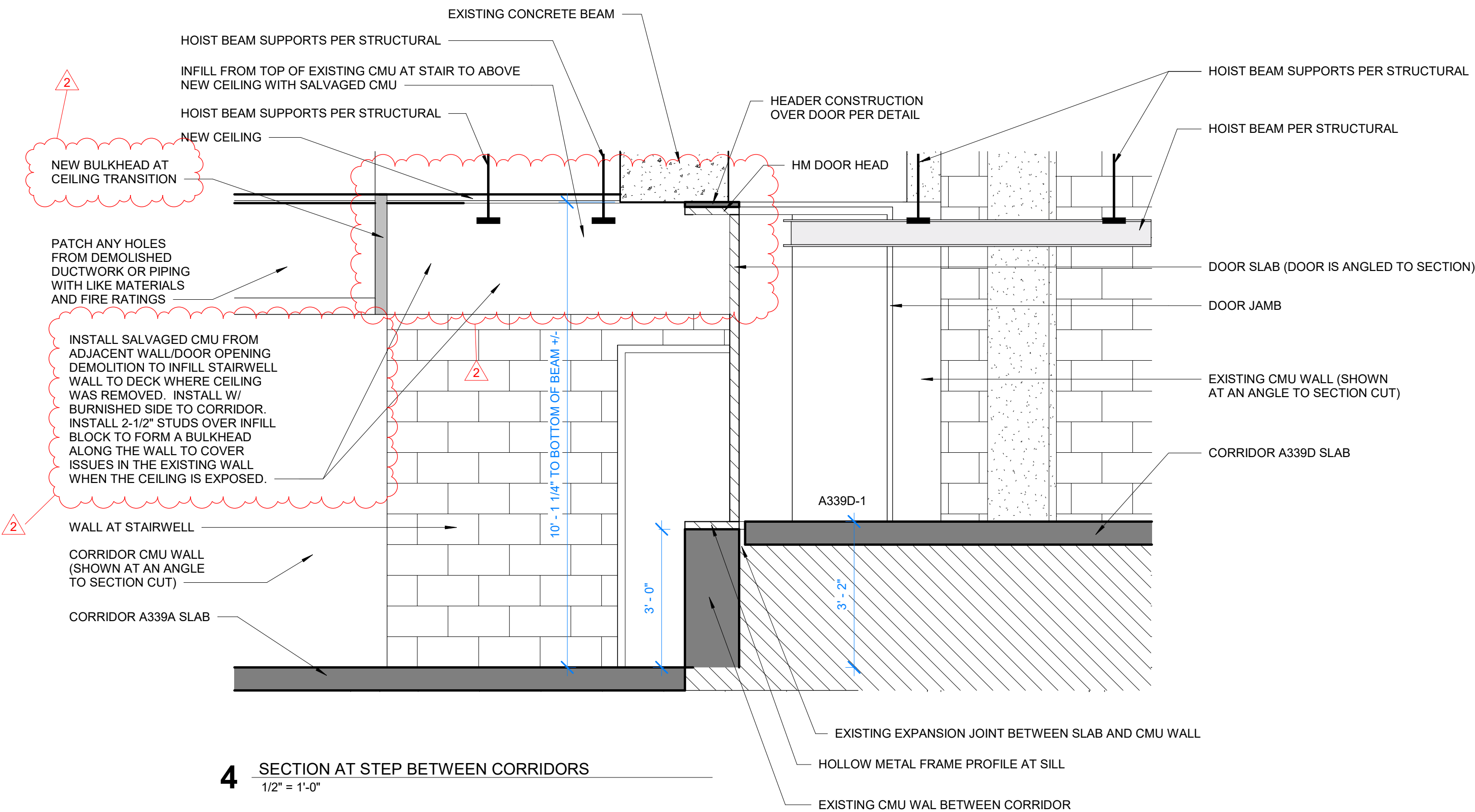
5 CORRIDOR ELEVATION
1/2" = 1'-0"



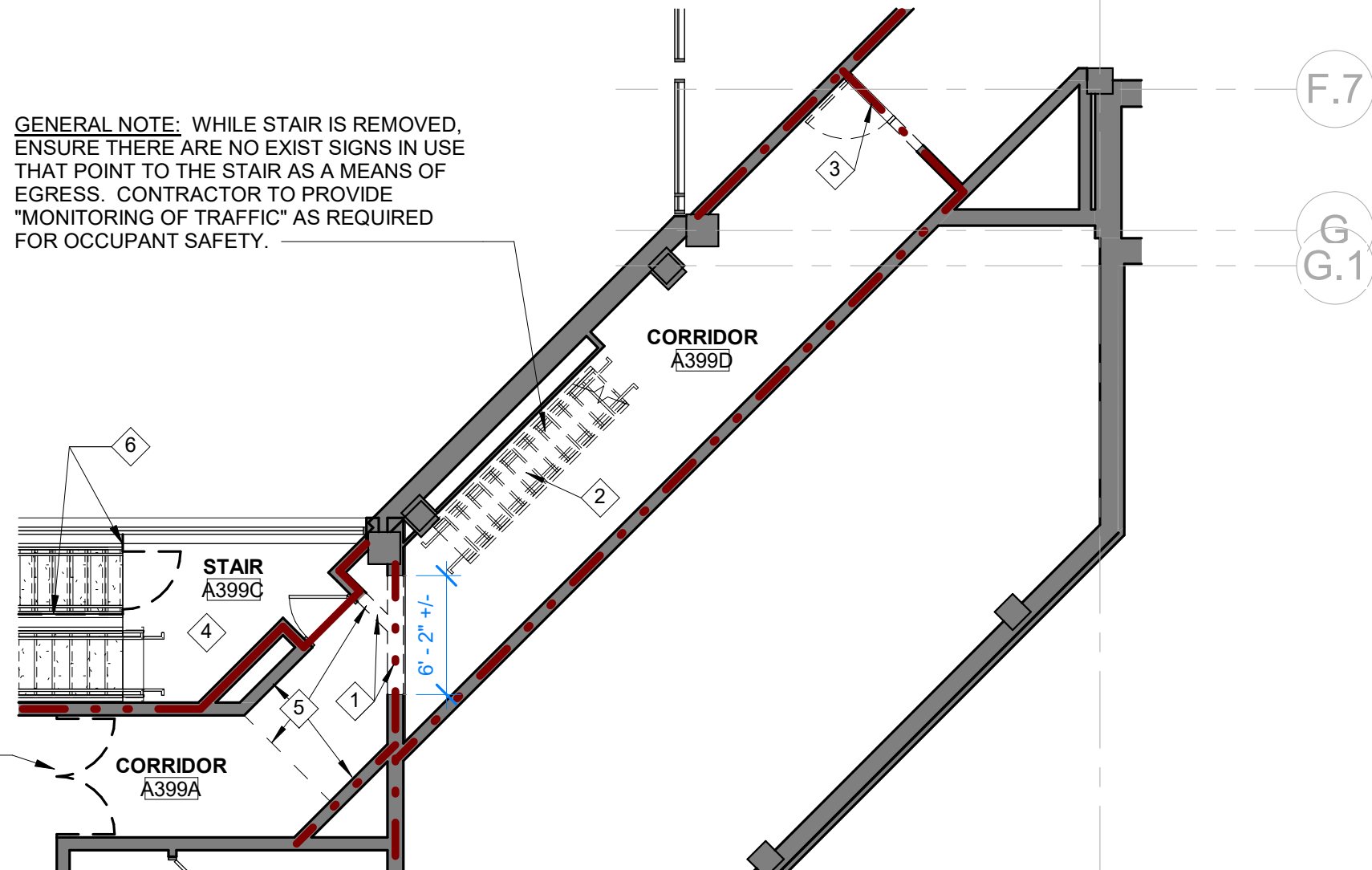
2 LEVEL 03 - ARCH
1/8" = 1'-0"

ARCH PLAN KEYNOTES ①

- EXISTING EXPANSION JOINT AT THIS LOCATION SEPARATING SLAB FROM CMU WALL. MAINTAIN CLEAR JOINT AT COMPLETION OF CONSTRUCTION.
- NEW DOOR TO HAVE A FRAME ON ALL 4 SIDES. THE SILL FRAME TO ALIGN WITH THE HIGHER MECHANICAL CORRIDOR FLOOR. DOOR AND FRAME TO BE PAINTED PT2.
- MEZZANINE STAIR TO BE REPLACED AFTER REMOVAL AND RECONFIGURATION. REFER TO STRUCTURAL DRAWINGS.
- BUILD NEW WALL WITH SALVAGED CMU. EXISTING CMU IS BURNISHED ON CORRIDOR A339A SIDE. BURNISHED FACE OF NEW WALL TO FACE CORRIDOR SIDE.
- PROVIDE LINTEL AND/OR BOND BEAM OVER HEAD OF DOOR PER STRUCTURAL.



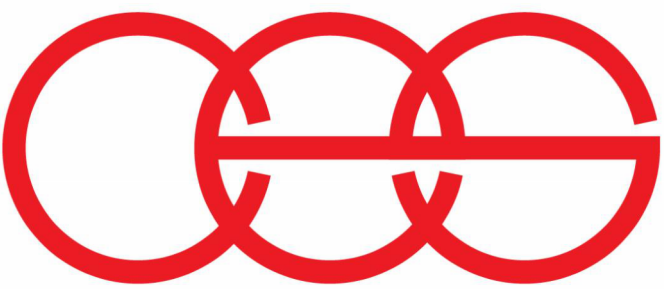
4 SECTION AT STEP BETWEEN CORRIDORS
1/2" = 1'-0"



1 LEVEL 03 - DEMO
1/8" = 1'-0"

DEMOLITION KEYNOTES ①

- REMOVE EXISTING CMU AS REQUIRED FOR INSTALLATION OF NEW DOOR OPENING AND SALVAGE FOR RE-USE. REFER TO PLANS AND SECTIONS FOR RELATIVE SCOPE OF WORK.
- REMOVE EXISTING STAIR PER STRUCTURAL DRAWINGS.
- REMOVE DOOR AND FRAME COMPLETE. REMOVE ADJACENT WALL AS REQUIRED FOR INSTALLATION OF NEW DOOR.
- REMOVE SLAT CEILING IN STAIRWELL AS REQUIRED FOR MEP SCOPE.
- REMOVE EXISTING CEILING COMPLETE.
- INSTALL A TEMPORARY FRAMED/PAINTED WALL W/ 3'-0" WIDE DOOR (W/ CONSTRUCTION CORE) AT THE SECOND FLOOR LANDING (AND IN THE TRIANGULAR AREA FROM THE RAIL UP TO THE STAIR RISER ABOVE) TO SEAL OFF THE STAIRWELL FROM NON-CONSTRUCTION TRAFFIC AND TO MITIGATE THE TRANSFER OF DUST/DEBRIS.
- INSTALL A TEMPORARY FRAMED/PAINTED WALL ACROSS THE CORRIDOR W/ 6'-0" DOUBLE DOOR (W/ CONSTRUCTION CORE) TO SEAL OFF THE CORRIDOR AND STAIRWELL FROM NON-CONSTRUCTION TRAFFIC AND TO MITIGATE THE TRANSFER OF DUST/DEBRIS. MODIFY AND/OR COVER EXIT SIGNS IN THE AREA TO REMOVE THIS PATH AS AN EMERGENCY EGRESS DURING CONSTRUCTION.



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DELV
DESIGN



Christopher W. Delv

20240312 - BL072 CHEMISTRY ADDITION -
REPLACE AHU1 THROUGH 4 - PHASE 1

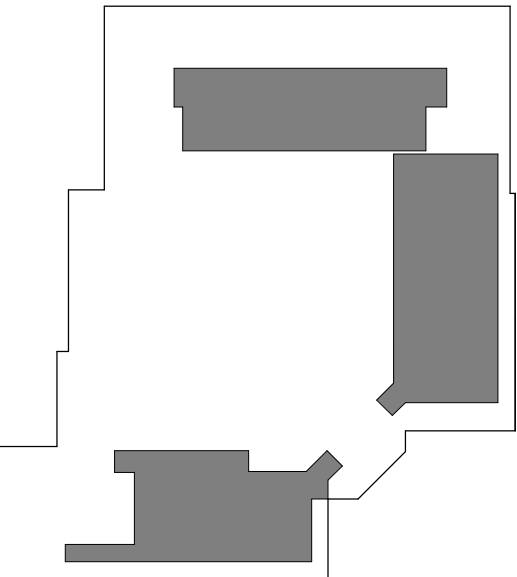
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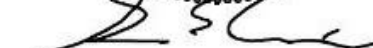
KEY PLAN

| # | REVISION | DATE |
|---|-------------|------------|
| 2 | ADDENDUM 02 | 03/18/2025 |

JOB NO. 20240312
PRODUCED CWL CWL
DATE 02/25/2025

ARCHITECTURAL SCOPE

A121

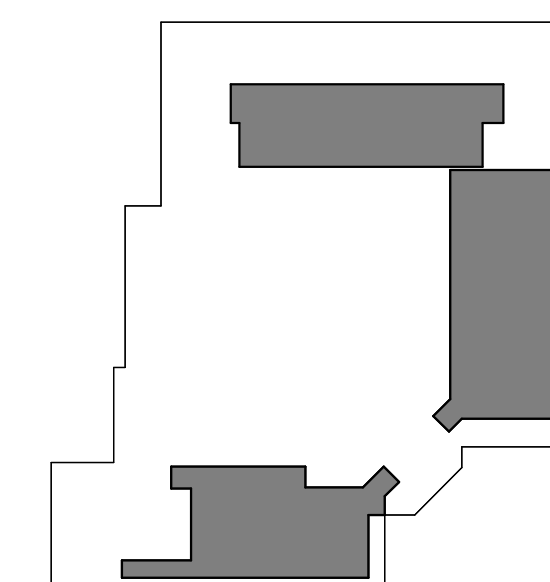
20240312 - BL072 CHEMISTRY ADDITION - REPLACE
AHU 1 THROUGH 4 - PHASE 1

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KEY PLAN

| # | REVISION | DATE |
|---|-------------|------------|
| 1 | ADDENDUM #2 | 03/18/2025 |

JOB NO. 20240312
PRODUCED JR / AM
DATE 02/25/2025

MECHANICAL PIPING
PARTIAL THIRD FLOOR
PLAN

MP101

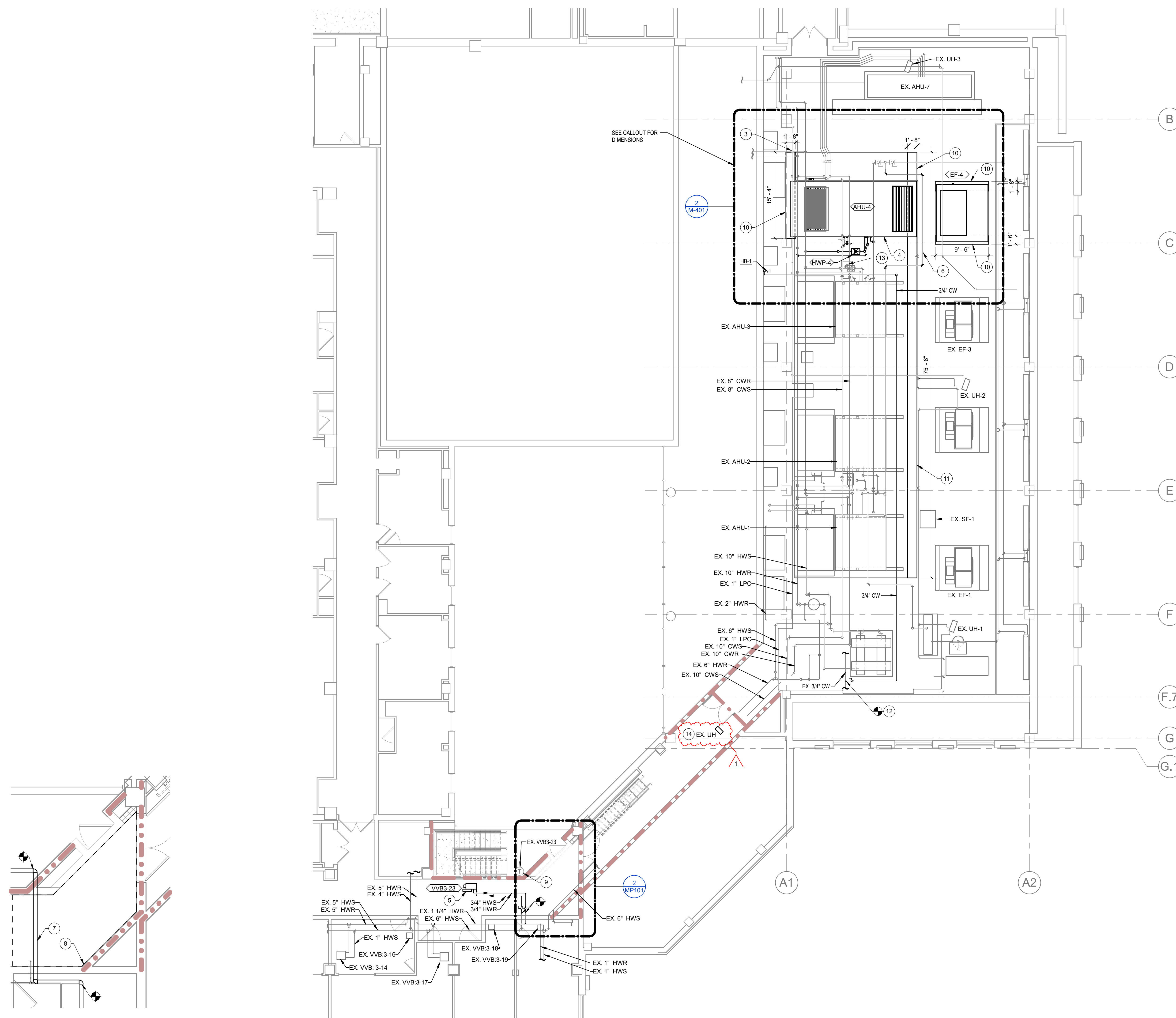
A. DARK LINES INDICATE NEW WORK.

B. LIGHT SOLID LINES INDICATE EXISTING MECHANICAL EQUIPMENT, DUCTWORK, PIPING, AND/OR MECHANICAL ACCESSORIES TO REMAIN AS-IS. CONTRACTOR TO FIELD VERIFY ACTUAL EXISTING CONDITIONS PRIOR TO BIDDING.

