ADDENDUM NUMBER ONE

To the Drawings and Project Manual Dated:

MAR 30, 2026

Entitled:

Indiana University
Launch Accelerator for Biosciences
1302 Indiana Ave.
Indianapolis, IN 46202

Prepared By:

BSA
175 S. Rangeline Rd., Suite 200
Carmel, IN 46032

_____

Addendum Dated: APR 20, 2026

IU Project #: 20250072
BSALS Project #: 00360481

IU Launch Accelerator for Biosciences Bid Event 04

Prebid Meeting \\ April 13th, 2026

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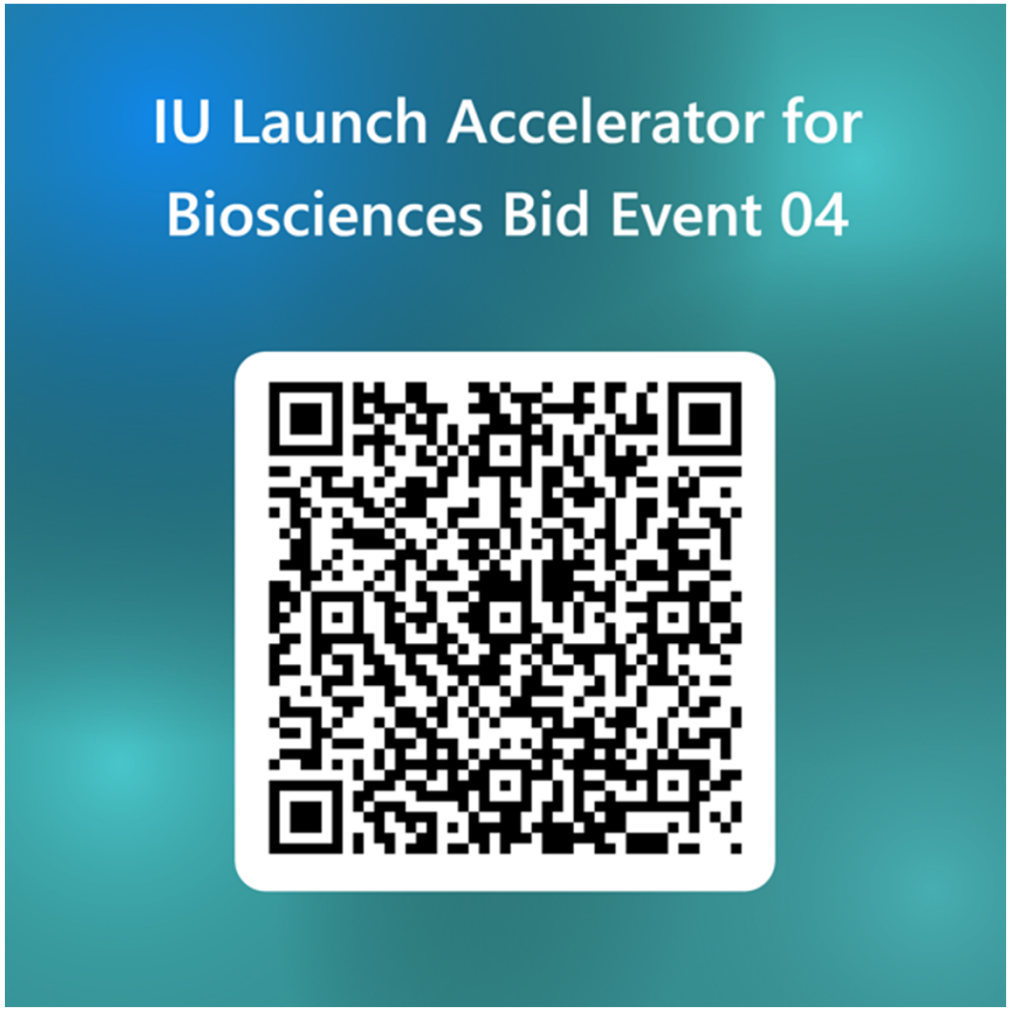
Prebid Meeting Sign-in

Please scan the QR code and fill out the requested information to sign in for the prebid meeting.



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Prebid Meeting Agenda

- Team Introductions
- Bid Information
- Project Overview
- Site Logistics
- Schedule

Project Team

Owner: The Trustees of Indiana University

Construction Manager: F.A. Wilhelm Construction Co., Inc.

Architect: BSA Lifestructures + Smithgroup

Structural Engineer: JPS Consulting Engineers

Site/Civil Engineering: JPS Consulting Engineers

Landscape Architecture: Terra Engineering

Vapor Mitigation: Keramida

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Project Overview

- The complete building will contain a combination of research and teaching labs, classrooms, admin space, and ancillary support facilitating IU teaching curriculum and external partnerships through start-ups & incubators.
- 5-stories
- ~150,000 SF
- Type 1B construction
- Site is located in a protected levy area from floodplain of Fall Creek
- Project is targeting LEED Gold Certification
- Interiors
    - Decorative metal railings
    - Wood veneer millwork
    - Fire rated and no-fire rated interior storefront systems
    - Fire alarm deployable 10B fire & smoke curtains
    - Various floor finishes
    - Storage specialties
    - Manual & electronic roller shades
    - Vertical folding partition

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Project Overview Contd.

- Interiors
  - Interior wall construction has taken into account STC requirements
  - Interior panel signage & exterior building signage
  - Lab casework, equipment, and systems
  - Wall protection and wall covering applications

  - **Bid Event 01 –** Building structure, early site work and utilities
  - **Bid Event 02 –** Early procurement package including Generator, Automatic Transfer Switches, Switchgear, Transformers, Custom Air Handling Units and an electrical utility package from IU substation to building
  - **Bid Event 03 –** Core and Shell, MEPFP & technology

Bid Information

Document Access:

- Plans, Specifications, Addendums, etc. will be distributed via Building Connected by Wilhelm. If you need access to the Building Connected link please contact Shari Bernhardt, ShariBernhardt@fawilhelm.com.

Bid Schedule:

• Documents Issued to Bid	04/06/2026
• Pre-Bid Meeting	04/13/2026
• Addendum 01 Issuance	04/20/2026
• Questions Due	04/22/2026
• Bids Due	05/05/2026 @ 2:00 PM ET

Requests for Information (RFI)/Clarifications:

- All requests for information must be submitted in writing by 04/22/2026 to Shari Bernhardt, ShariBernhardt@fawilhelm.com.

Submission of Bids:

- Bids will be received until 2:00 PM ET on Tuesday, May 5th

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Bid Information

Bid package Index – Bid Event 04

- BE4-01A – General Trades
- BE4-05A – Decorative Railings
- BE4-06A – Finished Carpentry (Furnish)
- BE4-06B – Translucent Panel
- BE4-07A – Joint Sealants
- BE4-08A – Hollow Metal Doors, Frames, & Hardware (Furnish)
- BE4-08B – Interior Glass & Glazing
- BE4-08C – Fire Curtains
- BE4-09A – Terrazzo
- BE4-09B – Tile
- BE4-09C – Soft Floring

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Bid Information

Bid package Index – Bid Event 04

- BE4-09D – Painting & Wallcoverings
- BE4-09E – Sealed Concrete & Epoxy Flooring
- BE4-10A – Toilet Partitions & Bathroom Accessories (Furnish)
- BE4-10B – Lockers (Furnish)
- BE4-10C – Wall Protection (Furnish)
- BE4-10D – Visual Display Units (Furnish)
- BE4-10E – Operable Partitions (Furnish)
- BE4-10F – Signage (Interior & Exterior)
- BE4-10G – Walkable Ceiling
- BE4-12A – Window Treatments
- BE4-13A – Lab Casework & Equipment
- BE4-32A – Flagpoles
- BE4-32B – Bike Racks (Furnish)
- BE4-32C – Bus Shelter
- BE4-32D – Site Railings

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Bid Information

Alternates:

- Payment and Performance Bond
- Resinous Epoxy Flooring System – BE4-09E
- Wood Slat Walls – BE4-06A
- Vinyl Sheet Flooring in Labs – BE4-09C

Diversity:

- Minority Owned Business Goal – 7% Participation
- Women Owned Business Goal – 5% Participation
- Veteran Owned Business Goal – 3% Participation

Diverse contractors must be certified with the State of Indiana and must be listed on the IDOA Directory:
https://www.in.gov/idoa/mwbe/minority-and-womens-business-enterprises/participation-goals/

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Bid Information

Bid Checklist (due at bid submission):

- Bid Form (executed, including attachments)
  - Bid Package Standard Bid Form
  - Combined Bid Form (if applicable)
  - Supplemental Information
  - Form 96
  - Subcontractor Qualification Form
  - Contractor Asbestos Certification and Protocol for Contractors
  - Bid Bond of five percent (5%) on bids over $150,000

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Bid Information

Bid Submission:

- Bids must be submitted electronically through the IU Plan Room website by 2:00 PM on bid day. www.iuplanroom.com
- Bidders must be registered on the IU Plan Room, and signed into the plan room, in order to submit a bid
  - Click on the *Sign In/Register tab* (create a User ID and Password if you are not yet registered)
  - Click on the project listing
  - Click on *Submit Bid* next to the job name on the information tab. Attach bid forms.
  - After bid is uploaded, click *Submit Bid* at the bottom of the screen.
  - You will receive a confirmation screen, stating that, "Your Bid Submission has been saved successfully," as well as an email confirmation, indicating that your submission was received.
- Save your completed Bid form in PDF format. Title your bid as follows:

  [your company name] – Bid for IU Project_20250072 – IU Launch Accelerator for Biosciences – [Bid Package Number and Name]

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Bid Information

Bid Submission:

- Bids received electronically through the IU Plan Room will be virtually opened and read out loud at 2:00 PM EST on May 5th, 2026. To attend the virtual Bid Opening, click the Zoom link: https://iu.zoom.us/j/82623978895

  Meeting ID: 826 2397 8895
  Join By Telephone: 312-626-6799

- To view bid results after opening, click on the VPCPF Construction Procurement Bid Tabs & Awards on the home page of the plan room website

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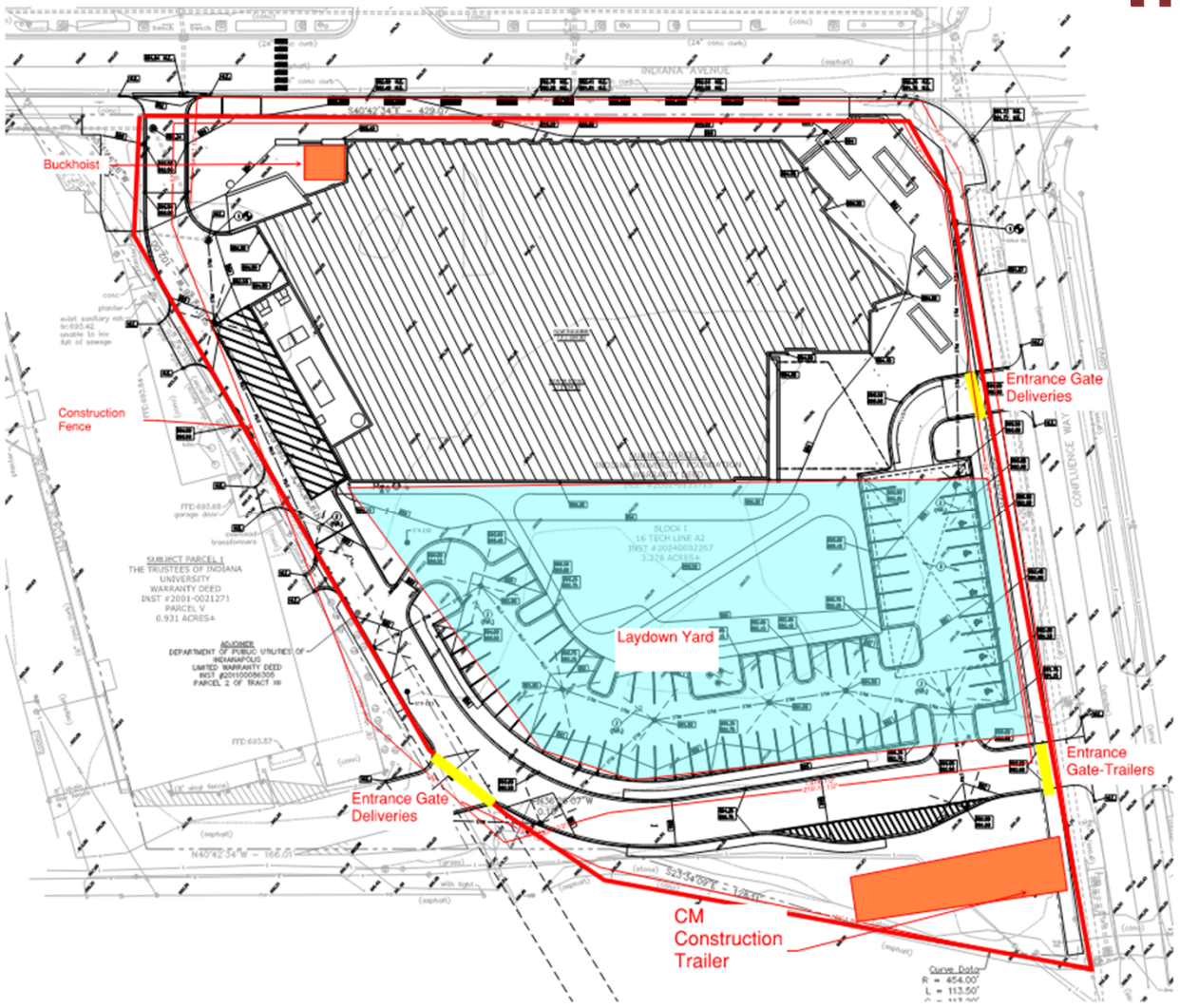
Site Logistics