C. PROVIDE SHUTOFF VALVES AT EVERY BRANCH CONNECTION TO A MAIN.

D. NEW SHUTOFF VALVES SHALL BE INSTALLED FOR ALL NEW HYDRONIC EQUIPMENT.

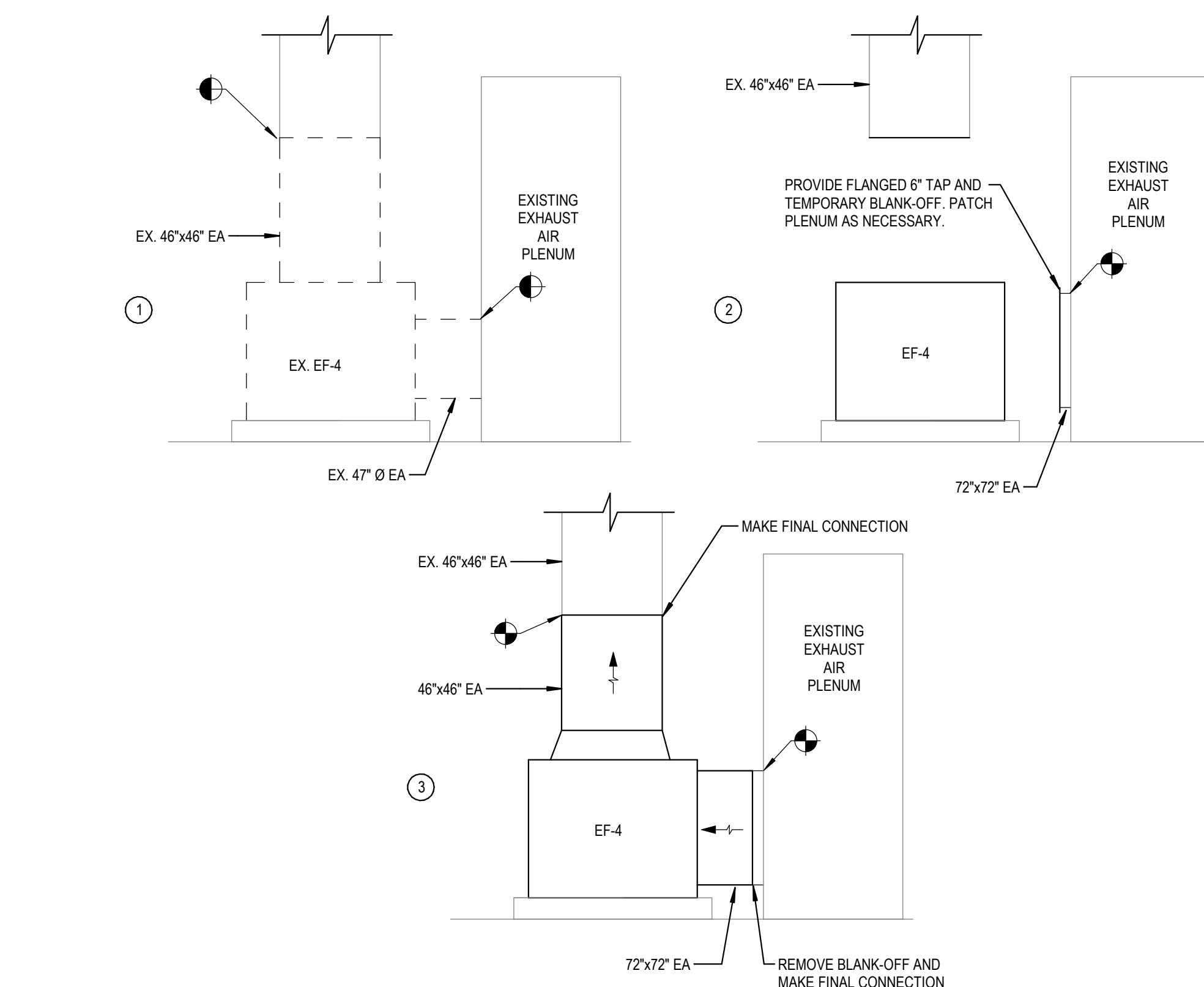
- 1 RECONNECT 1" STEAM SUPPLY PIPING AND 1" LPC PIPING TO UNIT HEATER. REFER TO DETAIL "X" ON M-501.
- 2 REINSTALL UNIT HEATER WITH BOTTOM OF HEATER AT "X" A.F.F.
- 3 PROVIDE 1" LPC PIPING AS INDICATED.
- 4 CONNECT C/OBSHWR AND H/SHWS PIPING TO NEW HAND-UPDILING UNIT AS REQUIRED. REFER TO DETAILS "1, 2, 3, AND 4" ON DRAWING M-501.
- 5 CONNECT H/SHWSR PIPING TO RELOCATED VAV TERMINAL UNIT. REINSTALL PNEUMATIC CONTROL VALVE. PROVIDE PIPING SPECIFICATIONS PER DETAIL "X" ON DRAWING M-501. PROVIDE PIPING INSULATION PER SPECIFICATIONS.
- 6 PROVIDE 5" HWS PIPING AS INDICATED.
- 7 REROUT E "F" FIRE PROTECTION PIPE.
- 8 WITHIN OUTLINED AREA, RECONFIGURE SPRINKLER MAINS, BRANCH PIPING, AND SPRINKLER HEADS TO ACCOMMODATE NEW CEILING LAYOUT. SPRINKLER COVERAGE SHALL MEET ALL STATE AND LOCAL CODES AND NFPA.
- 9 RECONNECT EXISTING SPACE TEMPERATURE SENSOR TO RELOCATED VAV TERMINAL UNIT. RECONNECT CONTROLLER. MAINTAIN EXISTING SEQUENCE OF OPERATION.
- 10 EXTEND EXISTING CONCRETE HOUSEKEEPING PAD. PROVIDE REINFORCED CONCRETE WITH DOWELS INTO EXISTING PAD. MATCH HEIGHT OF EXISTING PAD. APPROXIMATELY 4" DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY DIMENSIONS. COORDINATE FINAL DIMENSIONS OF PAD EXTENSIONS WITH ACTUAL EQUIPMENT PROVIDED.
- 11 EXTEND NEW SPACE OF HOUSEKEEPING PAD THE ENTIRE LENGTH OF THE EXISTING HOUSEKEEPING PAD.
- 12 CONNECT NEW COLD WATER LINE PIPING UPSTREAM OF BACK FLOW PREVENTER.
- 13 CLEAN INSIDE AND OUTSIDE OF EXISTING FLOOR DRAIN AND REPLACE GRATE.
- 14 LOCATE EXISTING UNIT HEATER AND PIPING TO MISS NEW DRAP.



2 ENLARGED FIRE PROTECTION PLAN VIEW
1/4" = 1'-0"

1 MECHANICAL PIPING PARTIAL THIRD FLOOR PLAN
1/8" = 1'-0"

[illegible]



EXHAUST AIR INSTALLATION SEQUENCING NOTES:

DEMOLITION OF EXISTING EA DUCT AND FABRICATION AND INSTALLATION OF NEW EA TAP AND BLANK-OFF PANEL AT THE EXISTING EX PLenum MUST BE COMPLETED AT THE SAME TIME AS THE SHUT-DOWN OF THE SUPPLY AIR SYSTEM. A MINIMUM OF (3) OF 4) SHUT SUPPLY AIR UNITS EX-1, EX-2, EX-3, EX-4 AND EX-5 MUST BE COMPLETED AT THE SAME TIME THAT EXHAUST FANS ARE OFFLINE TO PREVENT EXTRME BUILDING DIFFERENTIAL STATIC PRESSURE CONDITIONS.

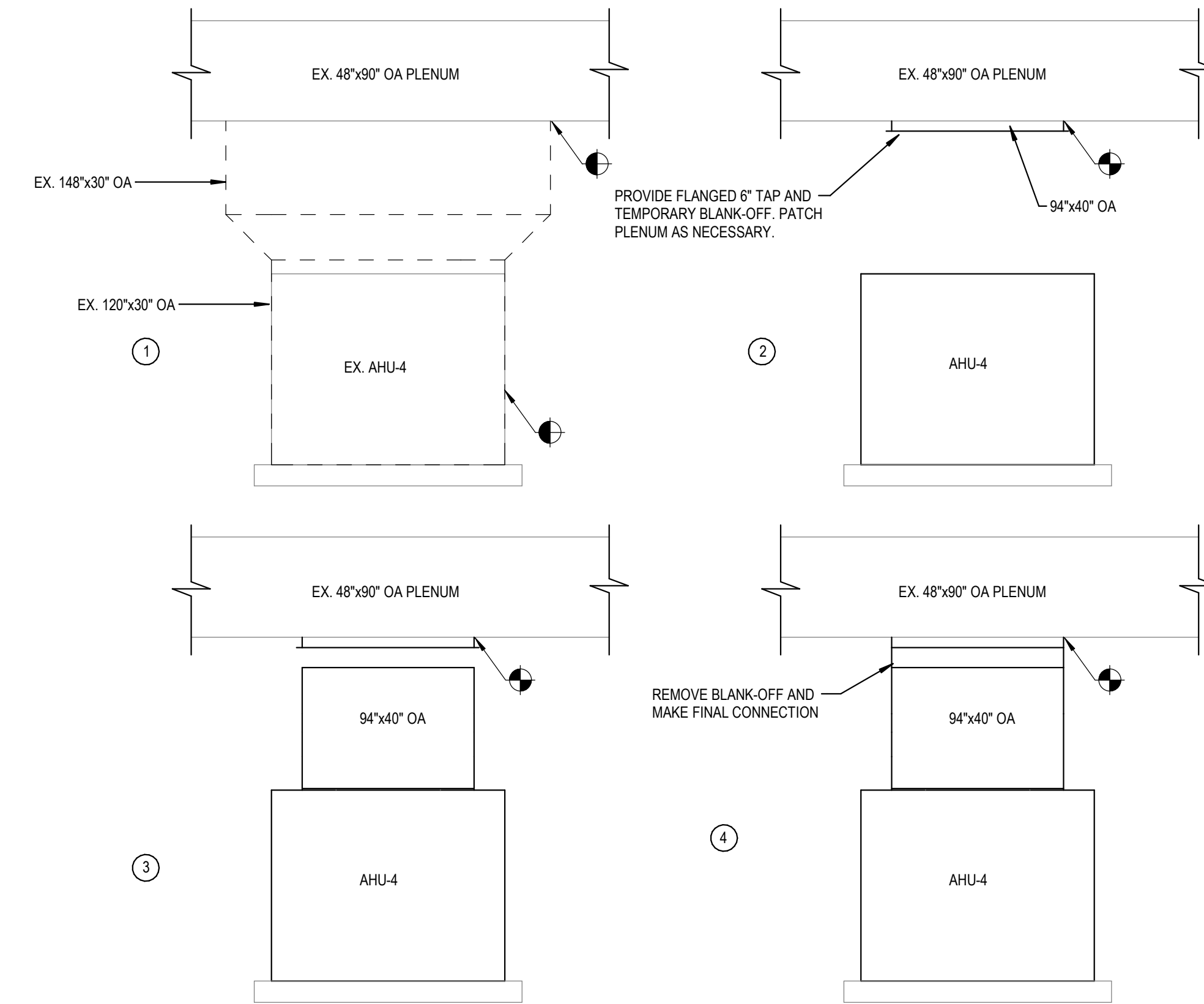
EXHAUST SHUT DOWN PERIOD TO COMPLETE STEP 1 AND STEP 2:

MAXIMUM 24 HOURS (ONE SINGLE CONTINUOUS SHUTDOWN MUST COINCIDE WITH SHUTDOWN REQUIRED FOR PROJECT 20181028. COORDINATE WITH OWNER)

MAXIMUM SHUT DOWN PERIOD TO COMPLETE STEP 4:

EXHAUST 8 HOURS (ONE SINGLE CONTINUOUS SHUTDOWN MUST COINCIDE WITH SHUTDOWN REQUIRED FOR PROJECT 20181028. COORDINATE WITH OWNER)

SHUTDOWN PERIOD MUST BE COORDINATED WITH OWNER TO MINIMIZE IMPACT ON BUILDING OCCUPANTS. MUST BE COORDINATED WITH PROJECT 20181028. SHUT DOWN OF EXHAUST SUPPLY AIR UNITS COULD OCCUR AT THE SAME TIME THAT EXHAUST FANS ARE OFFLINE TO PREVENT EXTRME BUILDING DIFFERENTIAL STATIC PRESSURE CONDITIONS.



REMOVE AIR INSTALLATION SEQUENCING NOTES:

DEMOLITION OF EXISTING OAC DUCT AND FABRICATION AND INSTALLATION OF NEW OAC TAP AND BLANK-OFF PANEL AT THE EXISTING OAC PLenum MUST BE COMPLETED AT THE SAME TIME AS THE SHUT-DOWN PERIOD FOR THE SUPPLY AIR AND EXHAUST AIR SYSTEMS. A MINIMUM OF (3) OUT OF THE FOLLOWING AIR UNITS (EX. AHU-3, EX. AHU-4 AND (3) EXHAUST FANS (EX. EF-1, EX. EF-2, EX. EF-3, EX. EF-4) MUST BE OPERATIONAL AT ALL TIMES WITH THE EXCEPTION OF THE FOLLOWING MAXIMUM SHUT DOWN PERIOD:

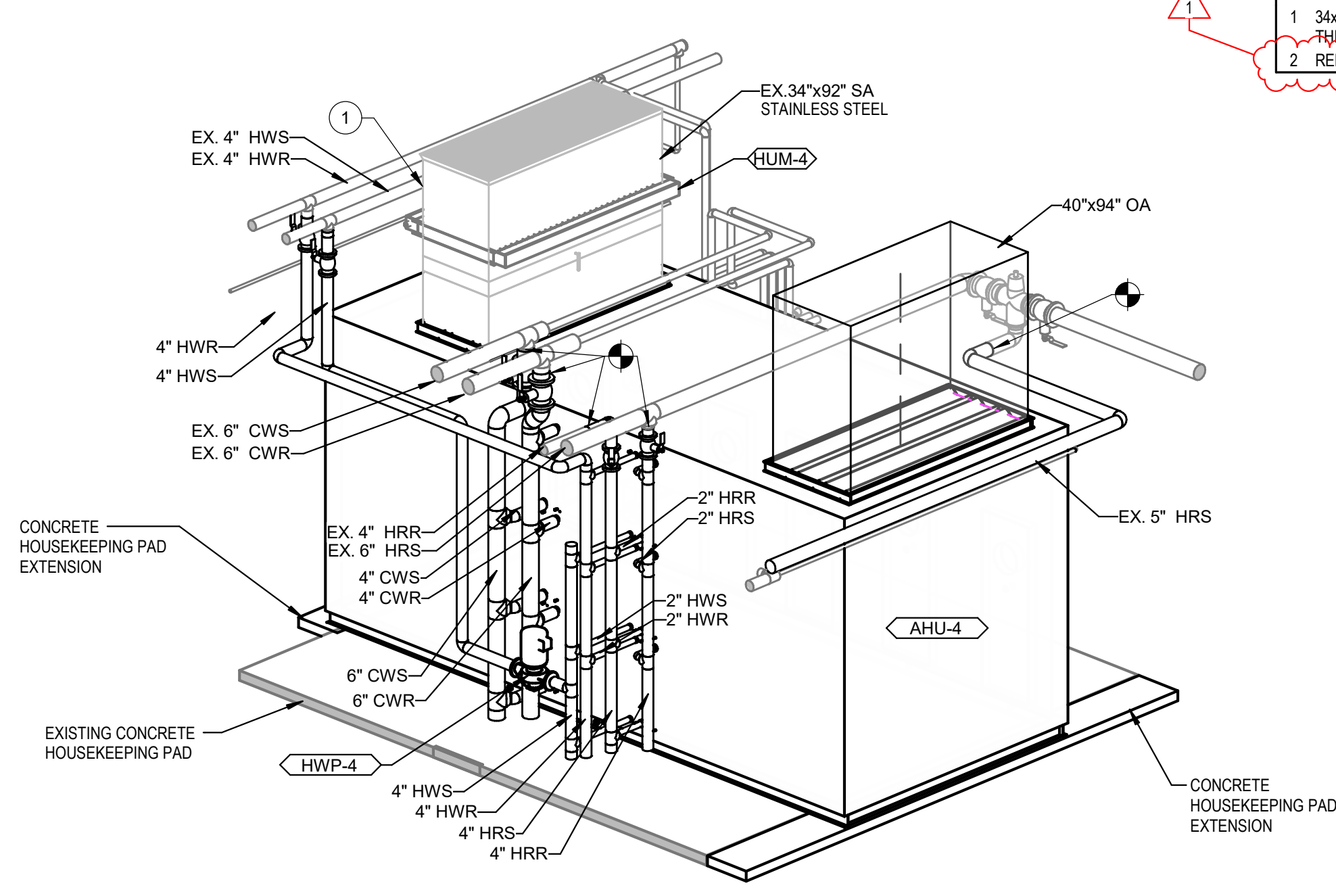
MAXIMUM SHUT DOWN PERIOD TO COMPLETE STEP 1 AND STEP 2: MUST COINCIDE WITH SHUTDOWN REQUIRED FOR IU PROJECT 20181028. COORDINATE WITH OWNER)

AHU-4: 24 HOURS (ONE SINGLE CONTINUOUS SHUTDOWN)