Site Address:
1302 Indiana Ave.
Indianapolis, IN 46202



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Schedule

Interior Build-Out: Overhead MEPs, Rough-In's, & Finishes

- March 2026 – July 2027

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Schedule

Interior Build-Out: Overhead MEPs, Rough-In's, & Finishes		346	346	16-Mar-26	23-Jul-27
Level 1		140	140	30-Sep-26	19-Apr-27
ROUG1000	Fire Proofing- Lower Level Steel	15	15	30-Sep-26	20-Oct-26
ROUG1010	Frame, Overhead, In-Wall MEP Rough-In's- Level 1	30	30	21-Oct-26	03-Dec-26
ROUG1020	Hang & Finish Drywall- Level 1	25	25	04-Dec-26	11-Jan-27
ROUG1030	Prime & Paint- Level 1	15	15	12-Jan-27	01-Feb-27
ROUG1040	Finishes- Level 1	30	30	02-Feb-27	15-Mar-27
ROUG1050	Punchlist- Level 1	15	15	16-Mar-27	05-Apr-27
ROUG1060	Final Clean- Level 1	10	10	06-Apr-27	19-Apr-27
Level 2		125	125	25-Sep-26	24-Mar-27
ROUG1070	Frame, Overhead, In-Wall MEP Rough-In's- Level 2	30	30	25-Sep-26	05-Nov-26
ROUG1080	Hang & Finish Drywall- Level 2	25	25	06-Nov-26	14-Dec-26
ROUG1090	Prime & Paint- Level 2	15	15	15-Dec-26	06-Jan-27
ROUG1100	Finishes- Level 2	30	30	07-Jan-27	17-Feb-27
ROUG1110	Punchlist- Level 2	15	15	18-Feb-27	10-Mar-27
ROUG1120	Final Clean- Level 2	10	10	11-Mar-27	24-Mar-27
Level 3		125	125	06-Nov-26	05-May-27
ROUG1130	Frame, Overhead, In-Wall MEP Rough-In's- Level 3	30	30	06-Nov-26	21-Dec-26
ROUG1140	Hang & Finish Drywall- Level 3	25	25	22-Dec-26	27-Jan-27
ROUG1150	Prime & Paint- Level 3	15	15	28-Jan-27	17-Feb-27
ROUG1160	Finishes- Level 3	30	30	18-Feb-27	31-Mar-27
ROUG1170	Punchlist- Level 3	15	15	01-Apr-27	21-Apr-27
ROUG1180	Final Clean- Level 3	10	10	22-Apr-27	05-May-27
Level 4		125	125	22-Dec-26	17-Jun-27
ROUG1190	Frame, Overhead, In-Wall MEP Rough-In's- Level 4	30	30	22-Dec-26	03-Feb-27
ROUG1200	Hang & Finish Drywall- Level 4	25	25	04-Feb-27	10-Mar-27
ROUG1210	Prime & Paint- Level 4	15	15	11-Mar-27	31-Mar-27
ROUG1220	Finishes- Level 4	30	30	01-Apr-27	12-May-27
ROUG1230	Punchlist- Level 4	15	15	13-May-27	03-Jun-27
ROUG1240	Final Clean- Level 4	10	10	04-Jun-27	17-Jun-27
Level 5		120	120	04-Feb-27	23-Jul-27
ROUG1250	Frame, Overhead, In-Wall MEP Rough-In's- Level 5	30	30	04-Feb-27	17-Mar-27
ROUG1260	Hang & Finish Drywall- Level 5	25	25	18-Mar-27	21-Apr-27
ROUG1270	Prime & Paint- Level 5	15	15	22-Apr-27	12-May-27
ROUG1280	Finishes- Level 5	30	30	13-May-27	24-Jun-27
ROUG1290	Punchlist- Level 5	10	10	25-Jun-27	09-Jul-27
ROUG1300	Final Clean- Level 5	10	10	12-Jul-27	23-Jul-27
Level 6 - Penthouse		70	70	24-Sep-26	05-Jan-27
ROUG1400	Fire Proofing- Penthouse Steel	5	5	24-Sep-26	30-Sep-26
ROUG1310	Level 6 Penthouse	60	60	01-Oct-26	28-Dec-26

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THANK
YOU.
IU Launch Accelerator for
Biosciences Bid Event 04
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First & Last Name	Company Name	Email Address	Bid Package(s) Interested In
Shari Bernhardt	FAW	sharibernhardt@fawilhelm.com	CM;
Shane Billingsley	Greenfield Signs	Shane@greenfieldsigns.com	BE4-10F - Signage (Interior & Exterior);
Dawn Jacobs	BICASA North America	dawn.jacobs@bicasa-usa.com	BE4-13A - Lab Casework & Equipment;
Jeff Morgan	First Onsite	jeffrey.morgan@firstonsite.com	BE4-01A - General Trades;
Joshua Baughman	Mock woodworking	Jbaughman@mockwoodworking.com	BE4-06A - Finished Carpentry (Furnish);
Kayl Talboo	Elevator Service of Indiana	Kayl.talboo@esiind.com	Elevators ;
Micheal frentz	Glenrock	Mfrentz@glenrockcompany.com	BE4-07A - Joint Sealants;
Tek osborn	Poynter	tekosborn@poyntersheetmetal.com	BE4-05A - Decorative Railings;
Tom Shouse	Kustom US	thomas.shouse@kustom.us	BE4-01A - General Trades;
Betsy Fouts	Lab Crafters	BFouts@lab-crafters.com	BE4-13A - Lab Casework & Equipment;
Lisa Combs	Harlan Graphics	lcombs@harlangraphics.com	BE4-06B - Translucent Panel;Interior signage;
Kris White	Signworks Inc	Kris@signworksthinks.com	BE4-10F - Signage (Interior & Exterior);
Bill McQueen	Perry Acoustics	Bmcqueen@perryacoustics.com	BE4-10D - Visual Display Units;BE4-10G - Walkable Ceiling;BE4-12A - Window Treatments;
Bruce Osborne	DECO Associates	Osborne@decoassociates.com	BE4-13A - Lab Casework & Equipment;
Derek Ries	Pace Systems	Derek.ries@wearepacesystems.com	BE4-10G - Walkable Ceiling;Cleanrooms ;
Gabrielle hardin	GCI Slingers	ghardin@gravelconveyors.com	BE4-01A - General Trades;Construction / slab work/backfill;
Jeremy Hanson	NEIS Collective	jeremy.hanson@neis.com	BE4-13A - Lab Casework & Equipment;
Dave Knopf	F.A. Wilhelm	DaveKnopf@fawilhelm.com	BE4-01A - General Trades;BE4-06A - Finished Carpentry (Furnish);BE4-08A - Hollow Metal Doors, Frames, & Hardware (Furnish);BE4-10D - Visual Display Units;BE4-10C - Wall Protection (Furnish);BE4-10B - Lockers (Furnish);BE4-10A - Toilet Partitions & Bathroom Accessories (Furnish);
Cindy Hulen	Essential Signs	Cindy@essentialsigns.com	BE4-10F - Signage (Interior & Exterior);
Allyson Pauly	CleanSpace	apauly@cleanspaceus.com	BE4-08A - Hollow Metal Doors, Frames, & Hardware (Furnish);BE4-01A - General Trades;BE4-06B - Translucent Panel;BE4-07A - Joint Sealants;BE4-08B - Interior Glass & Glazing;BE4-09B - Tile;BE4-09C - Soft Flooring;BE4-09D - Painting & Wallcoverings;BE4-09E - Sealed Concrete & Epoxy Flooring;BE4-10B - Lockers (Furnish);BE4-10C - Wall Protection (Furnish);BE4-10D - Visual Display Units;BE4-10E - Operable Partitions (Furnish);BE4-10F - Signage (Interior & Exterior);BE4-10G - Walkable Ceiling;BE4-13A - Lab Casework & Equipment;BE4-32D - Site Railings;Clean Room;
Carrie Albright	Shuck Corp	Carrie@shuckcorp.com	BE4-32C - Bus Shelter;
			BE4-10F - Signage (Interior & Exterior);
Patrick Mendel	NSA	Pmendel@bsadesign.com	All;
Parker Miles	Fisher Scientific	Parker.miles@thermofisher.com	BE4-13A - Lab Casework & Equipment;
Brian Estes	FA Wilhelm	Brianestes@fawilhelm.com	BE4-09B - Tile;BE4-09C - Soft Flooring;BE4-09A - Terrazzo;
Jeff Rich	Shoemaker	jeff@shoemakerav.com	A/V;
Penn Stoller	F.A. Wilhelm	pennstoller@fawilhelm.com	BE4-09A - Terrazzo;BE4-09B - Tile;BE4-09C - Soft Flooring;BE4-09E - Sealed Concrete & Epoxy Flooring;
Josh pascoe	LaForce	Josh.pascoe@laforceinc.com	BE4-08A - Hollow Metal Doors, Frames, & Hardware (Furnish);BE4-10A - Toilet Partitions & Bathroom Accessories (Furnish);BE4-10B - Lockers (Furnish);BE4-10C - Wall Protection (Furnish);
Ian Armstrong	NEIS	Ian.armtrong@neis.com	BE4-13A - Lab Casework & Equipment;
Wes Simpson	FAW	Wessimpson@fawilhelm.com	BE4-09A - Terrazzo;BE4-09B - Tile;BE4-09C - Soft Flooring;BE4-09E - Sealed Concrete & Epoxy Flooring;
Kevin Casterline	Giffin Interior	kevin.casterline@giffininterior.com	BE4-06A - Finished Carpentry (Furnish);

John McQueen	Perry Acoustics, Inc	jmcqueen@perryacoustics.com	BE4-10D - Visual Display Units;BE4-10G - Walkable Ceiling;BE4-12A - Window Treatments;
Robbie Springate	KNL Supply Group	Customerservice@knlsupplygroup.com	BE4-10A - Toilet Partitions & Bathroom Accessories (Furnish);BE4-10C - Wall Protection (Furnish);BE4-10E - Operable Partitions (Furnish);
Allen Williamson	Perry Acoustics	Awilliamson@perryacoustics.com	BE4-10G - Walkable Ceiling;BE4-12A - Window Treatments;
Todd France	F.A. Wilhelm	Toddfrance@fawilhelm.com	Construction Manager ;
Eric Spohn	Spohn Associates	espohn@spohnassociates.com	BE4-05A - Decorative Railings;BE4-32D - Site Railings;
Nikki Taylor	SmithGroup	nikki.taylor@smithgroup.com	BE4-13A - Lab Casework & Equipment;

BE4-10F – Signage (Interior ~~& Exterior~~)

The work for this Bid Package specifically includes, but is not limited to, all work as defined in the following Specification Sections:

Division 00	Procurement and Contract Requirements
Division 01	General Requirements
101400	Interior Signage
101419	Dimensional Letter Signage

Additionally, this scope of work includes, but is not limited to, the following:

1. Subcontractor shall furnish and install all interior and ~~exterior~~ signage on the project.
2. Includes exterior signage shown on A710:
    a. ~~North Entry "1301 Indiana Avenue"~~
    b. ~~North Screenwall IU Trident and "Indiana University Launch Accelerator for Biosciences"~~
    c. ~~North Tower IU Trident and "Indiana University"~~
    d. ~~South Tower IU Trident and "Indiana University"~~
    e. ~~South IU Trident (lower)~~
    f. ~~Monument Lettering "Indiana University Launch~~ Accelerator for Biosciences" and "26 Tech Innovation District" on LA202
3. Includes interior signage:
    a. All signage listed on the Signage Schedule – IF910.
    b. Excludes room schedulers – to be by others.
4. Provide Shop drawing inclusive of all required blocked and electrical connections.
    a. Illuminated signs to include integral lighting system and controls.
5. Includes all LEED documentation.

Work Performed by Others and Excluded:

1. Payment and Performance Bond, to be included as an alternate.
2. Sales Tax.

BE4-10H – Signage (Exterior)

The work for this Bid Package specifically includes, but is not limited to, all work as defined in the following Specification Sections:

Division 00	Procurement and Contract Requirements
Division 01	General Requirements
101419	Dimensional Letter Signage

Additionally, this scope of work includes, but is not limited to, the following:

1. Subcontractor shall furnish and install all ~~interior~~ and exterior signage on the project.
2. Includes exterior signage shown on A710:
    a. North Entry “1301 Indiana Avenue”
    b. North Screenwall IU Trident and “Indiana University Launch Accelerator for Biosciences”
    c. North Tower IU Trident and “Indiana University”
    d. South Tower IU Trident and “Indiana University”
    e. South IU Trident (lower)
    f. Monument Lettering “Indiana University Launch Accelerator for Biosciences” and “26 Tech Innovation District” on LA202
3. ~~Includes interior signage:~~
    ~~a. All signage listed on the Signage Schedule – IF910.~~
    ~~b. Excludes room schedulers – to be by others.~~
4. Provide Shop drawing inclusive of all required blocked and electrical connections.
    a. Illuminated signs to include integral lighting system and controls.
5. Includes all LEED documentation.

Work Performed by Others and Excluded:

1. Payment and Performance Bond, to be included as an alternate.
2. Sales Tax.

BE4-13A – Lab Casework & Equipment

The work for this Bid Package specifically includes, but is not limited to, all work as defined in the following Specification Sections:

Division 00	Procurement and Contract Requirements
Division 01	General Requirements
079200	Joint Sealants (as applicable)
115300	Misc. Lab Equipment
115313	Laboratory Fume Hoods
115317	Laboratory Glassware
115313	Laboratory Sterilizers with Electric Steam Generators
123553	General Requirements for Laboratory Casework and Fume Hoods
123553.03	Adaptable Laboratory Casework Systems
123553.13	Metal Laboratory Casework with Wood Fronts
123661	Simulated Stone Countertops

Additionally, this scope of work includes, but is not limited to, the following:

1. Subcontractor shall furnish and install all lab casework, countertops, equipment, fixtures, hardware etc.
    a. Reference QF Drawing Series and above-mentioned specifications.
    b. All equipment to be furnished and installed by contractor unless noted otherwise in the contract documents or the exclusions listed below.
        i. Furnish only items: emergency shower and eyewash stations, cup sinks, lab sinks, lab gas turrets. They are to be installed by plumbing contractor. Trim materials such as water supply stops, escutcheons, thread sealant, supply tubing, drainage connections and P-traps, consumables, etc. needed for installation to be provided by Pluming Contractor.
    c. The following items are to be furnished and installed by Contractor. Contractor to provide breakout price to provide and install this equipment within the base bid scope.
        i. Sterilizers to be CFCI.
        ii. Environmental Rooms to be CFCI.
        iii. Icemakers and bins to be CFCI.
        iv. Glassware Washers to be CFCI.
2. Includes service fixtures as listed on the service fixture schedule.
3. Furnish and install all fume hoods and associated exhaust valves, including valves in future fume hood locations.
4. All connections including final to this equipment supplied and or installed by this contractor to be by others.

5. Joint sealants and caulking against dissimilar surfaces of installed products.
6. Subcontractor to supply shop drawing inclusive of all required blocking.
7. Coordination of deliveries and storage with CM superintendent.
8. Subcontractor to provide any and all mockups required per specifications.
9. Includes all LEED documentation.

Work Performed by Others and Excluded:

1. Payment and Performance Bond, to be included as an alternate.
2. Installation of emergency shower and eyewash stations, cup sinks, lab sinks, lab gas turrets by others.
3. Provide voluntary alternate to include: Installation of owner furnished lab vacuum system. Piping to be by others. Final connection to be made by this subcontractor.
4. ~~3 Sterilizers to be OFOI.~~
5. ~~Environmental Rooms to be OFOI.~~
6. ~~2 Icemakers and bins to be OFOI.~~
7. ~~1 Glassware Washers to be OFOI.~~
8. Biological Safety Cabinets to be OFOI
9. Sales Tax.

GENERAL

1. See presentation and attendee sign-in sheet from the pre-bid meeting held on April 13th, 2026.

CONTRACTOR QUESTIONS

1. See attached list of bidder questions with design team responses.

CHANGES TO THE PROJECT MANUAL

1. **Section 00 0110:**
   a. Added missing line items for specification sections 06 7400, 10 7500, and 12 9300 previously issued in prior bid packages.

2. **Section 08 3100:**
   a. Added line item 2.01, B, 8. for STC rated access panels.

3. **Section 09 6623:**
   a. Revised text in line item 2.4, B. for precast terrazzo stair tread thickness.

4. **Section 10 5129:**
   a. Added line item 2.02, A, 7.

5. **Section 11 5313:**
   a. Removed references to "As Installed" testing as that is covered in specification 23 0595.

6. **Sections 23 0500, 23 0553, 23 8241:**
   a. Revised per the attached.

7. **Sections 23 0523:**
   a. Added per the attached.

8. **Sections 23 0906:**
   a. Paragraph 1.01.A.6.b: The 230906 Control Supplier Installation Drawings (provided by Siemens Industry Inc. - Smart Infrastructure Division) dated 04/15/26 are attached to this Addendum.

CHANGES TO THE DRAWINGS

1. **G100 – CODE SUMMARY**
   a. Added Gross Square Footage Schedule.

2. **A114A – DIMENSION PLAN – LEVEL 4 – AREA A**
   a. Revised Storefront Tag in Open Office Workspace 420.

3. **A114B – DIMENSION PLAN – LEVEL 4 – AREA B**
    a. Revised Storefront Tags
    b. Added Enlarged Dimension Plans.

4. **A122A – ARCHITECTURAL PLAN – LEVEL 2 – AREA A**
    a. Revised Plan note 'A16'.

5. **A125A – ARCHITECTURAL PLAN – LEVEL 5 – AREA A**
    a. Revised hatch pattern to reference Lab spaces.

6. **A131B - REFLECTED CEILING PLAN - LEVEL 1 - AREA B**
    a. Added dimensions and section cut of the operable partition.

7. **A410 – COMMUNICATING STAIR DETAIL**
    a. Added dimension strand as indicated in RFI 49 response.

8. **A420 - ENLARGED FLOOR PLANS AND ELEVATIONS**
    a. Added interior elevation 6/A420

9. **A422 – ENLARGED FLOOR PLANS AND ELEVATIONS**
    a. Added Sheet Note Schedule.

10. **A430 - ENLARGED CEILING PLANS**
    a. Added section of ACB3 ceiling for clarity.

11. **A431 - ENLARGED CEILING PLANS AND DETAILS**
    a. Revised section cut of operable partition with STC rated access panels.

12. **A432 - ENLARGED CEILING PLANS**
    a. Revised dimensions on 2/A432 and 3/A432

13. **A441 – INTERIOR PLAN DETAILS**
    a. Added plan details of interior brick conditions.

14. **A461 – INTERIOR CEILING DETAILS**
    a. Revised detail 5/A461

15. **A462 – ELEVATOR CAB PLAN AND ELEVATION DETAILS**
    a. New sheet to detail elevator cab finishes and elevations.

16. **A520 – INTERIOR GLAZING SCHEDULE & ELEVATIONS**
    a. Updated Interior Storefront Schedule.

17. **A521 - INTERIOR STOREFRONT SYSTEM DETAILS**
    a. Revised head at storefront section detail 3/A521
    b. Revised glazing note on 6/A521
    c. Revised connection note on 12/A521
    d. Added rated glass door jamb detail 16/A521

18. **A601 – INTERIOR ELEVATIONS**
    a. Clarifications for WDP1 extents and trim profiles.
    b. New elevation provided for clarification.

19. **A602 - INTERIOR ELEVATIONS**
    a. Clarifications for WDP1 extents and trim profiles.

20. **A603 - INTERIOR ELEVATIONS**
    a. Clarifications for WDP1 extents and trim profiles.

21. **A604 – INTERIOR ELEVATIONS**
    a. Renumbered elevations for clarity.
    b. 3/A604 - ELEVATION – 103 EMERGENCY SHOWER
        i. Note provided.
        ii. Break lines provided.
    c. 12/A604 - ELEVATION – 107 EMERGENCY SHOWER 1
        i. Note provided.

22. **A605 - INTERIOR ELEVATIONS**
    a. 2/A605 - ELEVATION
        i. Revised model number of reglet trim.

23. **A606 – INTERIOR ELEVATIONS**
    a. 1/606 – ELEVATION – MTG RM 214 ENTRY
        i. Revised note.

24. **A607 – INTERIOR ELEVATIONS**
    a. Add Interior Elevation 9/A607.
    b. Add Interior Elevation 10/A607.

25. **A710 – EXTERIOR BUILDING SIGNAGE**
    a. 1/A710 - NORTH SCREENWALL – CAST SIGNAGE
        i. Revise language for mounting and letter size.
    b. 2/A710 - NORTH SCREENWALL – CAST SIGNAGE
        i. Revise language for mounting and letter size.

26. **A721 - MILLWORK**
    a. Revisions for Wall Paneling Details.

27. **A722 - MILLWORK**
    a. Added detail for the AWP2 mounting.

28. **IF000 – INTERIOR FINISH SCHEDULE**
    a. Interior Finish General Notes
        i. Product information revised
        ii. New general note provided.
    b. Interior Finish Keyed Notes:
        i. Existing keynote revised.

c. Interior Design Selection Summary:
    i. Product information revised.

29. IF001 – INTERIOR FINISH DETAILS

a. Typical Floor Transition Details:
    i. Titles revised for clarification.
    ii. Detail added for terrazzo to concrete transitions on L1.
    iii. Detail added for terrazzo to carpet transitions on L2-L5.

30. IF111A – INTERIOR FINISH PLAN – LEVEL 1 - AREA A

a. Dimension provided.

31. IF111B – INTERIOR FINISH PLAN – LEVEL 1 - AREA B

a. Existing keynotes revised.
b. Flooring type changed. Associated room tag revised.
c. Flooring type changed. Associated room tag revised. Flooring hatch pattern removed.
d. Dimensions added for clarification of carpet location.

32. IF112A – INTERIOR FINISH PLAN – LEVEL 2 - AREA A

a. Elevation marker provided.
b. Keynotes removed.
c. Flooring type changed.

33. IF112B – INTERIOR FINISH PLAN – LEVEL 2 - AREA B

a. Keynote extents revised.
b. Keynote extent revised. Associated dimension revised.
c. Keynote added.
d. Keynotes removed.
e. Dimension provided.
f. Flooring type changed. Floor transition at door eliminated.

34. IF113A – INTERIOR FINISH PLAN – LEVEL 3 - AREA A

a. Keynotes removed.
b. Flooring type removed. Associated transitions, notes, and room tag revised accordingly.
c. Dimensions provided.

35. IF113B – INTERIOR FINISH PLAN – LEVEL 3 - AREA B

a. Keynote extents revised.
b. Dimensions provided.
c. Keynote added.
d. Flooring type changed. Floor transition at door eliminated.

36. IF114A – INTERIOR FINISH PLAN – LEVEL 4 - AREA A

a. Keynotes removed.
b. Dimensions provided.
c. Flooring type changed.

37. **IF114B – INTERIOR FINISH PLAN – LEVEL 4 - AREA B**
    a. Keynote extents revised.
    b. Dimensions provided.
    c. Flooring type changed. Floor transition at door eliminated.

38. **IF115A – INTERIOR FINISH PLAN – LEVEL 5 - AREA A**
    a. Keynotes removed.
    b. Dimensions provided.
    c. Flooring type changed.

39. **IF115B – INTERIOR FINISH PLAN – LEVEL 5 – AREA B**
    a. Flooring extents revised. Associated existing notes adjusted and/or removed. Room tag revised to reflect adjustment. Terrazzo strip extents revised.
    b. Dimension provided.
    c. Flooring type changed. Floor transition at door eliminated.

40. **IF116A – INTERIOR FINISH PLAN – LEVEL 6 - AREA A**
    a. Flooring type changed.

41. **IF116B – INTERIOR FINISH PLAN – LEVEL 6 - AREA B**
    a. Flooring type changed.

42. **IF911 – INTERIOR SIGNAGE PLAN – LEVEL 1**
    a. New typical elevations provided for sign types. Corresponding dimensions and notes provided.
    b. Interior signage type key: Descriptions updated.
    c. Existing signage and associated tags slightly repositioned to be O.C of sink and / or drying rack.
    d. Signage types and associated tags added.

43. **IF912 – INTERIOR SIGNAGE PLAN – LEVEL 2**
    a. Existing signage and associated tags slightly repositioned to be O.C of sink and / or drying rack.

44. **IF913 – INTERIOR SIGNAGE PLAN – LEVEL 3**
    a. Existing signage and associated tags slightly repositioned to be O.C of sink and / or drying rack.

45. **IF914 – INTERIOR SIGNAGE PLAN – LEVEL 4**
    a. Signage types added.

46. **IF915 – INTERIOR SIGNAGE PLAN – LEVEL 5**
    a. Signage types and associated tags removed.
    b. Signage types and associated tags added.

47. **Q0.1 GENERAL INFORMATION**
    a. Identified Wellfield, Non-Potable Water, and ANSI signage locations in Typical Mounting Height legend.
    b. Added abbreviations for signage in the Equipment Abbreviations list.

c. Added accesssible fixture mounting location at Condition at Lab Sink detail.

48. **Q0.2 - CASEWORK LEGEND**
    a. Added a base cabinet type for an accessible base cabinet with an atypical depth.
    b. Updated vacuum pump cabinet descriptions to include locks.
    c. Updated Detail description “a” in the Casework Type Symbol legend.
    d. Added elevation of a bench mounted drying rack and updated drying rack tagging information in the Accessories legend.

49. **Q0.4 - CASEWORK SCHEDULES**
    a. Updated Fixture Legend and Service Fixture Schedule to include accessible gas and electrical fixtures.
    b. Identified Wellfield signage location at handwash sink.

50. **Q1.2 EQUIPMENT SCHEDULES**
    a. Added knockout panel elevation detail for pipping when adjacent to cable tray for the OSC types:OSC-01, OSC-02, OSC-02A, OSC-04, OSC-05.

51. **ENLARGED PLANS: Q7.1.3, Q7.1.4, Q7.3.1, Q7.4.1, Q7.5.1; ELEVATIONS: Q8.1.3, Q8.1.4, Q8.3.1, Q8.4.2, Q8.5.2**
    a. Updated accessible sink soap and paper towel dispenser locations.
    b. Added accessible gas and power services near accessible sinks.
    c. Added elevation of a bench mounted drying rack.
    d. Added point exhausts for OFOI 3D bioprinters in Cell Culture 327C and 527F.
    e. Updated base cabinet size to accommodate filler panels in Wet Lab 427 and 527.

52. **Q9.1 LAB CASEWORK DETAILS**
    a. Added knockout panel elevation detail to *72 BENCH OVERHEAD SERVICE COLUMN – ELEVATION*

53. **Drawings M002, M101, M102, M103, M104, M105, M201A, M201B, M202A, M202B, M203A, M203B, M204A, M204B, M205A, M205B, M301A, M301B, M302A, M302B. M303A, M303B, M304A, M304B, M305A, M305B, M400, M401, M403, M404, M501, M502, M504, M602, M603, M604, M605, M606, M608, M702, M703, M704, M705, M708, M709, M710, M801, M802, M808A, M810, M811, MPETFP1:**
    a. Revised per the attached.

54. **T100**
    a. Updated Fiber type and hand hole type for EV Charging stations

55. **T126A**
    a. Updated security camera data outlet locations.

56. **T126B**
    a. Updated security camera data outlet locations.

57. **T132, T133, T134, T135**
    a. Lower cable tray from 9'6" to 8'2"
    b. Updated sheet note to reflect solid bottom cable tray.

58. TY126A, TY126B

a. Additional Security camera added to penthouse
b. Security camera relocations in penthouse

END OF ADDENDUM NUMBER ONE

Attachments:

- Sections: **00 0110, 06 7400, 08 3100, 09 6623, 10 5129, 11 5313, 12 9300, 23 0500, 23 0523, 23 0553, 23 0906, 23 8241**

- Drawings: **G100, A114A, A114B, A122A, A125A, A131B, A410, A420, A422, A430, A431, A432, A441, A461, A462, A520, A521, A601, A602, A603, A604, A605, A606, A607, A710, A721, A722, IF000, IF001, IF111A, IF111B, IF112A, IF112B, IF113A, IF113B, IF114A, IF114B, IF115A, IF115B, IF116A, IF116B, IF911, IF912, IF913, IF914, IF915, Q0.1, Q0.2, Q0.4, Q1.2, Q7.1.3, Q7.1.4, Q7.3.1, Q7.4.1, Q7.5.1, Q8.1.3, Q8.1.4, Q8.3.1, Q8.4.2, Q8.5.2, Q9.1, M002, M101, M102, M103, M104, M105, M201A, M201B, M202A, M202B, M203A, M203B, M204A, M204B, M205A, M205B, M301A, M301B, M302A, M302B, M303A, M303B, M304A, M304B, M305A, M305B, M400, M401, M403, M404, M501, M502, M504, M602, M603, M604, M605, M606, M608, M702, M703, M704, M705, M708, M709, M710, M801, M802, M808A, M810, M811, MPETFP1, T100, T126A, T126B, T132, T133, T134, T135, TY126A, TY126B**

20250072 - IU LAB - BP4 Bidder RFI's

RFI #	Bid Package	Discipline	Sheet/Spec Section	Question	Answer	Response By	Addendum
1				Can an updated Responsibility Matrix be provided?	The responsibility matrix has not been updated since issued in BP3 addendum 02 on 1/12/26. Refer back to that issuance for the last version of the responsibility matrix. That is also the same version used in the GMP to IU.	BSA	ADD-01
2				Notice to Bidders states the Bids are Due on May 5th, 2026 @ 2:00pm EST. The project information in Building Connected states that FAW will receive sealed bids on Monday, May 4th 2026 until 2:00pm. Please confirm the bid date and time.	Bid Date is Tuesday, May 5th by 2:00PM with virutal bid opening directly following, link was provided in the Bid Manual.	FAW	ADD-01
3	BE4-10H	Interiors	IU Interior Signage 2016	Can a complete sign drawing package for this job be provided. We have the "standard" IU sign type drawings that I am attaching. However, there are (8) sign types listed in their list of signs on sheet IF 910 that calls out sign types that we have never seen. Those types are Q, O R, RS W, V, S and T. Please include the sign drawing package for this project so we can proceed with quoting.	Types R, RS, S & T are included for reference only and not included in scope of work. For sign type Q refer to architectural elevations for more information. Additional information to be issued in Addendum 01 for sign types Q, U, V, W.	FPD	ADD-01
4				Can further details and a specification be provided for the monument sculpture as shown on sheet LA100?	The monument sculptures shown on sheet LA100 are not part of the current scope of work to bid. These will be future installations once IU has determined their design and procurement process.	IU	ADD-01
6	BE4-10B	Architectural	Substitution Request Documentation Link	Spectrum Lockers - 10 5129	Product is an acceptable substitution, though finish will be required to match Wilsonart "Landmark Wood" specified in project documents. It is not listed as a standard finish but is listed as an option.	BSA	ADD-01
8	BE4-10F			If we submit the Interior Signage pricing and not Exterior, will we be considered for this project? We do not manufacture Exterior signage.	Interior and exterior signage packages are now being accepted as individual packages, see scope of work revisions. 10F (Interior Signage) and 10H Signage (Exterior)	FAW	ADD-01
9	BE4-32C	Architectural		I can't locate details on the bus shelter on one site drawing showing "bus stop shelter" and it says see architectural drawings but none of those show the shelter. Could the bus shelter drawings and details be provided?	There are no drawings or details of the bus shelter as it is a prefabricated element. Refer to spec section 10 7343 for further information.	BSA	ADD-01
11				Looks like Wilhelm is the CM. Is this correct?	Yes	FAW	ADD-01
12	BE4-13A	Lab Planning		Will lab casework materials be delivering all at once? What is the phasing schedule? I can't locate one in the project documents.	No, For approximate delivery windows reference finishes line item for each level on the project schedule provided, lab casework will be starting at the end date.	FAW	ADD-01
13	BE4-13A	Lab Planning		Will lab casework materials be delivering 1st quarter of 2027?	Level 2 is the only delivery window currently in Q1	FAW	ADD-01
14	BE4-13A	Lab Planning		Are to pick up the hoods that are labeled as "FUTURE FH-1-6" on fume hood schedule Q1.1?	FAW thinks no, please confirm; SmithGroup: Future fume hoods are not a part of day one equipment and are not to be included.	SmithGroup	ADD-01
15	BE4-08C	Architectural		I do see that there are fire curtains on this project. I will get pricing for that. It also looks like you will need smoke curtains for the elevators. Can you confirm if smoke curtains are required at the elevators? If so, I can get pricing for that as well.	There are only (2) locations that will have UL 10B deployable fire-protective smoke curtains. Locations are on 2nd & 3rd floors as identified with an "L2" keynote on sheets G202 & G203. Also refer to spec section 07 8700 for additional information.	BSA	ADD-01

SECTION 00 0110
TABLE OF CONTENTS

THIS TABLE OF CONTENTS IS CUMULATIVE. SPECIFICATION SECTIONS AND REVISIONS ISSUED SINCE PREVIOUS CUMULATIVE WORK PACKAGE ARE INDICATED WITH BOLD FONT.