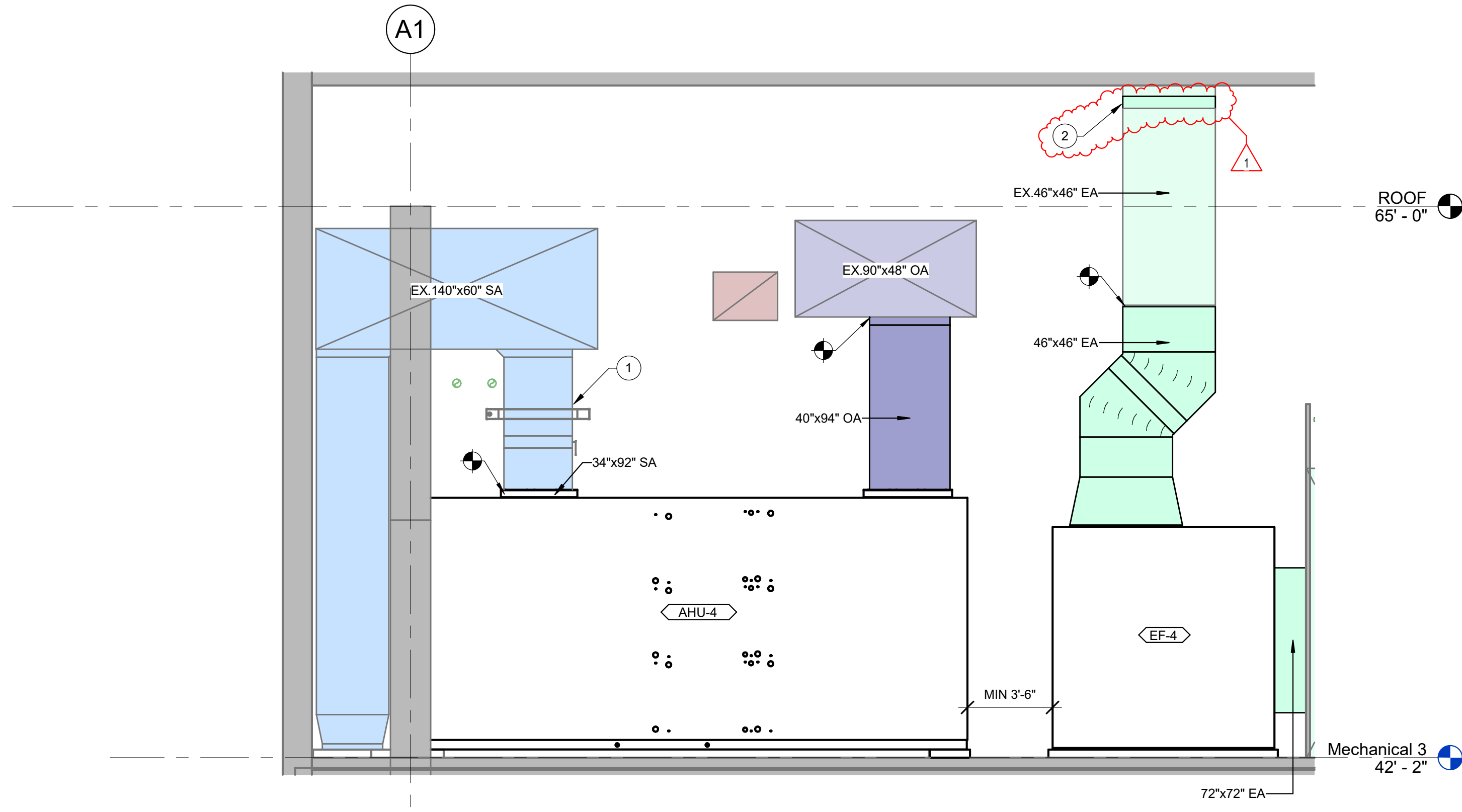
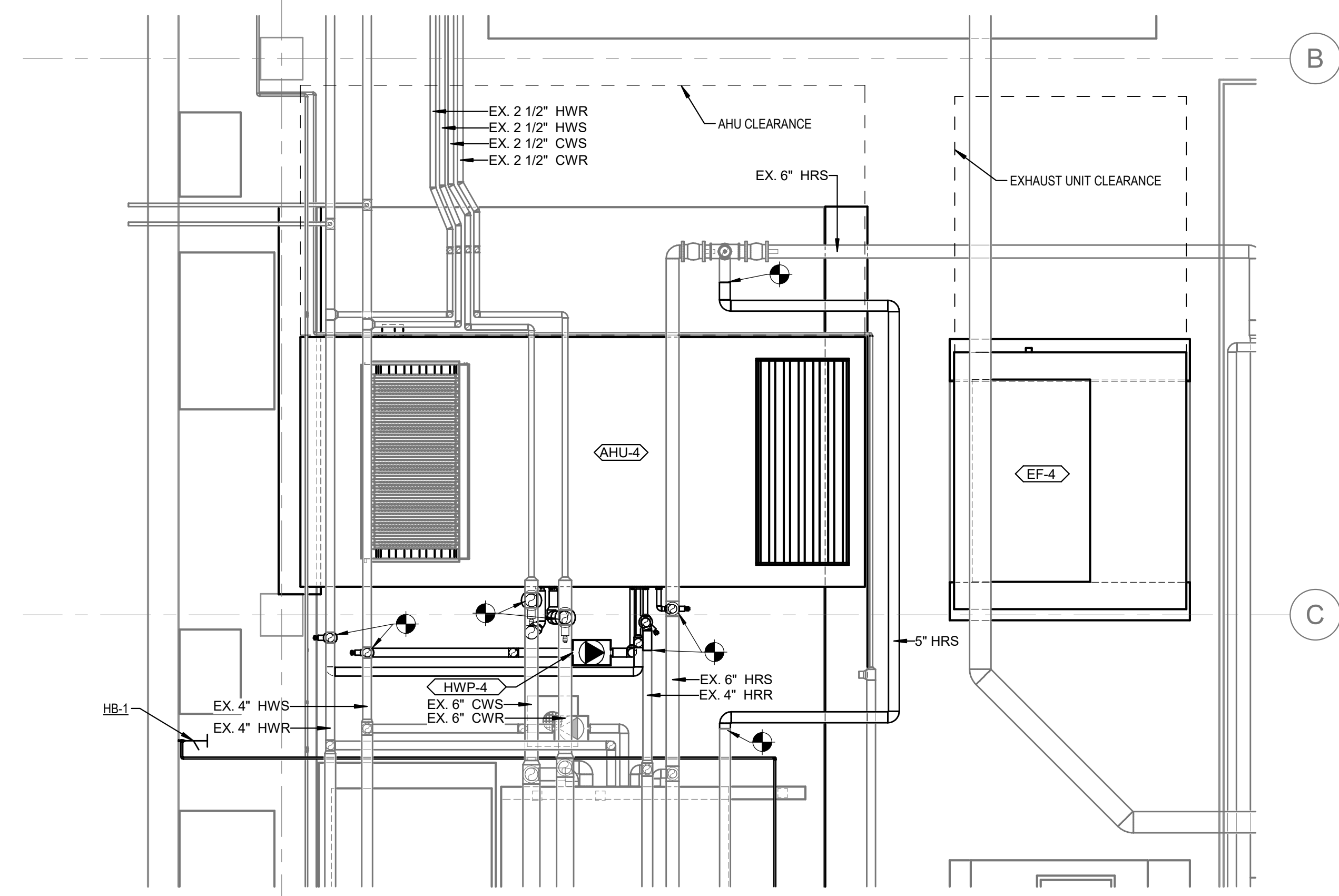
MAXIMUM SHUT DOWN PERIOD TO COMPLETE STEP 3: MUST COINCIDE WITH SHUTDOWN REQUIRED FOR IU PROJECT 20181028. COORDINATE WITH OWNER)

AHU-4: 8 HOURS (ONE SINGLE CONTINUOUS SHUTDOWN)

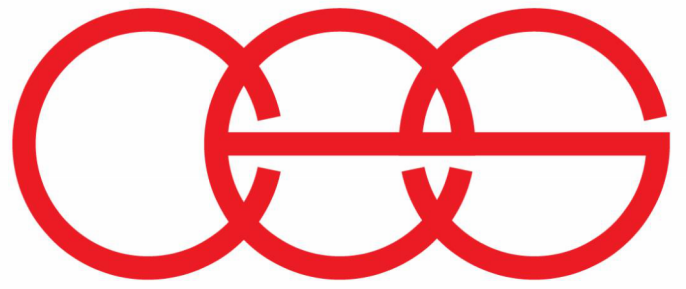
SHUTDOWN PERIOD MUST BE COORDINATED WITH OWNER TO MINIMIZE IMPACT ON BUILDING OCCUPANTS, AND MUST BE COORDINATED WITH IU PROJECT 20181028. SHUT DOWN OF ASSOCIATED EXHAUST FANS MUST OCCUR AT SAME TIME THAT SUPPLY AIR SYSTEMS ARE OFFLINE TO PREVENT EXCESS BUILDING DIRECTIONAL STATIC PRESSURE CONDITIONS.



ENLARGED HVAC PLAN NOTES



1 ENLARGED AHU-4 HVAC PLAN VIEW
1/4" = 1'-0"



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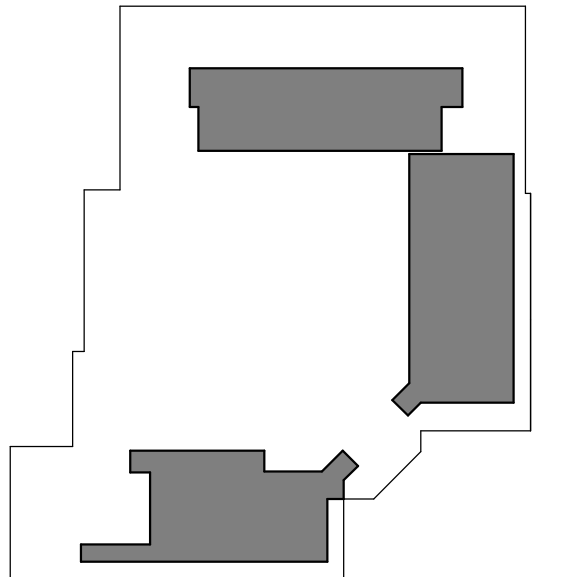
20240312 - BL072 CHEMISTRY ADDITION - REPLACE
AHU 1 THROUGH 4 - PHASE 1

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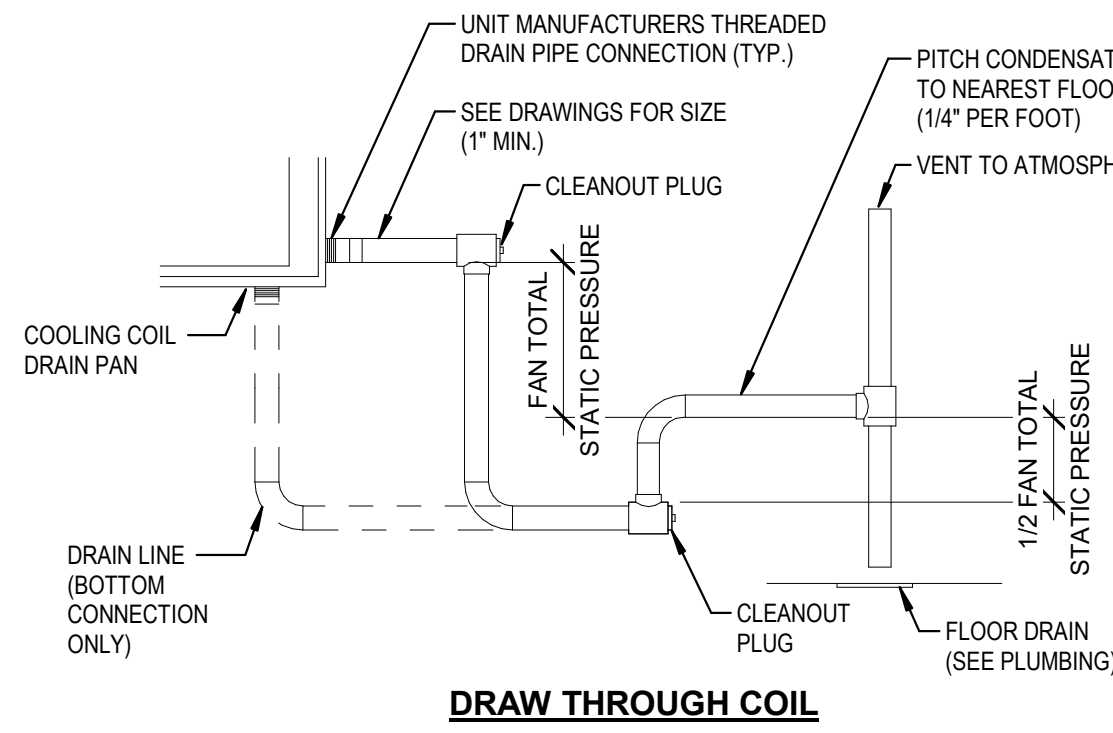


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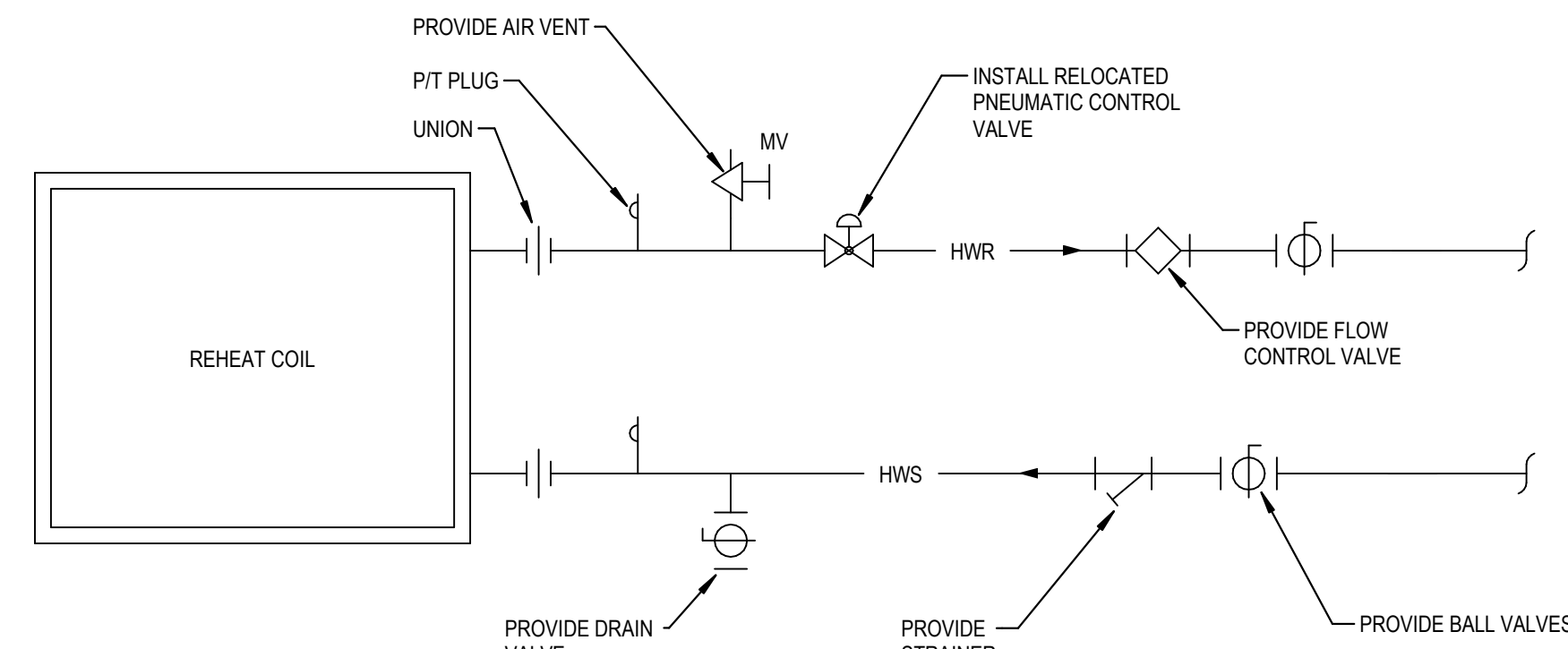
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PRODUCED JR / AM
DATE 02/25/2025

MECHANICAL ENLARGED
PLANS

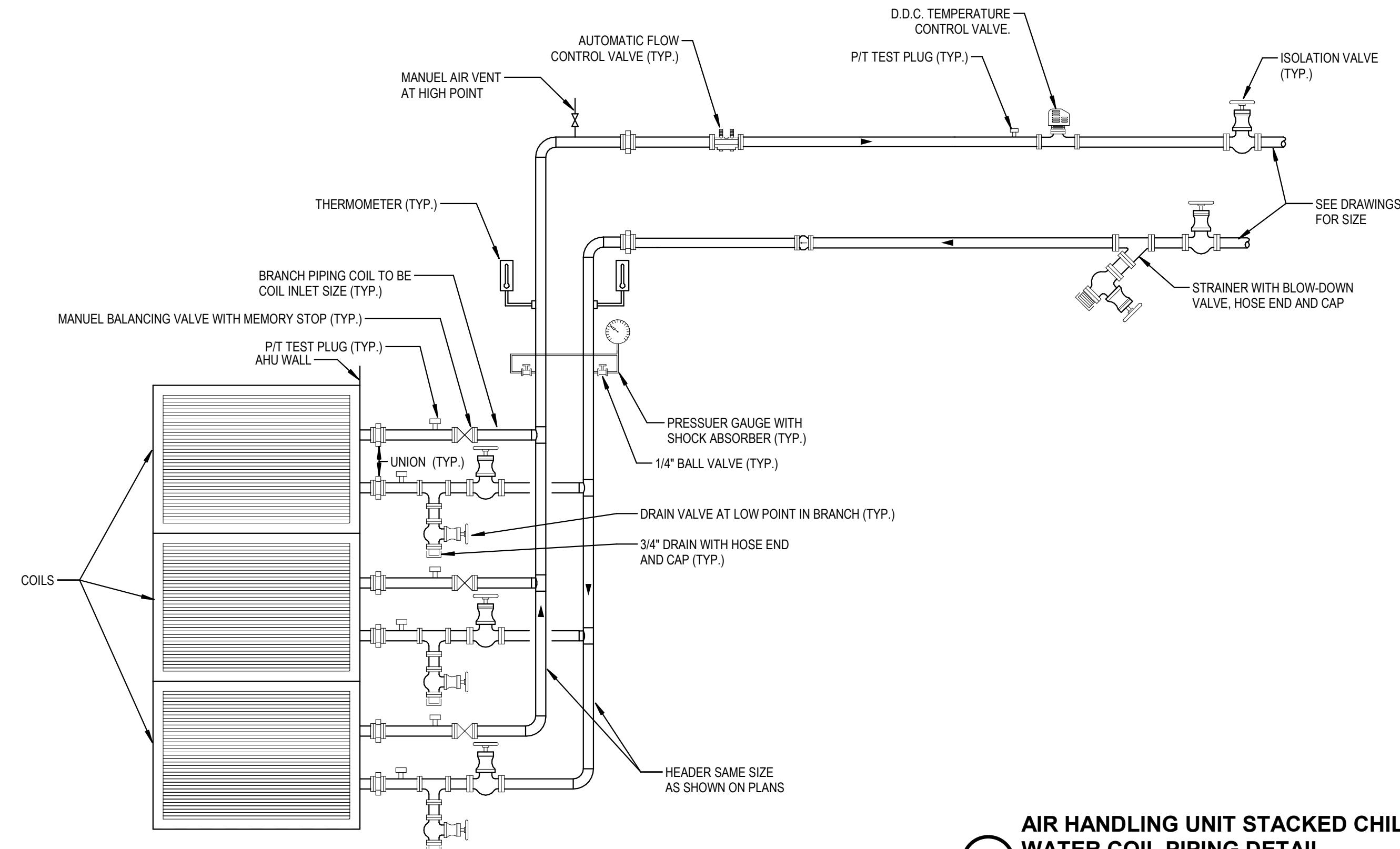
M-401



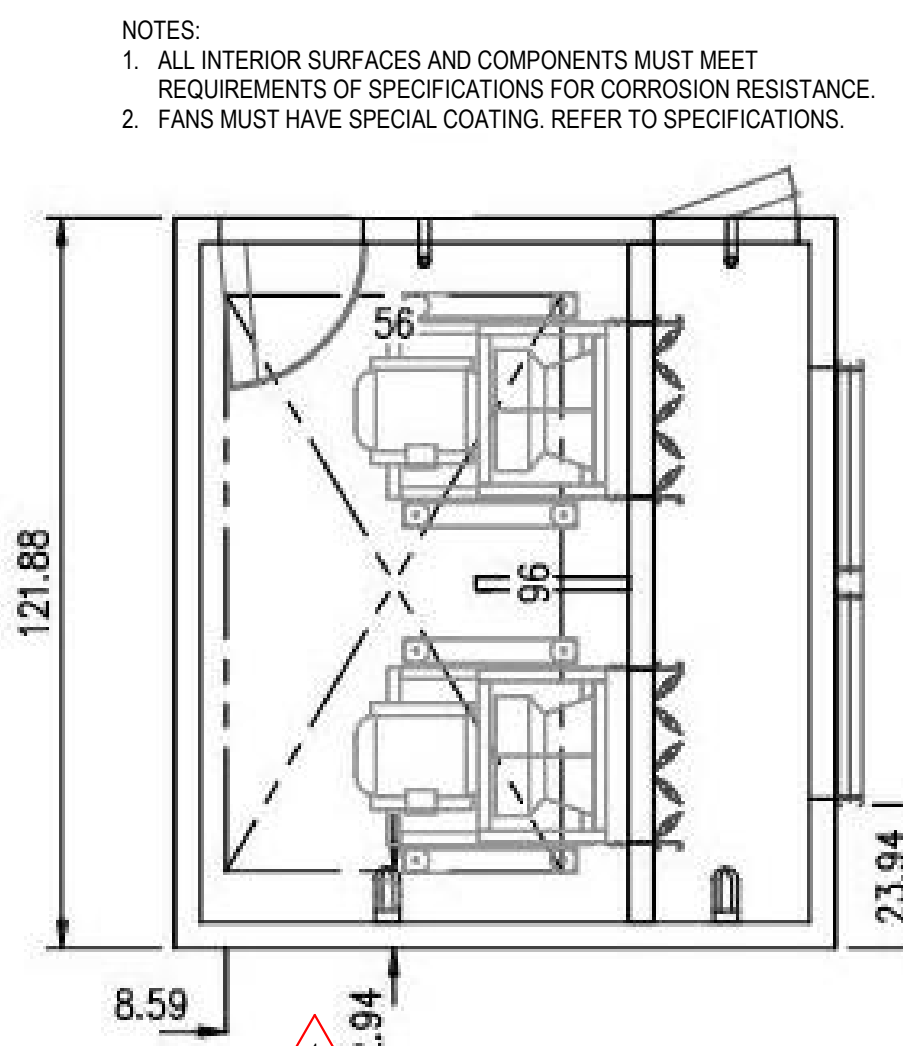
9 CONDENSATE DRAIN PIPING DETAIL
NOT TO SCALE