SPECIFICATIONS FOR THIS PROJECT ARE BEING BID IN SEPARATE BID PACKAGES BUT BEING ISSUED AS A CUMULATIVE WORK PACKAGE. REQUIREMENTS IN SPECIFICATION SECTIONS MAY BE REVISED AS DESIGN, PRODUCT, AND COORDINATION DECISIONS ARE MADE, AND TO INCLUDE REQUIREMENTS FOR SUBSEQUENT CUMULATIVE WORK PACKAGE REVISIONS THAT WILL BE REISSUED.

SPECIFICATION SECTIONS MAY CONTAIN REQUIREMENTS THAT DO NOT APPLY TO THE SCOPE OF WORK IN THE BID PACKAGES BEING SEPARATED AND ISSUED BY THE CONTRACTOR TO VARIOUS TRADES AND SUBCONTRACTORS, AS WELL AS CROSS REFERENCES TO SPECIFICATION SECTIONS THAT HAVE NOT YET BEEN ISSUED FOR CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING WITH THE ARCHITECT WHETHER A REVISION OF A SPECIFICATION SECTION HAS BEEN ISSUED AND IS CAUTIONED TO DO SO BEFORE PURCHASING PRODUCTS OR STARTING WORK DESCRIBED IN THE SECTION.

CONSTRUCTION CHANGES REQUIRED BECAUSE OF CONTRACTOR'S FAILURE TO USE CORRECT VERSION OF SPECIFICATIONS SECTIONS SHALL BE MADE AT NO ADDITIONAL COST TO OWNER.

PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
00 0105	Certifications Page	03/30/2026	BP4 CD: Build-Out Package		
00 0110	Table of Contents	03/30/2026	BP4 CD: Build-Out Package		
00 3100	Available Project Information	03/30/2026	BP4 CD: Build-Out Package		
00 4325	Substitution Request Form During Procurement	03/30/2026	BP4 CD: Build-Out Package		

SPECIFICATIONS

DIVISION 01 -- GENERAL REQUIREMENTS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
01 2000	Price and Payment Procedures	03/30/2026	BP4 CD: Build-Out Package		

01 2300	Alternates	03/30/2026	BP4 CD: Build-Out Package		
01 2500	Substitution Procedures	03/30/2026	BP4 CD: Build-Out Package		
01 3000	Administrative Requirements	03/30/2026	BP4 CD: Build-Out Package		
01 3329.02	Sustainable Design Reporting - LEED v4	03/30/2026	BP4 CD: Build-Out Package		
01 3566.05	Project Sustainability Goal Credit Summary - LEED v4	03/30/2026	BP4 CD: Build-Out Package		
01 3566.12	Sustainability Certification Project Procedures - LEED v4	03/30/2026	BP4 CD: Build-Out Package		
01 4000	Quality Requirements	03/30/2026	BP4 CD: Build-Out Package		
01 4219	Reference Standards	03/30/2026	BP4 CD: Build-Out Package		
01 6000	Product Requirements	03/30/2026	BP4 CD: Build-Out Package		
01 6116	Volatile Organic Compound (VOC) Content Restrictions	03/30/2026	BP4 CD: Build-Out Package		
01 7000	Execution and Closeout Requirements	03/30/2026	BP4 CD: Build-Out Package		
01 7419	Construction Waste Management and Disposal	03/30/2026	BP4 CD: Build-Out Package		
01 7800	Closeout Submittals	03/30/2026	BP4 CD: Build-Out Package		
01 7900	Demonstration and Training	03/30/2026	BP4 CD: Build-Out Package		
01 8000	Airborne Contaminants Control	03/30/2026	BP4 CD: Build-Out Package		
01 8001	Contractor Project Procedures	03/30/2026	BP4 CD: Build-Out Package		
01 9100	Commissioning	03/30/2026	BP4 CD: Build-Out Package		
01 9151	Systems Manual	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 02 -- EXISTING CONDITIONS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision

02 0100	Maintenance of Existing Conditions	09/29/2025	BP1 CD: Site and Foundation Package		
02 4113	Selective Site Demolition	11/17/2025	BP2 CD: Early Equipment Package		

DIVISION 03 -- CONCRETE

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
03 1000	Concrete Formwork	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2
03 2000	Concrete Reinforcement	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2
03 3000	Cast-in-Place Concrete	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2
03 3511	Concrete Floor Finishes	03/30/2026	BP4 CD: Build-Out Package		
03 4500	Precast Architectural Concrete	12/15/2025	BP3 CD: Core and Shell Package	12/15/2025	
03 5216	Lightweight Insulating Concrete	01/07/2026	BP3 CD: Addendum 01		
03 6000	Epoxy Grout	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2
03 6001	Grouting	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2
03 6200	Non Shrink Grouting	09/29/2025	BP1 CD: Site and Foundation Package	12/15/2025	2

DIVISION 04 -- MASONRY

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
04 2000	Unit Masonry	12/15/2025	BP3 CD: Core and Shell Package		
04 4313	Stone Masonry Veneer	12/15/2025	BP3 CD: Core and Shell Package		

DIVISION 05 -- METALS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
05 1200	Structural Steel Framing	12/15/2025	BP3 CD: Core and Shell Package		
05 3123	Steel Roof Decking	12/15/2025	BP3 CD: Core and Shell Package		

05 3600	Composite Metal Decking	12/15/2025	BP3 CD: Core and Shell Package		
05 4000	Cold-Formed Metal Framing	12/15/2025	BP3 CD: Core and Shell Package		
05 5000	Metal Fabrications	12/15/2025	BP3 CD: Core and Shell Package		
05 5100	Metal Stairs	12/15/2025	BP3 CD: Core and Shell Package		
05 5133	Metal Ladders	12/15/2025	BP3 CD: Core and Shell Package		
05 5213	Pipe and Tube Railings	12/15/2025	BP3 CD: Core and Shell Package		
05 5305	Metal Gratings and Floor Plates	12/15/2025	BP3 CD: Core and Shell Package		
05 7100	Decorative Metal Stairs	12/15/2025	BP3 CD: Core and Shell Package		
05 7300	Decorative Metal Railings	03/30/2026	BP4 CD: Build-Out Package		
05 7500	Decorative Formed Metal	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
06 1053	Miscellaneous Rough Carpentry	12/15/2025	BP3 CD: Core and Shell Package		
06 1600	Sheathing - USG	12/15/2025	BP3 CD: Core and Shell Package		
06 2000	Finish Carpentry	03/30/2026	BP4 CD: Build-Out Package		
06 4100	Architectural Wood Casework	03/30/2026	BP4 CD: Build-Out Package		
06 6413	Translucent Resin Panel Fabrications	03/30/2026	BP4 CD: Build-Out Package		
06 4200	Wood Paneling	03/30/2026	BP4 CD: Build-Out Package		
06 7400	**Composite Gratings**	**03/30/2026**	**BP4 CD: Build-Out Package**		

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
07 1113	Bituminous Dampproofing	09/29/2025	BP1 CD: Site and Foundation Package		

07 1300	Sheet Waterproofing	09/29/2025	BP1 CD: Site and Foundation Package		
07 1616	Crystalline Waterproofing	09/29/2025	BP1 CD: Site and Foundation Package		
07 2100	Thermal Insulation	12/15/2025	BP3 CD: Core and Shell Package		
07 2113.13	Foam Board Insulation - Hunter	12/15/2025	BP3 CD: Core and Shell Package		
07 2400	Exterior Insulation and Finish Systems	12/15/2025	BP3 CD: Core and Shell Package		
07 2700	Air Barriers	12/15/2025	BP3 CD: Core and Shell Package		
07 4113	Metal Roof Panels	12/15/2025	BP3 CD: Core and Shell Package		
07 4213	Metal Wall Panels	01/19/2026	BP3 CD: Addendum 03		
07 4213.19	Insulated Metal Wall Panels	12/15/2025	BP3 CD: Core and Shell Package		
07 4213.23	Metal Composite Material Wall Panels	12/15/2025	BP3 CD: Core and Shell Package	01/19/2026	2
07 5323	EPDM Thermoset Single-Ply Roofing - Carlisle	12/15/2025	BP3 CD: Core and Shell Package	01/19/2026	3
07 5556	Fluid- Applied Protected Membrane Roofing	12/15/2025	BP3 CD: Core and Shell Package		
07 6200	Sheet Metal Flashing and Trim	12/15/2025	BP3 CD: Core and Shell Package	01/19/2026	2
07 7100	Roof Specialties	12/15/2025	BP3 CD: Core and Shell Package		
07 7200	Roof Accessories	12/15/2025	BP3 CD: Core and Shell Package		
07 7600	Roof Pavers	12/15/2025	BP3 CD: Core and Shell Package		
07 8100	Applied Fire Protection	12/15/2025	BP3 CD: Core and Shell Package		
07 8400	Firestopping	12/15/2025	BP3 CD: Core and Shell Package		
07 8700	Smoke Containment Barriers	03/30/2026	BP4 CD: Build-Out Package		
07 9200	Joint Sealants	12/15/2025	BP3 CD: Core and Shell Package		

DIVISION 08 -- OPENINGS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision

08 1113	Hollow Metal Doors and Frames	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
08 1116	Aluminum Doors and Frames	12/15/2025	BP3 CD: Core and Shell Package		
08 3100	**Access Doors and Panels**	**03/30/2026**	**BP4 CD: Build-Out Package**	**04/20/2026**	**2**
08 3323	Overhead Coiling Doors	12/15/2025	BP3 CD: Core and Shell Package	01/07/2026	2
08 3400	Special Function Doors	03/30/2026	BP4 CD: Build-Out Package		
08 4313	Aluminum-Framed Storefronts	03/30/2026	BP4 CD: Build-Out Package		
08 4413	Glazed Aluminum Curtain Walls	12/15/2025	BP3 CD: Core and Shell Package	01/19/2026	3
08 4435	Protective Framed Glazing Assemblies	03/30/2026	BP4 CD: Build-Out Package		
08 7100	Door Hardware	03/30/2026	BP4 CD: Build-Out Package		
08 8000	Glazing	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	3
08 8720	Architectural Glazing Film	03/30/2026	BP4 CD: Build-Out Package		
08 8813	Fire-Rated Glazing	03/30/2026	BP4 CD: Build-Out Package		
08 9100	Louvers	12/15/2025	BP3 CD: Core and Shell Package	01/07/2026	2

DIVISION 09 -- FINISHES

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
09 2116	Gypsum Board Assemblies	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	3
09 2700	Plaster Fabrications	03/30/2026	BP4 CD: Build-Out Package		
09 3013	Ceramic Tiling	03/30/2026	BP4 CD: Build-Out Package		
09 5000	Acoustical Panels	03/30/2026	BP4 CD: Build-Out Package		
09 5100	Linear Acoustical Panel Ceilings	03/30/2026	BP4 CD: Build-Out Package		
09 5123	Acoustical Tile Ceilings	03/30/2026	BP4 CD: Build-Out Package		
09 5423	Metal Ceilings	03/30/2026	BP4 CD: Build-Out Package		
09 6513	Resilient Base and Accessories	03/30/2026	BP4 CD: Build-Out Package		

09 6516	Resilient Sheet Flooring	03/30/2026	BP4 CD: Build-Out Package		
09 6519	Resilient Tile Flooring	03/30/2026	BP4 CD: Build-Out Package		
09 6536	Static-Control Resilient Flooring	03/30/2026	BP4 CD: Build-Out Package		
09 6623	**Resinous Matrix Terrazzo Flooring**	**03/30/2026**	**BP4 CD: Build-Out Package**	**04/20/2026**	**2**
09 6723	Resinous Flooring	03/30/2026	BP4 CD: Build-Out Package		
09 6813	Tile Carpeting	03/30/2026	BP4 CD: Build-Out Package		
09 7200	Wall Coverings	03/30/2026	BP4 CD: Build-Out Package		
09 7713	Stretched-Fabric Wall Systems	03/30/2026	BP4 CD: Build-Out Package		
09 8433	Sound Absorbing Wall Units	03/30/2026	BP4 CD: Build-Out Package		
09 9000	High Performance Coatings	03/30/2026	BP4 CD: Build-Out Package		
09 9113	Exterior Painting	12/15/2025	BP3 CD: Core and Shell Package	01/19/2026	2
09 9123	Interior Painting	03/30/2026	BP4 CD: Build-Out Package		
09 9300	Staining and Transparent Finishing	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 10 -- SPECIALTIES

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
10 1100	Visual Display Boards	03/30/2026	BP4 CD: Build-Out Package		
10 1400	Interior Signage	03/30/2026	BP4 CD: Build-Out Package		
10 1419	Dimensional Letter Signage	03/30/2026	BP4 CD: Build-Out Package		
10 2113.13	Metal Toilet Compartments	03/30/2026	BP4 CD: Build-Out Package		
10 2213	Wire Mesh Partitions	12/15/2025	BP3 CD: Core and Shell Package		
10 2239	Folding Panel Partitions	03/30/2026	BP4 CD: Build-Out Package		
10 2600	Wall and Door Protection	03/30/2026	BP4 CD: Build-Out Package		
10 2800	Toilet, Bath, and Laundry Accessories	03/30/2026	BP4 CD: Build-Out Package		

10 4300	Emergency Aid Specialties	03/30/2026	BP4 CD: Build-Out Package		
10 4400	Fire Protection Specialties	03/30/2026	BP4 CD: Build-Out Package		
10 5113	Metal Locker	03/30/2026	BP4 CD: Build-Out Package		
10 5129	**Phenolic Lockers**	**03/30/2026**	**BP4 CD: Build-Out Package**	**04/20/2026**	**2**
10 5617	Wall Mounted Standards and Shelving	03/30/2026	BP4 CD: Build-Out Package		
10 7343	Transportation Stop Shelters	09/29/2025	BP1 CD: Site and Foundation Package		
10 7500	Flagpoles	09/29/2025	BP1 CD: Site and Foundation Package		
10 8213	Exterior Grilles and Screens	12/15/2025	BP3 CD: Core and Shell Package		
10 8223	Interior Grilles and Screens	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 11 -- EQUIPMENT