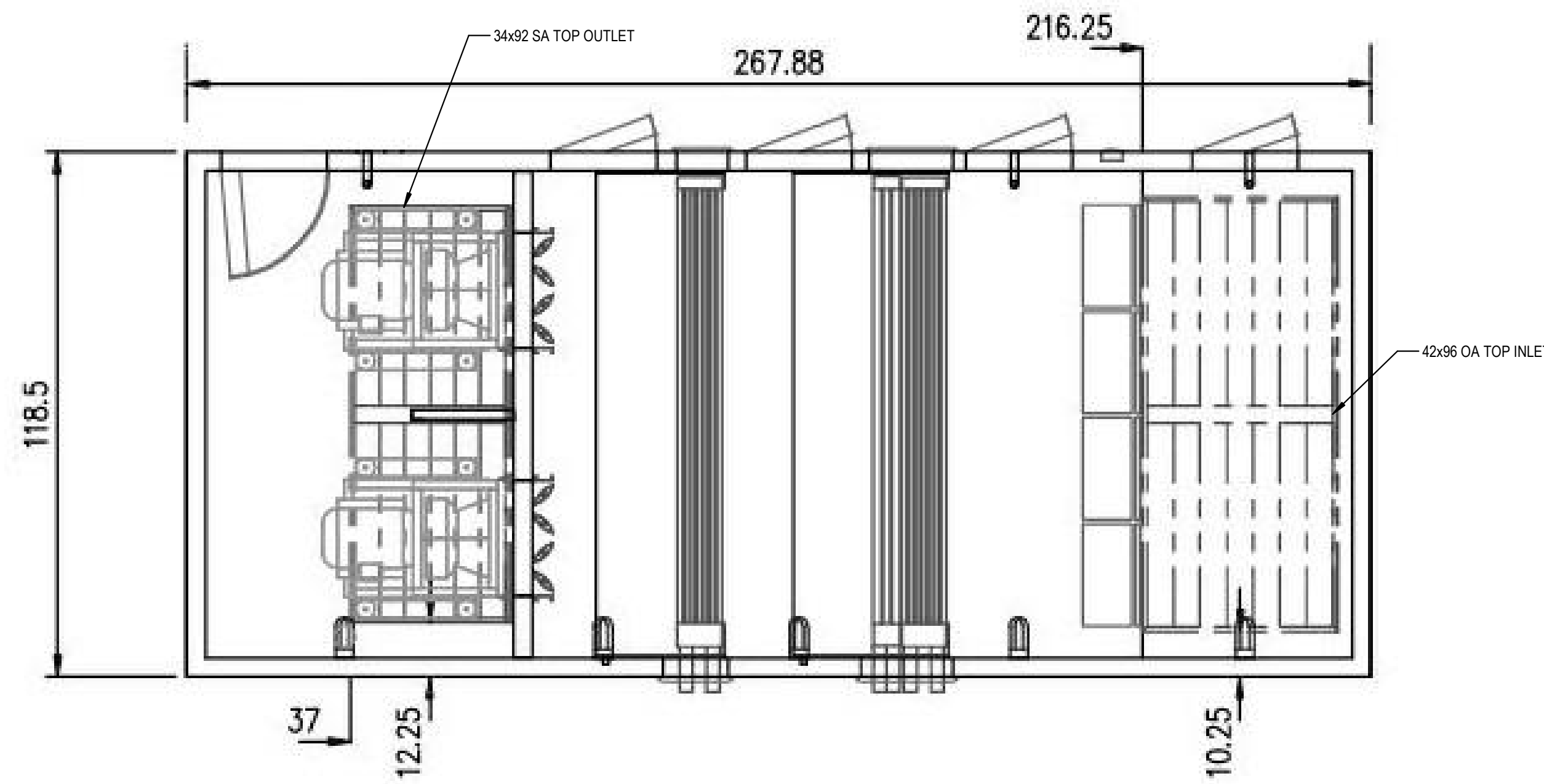
6 REHEAT COIL PIPING DIAGRAM 2-WAY
DETAIL
NOT TO SCALE



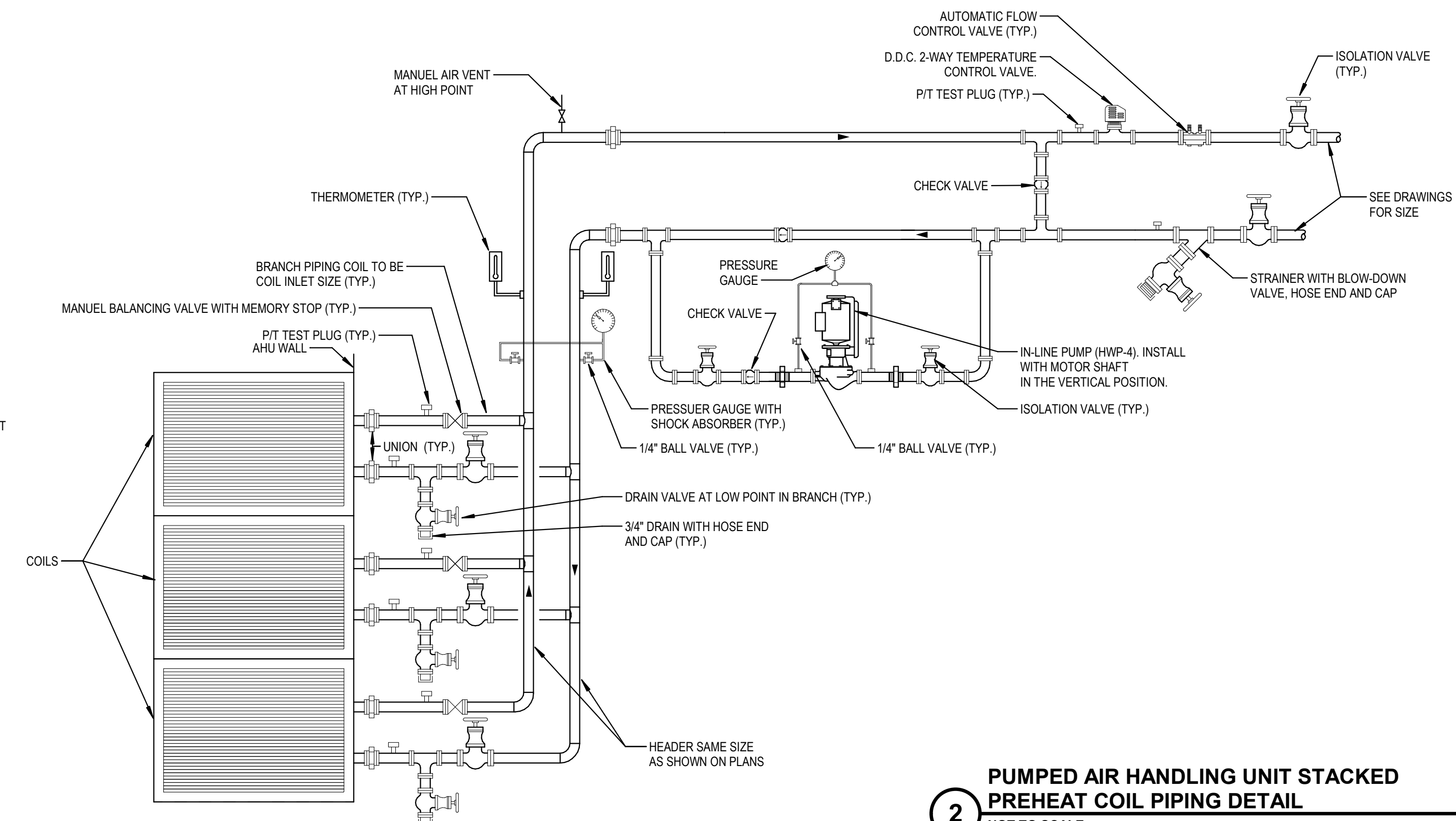
3 AIR HANDLING UNIT STACKED CHILLED
WATER COIL PIPING DETAIL
NOT TO SCALE



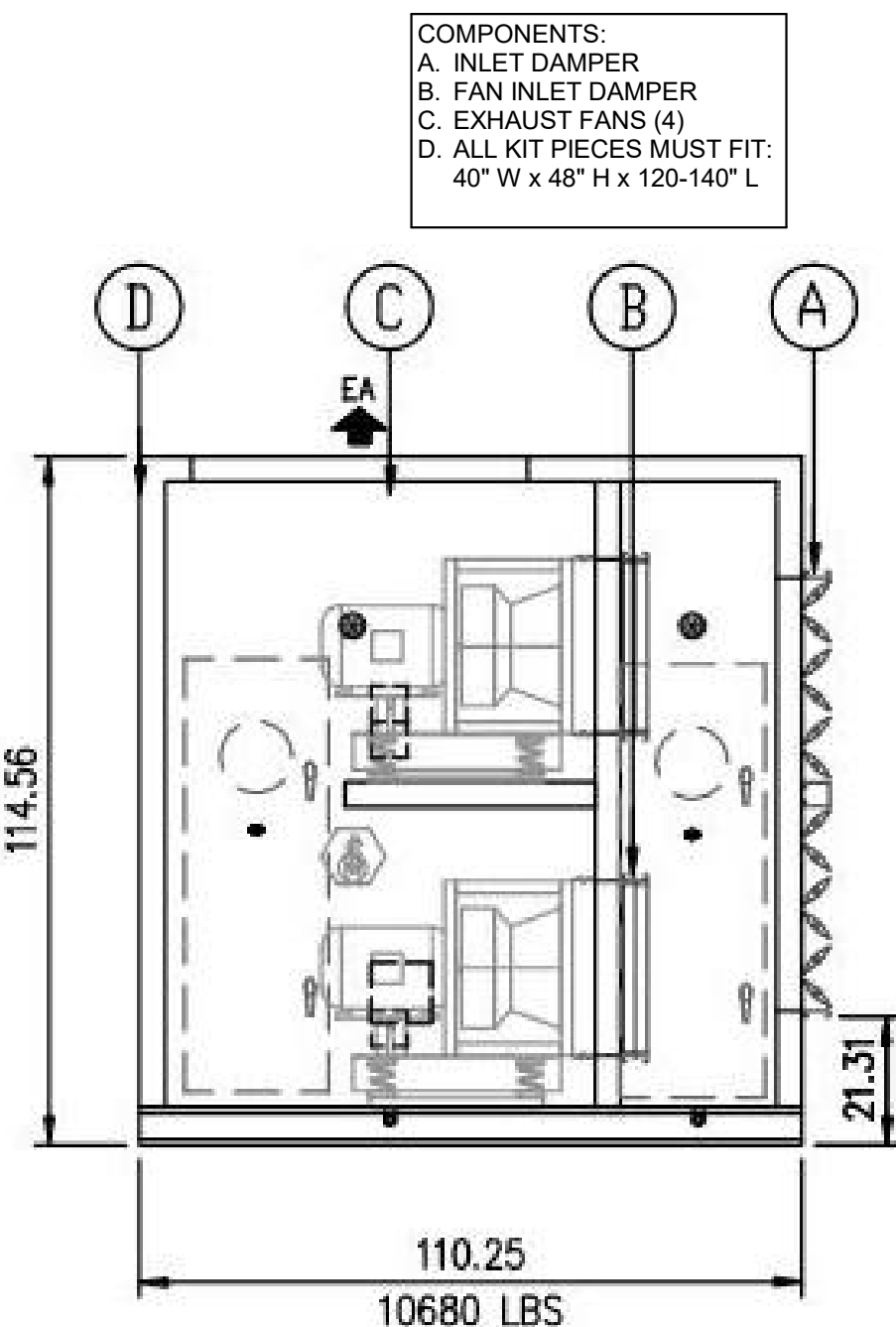
8 EF-4 TOP VIEW DETAIL
NOT TO SCALE



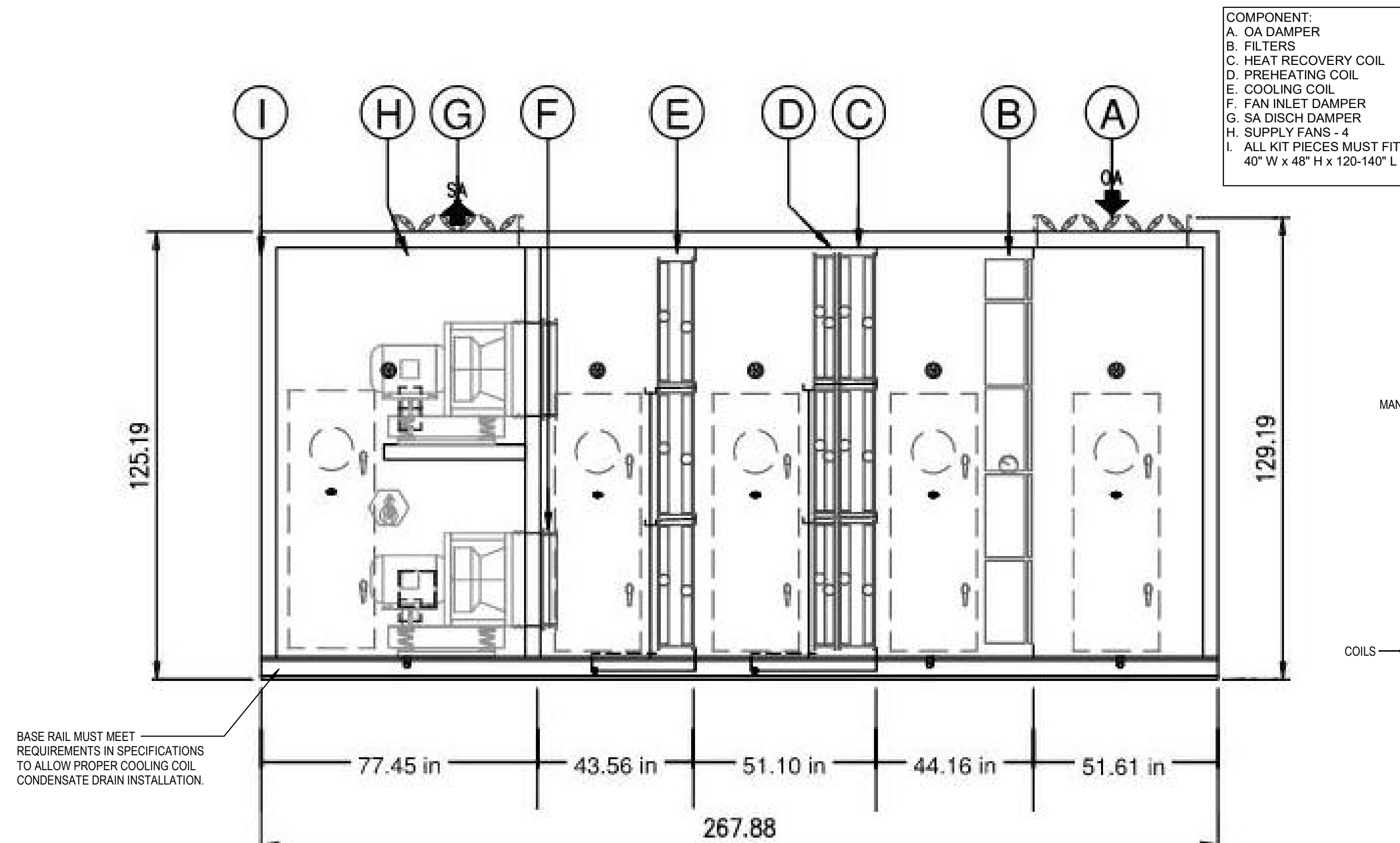
5 AHU-4 TOP VIEW DETAIL
NOT TO SCALE



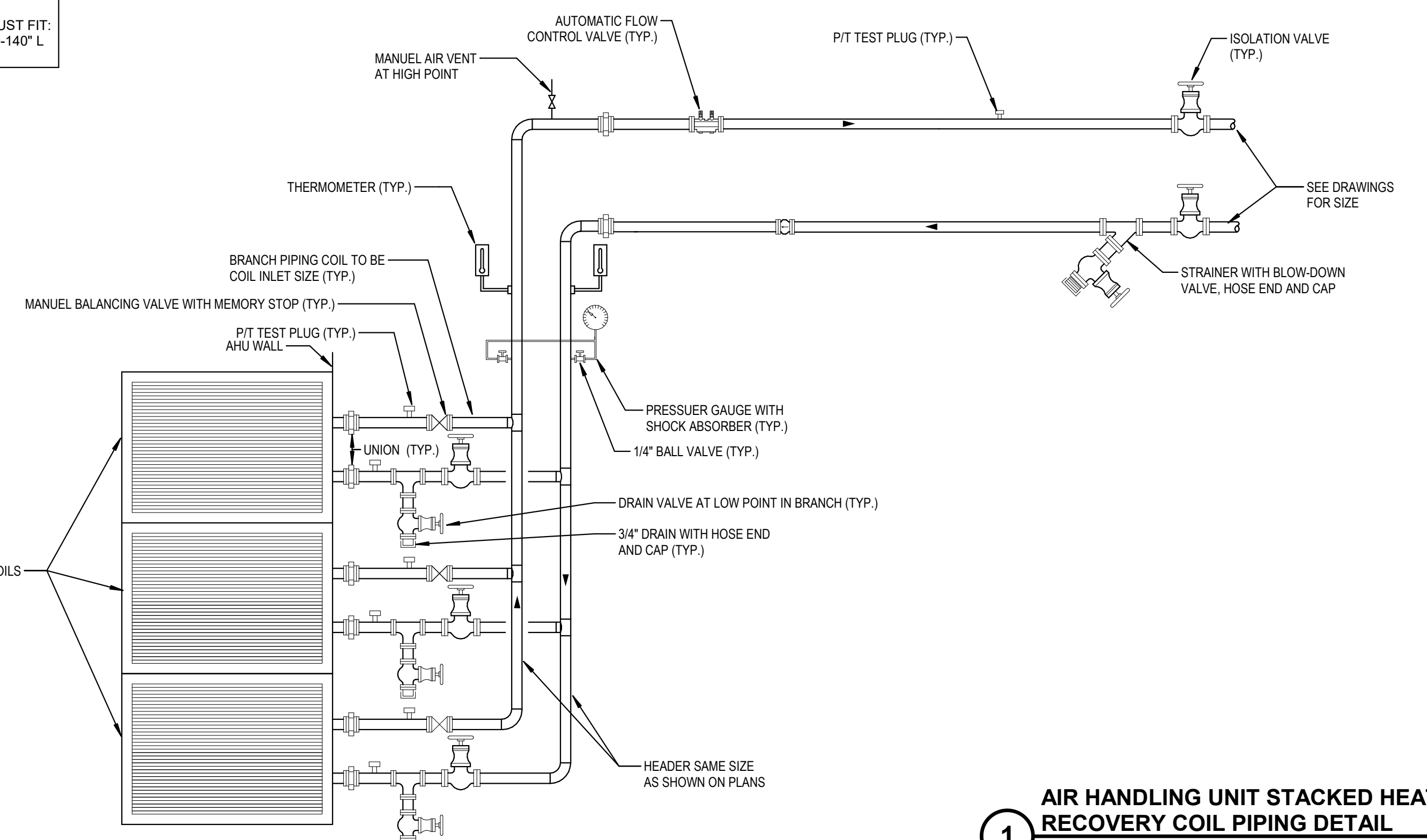
2 PUMPED AIR HANDLING UNIT STACKED
PREHEAT COIL PIPING DETAIL
NOT TO SCALE



7 EF-4 SIDE VIEW DETAIL
NOT TO SCALE



4 AHU-4 SIDE VIEW DETAIL
NOT TO SCALE



1 AIR HANDLING UNIT STACKED HEAT
RECOVERY COIL PIPING DETAIL
NOT TO SCALE



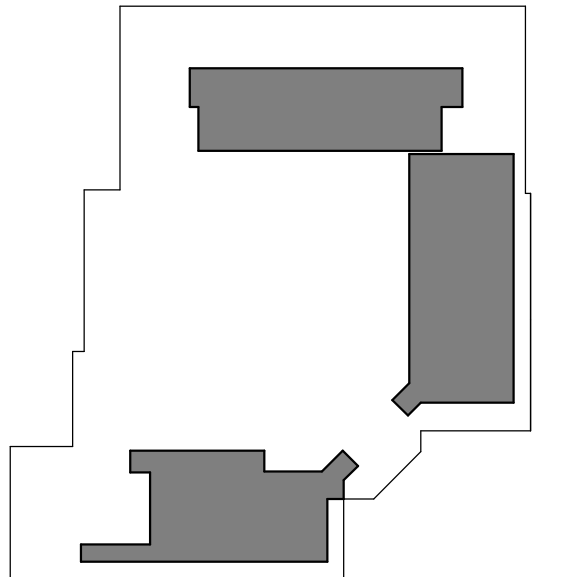
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MECHANICAL DETAILS