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
11 3013	Residential Appliances	03/30/2026	BP4 CD: Build-Out Package		
11 5300	Miscellaneous Laboratory Equipment	03/30/2026	BP4 CD: Build-Out Package		
11 5313	**Laboratory Fume Hoods**	**03/30/2026**	**BP4 CD: Build-Out Package**	**04/20/2026**	**2**
11 5317	Laboratory Glassware Washers	03/30/2026	BP4 CD: Build-Out Package		
11 5319	Laboratory Sterilizers with Electric Steam Generators	03/30/2026	BP4 CD: Build-Out Package		
11 8129	Facility Fall Protection	12/15/2025	BP3 CD: Core and Shell Package		

DIVISION 12 -- FURNISHINGS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
12 2413	Roller Window Shades	03/30/2026	BP4 CD: Build-Out Package		
12 3553	General Requirements for	03/30/2026	BP4 CD: Build-Out Package		

	Laboratory Casework and Fume Hoods				
12 3553.03	Adaptable Laboratory Casework Systems	03/30/2026	BP4 CD: Build-Out Package		
12 3553.13	Metal Laboratory Casework with Wood Fronts	03/30/2026	BP4 CD: Build-Out Package		
12 3661	Simulated Stone Countertops	03/30/2026	BP4 CD: Build-Out Package		
12 6200	Upholstered Furniture	03/30/2026	BP4 CD: Build-Out Package		
12 9300	Site Furnishings	09/29/2025	BP1 CD: Site and Foundation Package	10/15/2025	2
12 9313	Bicycle Racks	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 13 -- SPECIAL CONSTRUCTION

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
13 2100	Controlled Environmental Rooms	03/30/2026	BP4 CD: Build-Out Package		

DIVISION 14 -- CONVEYING EQUIPMENT

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
14 2123	Machine Room-Less Electric Traction Passenger Elevators	12/15/2025	BP3 CD: Core and Shell Package		

DIVISION 21 -- FIRE SUPPRESSION

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
21 0800	Commissioning of Fire Suppression Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
21 1300	Fire Sprinkler and Standpipe Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
21 3000	Fire Pumps, Pump Controllers, and Other Appurtenances	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

DIVISION 22 -- PLUMBING

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
22 0500	Common Work Results for Plumbing	12/15/2025	BP3 CD: Core and Shell Package		
22 0523.14	Check Valves for Plumbing Piping	03/30/2026	BP4 CD: Build-Out Package		
22 0523.15	Gate Valves for Plumbing Piping	03/30/2026	BP4 CD: Build-Out Package		
22 0529	Hangers and Supports for Plumbing Piping and Equipment	03/30/2026	BP4 CD: Build-Out Package		
22 0553	Identification for Plumbing Piping and Equipment	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
22 0716	Plumbing Equipment Insulation	03/30/2026	BP4 CD: Build-Out Package		
22 0719	**Plumbing Piping Insulation**	**03/30/2026**	**BP4 CD: Build-Out Package**		
22 0800	Commissioning of Plumbing Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
22 1005	Plumbing Piping	12/15/2025	BP3 CD: Core and Shell Package		
22 1116	Domestic Water Piping	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
22 1119	Domestic Water Piping Specialties	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
22 1123.13	Natural Gas Piping and Accessories	12/15/2025	BP3 CD: Core and Shell Package		
22 1123.21	Inline, Domestic-Water Pumps	03/30/2026	BP4 CD: Build-Out Package		
22 1300	Sanitary Waste and Vent Piping	12/15/2025	BP3 CD: Core and Shell Package		
22 1329	Laboratory Waste and Vent Piping	12/15/2025	BP3 CD: Core and Shell Package		
22 1400	Storm Drainage Piping and Accessories	12/15/2025	BP3 CD: Core and Shell Package		
22 3400	Gas-Fired Domestic Water Heaters	12/15/2025	BP3 CD: Core and Shell Package		
22 4000	Plumbing Fixtures	12/15/2025	BP3 CD: Core and Shell Package		
22 6200	Laboratory Compressed Air Generation System	12/15/2025	BP3 CD: Core and Shell Package		

22 6213	Laboratory Compressed Air Piping	12/15/2025	BP3 CD: Core and Shell Package		
22 8300	Laboratory High Purity Water Piping	12/15/2025	BP3 CD: Core and Shell Package		

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

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
23 0500	**Common Work Results for HVAC**	**12/15/2025**	**BP3 CD: Core and Shell Package**	**04/20/2026**	**3**
23 0513	Common Motor Requirements for HVAC Equipment	11/17/2025	BP2 CD: Early Equipment Package		
23 0517	Sleeves and Sleeve Seals for HVAC Piping	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0519	Meters and Gauges for HVAC Piping	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0523	**General-Duty Valves for HVAC Piping**	**12/15/2025**	**BP3 CD: Core and Shell Package**	**04/20/2026**	**3**
23 0529	Hangers and Supports for HVAC Piping and Equipment	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0548	Vibration and Noise Control for HVAC, Piping, and Equipment	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0553	**Identification for HVAC Piping and Equipment**	**12/15/2025**	**BP3 CD: Core and Shell Package**	**04/20/2026**	**3**
23 0593	Testing, Adjusting, and Balancing for HVAC	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0595	Certification of Fume Hoods	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0713	Duct Insulation	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0716	HVAC Equipment Insulation	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0719	HVAC Piping Insulation	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0800	Commissioning of HVAC Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 0906	**Control Installation Contract**	**12/15/2025**	**BP3 CD: Core and Shell Package**	**04/20/2026**	**3**
23 2113	Hydronic Piping	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

23 2114	Hydronic Specialties	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 2123	Hydronic Pumps	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 2213	Steam and Condensate Heating Piping	03/30/2026	BP4 CD: Build-Out Package		
23 2500	HVAC Water Treatment	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 2501	Glycol Water Treatment	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 2502	HVAC Water Filtration Equipment	03/30/2026	BP4 CD: Build-Out Package		
23 3100	HVAC Ducts and Casings	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3300	Air Duct Accessories	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3319	Duct Silencers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3420	Induced Dilution Exhaust Fans	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3423	HVAC Power Ventilators	03/30/2026	BP4 CD: Build-Out Package		
23 3439	High-Volume, Low-Speed Propeller Fans	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3600	Air Terminal Units	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 3700	Air Outlets and Inlets	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 5100	Breechings, Chimneys, and Stacks	12/15/2025	BP3 CD: Core and Shell Package		
23 5216	Condensing Boilers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 5700	Heat Exchangers for HVAC	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 6416	Centrifugal Water Chillers	11/17/2025	BP2 CD: Early Equipment Package	12/09/2025	2
23 6423	Scroll Water Chillers	03/30/2026	BP4 CD: Build-Out Package		
23 6514	Induced-Draft Cooling Towers	11/17/2025	BP2 CD: Early Equipment Package	12/09/2025	2
23 6515	Induced-Draft Fluid Coolers	03/30/2026	BP4 CD: Build-Out Package		
23 7200	Air-to-Air Energy Recovery Equipment	11/17/2025	BP2 CD: Early Equipment Package		

23 7213	Custom Air Handling Units	11/17/2025	BP2 CD: Early Equipment Package		
23 8200	Miscellaneous Heating and Cooling Units	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 8214	Chilled Beams	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 8216	Air Coils	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
23 8241	**Water-to-Water Heat Pumps**	**12/15/2025**	**BP3 CD: Core and Shell Package**	**04/20/2026**	**3**
23 8413.29	Self-Contained Humidifiers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

DIVISION 25 -- INTEGRATED AUTOMATION (NOT USED)

DIVISION 26 -- ELECTRICAL

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
26 0513	Medium-Voltage Cables	11/17/2025	BP2 CD: Early Equipment Package	12/09/2025	2
26 0519	Low-Voltage Electrical Power Conductors and Cables	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0526	Grounding and Bonding for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0529	Hangers and Supports for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0533.13	Conduit for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0533.16	Boxes for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0533.23	Surface Raceways for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0543	Electrical Underground Ducts, Ductbanks, and Manholes	11/17/2025	BP2 CD: Early Equipment Package	03/30/2026	3
26 0548	Vibration and Seismic Controls for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0553	Identification for Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

26 0573	Power System Studies	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0800	Commissioning of Electrical Systems	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 0923	Lighting Control Devices	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 1116	Secondary Unit Substations	11/17/2025	BP2 CD: Early Equipment Package	03/30/2026	3
26 2200	Low-Voltage Transformers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2413	Switchboards	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2416	Panelboards	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2726	Wiring Devices	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2813	Fuses	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2816.13	Enclosed Circuit Breakers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2816.16	Enclosed Switches	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2913	Enclosed Controllers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 2923	Variable-Frequency Motor Controllers	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 3213	Engine Generators	11/17/2025	BP2 CD: Early Equipment Package	03/30/2026	3
26 3600	Transfer Switches	11/17/2025	BP2 CD: Early Equipment Package	03/30/2026	3
26 3633	Connection Cabinets for Portable Generators and Load Banks	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 4100	Facility Lightning Protection	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 4300	Surge Protective Devices	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 5100	Interior Lighting	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
26 5600	Exterior Lighting	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

DIVISION 27 -- COMMUNICATIONS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision

27 0100	Operation and Maintenance	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0200	References	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0300	Definitions	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0410	Quality Assurance	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0420	Submittals	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0430	Delivery, Storage and Handling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0440	Sequencing and Scheduling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0450	General Installation	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0460	Testing and Documentation	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0470	Record Drawings	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0480	Warranty	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0500	Common Work Results	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0526	Grounding and Bonding	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0528	Pathways	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0529	Hangers and Supports	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0533	Conduits and Backboxes	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0536	Cable Trays	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0539	Surface Raceways	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0543	Underground Duct Systems and Raceways	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 0553	Identification	03/30/2026	BP4 CD: Build-Out Package		
27 0600	Schedules for Communications	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1100	Equipment Room Fittings	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1113	Entrance Protection	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

27 1116	Cabinets, Racks, Frames and Enclosures	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1119	Termination Blocks and Patch Panels	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1123	Cable Management and Ladder Rack	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1136	Equipment Rack Layouts	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1146	Equipment Room Layout	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1200	Transmission Media	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1313	Copper Backbone Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1323	Optical Fiber Backbone Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1500	Horizontal Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1516	Voice Communications Horizontal Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1519	Data Communications Copper Horizontal Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 1543	Faceplates and Connectors	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 3523	Emergency Responder Radio Coverage	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 4000	Audio-Video Communications	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 5123	Two-Way Communication System	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
27 9999	Appendix: Design Guide	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
28 0413	Common Submittal Requirements for Electronic Safety and Security	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

28 0513	Conductors and Cables for Electronic Safety and Security	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 0526	Grounding and Bonding for Electronic Safety and Security	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 0528	Pathways for Electronic Safety and Security	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 0544	Sleeves and Sleeve Seals for Electronic Safety and Security Pathways and Cabling	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 1300	Access Control	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 2300	Video Surveillance	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2
28 3111	Digital, Addressable Fire-Alarm System	12/15/2025	BP3 CD: Core and Shell Package	03/30/2026	2

DIVISION 31 -- EARTHWORK

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
31 1100	Site Clearing	09/29/2025	BP1 CD: Site and Foundation Package		
31 2000	Earthwork	11/17/2025	BP2 CD: Early Equipment Package		
31 2323	Flowable Fill	09/29/2025	BP1 CD: Site and Foundation Package		
31 2330	CU Structural Soil	09/29/2025	BP1 CD: Site and Foundation Package		
31 2500	Erosion Control	09/29/2025	BP1 CD: Site and Foundation Package		
31 3116	Termite Control	09/29/2025	BP1 CD: Site and Foundation Package		
31 6000	Rammed Aggregate Pier	09/29/2025	BP1 CD: Site and Foundation Package		

DIVISION 32 -- EXTERIOR IMPROVEMENTS

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
32 1216	Asphalt Paving	09/29/2025	BP1 CD: Site and Foundation Package		

32 1300	Site Concrete	09/29/2025	BP1 CD: Site and Foundation Package		
32 1723	Pavement Marking	09/29/2025	BP1 CD: Site and Foundation Package		
32 8000	Irrigation System (Design-Build)	09/29/2025	BP1 CD: Site and Foundation Package		
32 9200	Seeding	09/29/2025	BP1 CD: Site and Foundation Package		
32 9223	Sodding	11/26/2025	ASI 003		
32 9300	Planting	09/29/2025	BP1 CD: Site and Foundation Package		
32 9443	Tree Grate	09/29/2025	BP1 CD: Site and Foundation Package		
32 9450	Pavement Support System	09/29/2025	BP1 CD: Site and Foundation Package		

DIVISION 33 -- UTILITIES

Section Number	Section Name	Section Issue Date	Section Issue Description	Current Revision Date	Current Revision
33 0500	Common Work Results for Utilities	11/17/2025	BP2 CD: Early Equipment Package		
33 1000	Site Water Distribution	09/29/2025	BP1 CD: Site and Foundation Package		
33 3000	Sanitary Sewers	11/17/2025	BP2 CD: Early Equipment Package		
33 4000	Storm Drainage	09/29/2025	BP1 CD: Site and Foundation Package		
33 4600	Subdrainage	09/29/2025	BP1 CD: Site and Foundation Package		

END OF SECTION 00 0110

SECTION 06 7400
COMPOSITE GRATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Molded gratings.

B. Grating edge components.

C. Panel clips.

1.02 DEFINITIONS

A. Comply with ANSI/ACMA (GM) for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

A. ANSI/ACMA (GM) - FRP Composites Grating Manual for Pultruded and Molded Grating and Stair Treads.

B. ANSI/ACMA/PIC (CSP) - Code of Standard Practice, Industry Guidelines for Fabrication and Installation of Pultruded FRP Structures.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

D. ASCE/ACMA (PS) - ASCE/ACMA Pre-Standard for Load & Resistance Design (LRFD) of Pultruded (FRP) Structures.

E. ASTM A436 - Standard Specification for Austenitic Gray Iron Castings.

F. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

H. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

I. ASTM F594 - Standard Specification for Stainless Steel Nuts.

1.04 ADMINSTRATIVE REQUIREMENTS

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements relating to preinstallation meetings.

B. Coordination: Coordinate fabrication and construction requiring holes and cutouts in composite gratings.

C. Preinstallation Meeting: Conduct preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data - Molded Gratings: Include resin, load/deflection tables, panel size, panel depth, mesh dimensions, load bar centers, load bars per foot, open area, bonded grit, color, panel anchoring clips, and bolt assemblies.

C. Shop Drawings: For each grating system:
   1. Elevations, Plans, and Sections: Include dimensions; indicate panel sizes, panel layouts, and clearances between panels and adjacent construction.
      a. Drawing Scale: 1/4 inch to 1 foot, minimum.

2. Details: Include connection, fastening, and anchorage details; indicate clearances between grating and adjacent construction.
   a. Drawing Scale: 1-1/2 inches to 1 foot, minimum.