M-501



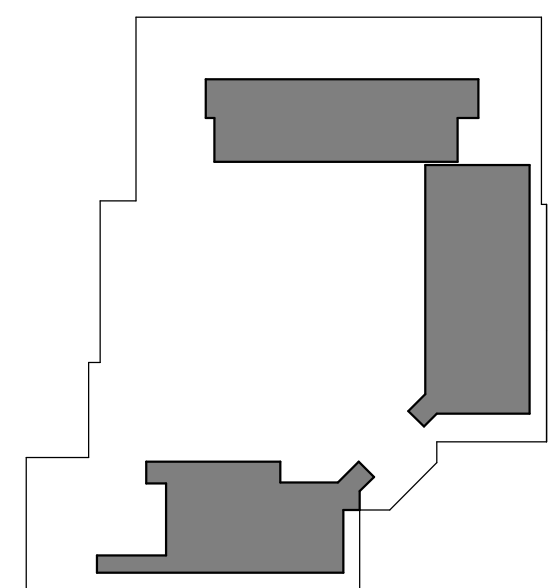
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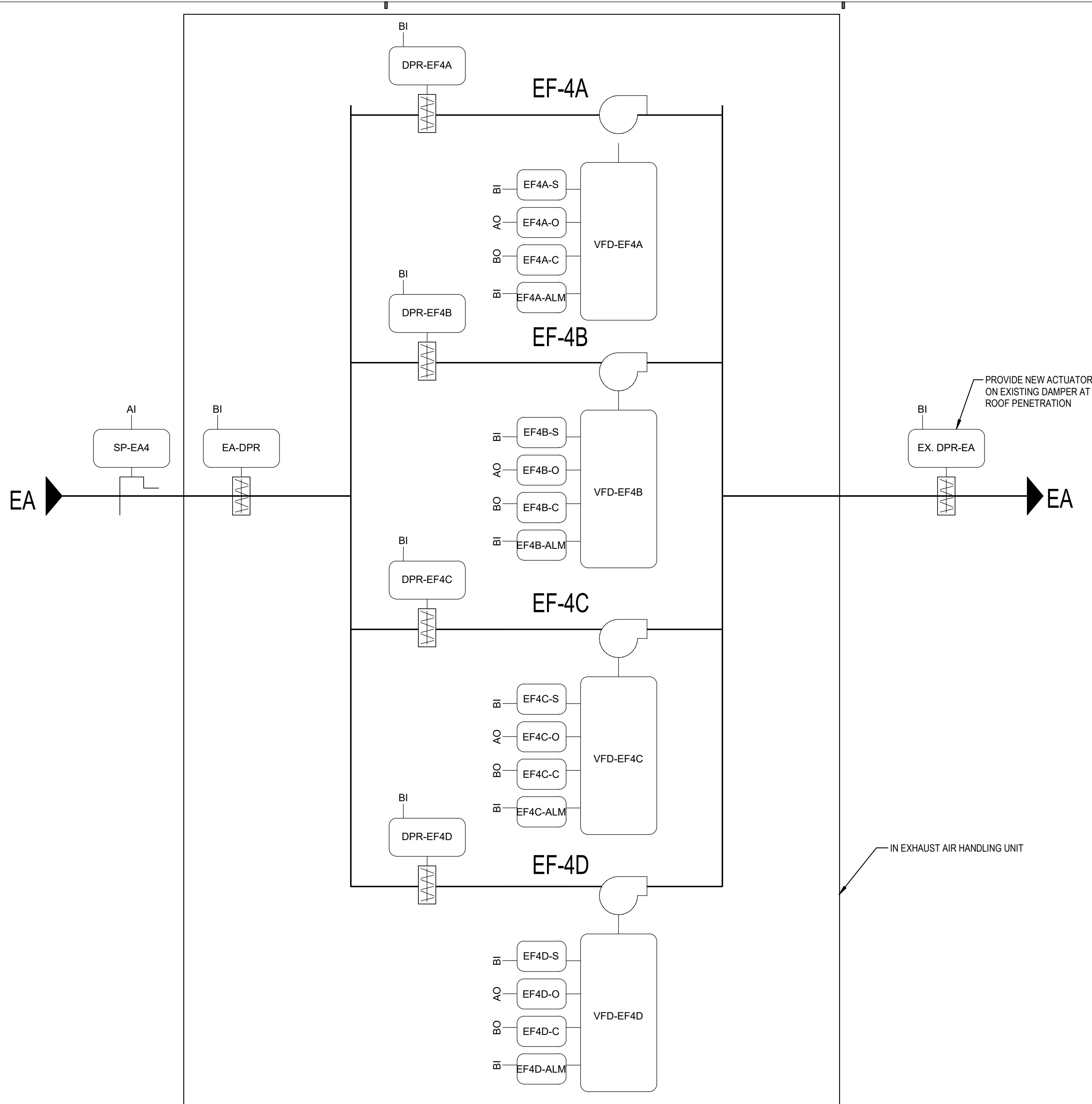
KEY PLAN

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TEMPERATURE CONTROLS SCHEMATICS

M-701



EXHAUST AIR HANDLING UNITS SEQUENCE OF OPERATION.

EF-4 OPERATES IN SEQUENCE WITH EF-1, EF-2, AND EF-3 TO EXHAUST AIR FROM A COMMON EXHAUST PLENUM FOR BUILDING PRESSURIZATION CONTROL. EF-4 IS A CUSTOM EXHAUST AIR HANDLING UNIT CONSISTING OF AN EXHAUST AIR ISOLATION DAMPER AND EXHAUST FAN ARRAY.

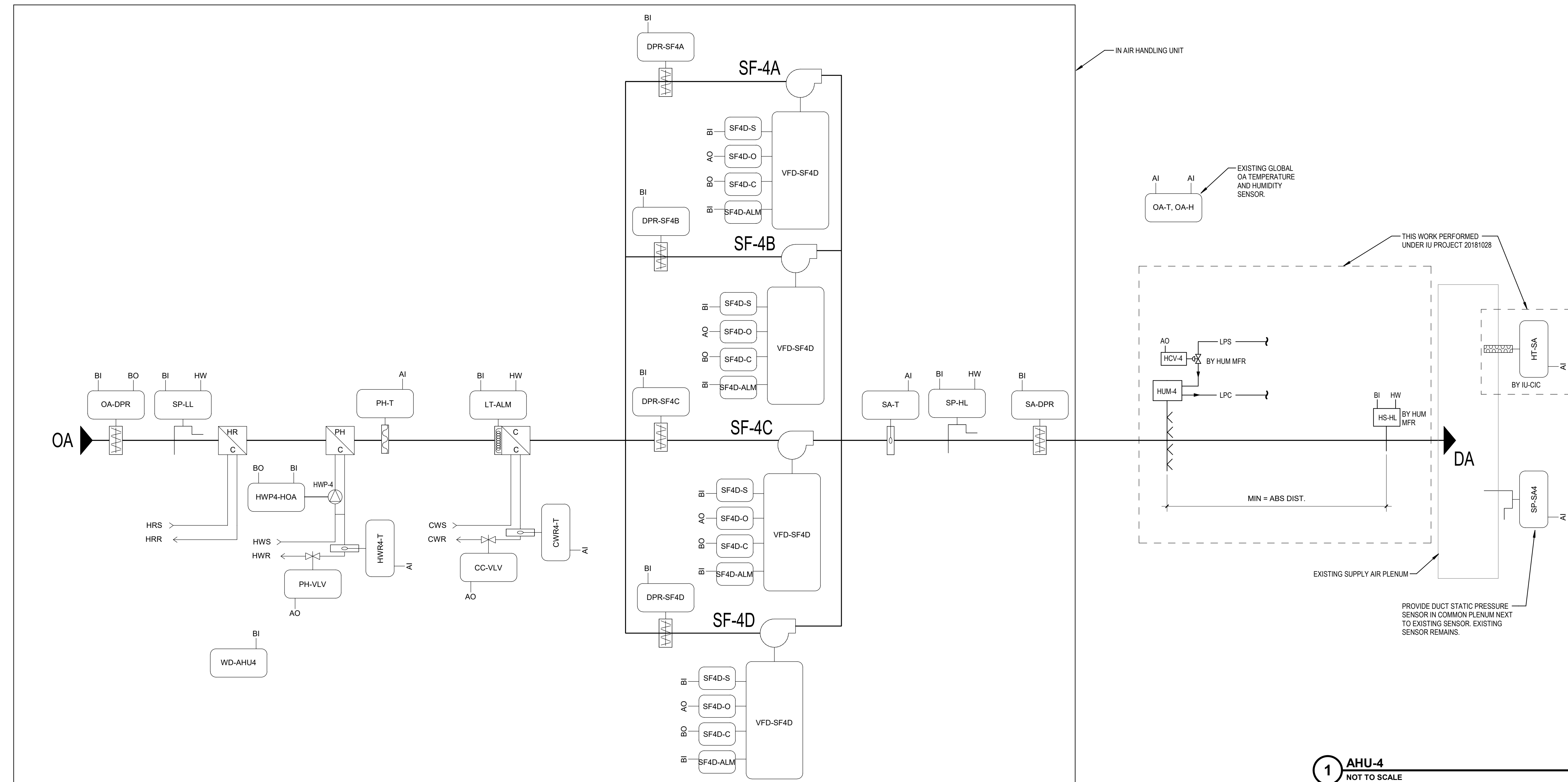
SYSTEM ENABLE/DISABLE: EF-1, EF-2, EF-3, AND EF-4 SHALL BE AUTOMATICALLY ENABLED/DISABLED VIA DDC SYSTEM, OR MANUALLY AT THE OPERATOR TERMINAL OR LOCALLY AT THE UNIT.

UNIT STAGING (EF-1, EF-2, EF-3, EF-4): EF-1 THROUGH 4 OPERATE IN A LEAD-LAG-LAG SEQUENCE. THE LEAD EXHAUST UNIT SHALL RUN CONTINUOUSLY, AND ITS ASSOCIATED VFD SHALL MODULATE THE FAN SPEED TO MAINTAIN THE EXHAUST AIR PLENUM DUCT STATIC PRESSURE SETPOINT OF 3.3" WC, AS SENSED BY DUCT STATIC PRESSURE TRANSMITTER (EA-SP) LOCATED IN THE COMMON EXHAUST AIR PLENUM. IF THE STATIC PRESSURE SETPOINT IS GREATER THAN THE SETPOINT, AND THE LEAD FAN VFD IS AT 100% FAN SPEED FOR A PERIOD OF 15 MINUTES (ADJ), A LAG FAN SHALL BE ENERGIZED AND THE VFDs OF EACH FAN SHALL MODULATE IN UNISON TO MAINTAIN THE EXHAUST AIR PLENUM STATIC PRESSURE SETPOINT. IF THE LEAD AND LAG FAN(S) ARE ENERGIZED, AND THE EXHAUST AIR PLENUM STATIC PRESSURE FALLS BELOW THE SETPOINT AND THE LEAD AND LAG FAN(S) VFDs ARE AT 45% FAN SPEED FOR A PERIOD OF 15 MINUTES (ADJ), THE LAG FAN SHALL BE DE-ENERGIZED AND THE REMAINING FAN(S) VFDs SHALL MODULATE TO MAINTAIN THE EXHAUST AIR PLENUM DUCT STATIC PRESSURE SETPOINT. THE LEAD EXHAUST FAN DESIGNATION SHALL CHANGE EVERY 750 HOURS (ADJ).

EXHAUST FAN CONTROL: WHEN EF-4 IS ENABLED (EF-4A, EF-4B, EF-4C, EF-4D), THE EXISTING EXHAUST AIR OUTLET DAMPER (EX-DPR-EA) SHALL OPEN AND THE EXHAUST FAN ISOLATION DAMPERS (DPR-EF4A, DPR-EF4B, DPR-EF4C, DPR-EF4D) SHALL OPEN. ONCE ALL DAMPERS ARE PROVEN OPEN VIA END SWITCH, THE EXHAUST FANS (EF-4A, EF-4B, EF-4C, EF-4D) SHALL BE ENERGIZED AND MODULATE TO MINIMUM SPEED (25%). IF THE EXHAUST FAN STATUS (EF4A-S, EF4B-S, EF4C-S, EF4D-S) DOES NOT MATCH THE COMMANDDED VALUE AFTER 30 SECONDS, AN ALARM SHALL BE GENERATED AT THE OPERATOR TERMINAL. AFTER THE EXHAUST FANS ARE AT MINIMUM SPEED FOR A PERIOD OF 120 SECONDS, THE EXHAUST AIR INLET ISOLATION DAMPER (EX-DPR) SHALL OPEN, AND THE EXHAUST FANS (EF-4A, EF-4B, EF-4C, EF-4D) SHALL RUN CONTINUOUSLY, AND THE EXHAUST FAN VFDs (VFD-EF4A, VFD-EF4B, VFD-EF4C, VFD-EF4D) SHALL MODULATE INDIVIDUAL FAN SPEEDS IN UNISON, AND STAGE IN SEQUENCE WITH EF-1, EF-2, AND EF-3 AS DETAILED ABOVE, TO MAINTAIN THE EXHAUST AIR DUCT STATIC PRESSURE SETPOINT.

EXHAUST FAN CONTROL: WHEN EF-4 IS ENABLED (EF4A-C, EF4B-C, EF4C-C, EF4D-C), EA ISOLATION DAMPER (EA-DPR) SHALL OPEN. ONCE PROVEN OPEN VIA END SWITCH, THE EXHAUST FANS SHALL BE ENERGIZED. IF EXHAUST FAN(S) STATUS (EF4A-S, EF4B-S, EF4C-S, EF4D-S) DOES NOT MATCH THE COMMANDDED VALUE AFTER 30 SECONDS, AN ALARM SHALL BE GENERATED AT THE OPERATOR TERMINAL. WHEN FANS ARE ENERGIZED, THEY SHALL RUN CONTINUOUSLY, AND THE EXHAUST FAN VFDs (VFD-EF4A, VFD-EF4B, VFD-EF4C, VFD-EF4D) SHALL MODULATE THE FAN SPEEDS IN UNISON, AND IN SEQUENCE WITH EF-1, EF-2, AND EF-3, TO MAINTAIN THE EXHAUST AIR DUCT STATIC PRESSURE SETPOINT OF 3.3" WC (ADJ).

2 EF-4
NOT TO SCALE



SUPPLY AIR HANDLING UNITS SEQUENCE OF OPERATION.

AHU-4 OPERATES IN SEQUENCE WITH AHU-1, AHU-2, AND AHU-3 TO PROVIDE SUPPLY AIR TO A COMMON SUPPLY AIR PLENUM THAT SERVES VARIABLE AIR VOLUME TERMINAL BOXES WITH REHEAT SERVING SPACES ON GROUND, FIRST, AND SECOND FLOORS. AHU-4 IS 100% OA UNIT CONSISTING OF OA ISOLATION DAMPER, FILTRATION, HEAT RECOVERY COIL, PREHEAT COIL, COOLING COIL, SUPPLY FAN ARRAY, AND SA ISOLATION DAMPER. A DUCT MOUNTED HUMIDIFIER MOUNTED IN THE SUPPLY AIR DUCT BETWEEN THE UNIT OUTLET AND COMMON SUPPLY AIR PLENUM PROVIDES SUPPLY AIR HUMIDITY CONTROL.

SYSTEM ENABLE/DISABLE: AHU-1, AHU-2, AHU-3, AND AHU-4 SHALL BE AUTOMATICALLY ENABLED/DISABLED VIA DDC SYSTEM, OR MANUALLY AT THE OPERATOR TERMINAL OR LOCALLY AT THE UNIT.

UNIT STAGING (AHU-1, AHU-2, AHU-3, AHU-4): AHU-1 THROUGH 4 OPERATE IN A LEAD-LAG-LAG SEQUENCE. THE LEAD AIR HANDLING UNIT SHALL RUN CONTINUOUSLY, AND ITS ASSOCIATED VFD SHALL MODULATE THE FAN SPEED TO MAINTAIN THE SUPPLY AIR PLENUM DUCT STATIC PRESSURE SETPOINT OF 3.0" WC (ADJ), AS SENSED BY DUCT STATIC PRESSURE TRANSMITTER (SA-SP) LOCATED IN THE COMMON SUPPLY AIR PLENUM. IF THE STATIC PRESSURE FALLS BELOW THE SETPOINT, AND THE LEAD AHU VFD IS AT 100% FAN SPEED FOR A PERIOD OF 15 MINUTES (ADJ), A LAG AHU SHALL BE ENERGIZED AND THE VFDs OF EACH AHU SHALL MODULATE IN UNISON TO MAINTAIN THE SUPPLY AIR PLENUM STATIC PRESSURE SETPOINT. IF THE LEAD AND LAG AHU(S) ARE ENERGIZED, AND THE SUPPLY AIR PLENUM STATIC PRESSURE RISES BELOW THE SETPOINT, AND THE LEAD AND LAG AHU VFDs ARE AT 45% FAN SPEED FOR A PERIOD OF 15 MINUTES (ADJ), THE LAG AHU SHALL BE DE-ENERGIZED AND THE REMAINING AHU VFDs SHALL MODULATE TO MAINTAIN THE SUPPLY AIR PLENUM DUCT STATIC PRESSURE SETPOINT. THE LEAD AHU DESIGNATION SHALL CHANGE EVERY 750 HOURS (ADJ).