D. Delegated Design Documents: Drawings and calculations sealed by Designer:
   1. Sufficient to demonstrate compliance with ASCE/ACMA (PS) and applicable building code; signed and sealed by Engineer of Record for design of composite gratings.

E. Test Reports: Provide test reports of surfacing burning characteristics of tested grating panel; provide report in accordance with reporting criteria of ASTM E84.

F. Source Quality Control Submittals: Report documenting compliance with quality control section of ANSI/ACMA/PIC (CSP).

G. Designer's qualification statement.

H. Fabricator's qualification statement.

I. Executed Warranty.

1.06 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of composite grating systems and licensed in the State in which the Project is located.

B. Fabricator Qualifications: Company specializing in fabricating products of this section, with at least ten years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original, unbroken packages or bundles bearing label of manufacturer.

B. Store materials in enclosed areas, under cover, and elevated above grade.

C. Store resins, catalysts, and hardeners in accordance with manufacturer's instructions.

D. Protect composite grating panels from damage, including abrasion, cracking, chipping, and twisting.

E. Packaging Waste Management: See Section 01 7419 - Construction Waste Management and Disposal.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 3-year manufacturer warranty against defective products. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 COMPOSITE GRATINGS - GENERAL

A. Fiber-Reinforced Polymer (FRP) Composite Gratings:
   1. Composite grating plates manufactured by molded or pultrusion process; composed of reinforcements and resins; in qualities, quantities, and arrangements required to meet specified requirements.
   2. Surface Burning Characteristics: Flame spread rating of 25 or less when tested in accordance with ASTM E84.
   3. Fabricate bars smooth and uniform with no evidence of visible glass fibers, fiber orientation irregularities, interlaminar voids, porosity, or resin-starved areas.

4. Finished Surfaces: Smooth, resin-rich, free of voids; without dry spots, cracks, crazes, or unreinforced areas.

2.02 DESIGN CRITERIA:

A. Comply with requirements for Contractor's design-related professional services indicated in Section 01 4000 - Quality Requirements.

B. Design Criteria: Design composite grating systems in accordance with applicable building codes.

C. Design Loads: As indicated on drawings.

D. Earthquake Loads: Comply with ASCE 7 and with local authorities having jurisdiction.
1. Site Class: C.
2. Seismic Design Category: B.
3. Seismic Importance Factor: 1.25.

2.03 MOLDED GRATINGS

A. Manufacturers:
1. McNichols Co.; MS-S-200 Fiberglass Grating: www.mcnichols.com/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Description: FRP composite grating plates manufactured by open, heated mold; one-piece construction with tops and bottoms of bars in same plane.

C. Reinforcements: Continuous rovings of equal number of layers in each direction; top layer of reinforcement 3/16 inch maximum below top surface; 40 percent maximum glass content by weight.

D. Molded Gratings:
1. Resin: Fiberglass-reinforced polyester resin.
2. Mesh Pattern: 2 inches by 2 inches.
3. Bearing Bar Width: 19/64 inch top, 13/64 inch bottom.
4. Bearing Bar Depth: 2 inches.
5. Surfacing: Applied grit.
6. Color: Dark gray.

2.04 GRATING EDGE COMPONENTS

A. Manufacturer's standard composite edge components for composite grating, including edge banding, kickplates, and kickplate supporting angles.

2.05 PANEL CLIPS

A. Manufacturer's standard metal clips for securing grating panels to structural supports; end panel clips for panel-to-panel unsupported connections.
1. Stainless Steel: Comply with ASTM A666/A666M, Type 316 alloy.

2.06 ACCESSORIES

A. Stainless Steel Fasteners:
1. Bolts and Nuts: ASTM F593 bolts and ASTM F594 nuts.
2. Washers: Compatible with stainless steel grades of bolts and nuts; in accordance with size requirements of ASTM A436.

2.07 FABRICATION

A. Fabricate gratings in accordance with fabrication chapter of ANSI/ACMA/PIC (CSP).

B. Assemble grating panels for tightly fitted and secured joints.

C. Fabricate grating panels free from warps, twists, or other defects that would negatively affect appearance and serviceability.

D. Fabricate openings in grating panels as indicated on drawings; provide additional grating support as required in accordance with structural performance requirements.

E. Fabricate grating panels free from visual defects of foreign inclusion, delaminations, blisters, resin burns, air bubbles, and pits. Classify visual defects in accordance with ASTM D4385.

F. Fabricate grating panels to be readily-removable.

G. Fabricate grating panels to sizes that will accommodate clearances indicated below:
   1. Between Panels and Vertical Surfaces: 4 inch minimum.
   2. Between Adjacent Panels: 1/4 inch.

H. Matchmark grating panels and edge components to facilitate correct relative position assembly.

2.08 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Verify compliance with quality control sections of ANSI/ACMA/PIC (CSP) indicated below:
   1. Conformance to design and specifications.
   2. Material inspection.
   3. Fabrication inspection.
   4. Internal auditing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify supporting conditions are acceptable and ready to receive work.

3.02 INSTALLATION

A. Install grating panels and contiguous grating layouts with specified clips and fasteners in accordance with manufacturer's installation instructions and as required to meet specified performance requirements.

B. Seal field cuts, drilled edges, holes, and abrasions with compatible resin recommended by manufacturer based on application.

3.03 TOLERANCES

A. Maximum Offset From True Alignment: 1/4 inch.

B. Maximum Out-of-Position: 1/4 inch.

3.04 CLEANING

A. Clean composite gratings in accordance with manufacturer's instructions.

B. See Section 01 7419 - Construction Waste Management and Disposal for additional requirements.

3.05 PROTECTION

A. Protect installed composite gratings from subsequent construction operations.

END OF SECTION 06 7400

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Field paint finish.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products.

B. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of access door(s) and frame(s) through one source from a single manufacturer.

B. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing inspecting agency acceptable to authorities having jurisdiction:

1. NFPA 252 or UL10B for vertical access doors and frames

C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

D. It shall be the responsibility of each trade requiring access doors and frames to furnish same according to the specification.

E. Installation of access doors and frames shall belong to the trade that constructs the walls or ceilings, or any trade that by the nature of their installation obstructs access to equipment, valves, and piping requiring access.

1.06 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" subpart.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Manufacturers:

1. Cendrex, Inc.
2. Jensen Industries
3. J. L. Industries, Inc.
4. Karp Associates, Inc.
5. Larsen's Manufacturing Company
6. Milcor, Inc.
7. Nystrom, Inc.

B. Wall-Mounted Units in Areas Not Otherwise Identified :
1. Location: As indicated on drawings.
2. Panel Material: Steel. Paint to match adjacent surfaces.
3. Size: 24 by 24 inches minimum, unless otherwise noted on drawings.
4. Door/Panel: Hinged, standard duty, with cylinder core lock and no handle where exposed to view in public areas.
5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface recessed for infill with wall finish.
7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.
8. Where indicated on drawings, access panels are to be STC rated to match the wall or ceiling assembly they are mounted within. Panels should be tested in accordance with ASTM E90.

C. Wall-Mounted Units in Restrooms, Custodian Closets, and Other Wet Areas:
1. Location: As indicated on drawings.
2. Panel Material: Stainless steel.
3. Size: 24 by 24 inches minimum, unless otherwise noted on drawings.
4. Door/Panel: Hinged, standard duty, with cylinder core lock and no handle where exposed to view in public areas.
   a. Locations in custodian closets do not require a cylinder core. Utilize a screw driver slot spring cam lock.
5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

D. Fire-Rated Wall-Mounted Units:
1. Location: As indicated on drawings.
2. Wall Fire-Rating: As indicated on drawings.
3. Panel Material: Steel. Painted to match adjacent surface.
4. Size: 24 by 24 inches minimum unless otherwise noted on drawings.
5. Door/Panel: Insulated double-surface panel with cylinder core lock and no handle.
   a. Locations in custodian closets do not require a cylinder core. Utilize a screw driver slot spring cam lock.

E. Ceiling-Mounted Units:
1. Location: Where required by above ceiling equipment manufacturer and as indicated on drawings.
2. Panel Material: Aluminum extrusion with gypsum board inlay.

3. Size - Lay-In Grid Ceilings: To match module of ceiling grid. Not required in accessible ceilings.
4. Size - Other Ceilings: 24 by 18 inches minimum, unless otherwise noted on drawings.
5. Door/Panel: Hinged, standard duty, with screw driver slot spring or cam lock and no handle.

F. Fire-Rated Ceiling-Mounted Units:
1. Location: Where required by above ceiling equipment manufacturer and as indicated on drawings.
2. Ceiling Fire-Rating: As indicated on drawings.
3. Panel Material: Steel.
4. Size: 24 by 24 inches minimum, unless otherwise noted on drawings.
5. Door/Panel: Hinged, standard duty, with screw driver slot operated spring or cam lock and no handle.

2.02 WALL- AND CEILING-MOUNTED ACCESS UNITS

A. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
1. Style: Recessed door panel for infill with wall/ceiling finish.
a. Units in fire-rated assemblies, restrooms, custodian closets, and other wet areas, provide exposed frame with door surface flush with frame surface.
b. Gypsum Board Mounting Criteria: Use drywall bead type frame.
2. Door Style: Single thickness with rolled or turned in edges.
3. Frames: 16-gauge, 0.0598-inch minimum thickness.
4. Single Steel Sheet Door Panels: 16-gauge, 0,0625-inch minimum thickness.
5. Double-Skinned Hollow Steel Sheet Door Panels: 16-gauge, 0.059-inch minimum thickness, on both sides and along each edge.
6. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch back from wall face for application of gypsum board.
a. Surface recessd 3/4 inch back from wall face for application of flat veneer wood wall panels.
7. Insulation: Non-combustible mineral wool or glass fiber.
8. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
9. Steel Finish: Primed in areas not otherwise identified.
10. Stainless Steel Finish: No.4 brushed finish in restrooms, custodian closets, and other wet areas.
11. Hardware:
a. Hardware for Fire-Rated Units: As required for listing.
b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
c. Latch/Lock: Screw driver slot for quarter turn cam latch at wall locations in custodian closets and ceiling locations in public areas.
d. Latch/Lock: Cylinder lock-operated cam latch at wall locations in public areas, two keys for each unit.
1) Verify with University Locksmith for type of key cylinder cores.
e. Inside Latch Release: Mechanism that allows door/panel to be opened from inside.
f. Gasketing: Extruded neoprene, around perimeter of door panel.

2.03 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
   1. Exposed flanges: Nominal 1 to 1-1/2 inches wide around perimeter of frame.
   2. For trim-less frames with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
   3. Provide mounting holes in frame for attachment of masonry anchors. Furnish adjustable metal masonry anchors for installation by others.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 08 3100

SECTION 09 66 23 - RESINOUS MATRIX TERRAZZO FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Thin-set, epoxy-resin terrazzo flooring.

2. Precast epoxy-resin terrazzo units.

B. Related Requirements:

1. Section 07 92 00 "Joint Sealants" for sealants installed with terrazzo.

2. Section 09 67 23 "Resinous Flooring" for decorative resinous flooring systems applied as self-leveling slurries or as troweled or screeded mortars.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Product manufacturer rep required at meeting.

1. Review methods and procedures related to terrazzo including, but not limited to, the following:

a. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
b. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
c. Review special terrazzo designs and patterns.
d. Review of expansion joints.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED product data.

C. Shop Drawings: Include terrazzo installation requirements. Include plans, sections, component details, and relationship to other work. Show layout of the following:

1. Divider strips.
2. Control-joint strips.
3. Accessory strips.
4. Abrasive strips.
5. Stair treads, risers, and landings.
6. Precast terrazzo jointing and edge configurations.
7. Terrazzo patterns.

D. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo Sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare Samples of same thickness and from same material to be used for the Work, in sizes indicated below:

1. Terrazzo: 6-inch- (150-mm-) square Samples.
2. Precast Terrazzo: 6-inch- (150-mm-) square Samples.
3. Accessories: 6-inch- (150-mm-) long Samples of each exposed strip item required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each type of terrazzo material or product.

C. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

D. Preinstallation moisture-testing reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For terrazzo to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. Engage an installer who is a contractor member of NTMA.

2. Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockups for terrazzo including accessories.

a. Size: Minimum 100 sq. ft. (9 sq. m) of typical poured-in-place flooring and base condition for each color and pattern in locations directed by Architect.
b. Include base first three stair treads.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.

B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.

B. Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.

C. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

D. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

E. Control and collect water and dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS: Basis of Design: Terroxy Decorative Thin-Set System

A. Source Limitations: Obtain primary terrazzo materials from single source from single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

B. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. NTMA Standards: Comply with NTMA's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

B. Terrazzo contractor to be NTMA member.

2.3 EPOXY-RESIN TERRAZZO

A. Epoxy-Resin Terrazzo TZ1: Comply with manufacturer's written instructions for matrix and aggregate proportions and mixing.

1. Manufacturer: Terroxy Resin Systems

B. Mix Color and Pattern: Match Architect's sample. Refer to Design Selection Summary for sample number.

C. Materials:

1. Moisture-Vapor-Emission-Control Membrane: Two-component, high-solids, high-density, low-odor, epoxy-based membrane-forming product produced by epoxy terrazzo manufacturer that reduces moisture emission from concrete substrate to not more than 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

2. Substrate-Crack-Suppression Membrane: Terroxy Isolation Crack Membrane, having minimum 120 percent elongation potential according to ASTM D412.

a. Reinforcement: Fiberglass scrim.

3. Primer: Manufacturer's product recommended for substrate and use indicated

4. Epoxy-Resin Matrix: Manufacturer's standard recommended for use indicated and in color required for mix indicated.

a. Physical Properties without Aggregates:

1) Hardness: 60 to 85 per ASTM D2240, Shore D.
2) Minimum Tensile Strength: 3000 psi (20.7 MPa) per ASTM D638 for a 2-inch (51-mm) specimen made using a "C" die per ASTM D412.
3) Minimum Compressive Strength: 10,000 psi (6.9 MPa) per ASTM D695, Specimen B cylinder.
4) Chemical Resistance: No deleterious effects by contaminants listed below after seven-day immersion at room temperature per ASTM D1308.

a) Distilled water.
b) Mineral water.
c) Isopropanol.
d) Ethanol.
e) 0.025 percent detergent solution.
f) 1.0 percent soap solution.
g) 5 percent acetic acid.
h) 10 percent sodium hydroxide.
i) 10 percent hydrochloric acid.
j) 30 percent sulfuric acid.

b. Physical Properties with Aggregates: For terrazzo blended according to manufacturer's recommendations with one part epoxy resin with three parts marble aggregate consisting of 60 percent No. 1 chips and 40 percent No. 0 chips that is ground and grouted to a 1/4-inch (6.35-mm) nominal thickness, and cured for 7 days at 75 deg F (24 deg C) plus or minus 2 deg F (1 deg C) and at 50 percent plus or minus 2 percent relative humidity.

1) Flammability: Self-extinguishing, maximum extent of burning 1/4 inch (6.35 mm) according to ASTM D635.
2) Thermal Coefficient of Linear Expansion: 0.0025 inch/inch per deg F (0.0025 mm/mm per 0.5556 deg C) according to ASTM C531.

5. Aggregates: Comply with NTMA gradation standards for mix indicated and contain no deleterious or foreign matter.

a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C131/C131M.
b. 24-Hour Absorption Rate: Less than 0.75 percent.
c. Dust Content: Less than 1.0 percent by weight.

6. Finishing Grout: Resin based.

2.4 PRECAST EPOXY-RESIN TERRAZZO

A. Precast Terrazzo Base TZB1: Minimum 3/8-inch- (10-mm-) thick, epoxy terrazzo units cast in maximum lengths possible, but not less than 36 inches (900 mm). Comply with manufacturer's written instructions for fabricating precast terrazzo base units in sizes and profiles indicated.

1. Type: Straight.

2. Top Edge: Straight, unfinished.

3. Outside Corner Units: With finished returned edges at outside corner.

4. Color, Pattern, and Finish: Match adjacent poured-in-place terrazzo flooring.

5. Refer to Interior Design Selection Summary and drawings.

B. Precast Terrazzo Stair Treads & Risers – TZST1: Minimum 3/4 ~~1~~-inch thick, epoxy terrazzo units. Comply with manufacturer's written instructions for fabricating precast units in sizes and profiles indicated. Reinforce units as required by unit sizes, profiles, and thicknesses and as recommended by manufacturer. Finish exposed-to-view edges and reveals to match face finish. Ease exposed edges to 1/8-inch (3.2-mm) radius.

1. Basis of Design: Wausau Tile Epoxy Tread & Risers.
   a. Acceptable Manufacturer: Precast Terrazzo Enterprises.

2. Color, Pattern, and Finish: Match adjacent poured-in-place terrazzo flooring.

3. Refer to Interior Design Selection Summary and drawings.

2.5 STRIP MATERIALS

A. Thin-Set Divider Strips: L-type angle in depth required for topping thickness indicated.

1. Material: White-zinc alloy.

2. Top Width: **1/8 inch (3.2 mm)**.

B. Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material and color of divider strips and in depth required for topping thickness indicated.

C. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:

1. Base-bead strips for exposed top edge of terrazzo base.

2. Edge-bead strips for exposed edges of terrazzo.

3. Nosings for terrazzo stair treads and landings.

D. Abrasive Strips: **Two-line** abrasive inserts at nosings. Silicon carbide or aluminum oxide, or combination of both, in epoxy-resin binder and set in channel.

1. Width: 1/2 inch (12.7 mm)

2. Depth: As required by terrazzo thickness.

3. Length: 4 inches (100 mm) less than stair width.

4. Color: As selected by Architect from full range of industry colors.

2.6 MISCELLANEOUS ACCESSORIES

A. Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use.

B. Anchoring Devices:

1. Strips: Provide mechanical anchoring devices or adhesives for strip materials as recommended by manufacturer and as required for secure attachment to substrate.

2. Precast Terrazzo: Provide mechanical anchoring devices as recommended by fabricator for proper anchorage and support of units for conditions of installation and support.

C. Patching and Fill Material: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.

D. Joint Compound: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.

E. Resinous Matrix Terrazzo Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.

F. Sealer: Slip- and stain-resistant, penetrating-type sealer that is chemically neutral; does not affect terrazzo color or physical properties; and is recommended by sealer manufacturer.

1. Surface Friction: Not less than 0.6 according to ASTM D2047.

2. Acid-Base Properties: With pH factor between 7 and 10.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 PREPARATION

A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.

B. Concrete Slabs:

1. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with terrazzo.

    a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    b. Repair damaged and deteriorated concrete according to terrazzo manufacturer's written instructions.
    c. Use patching and fill material to fill holes and depressions in substrates according to terrazzo manufacturer's written instructions.

C. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

D. Preinstallation Moisture Testing:

1. Testing Agency: Engage a qualified testing agency to perform tests.

2. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

    a. Moisture-Vapor-Emission Test: Maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours when tested according to ASTM F1869 using anhydrous calcium chloride.
    b. Relative Humidity Test: Maximum 75 percent relative humidity measurement when tested according to ASTM F2170 using in-situ probes.

3. Proceed with terrazzo installation only after concrete substrates pass moisture testing or after installation of moisture-vapor-emission-control membrane on substrate areas that fail testing.

E. Moisture-Vapor-Emission-Control Membrane: Install according to manufacturer's written instructions.

1. Install on concrete substrates that incorporate lightweight aggregates.

2. Install concrete substrates that fail preinstallation moisture testing.

F. Substrate-Crack-Suppression Membrane: Install to isolate and suppress substrate cracks according to manufacturer's written instructions.

1. Prepare and prefill substrate cracks with 100% solids epoxy.

2. Install solids to produce full substrate coverage in areas to receive terrazzo.

3. Reinforce membrane with fiberglass scrim.

G. Protect other work from water and dust generated by grinding operations. Control water and dust to comply with environmental protection regulations.

1. Erect and maintain temporary enclosures and other suitable methods to limit water damage and dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 EPOXY-RESIN TERRAZZO INSTALLATION

A. Comply with NTMA's written recommendations for terrazzo and accessory installation.

B. Strip Materials:

1. Divider and Control-Joint Strips:

a. Locate divider strips in locations indicated.
b. Install control-joint strips **in locations indicated.**
c. Install control-joint strips with 1/4-inch (6.4-mm) gap between strips, and install sealant in gap.
d. Install strips in adhesive setting bed without voids below strips, or mechanically anchor strips as required to attach strips to substrate, as recommended by strip manufacturer.

2. Accessory Strips: Install in locations indicated.

3. Abrasive Strips: Install with surface of abrasive strip positioned 1/16 inch (1.6 mm) higher than terrazzo surface.

C. Apply primer to terrazzo substrates according to manufacturer's written instructions.

D. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions.

1. Installed Thickness: 3/8 inch (9.5 mm) nominal.

2. Terrazzo Finishing: Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

a. Rough Grinding: Grind with 24-grit or finer stones or with comparable diamond abrasives. Follow initial grind with 60/80-grit stones or with comparable diamond abrasives.
b. Grouting: Before grouting, clean terrazzo with water, rinse, and allow to dry. Apply and cure epoxy grout.
c. Fine Grinding/Polishing: Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted. Grind with **120**-grit stones or with comparable diamond abrasives until grout is removed from surface.

3. Installation Tolerance: Limit variation in terrazzo surface from level to 1/4 inch in 10 feet (6.4 mm in 3 m); noncumulative.

E. Install and finish poured-in-place terrazzo stairs at the same time the adjacent terrazzo flooring is installed.

F. Install and finish poured-in-place terrazzo base at the same time the adjacent terrazzo flooring is installed.

3.4 PRECAST TERRAZZO INSTALLATION

A. Install precast terrazzo units using method recommended in writing by NTMA and manufacturer unless otherwise indicated.

B. Do not install units that are chipped, cracked, discolored, or improperly finished.

C. Seal joints between units with [joint compound matching precast terrazzo matrix] [joint sealant] <Insert requirements>.

3.5 REPAIR

A. Cut out and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

3.6 CLEANING AND PROTECTION

A. Cleaning:

1. Remove grinding dust from installation and adjacent areas.

2. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.

B. Sealing:

1. Seal surfaces according to NTMA's written recommendations.

2. Apply sealer according to sealer manufacturer's written instructions.

C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 66 23

SECTION 10 5129
PHENOLIC LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Phenolic lockers.

1.02 RELATED REQUIREMENTS

A. Section 06 1053 - Miscellaneous Rough Carpentry #: Wood blocking and nailers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.

C. Shop Drawings: Indicate locker plan layout, numbering plan, component profiles and accessories.

D. Samples: Submit two samples 6 by 6 inches in size, of each color scheduled.

E. Sustainable Design (LEED) Submittals Requirements: See Section 013329.02 “Sustainable Design Reporting – LEED v4” for submittal requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver plastic lockers to the site until the building is enclosed and HVAC systems are in operation. Deliver lockers in manufacturer's original packaging. Store in an upright condition. Protect lockers from exposure to direct sunlight.

B. Protect locker finish and adjacent surfaces from damage.

C. Ship lockers fully assembled

D. Life and handle lockers from the base and not the sides.

1.06 WARRANTY

A. Special Manufacturer’s Warranty: 20-year against rust, delamination or breakage of phenolic parts under normal use.

PART 2 PRODUCTS

2.01 SUSTAINABLE DESIGN (LEED) MATERIAL REQUIREMENTS:

A. Materials shall comply with the requirements of section 013329.02 “Sustainable Design Reporting – LEED v4”

2.02 MANUFACTURERS

A. Phenolic Lockers:
   1. Bradley Corp.
   2. Summit Lockers, Inc[<>]: www.summitlockers.com/#sle.
   3. Columbia Lockers, a division of PSiSC; Phenolic Lockers: www.psisc.com/#sle.

4. ASI Storage Solutions[<>]: www.asi-storage.com/#sle.
5. Scranton Products
6. Hollman, Inc
7. SPECTRUM Lockers
8. Substitutions: See Section 01 6000 - Product Requirements.

2.03 LOCKER APPLICATIONS

A. Wardrobe Lockers: Phenolic lockers, free-standing with matching closed base.
   1. Accessibility: Comply with ICC A117.1 and ADA Standards.
   2. Width: as indicated on drawings.
   3. Depth: 18 inches unless otherwise noted.
   4. Height: 72 inches.
   5. Locker Configuration: Z-tier (2 lockers each with a short and long compartment).
   6. Fittings: Size and configuration as indicated on drawings.
      a. Single shoe shelf.
      b. Hooks: One double prong.
   7. Ventilation: By open space between the back of the door and locker body.
   8. Locking: Built-in combination locks.

2.04 PHENOLIC LOCKERS

A. Lockers: Factory assembled, made of phenolic core panels with mortise and tenon joints and stainless steel mechanical joint fasteners; fully finished inside and out; each locker capable of standing alone.
   1. Doors: Full overlay, covering full width and height of locker body; square edges.
   2. Panel Core Exposed at Edges: Machine polished, without chips or tool marks; square edge unless otherwise indicated.
   3. Where locker ends or sides are exposed, finish the same as fronts or provide extra panels to match fronts.
   4. Provide filler strips where indicated, securely attached to lockers.
   5. Door Color: Custom finish as selected by Architect; As indicated in drawings..
   6. Body Color: Manufacturer's standard white or light color.
   7. Fasteners for Accessories and Locking Mechanisms: Tamperproof type.

B. Component Thicknesses:
   1. Doors: 1/2 inch minimum thickness.
   2. Locker Body: One of the following combinations:
      a. Tops, bottoms, and shelves 1/2" inch; sides and backs 1/2" inch; minimum.
      b. Tops, bottoms, and shelves 1/2 inch; sides 3/8 inch; backs 1/4 inch; minimum.
   3. End Panels and Filler Panels: 1/2 inch minimum thickness.
   4. Toe Kick Plates: 1/2 inch minimum thickness.

C. Phenolic Core Panels: Nonporous phenolic resin and paper core formed under high pressure, with natural colored finished edges, integral melamine surface, matte finish, and uniform surface appearance; glued laminated panels not acceptable.
   1. Surface Burning Characteristics: Flame spread index of 75 or less, and smoke developed index of 450 or less; when tested in accordance with ASTM E84.

D. Hinges: Stainless steel finish; Black Powder Coat Finish, minimum of 180 degree opening; either exposed barrel 5-knuckle hinge attached to back of door and inside of body with tamperproof screws, or concealed cabinetwork style hinge attached with tamperproof screws.

E. Coat Hooks: Stainless steel or reinforced nylon; attached with tamperproof screws.

F. Number Plates: Manufacturer's standard, minimum 4-digit, permanently attached with adhesive; may be field installed.

G. Built-In Multi-User Mechanical Combination Locks:
   1. Manufacturers:
      a. Keyless Co: www.keyless.co/#sle.
      b. Zephyr Lock, LLC: www.zephyrlock.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Built-In Digital Keypad Lock: Battery free lock with multi user combination lock keypad for 4-digit code with manager bypass key.
      a. Latch: Deadbolt.
      b. Temporary or shared access with user-defined code.

H. Lock Strike: Stainless steel, or black high impact ABS plastic strike plate attached to locker body with throughbolts.

I. Locker Legs: Manufacturer's standard adjustable support and leveling leg, minimum 1 inch adjustment; with hardware for attaching toe kick plates.

2.05 LOCKER FABRICATION

A. Hardware Attachment: All hinges, handles, hasps, hooks, latch bars, and locks attached with tamper-resistant screws.

B. Provide ventilated panels where indicated.

C. Filler Panels: Fabricated in unequal leg angle shape; finished to match lockers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install lockers in climate controlled environment, shielded from direct sunlight.

B. Install in accordance with manufacturer's instructions.

C. Place and secure on prepared base.

D. Install lockers plumb and square.

E. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 pounds.

F. Bolt adjoining locker units together to provide rigid installation.

G. Install end panels and filler panels

H. Accessories: Fit exposed connections of trim, fillers, and closures together to form tight, hairline joints, with concealed fasteners and splice plates furnished by locker manufacturer. Install as indicated on approved shop drawings.
   1. Coat hooks: Attach with at least two fasteners.
   2. Identification plates: Identify plastic lockers with approved identification numbers. Attach plates to each locker door.
   3. Filler panels: Attach with concealed fasteners.

I. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

B. Remove packaging and construction debris and legally dispose of off-site.

END OF SECTION 10 5129

SECTION 10 75 00
FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

1.02 REFERENCE STANDARDS

A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2016.

B. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2016.

C. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.03 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pole, accessories, and configurations.
   1. Submit full-line color charts.

C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, grounding, and imposed loads.

D. Submit foundation detail stamped by licensed structural engineering in the State of Indiana. Refer to Drawings for parameters.

E. Samples: Submit two finish samples, 3 by 3 inch in size, illustrating pole material, color, and finish.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with protective covering and pack in protective shipping tubes or containers.

B. Protect flagpoles and accessories from damage or moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flagpoles:
   1. Acme/Lingo Flagpoles, LLC.
   2. American Flagpole; ____: www.americanflagpole.com/#sle.
   3. Baartol Company.
   4. Concord Industries, Inc; ___: www.concordindustries.com/sle.
   5. Elder Flag Manufacturing Company, Inc.
   6. Ewing Flagpoles.
   7. Morgan-Francis Flagpoles and Accessories.
   8. Pole-Tech Co, Inc; ____: www.poletech.com/sale.
   9. The Flag Zone: www.theflagzone.com

2.02 FLAGPOLES

A. Flagpoles: Designed in accordance with NAAMM FP 1001.
   1. Material: Black Anodized Aluminum.
   2. Design: Cone tapered.

3. Mounting: Ground mounted type.
4. Flags
   a. American Flag Nominal Height: 50 ft; measured from nominal ground elevation.
   b. IU Flag Nominal Height: 45 ft; measured from nominal ground elevation.
   c. Indiana State Flag Nominal Height: 45 ft; measured from nominal ground elevation.
   d. 6’x10’ flag sizes
5. Halyard: Interior type.

B. Performance Requirements: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001, “Guide Specifications for Design of Metal Flagpoles”.
   1. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.
   2. Basic Wind Speed: 3 second gust speed at 33 feet (10 m) aboveground.

2.03 POLE MATERIALS

A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.