SUPPLY FAN CONTROL: WHEN AHU-4 SUPPLY FAN IS ENABLED (SF-4A, SF-4B, SF-4C, SF-4D), THE OUTSIDE AIR INLET DAMPER (OA-DPR) SHALL OPEN AND THE SUPPLY FAN ISOLATION DAMPERS (DPR-SF4A, DPR-SF4B, DPR-SF4C, DPR-SF4D) SHALL OPEN. ONCE ALL DAMPERS ARE PROVEN OPEN VIA END SWITCH, THE SUPPLY FANS (SF-4A, SF-4B, SF-4C, SF-4D) SHALL BE ENERGIZED AND MODULATE TO 20% FAN SPEED (ADJ), IF THE SUPPLY FAN STATUS (SF4A-S, SF4B-S, SF4C-S, SF4D-S) DOES NOT MATCH THE COMMANDDED VALUE AFTER 30 SECONDS, AN ALARM SHALL BE GENERATED AT THE OPERATOR TERMINAL. AFTER THE SUPPLY FANS ARE AT MINIMUM SPEED FOR A PERIOD OF 120 SECONDS, THE SUPPLY AIR OUTLET ISOLATION DAMPER (SA-DPR) SHALL OPEN, AND THE SUPPLY FANS (SF-4A, SF-4B, SF-4C, SF-4D) SHALL RUN CONTINUOUSLY, AND THE SUPPLY FAN VFDs (VFD-SF4A, VFD-SF4B, VFD-SF4C, VFD-SF4D) SHALL MODULATE INDIVIDUAL FAN SPEEDS IN UNISON, AND STAGE IN SEQUENCE WITH AHU-1, AHU-2, AND AHU-3 AS DETAILED ABOVE, TO MAINTAIN THE SUPPLY AIR DUCT STATIC PRESSURE SETPOINT.

DISCHARGE AIR TEMPERATURE CONTROL: THE PREHEAT COIL AND COOLING COIL 2-WAY, TEMPERATURE CONTROL VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT OF 59F (ADJ) (ASSUMES COIL DISCHARGE OF 55F AND FAN HEAT OF 4F), AS SENSED BY DUCT MOUNTED TEMPERATURE SENSOR (DA-T), UPSTREAM OF DUCT MOUNTED HUMIDIFIER.

HUMIDIFIER CONTROL: HUMIDIFIER INSTALLATION AND CONTROLS PERFORMED UNDER IU PROJECT 20181028 CONTRACT. COORDINATE WITH ALL PARTIES TO PROVIDE THE INTENDED SEQUENCE OF OPERATION AND FULLY FUNCTIONAL SYSTEM. THE HUMIDIFIER STEAM SUPPLY CONTROL VALVE (HUM-VLV) SHALL MODULATE TO MAINTAIN A SUPPLY PLENUM HUMIDITY BETWEEN 45% (ADJ) MINIMUM AND 70% (ADJ) MAXIMUM.

FREEZE PROTECTION PUMP CONTROL: WHEN THE OUTSIDE AIR TEMPERATURE (AS SENSED BY EXISTING GLOBAL OA TEMPERATURE SENSOR) IS BELOW 50F, THE CIRCULATING PUMP HWP-4 SHALL BE ENERGIZED AND RUN CONTINUOUSLY AT CONSTANT SPEED. WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55F (ADJ), CIRCULATING PUMP HWP-4 SHALL BE DE-ENERGIZED. IF THE COMMANDDED VALUE DOES NOT MATCH THE PUMP STATUS, AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

HEAT RECOVERY CONTROL: THE HEAT RECOVERY SYSTEM CONTROL IS INDEPENDENT OF AIR HANDLING UNIT AND SHALL REMAIN UNCHANGED.

SAFETIES:

-LOW TEMPERATURE SWITCH (LT-ALM): IF LOW TEMPERATURE SWITCH, WITH SERPENTINE TYPE SENSOR ON UPSTREAM FACE OF COOLING COIL, SENSES A TEMPERATURE BELOW 38F (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE, THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE, THE COOLING COIL CONTROL VALVE (CLC-VLV) SHALL CLOSE, THE HEATING COIL VALVE (HTC-VLV) SHALL OPEN, CIRCULATING PUMP HWP-4 SHALL BE ENERGIZED, AND AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. LOW TEMPERATURE SWITCH SHALL BE MANUALLY RESET.

SUPPLY AIR HIGH PRESSURE SWITCH (SP-HL): IF HIGH STATIC PRESSURE LIMIT SWITCH SENSES A STATIC PRESSURE EXCEEDING 6" WC (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE AND THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE. AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. HIGH STATIC PRESSURE SWITCH SHALL BE MANUALLY RESET.

OUTDOOR AIR LOW PRESSURE SWITCH (SP-LL): IF LOW STATIC PRESSURE LIMIT SWITCH SENSES A STATIC PRESSURE BELOW .6" WC (ADJ), THE UNIT SHALL BE DISABLED, THE OA ISOLATION DAMPER (OA-DPR) SHALL CLOSE AND THE SA ISOLATION DAMPER (SA-DPR) SHALL CLOSE. AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION. HIGH STATIC PRESSURE SWITCH SHALL BE MANUALLY RESET.

WATER DETECTOR (WD-AHU4): IF WATER DETECTOR, PLACED ON FLOOR NEAR HYDRONIC COILS AND RECIRCULATION PUMP HP-4, SENSES WATER, AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

1 AHU-4
NOT TO SCALE



- 1 ELECTRICAL DEMOLITION PLAN FOURTH FLOOR NORTH AND SOUTH ELECTRICAL AND MECHANICAL ROOMS**
1/16" = 1'-0"





A REFER TO ELECTRICAL SYMBOLS AND ABBREVIATIONS SHEET E-001 FOR ADDITIONAL INFORMATION.

B PROVIDE A GEAR SUBMITTAL FOR GENERAL APPROVAL PRIOR TO CONDUCTING STUDIES. IMPLEMENT RECOMMENDATIONS TO ELECTRICAL GEAR FOR FINAL APPROVAL AFTER STUDIES ARE COMPLETED AND APPROVED.

C CONNECT ALL CIRCUITS TO SWITCH BOARD SWBD-EP UNLESS OTHERWISE NOTED OR INDICATED.

- 1 APPROXIMATE LOCATION OF EMC-NP- SHOWN FOR REFERENCE ONLY. FIELD LOCATION.
- 2 REFER TO SHEET EP-101 FOR LOCATION OF MCC-EP.
- 3 REFER TO SHEET E-701 DETAIL 1 FOR FEEDER INFORMATION.
- 4 REFER TO SHEET E-601 FEEDER SCHEDULE FOR FEEDER INFORMATION.
- 5 PROVIDE UNISURTR RACK. FACE OF ALL DEVICES SHALL BE IN THE SAME VERTICAL PLANE.
- 6 ROUTE LPMC FROM VARIABLE FREQUENCY DRIVE TO EXHAUST FAN ON CONCRETE BASE OF EXHAUST FAN.
- 7 COORDINATE FINAL CONNECTION WITH LPMC TO EXHAUST FAN CONNECTION.
- 8 EXTEND SHIELDED VARIABLE FREQUENCY CABLE FROM EXHAUST FAN CONNECTION TO MOTOR TERMINAL HOUSE.
- 9 PROVIDE CONDUIT SLEEVES.
- 10 ROUTE CONDUITS UP HIGH.
- 11 PROVIDE POWER CONNECTION TO MECHANICAL EQUIPMENT LIGHTS.
- 12 PROVIDE LPMC FROM THE HORIZONTAL. CONDUIT DOWN TO AIR HANDLER.
- 13 MOUNT TRANSFORMER ABOVE PANELBOARD. MAINTAIN CLEAR SPACE ABOVE PANELBOARD FOR CONDUITS.
- 14 COORDINATE FINAL CONNECTION WITH LPMC TO AIR HANDLER CONNECTION. EXTEND SHIELDED VARIABLE FREQUENCY CABLE FROM AIR HANDLER CONNECTION TO MOTOR TERMINAL HOUSE.
- 15 PROVIDE POWER CONNECTION AND DATA TO BAS PANEL. COORDINATE WITH DIVISION 23. ROUTE TO THE NEAREST DATA ROOM.
- 16 RELOCATED LIGHT SWITCH, EXIT SIGN, AND CONDUIT. PROVIDE CONDUIT, CONDUCTORS, ETC. AS REQUIRED FOR AN OPERATIONAL SYSTEM. SUSPEND EXIT SIGN IN FRONT OF DUCT WORK AND RAISE LIGHT FIXTURE FOR VIEWING OF EXIT SIGN.
- 17 RELOCATE POWER CONNECTION AND DISCONNECT TO UNIT HEATER. COORDINATE LOCATION WITH DIVISION 23. PROVIDE CIRCUIT EXTENSION AS REQUIRED.



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AHU1 THROUGH 4 - PHASE 1

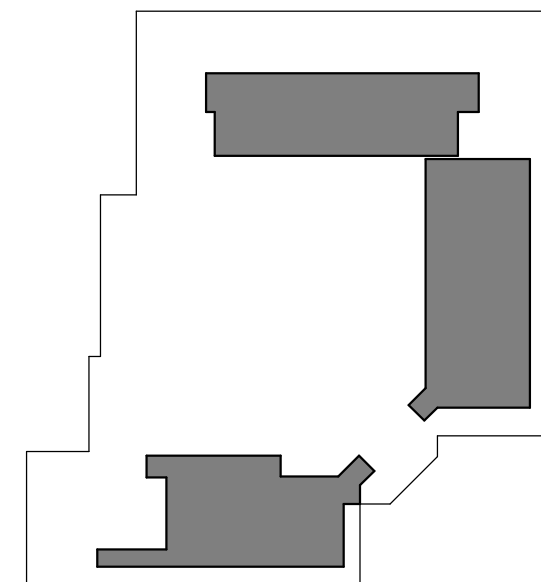
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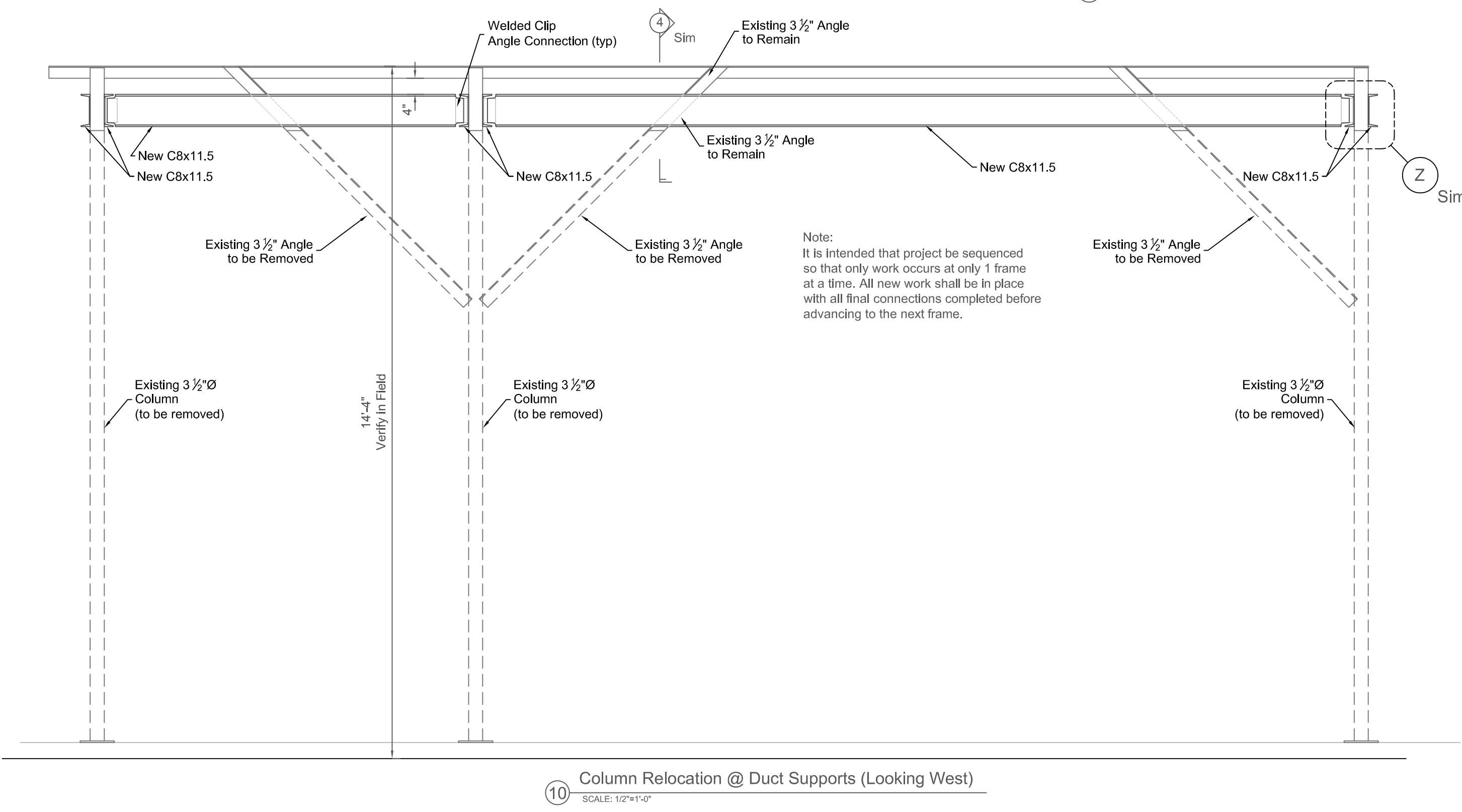
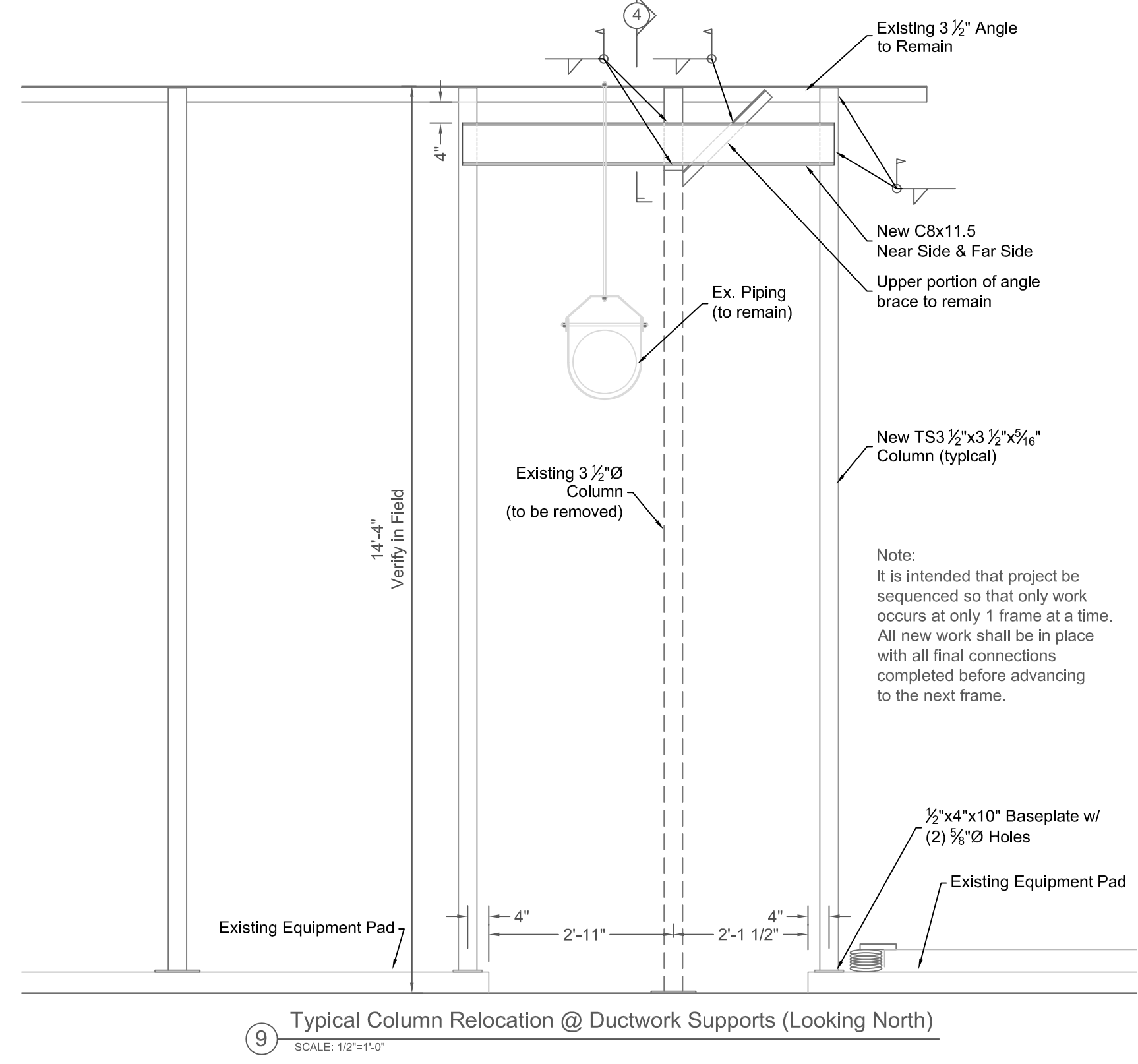
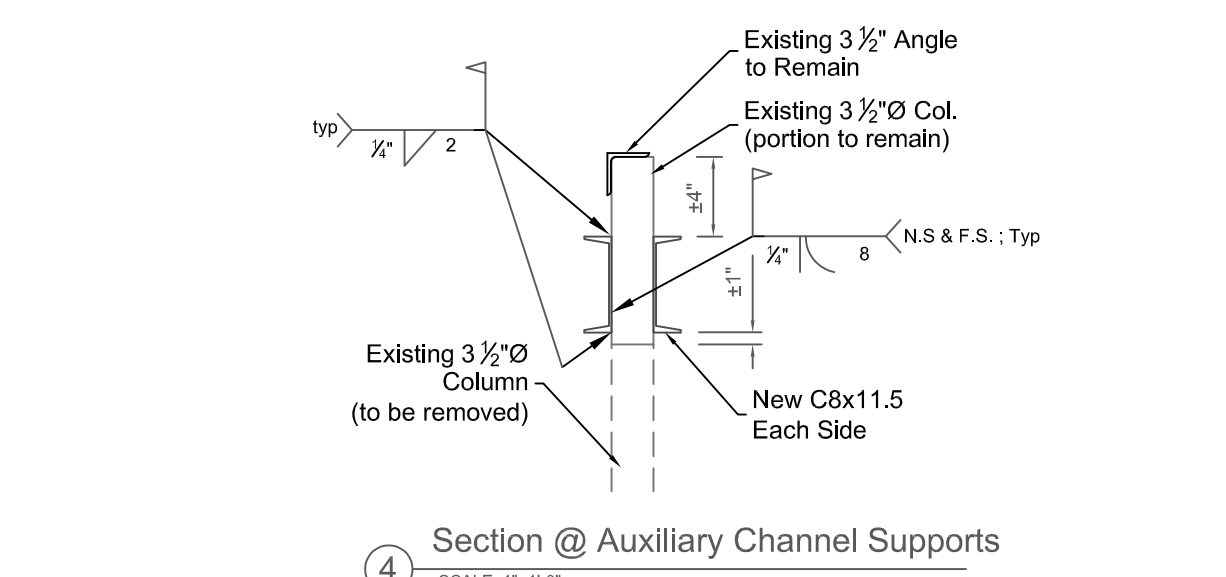
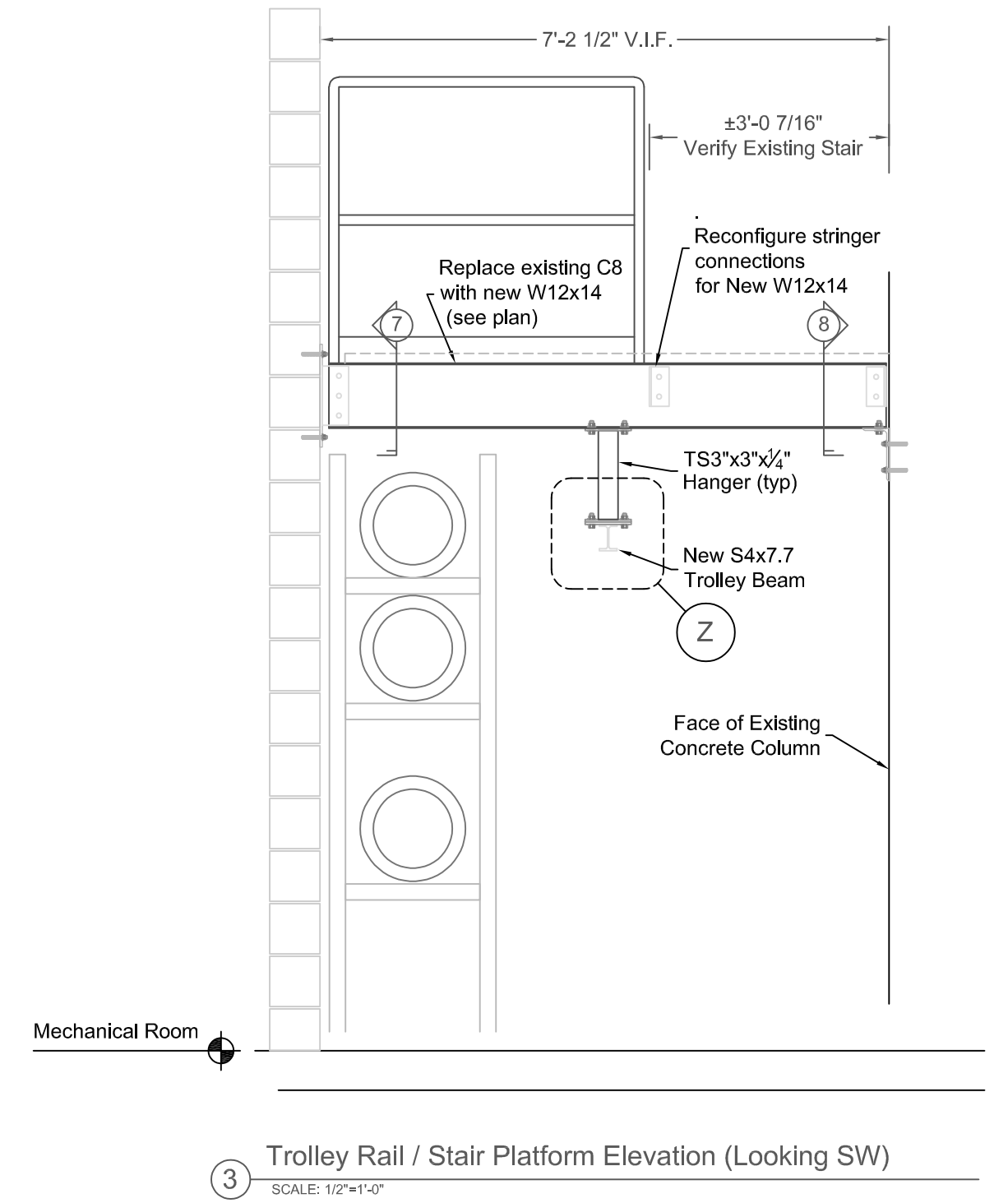
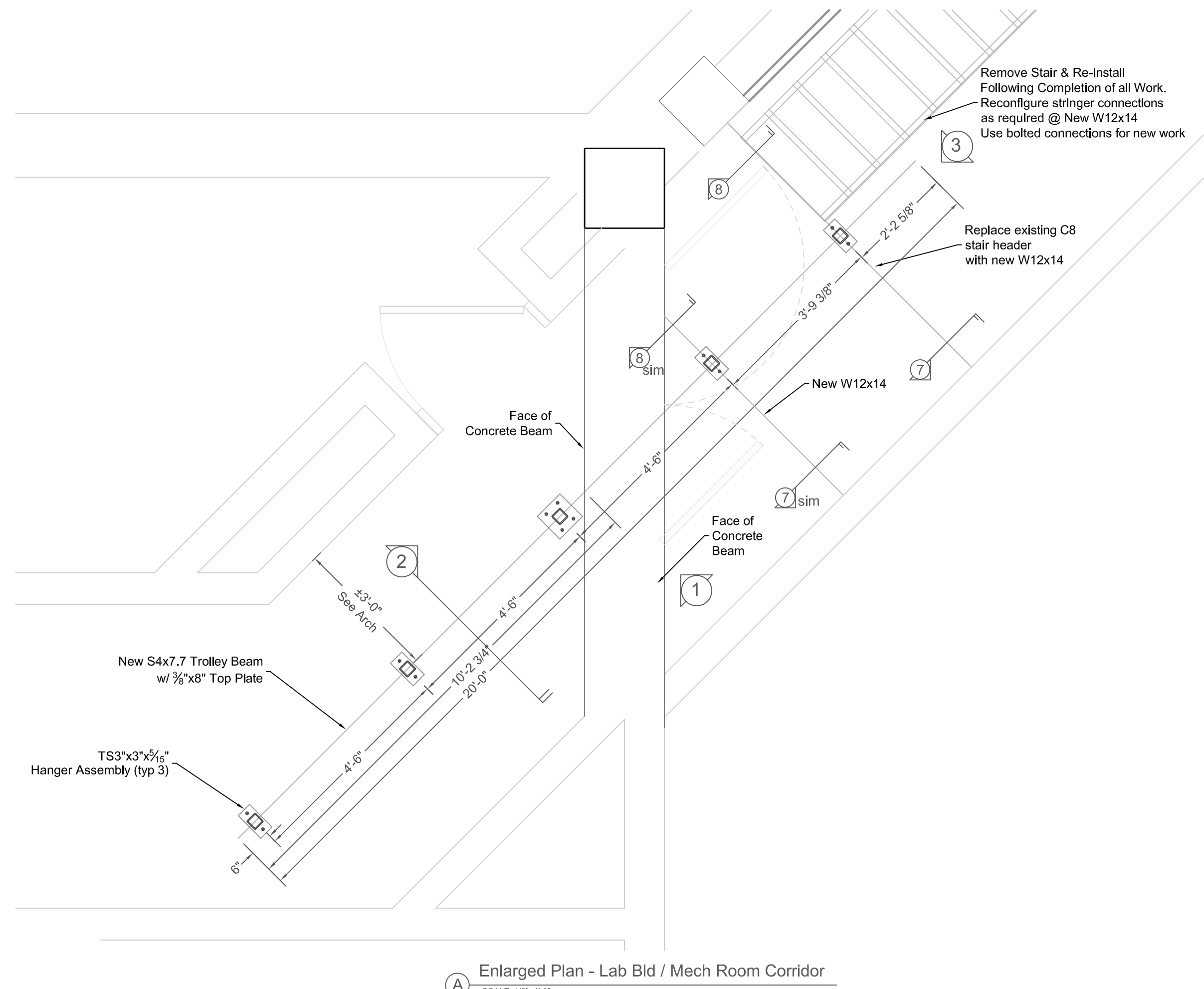
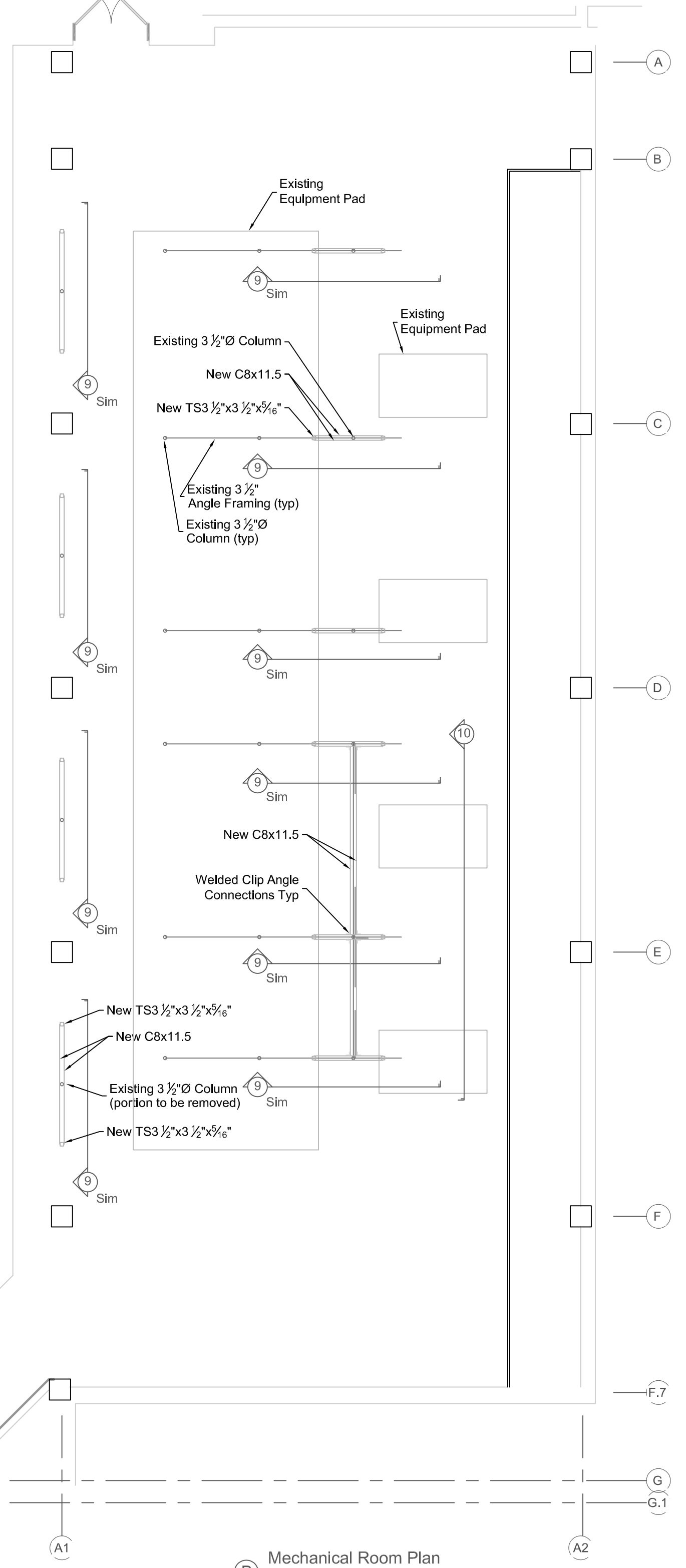
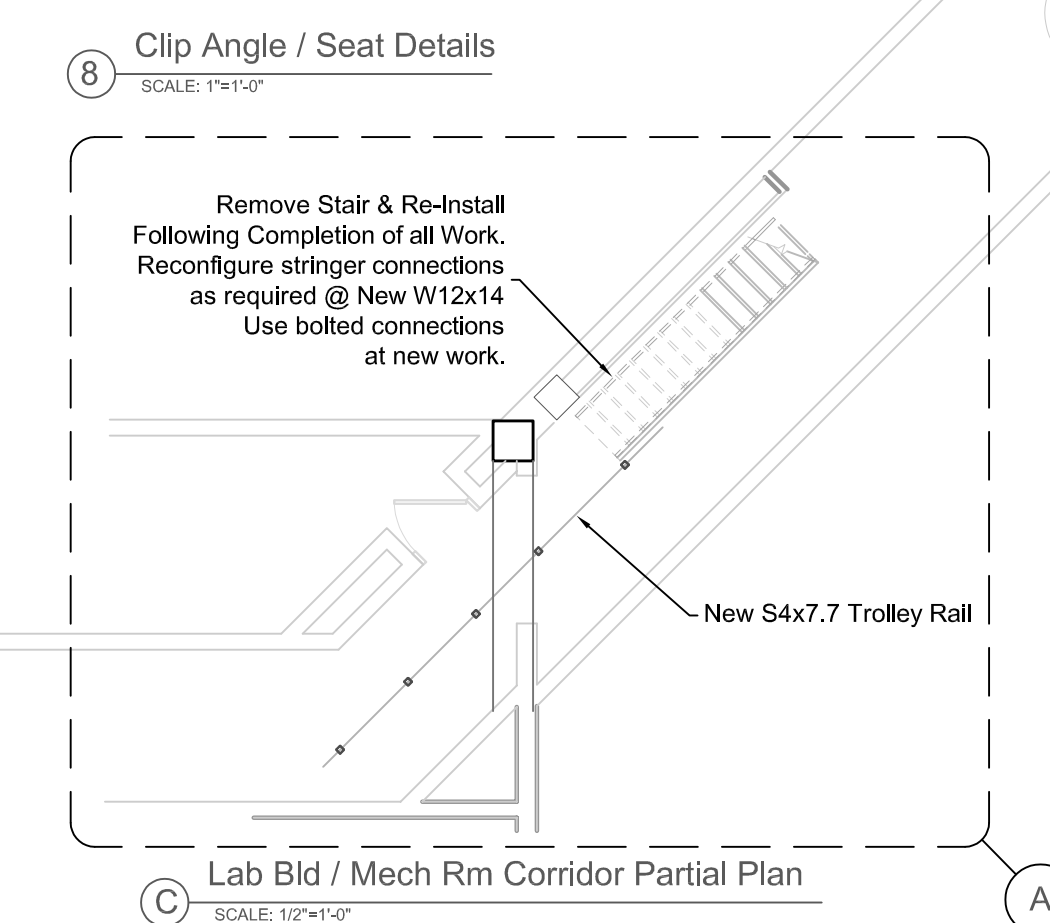
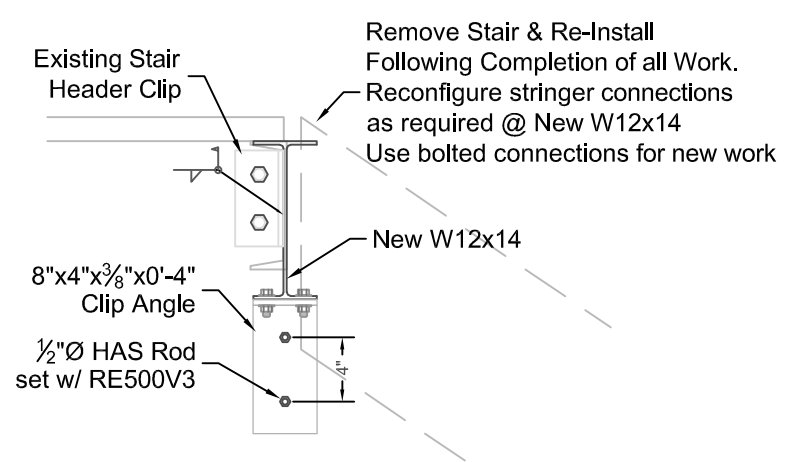
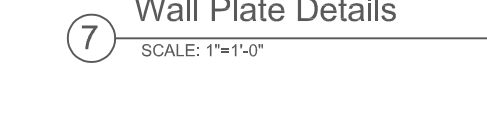
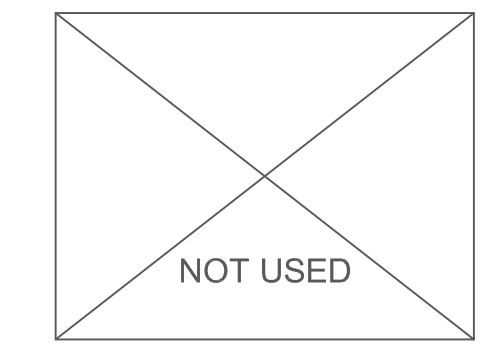
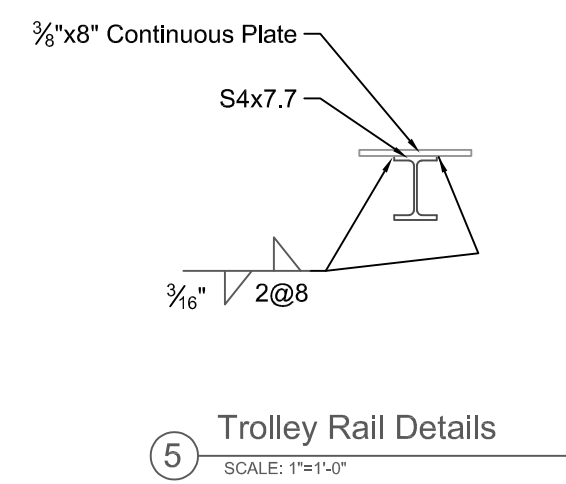
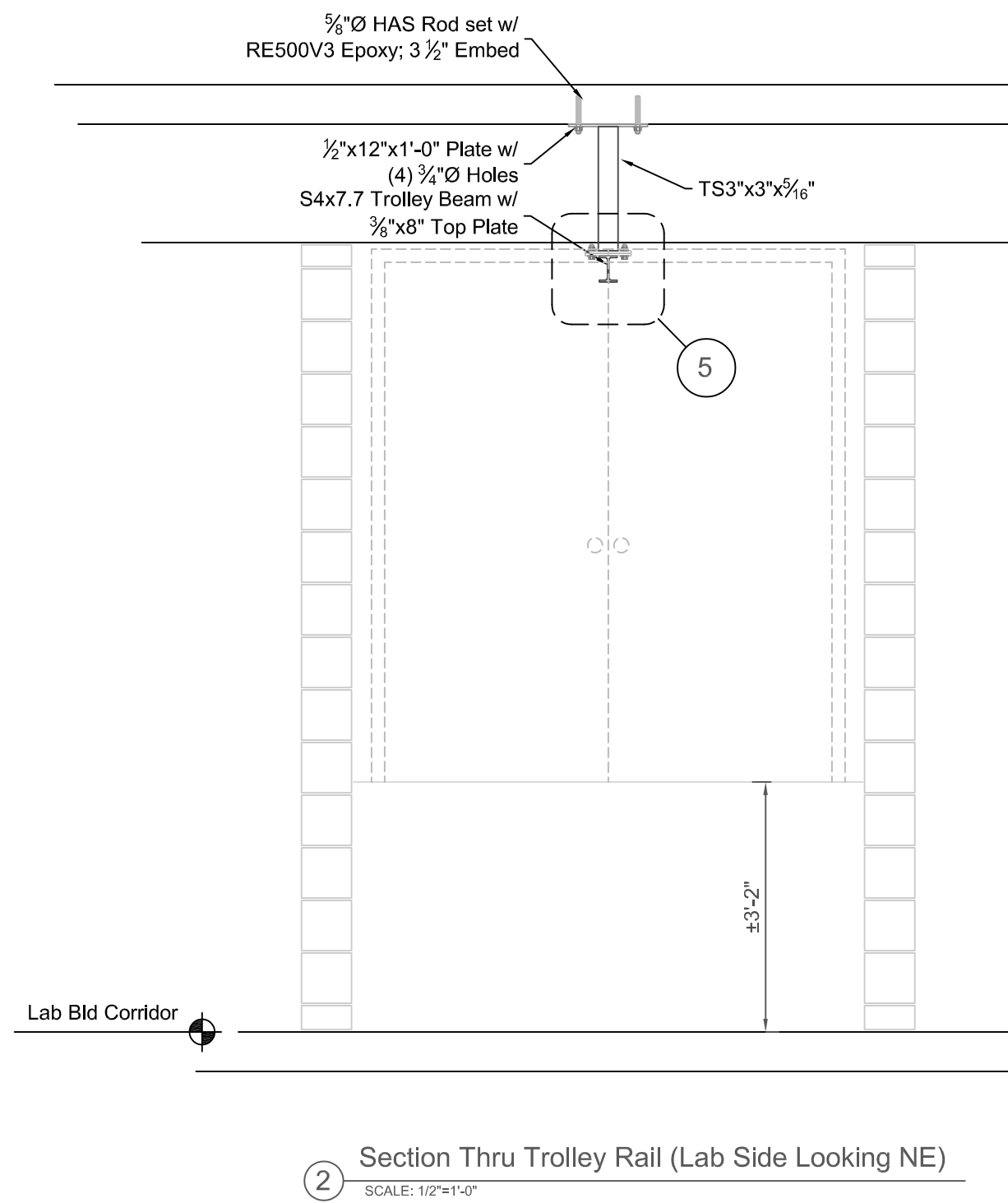
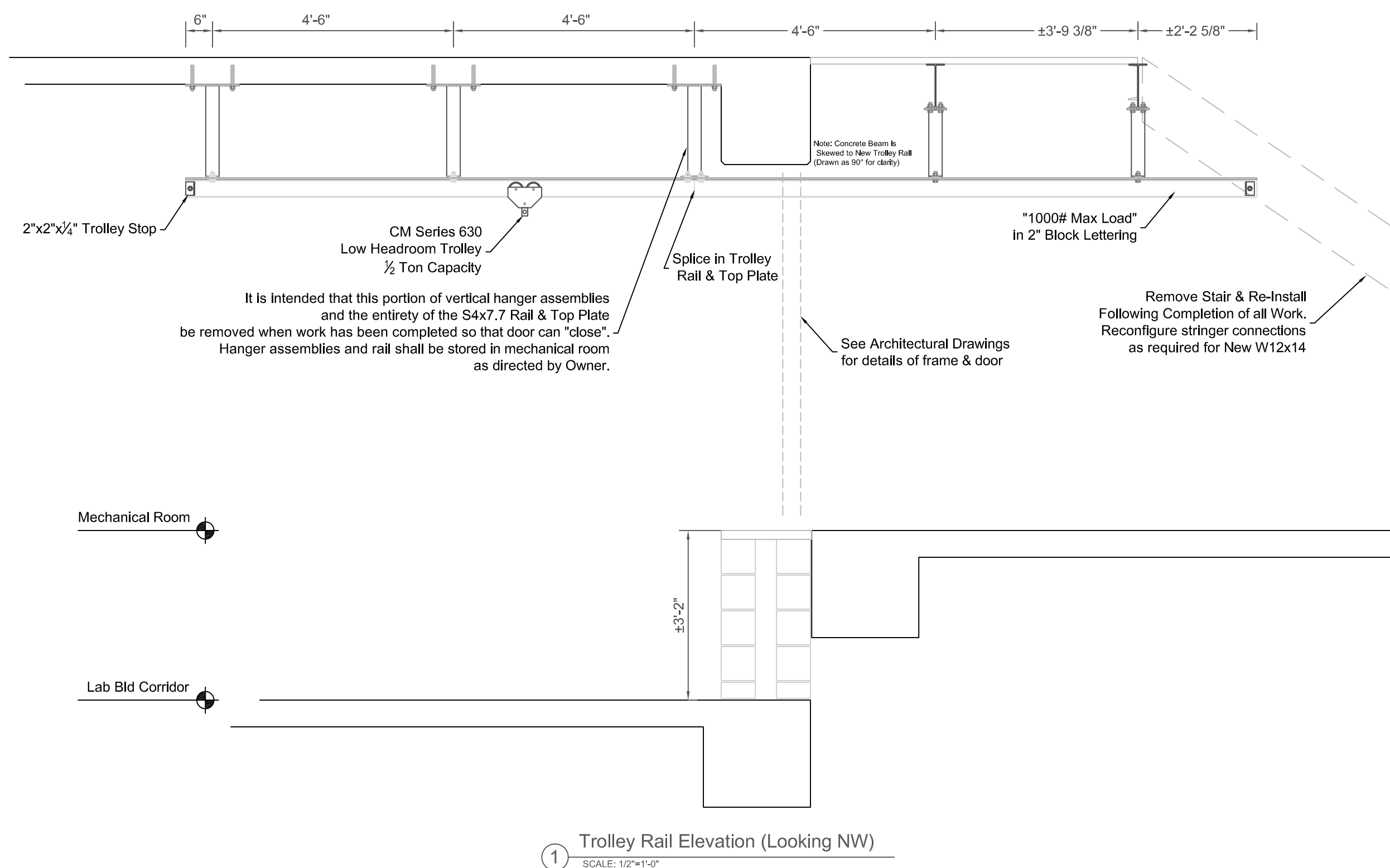
KEY PLAN



| # | REVISION | DATE |
|---|-------------|------------|
| 1 | ADDENDUM #2 | 03/18/2025 |

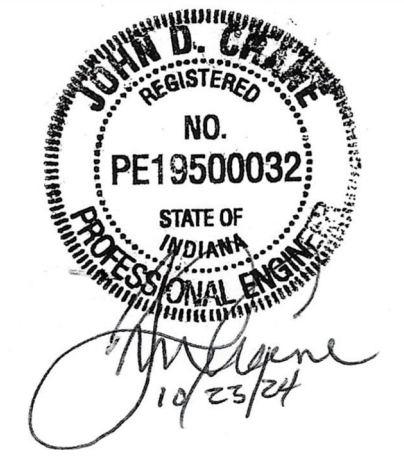
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|----------|------------|
| JOB NO. | 20240312 |
| PRODUCED | BJW |
| DATE | 02/25/2025 |

POWER PLAN FOURTH FLOOR
NORTH AND SOUTH
ELECTRICAL AND
MECHANICAL ROOMS
EP102



- Project Summary**
This project basically consists of two work activities:
- Relocate steel columns in mechanical room to allow for more "open" aisleway. It is intended that modifications be sequenced so that work is completed at a frame before advancing to the next. (work 1 frame at a time)
 - Install rail for trolley in lab / mechanical room corridor. This is intended to facilitate handling of HVAC equipment. After HVAC work has been completed a portion of the hangers and entire rail will be removed and stored for next usage.

- GENERAL NOTES**
- Design Loading trolley beam: 1000# Live Load applied via CM 630 Trolley.
 - All Structural Steel Shall Conform to the Following:
 - Angles, Plates: ASTM A572 (Fy=50 ksi)
 - Angles, Plates: ASTM A36 (Fy=36 ksi)
 - Structural Tubes: ASTM A500-B (Fy=46 ksi)
 - Anchor Bolts: ASTM F 1554 (Fy=36 ksi)
 - All welds shall be per AWS Standards, and be with E70xx Electrode or ER70Sxx wire. Welded connections shall be 1/4" fillet/butt at contact perimeter unless noted otherwise.
 - All Structural Steel shall be detailed, fabricated and erected in accordance with AISC 'Load & Resistance Factor Design - Manual of Steel Construction'
 - Fabrication shall be detailed to minimize field welds. Bolted connections shall be utilized where ever practical.
 - Use ASTM A325 bolts @ connections.
 - Field verify all dimensions prior to material fabrication.
 - Follow all OSHA '10 Safety' and all other jurisdictional agency guidelines when performing work.
 - Install fasteners, epoxy, etc., in accordance with manufacturers' guidelines.
 - Contractor shall "walk down" project area so that they develop a full understanding of the access limitations, existing mechanical, electrical and structural conditions.
 - All steel material shall receive one coat Red Oxide (or Gray) Alkyd Enamel Primer. After field welding has been completed, welds shall be cleaned and same primer applied. Following proper cure of primer, all steel material shall receive (1) top coat of Oil-Based Enamel: #4084 Safety Yellow (color confirmed by Owner).
 - Field welds will be acceptable where shop welds are indicated. Weld details (throat, length, etc.) shall be maintained. Use E7018 or Eq.



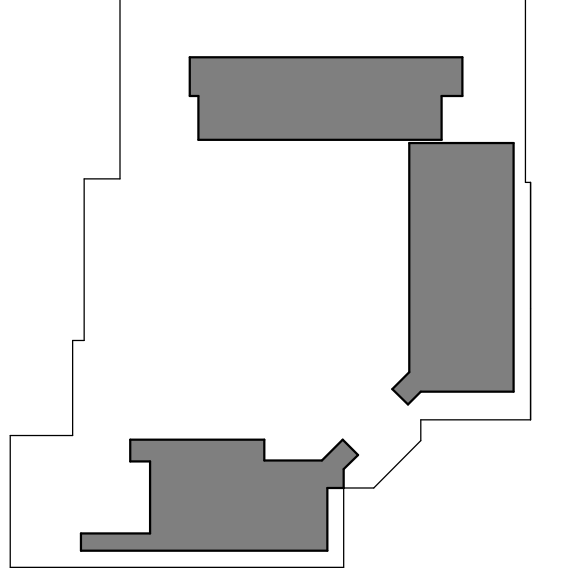
20240312 - BL072 CHEMISTRY ADDITION - REPLACE
AHU 1 THROUGH 4 - PHASE 1

INDIANA UNIVERSITY BLOOMINGTON

800 E KIRKWOOD AVE.
BLOOMINGTON, IN 47405



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| # | REVISION | DATE |
|---|-------------|------------|
| 1 | ADDENDUM #2 | 03/18/2025 |

JOB NO. 20240312
PRODUCED JC
DATE 02/25/2025

STRUCTURAL PLANS

Exhibit A

20231351
Weddle

20240312
successful bidder

Kirkwood Hall

Kirkwood Hall

chemistry building

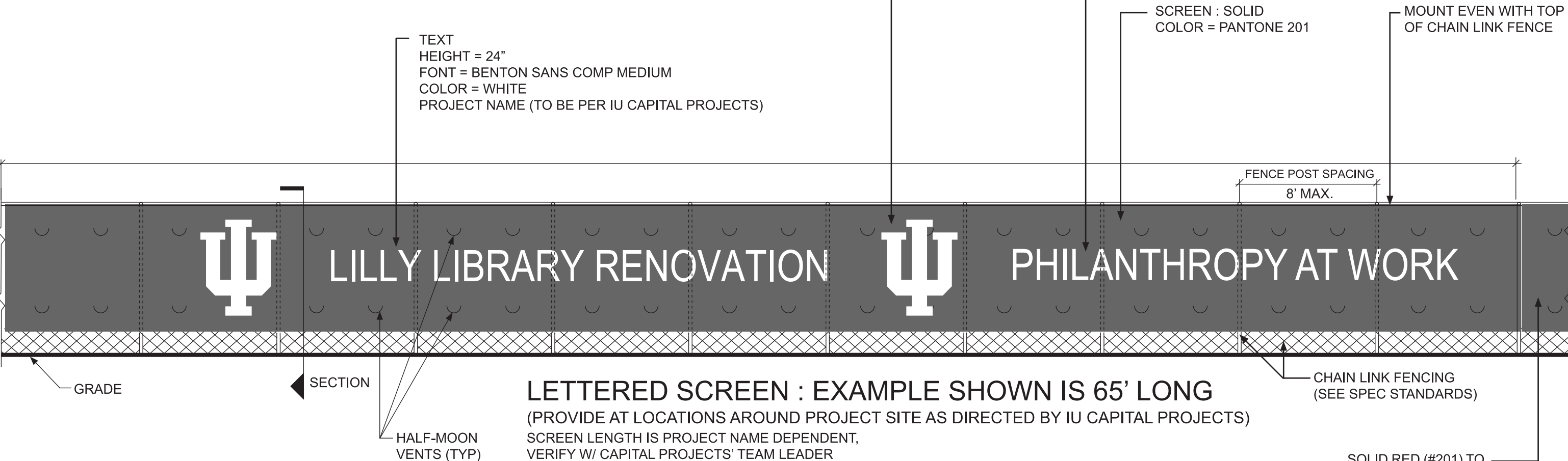
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FRONT

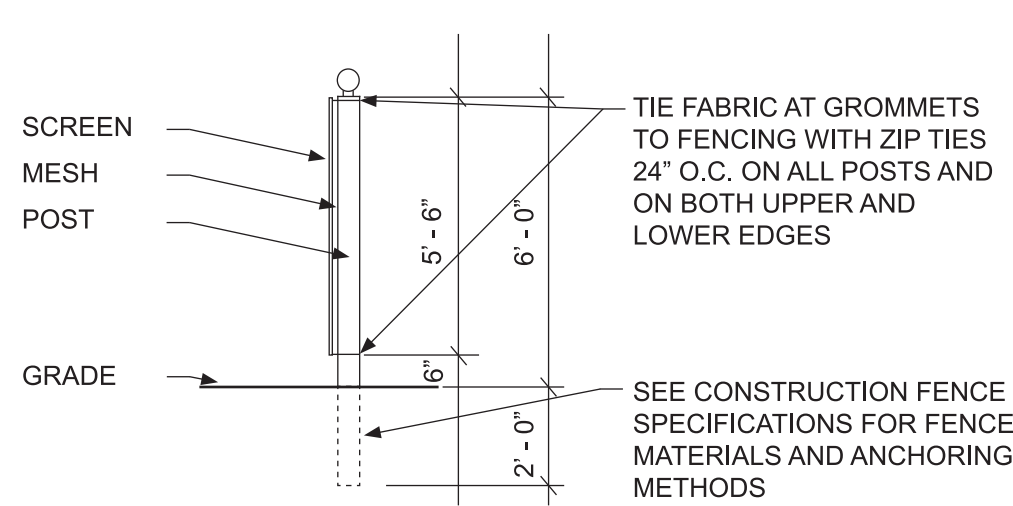
- CRITERIA:
- ≥ \$2M AWARDED CONSTRUCTION COST AS A DONOR SUPPORTED PROJECT: USE LETTERED FENCING WITH “PHILANTHROPY AT WORK”.
 - ≥ \$2M AWARDED CONSTRUCTION COST AS A NON-DONOR SUPPORTED PROJECT: USE LETTERED FENCING
 - < \$2M AWARDED CONSTRUCTION COST PROJECT: ONLY SOLID RED (#201) FENCING (NO LETTERING OR LOGOS).

- NOTES:
1. ALL LETTERING & LOGO TO BE CENTERED VERTICALLY ON SCREEN FABRIC
 2. PROVIDE HALF MOON VENTS 4’ O.C. - MIN TWO ROWS VERTICALLY ABOVE AND BELOW LETTERING
 3. SCREEN TO BE MINIMUM 80% PRIVACY, KNITTED HDPE UV POLYETHYLENE OR PVC CONSTRUCTION
 4. FONTS AND IU LOGO MUST BE PER IU BRAND GUIDELINES/STANDARDS

INDIANA UNIVERSITY
CAPITAL PROJECTS
CONSTRUCTION FENCING SCREEN
STYLE GUIDE 05/04/2020



SECTION



CONTACT INFORMATION
PLEASE CONTACT IU STUDIOS FOR ANY BRAND, LOGO, FONT OR COLOR NEEDS: studios@iu.edu OR VISIT brand.iu.edu FOR DOWNLOADS

PLEASE CONTACT IU SIGN SHOP FOR ANY ADDITIONAL CONSTRUCTION NEEDS: 812-856-0761

Meeting Sign-In Sheet

| | | | |
|---------------------|--------------------------------------|----------------------|-----------------|
| Project: | 20240312 BL072 & 20181028 BL072 | Meeting Date: | 3/4/2025 |
| Facilitator: | Creative Engineering Solutions, Inc. | Place/Room: | BL072 Chemistry |

| Name | Title | Company | Cell | E-Mail |
|---------------|-----------|--------------------|-----------------|------------------------------------|
| Name 1 | Title | Company | Phone | Email |
| Colin Hindman | ESTIMATOR | HFI | 812 339-2579 | chindman@harrell-fish.com |
| Curtis Cowden | P.E. | HFI | 812 369-5131 | CCowden@harrell-fish.com |
| Shawn McGee | P/M | HVIC | 812-788-2860 | Shawnmcgee@Hiltonventilation.com |
| Jeremy Boner | Acct. MGR | IRISH | 317-294-9875 | jboner@irishmechanicalservices.com |
| Tom Hall | Acct. MGR | IRISH | 317-294-9875 | THALL@irishmechanicalservices.com |
| Joe Townsend | CM | I. U. | | |
| Ben Ollestad | P.C. | Poynter | 812-603-7337 | benollestad@poyntersheetmetal.com |
| Tyler Doades | PM | Commercial Service | 812-339-9114 | tdoades@commercial-service.com |
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Meeting Sign-In Sheet

| | | | |
|--------------|--------------------------------------|---------------|-----------------|
| Project: | 20240312 BL072 & 20181028 BL072 | Meeting Date: | 3/12/2025 |
| Facilitator: | Creative Engineering Solutions, Inc. | Place/Room: | BL072 Chemistry |

| Name | Title | Company | Cell | E-Mail |
|----------------|-----------------|-----------------------------------|----------------|--|
| Name 1 | Title | Company | Phone | Email |
| Colin Hindman | Estimator | HFI | 812-339-2571 | CHINDMAN@HARRELL-FISH.COM |
| MICHAEL GUINON | Sr. PM | CFI | 314) 318-5727 | michael@customfabricsall.com |
| Caleb Meadows | Estimator | Repp + Mundt | 812-276-3897 | cmeadows@repp-mundt.com |
| Reid Sills | Estimator | W.B. | 812-320-7783 | rsills@weddlebro.com |
| AL SNODDY | FOREMAN | HEFLIN IND | 812-320-8653 | ASNODDY@HEFLININD.COM |
| Tom Hall | Estimator | Irish | 317 306 1357 | THall@IrishMechanicalServices.com |
| Jason Beckit | Foreman | B5M | 317 774 7147 | D5Rtranspactegmit.com |
| BART ABRAM | Service Manager | Electric Plus | 812 320-2396 | BABRAM@electricplus.com Babram@electricplus.com |
| JOE TOWNSON | CM | IU | - | - |
| FRED BOULING | ELECT ENG. | IU | - | - |
| Aaron King | Regional Mgr | United Mobile Heating and Cooling | (317) 617-7652 | aaron.king@unitedmhcc.com |
| DARBY SIMPSON | MECH. ENG. I.U. | CAPITAL PLANNING | | darbsimp@iu.edu |
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