2.04 ACCESSORIES

A. Finial Ball: Aluminum, 6-inch diameter.

B. Halyard: 5/16-inch diameter stainless steel aircraft cable.

2.05 OPERATORS

A. Hand Crank: Removable winch type.

2.06 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized.

B. Pole Base Attachment: Flush; aluminum base with base cover.

C. Lightning Ground Cable: Copper No. 6 AWG, soft drawn.

2.07 FINISHING

A. Metal Surfaces in Contact With Concrete: Asphaltic paint.

B. Aluminum: Mill finish.

C. Finial: Spun finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION

A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch.

3.05 ADJUSTING

A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION 10 75 00

SECTION 115313 - LABORATORY FUME HOODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Benchtop Chemical Fume Hoods.
2. Accessible Fume Hoods.

B. Related Requirements:
1. Section 013573 "Delegated Design Requirements and Procedures" for definitions, submittal procedures, responsibilities, and scheduling requirements associated with delegated design assignment indicated in this Section.
2. Section 123553 "General Requirements for Casework and Fume Hoods" for references, coordination, submittal requirements, quality assurance, materials, hardware, finishes, installation, etc.
3. Division 22: Furnishing and installation of plumbing utilities and final connections to fume hoods.
4. Division 23: Furnishing and installation of exhaust duct work and equipment, and final connection of fume hoods.
5. Division 23: Furnishing and installation of exhaust controls and final connections to hoods.
6. Division 23: "Testing, Adjusting, and Balancing for HVAC" for field quality-control testing of fume hoods.
7. Division 26: Furnishing and installation of electrical utilities and final connections to fume hoods.

1.2 DESIGN REQUIREMENTS

A. Comply with SEFA 1 "Laboratory Fume Hoods."

B. Factory UL 1805 Classified. Provide each fume hood with UL 1805 Classified labeling.

C. Fume hoods shall function as ventilated, enclosed workspaces, designed to capture and confine exhaust fumes, vapors and particulate matter produced or generated within the enclosure.

D. Manufacturers to provide high performance fume hoods. Hoods which achieve a reduction in volumetric flow by restricting the sash opening area do not qualify as High Performance fume hoods unless they also meet the performance requirements through the maximum sash opening. The "maximum sash opening" shall be considered a vertical sash opening not less than 25 inches high off the fume hood work surface.
1. High Performance Fume Hoods are hood designs that provide a reduction in the required exhaust air volume, when compared to the volume required for the same size fume hood to operate with a face velocity of 100 FPM through a fully opened vertical sash and provides containment levels equivalent or superior to ASHRAE 110 tracer gas test ratings of 4.0 AM 0.05, and 4.0 AI/AU 0.10, with a face velocity of 60 FPM or less through the fully opened vertical sash.

E. Design fume hoods for consistent and safe air flow through the hood face. Negative variations of face velocity shall not exceed 10 percent of the average face velocity at any designated measuring point as defined in this section.

F. Average illumination of work area: Minimum 80 foot candles (860 lx). Work area shall be defined as the area inside the superstructure from side to side and from face of baffle to the inside face of the sash, and from the working surface to a height of 28 inches (710 mm).

G. Maximum average static pressure loss readings taken three diameters above the hood outlet from four points, 90 degrees apart not to exceed:

Face Velocity (FPM)	Measured Static Pressure Loss (WG)
75	0.18 inches
100	0.30 inches
125	0.45 inches
150	0.60 inches

H. Fume hoods shall be constructed in such a manner as to cause no perceptible increase in sound pressure

level over the mechanical exhaust system.

I. Fume hood to have set baffle system. No manually adjustable baffles allowed.

1.3 ACTION SUBMITTALS

A. Refer to Section 123553 and as noted below.

B. Product Data: Submit manufacturer's data for each item. Include component dimensions, configurations, construction details, and attachments. Indicate location, size, and service requirement for each utility connection.

C. Shop Drawings: Include the following:
1. Indicate locations and types of service fittings together with associated service supply connection required.
2. Indicate duct connections, electrical connections, and locations of access panels.
3. Include layout of fume hoods in relation to lighting fixtures and air-conditioning registers and grilles.

1.4 INFORMATIONAL SUBMITTALS

A. Refer to Section 123553 and as noted below.

B. Certifications: All manufacturers to test and certify their products to meet UL1805, ASHRAE 110 and SEFA 1.

C. Test Reports: Submit complete reports verifying conformance to performance standards outlined in this specification when tested to the ASHRAE 110 Standard in the "As Manufactured" environment.

1.5 CLOSEOUT SUBMITTALS

A. Refer to Section 123553 and as noted below.

B. Operator Training Guide: Provide an electronic training presentation, highlighting the proper operating practices of the laboratory fume hood.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers/Fabricators and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers/fabricators listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
1. Kewaunee Scientific Corporation, Supreme Air.
2. Lab Crafters, Inc., Air Sentry.
3. Labconco Corporation Protector XStream.
4. Mott Manufacturing Limited, RFV2.

B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other manufacturers/fabricators offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.
1. Basis-of-Design: **<Mott Manufacturing Limited RFV2 Bench – Combination Sash>**.

C. Furnish and install casework, fume hoods, furnishings and equipment specified in the following sections by the same supplier.
1. Section 123553 "General Requirements for Laboratory Casework and Fume Hoods."
2. Section 123553.03 "Adaptable Laboratory Casework."
3. Section 123553.13 "Metal Laboratory Casework."
4. Section 123553.16 "Plastic Laminate Laboratory Casework."
5. Section 123553.19 "Wood Laboratory Casework."
6. Section 123553.23 "Polypropylene Laboratory Casework."
7. Section 123553.26 "Solid Phenolic Resin Laboratory Casework."
8. Section 115300 "Miscellaneous Laboratory Equipment."
9. Section 115313 "Laboratory Fume Hoods."
10. Section 115313.16 "Polypropylene Fume Hoods."

2.2 MATERIALS

A. Refer to Section 123553.

2.3 BENCH TOP CHEMCIAL FUME HOODS

A. Superstructure:
1. Wall: Rigid, self-supporting double wall assembly, nominally 5 inches thick. Double wall shall consist of a sheet steel outer shell and a corrosion resistant inner liner and shall house and conceal steel framing members, attaching brackets and remote operating service fixture mechanisms and services. Hoods shall be completely factory assembled to form a rigid, self-supporting structure.
2. Face Opening Perimeter Edge: Air foil or streamlined shape with all right-angle corners radiused or angled.
3. Interior Hood Height: 48 inches (1219 mm) minimum to hood roof.
4. Bypass: Low resistant down draft type. Bypass air shall enter at horizontal full length opening at the top front superstructure to enter hood in a down flow direction. Directional louvers are not acceptable. Material to match fume hood interior liner.
   a. Restricted Bypass: Provide on all variable volume or constant volume hoods with combination sashes and on all variable volume hoods with a vertical rising sash.
5. Ceiling Enclosure Panel: Used to enclose space between top of fume hood and ceiling on all exposed or open sides. Minimum 18 gage (1.2 mm) thick, finish to match hood. Provide a lower removable front panel for access to hood lights, piping, and exhaust duct connections. Refer to the Fume Hood Schedule on Q1.1 for fume hoods with enclosure panels.
   a. Extend to within 1 inch below ceiling for suspended ceiling to continue over fume hood enclosure panels for a finished look.
6. Interior and Exterior Fastening Devices: Conceal all devices. Exposed screws not acceptable. Unexposed structural member attachments: sheet metal screws, zinc plated.

B. Sill Airfoil:
1. Bypass type designed to prevent reverse air flows or air eddies at the fume hood work surface. Low profile, flush with work surface, notched or hinged to allow pass-through of hospital grade electrical plugs. Sill to include an integral spill trough for secondary containment. Provide a chemical resistant sealant between sill and work surface.
2. Material: All components 16 gage (1.6 mm) thick Type 316 stainless steel, with an acid and abrasion resistant electrostatic epoxy or urethane powder coating.

C. Sash:
1. Full view type with clear, unobstructed, side to side view of fume hood interior and service fixture connections. Vertical rising or combination vertical rising/horizontal sliding. Refer to Fume Hood Schedule for type and height of sash at each fume hood.
2. Sash shall be aerodynamically designed, all stainless-steel components with chemically resistant polyurethane powder coat finish, with either frameless vertical rising style or combination style with both vertical and horizontal moving glass panels.
3. Vertical Rising Sash: Provide sash stops at the design sash opening.
4. Horizontal Sliding Sash: Provide panels on two tracks for all hoods except 5-foot widths. For 5-foot wide fume hoods provide three tracks. Each panel must ride on top hung rollers supported from top rail only.
5. Counterbalance system: Single weight, pulley, cable or chain and sprocket, counter balance system shall prevent sash tilting and permit one finger operation at any point along full width pull. Design system to hold sash at any position without creep and prevent sash drop in the event of cable failure. Sash and counterbalance mechanism to be life cycle tested to withstand a minimum of 100,000 cycles without signs of fatigue. Open and close sash against rubber bumper stops.
6. Sash glass: 7/32-inch thick laminated safety glass.
7. Sash guides: Corrosion resistant polypropylene.
~~8. Automatically closes sash to fully closed position using infrared occupancy sensor with user-programmable time-delay. Programmable in one second increments. Set delay to 30 minutes.~~
~~9. Electrically actuated mechanism designed to engage both sides of the sash evenly to ensure smooth sash movement. Mechanism to utilize no more than 1 amp AC when actuated.~~
~~10. Incorporate infrared light curtain detection system which stops the sash from closing and turns on a red obstruction indicator light. Infrared light curtain must detect any obstruction in the path of the sash from full-open to full-close. Provide with red obstruction indicator light that will turn off when reset button is pressed. Provide additional switch to engage and disengage the sash operator.~~

D. Liners: Fiberglass reinforced polyester panel, 1/4 inch thick, smooth finish and white color in final appearance. Flame spread: 25 or less per UL 723 and ASTM E84-80. Manufactured by WS Hampshire Inc. "Wesliner 1125" or equal. Provide gasketed access panels in the liner for access to valves and fixtures. Panels shall be of the same material as the liner and be provided with a PVC gasket to eliminate air leakage and retain liquids inside the hood.

E. Baffles: Provide fixed baffles to control air vectors into and through the fume hood. Fabricate of the same material as the liner. All baffle supports and brackets to be non-metallic. Baffle designs which permit close off of all slots are not acceptable.

F. Work Surfaces: Solid phenolic resin 1-1/2 inches (38 mm) thick surface, dished 3/4 inch (19 mm) to contain spills. Refer to Section 123553.

G. Sinks: Where indicated on the drawings provide stainless steel cup sinks as specified in Section 123553.

H. Service Fixtures and Piping:
1. Factory pre-pipe hoods compliant to all state and local codes with services indicated on the drawings, to a point of connection 2 inches (48 mm) above hood roof. Provide, per Division 22 the piping material and installation of each service type. Pressure test all pre-piped lines in the factory.
a. Factory pre-drill and pre-punch holes for Vacuubrand VACUU-LAN Lab Vacuum system, but do not pre-pipe vacuum. Complete Vacuubrand VACUU-LAN Lab Vacuum System by BrandTech Scientific, with all vacuum pumps, vacuum valves/turrets, PTFE (Teflon) vacuum supply line and exhaust line tubing, fittings, and connectors supplied with the system. Copper pipe should not be used. Contact: vacuu-lan@brandtech.com 860-581-1648.
2. Provide service fixtures within fume hoods with color coded, acid and solvent resistant plastic coating, applied over fine sandblasted surface, properly cleaned then sprayed and baked three times. With a minimum coating thickness of 6 mil.
3. Control Valves: Straight or 45 degree angle mounted fixtures on the front panel of the fume hood. Provide panel mounted or rod-type control valves with a threaded collar to hold the valve in place.
4. Color coding of hood interior service fixtures and remote-control valves as specified for Laboratory Service Fixtures in Section 123553.
5. On fume hoods with pre-punched service fixture holes, provide metal or plastic plugs in color to match fume hood, for all unused holes.

I. Electrical:
1. Factory install receptacles, lighting, electrical fixtures and wiring in accordance with all applicable state and local codes and Division 26 specifications. Terminate wiring in a single service junction box on top of fume hood roof for in-the-field point of connection. All electrical fixtures shall be UL listed and labeled.
2. Wiring: Minimum #12 copper, type THHN/THWN insulation. Wire color coding shall be black for current carrying conductors, white for neutral conductors and green for ground conductors.
3. Conduit: Unless noted or required otherwise, ½ inch flexible metal or PVC conduit. Secure conduit to superstructure framework with conduit clamps. Conduit to light fixture to have a pigtail for ease of lamp maintenance.
4. Receptacles: Provide each hood with the receptacle quantities as follows:
a. For 72 inch (1200 mm) wide hoods: Provide one duplex receptacle at each side post near the bottom. Provide one circuit per hood assembly.
b. Provide grounding wire to all under-counter flammable storage cabinets.
c. Receptacle: NEMA-5-20R, three wire grounding type receptacles rated at 120 VAC at 20 AMP with Ground Fault Interruption, Gray in color with stainless steel brushed finish flush face plate. Install receptacles with the ground outlet above the power slots. Label each receptacle with the associated panel and circuit number.
5. Lighting:
a. Fixture: LED, UL listed light fixture with 15 intensity adjustment levels and 3 color options installed on exterior of fume hood roof. Provide light fixture isolated from the hood interior by 1/4 inch thick laminated safety glass cemented and sealed to the hood roof. The lighting shall be serviceable from outside the fume hood interior. Color temperature of fume hood lighting to match color temperature for general room lighting.
b. Illumination: Minimum 80 foot candle at the full intensity setting at the worksurface.
c. Light Switch: Toggle type, single pole 120 VAC, 20 AMP, Gray in color with stainless steel brushed finished flush face plate. Mount on left side of fume hood side post

J. Exhaust Outlet:
1. Rectangular or round bell mouth collar; 18 gage (1.2 mm) thick, Type 316 stainless steel.
2. For hoods with rectangular duct collars, provide exhaust duct transition from the hood rectangular exhaust collar to the building exhaust system round duct connection. Round duct size as indicated in the Fume Hood schedule. Contractor shall coordinate between trades. Fabricate transition of the same material as the exhaust outlet.

K. Fume Hood Signage:
1. Operation Instructions: Provide a permanent acid resistant decal or plate attached to fume hood exterior with condensed information covering recommended locations for apparatus and accessories, baffle settings, use of sash, and recommended safe operating procedures.
2. Vertical Sash Stop Decal: Provide an acid resistant decal as detailed on the Drawings. Exact location to be determined when the fume hood is balanced.
3. Fume Hood Information/Certification Holder: Provide a 4 inch by 6 inch (100 mm by 150 mm) corrosion resistant metal or plastic frame attached to front face of fume hood exterior with plastic or glass glazing to contain a removable data card to identify hood and show hood characteristics and field test data.

L. UL Label: Clearly visible label affixed to hood front identifying fume hood as UL Classified. List the UL file number for verification of UL Classification.

M. Safety Monitor/Alarm System:
1. Variable volume hoods: Equip each fume hood with a velocity control and safety alarm unit which is provided under Division 23. Provide factory cut outs in the front of the hood for field mounting of the unit. Coordinate location and size of cut out with Division 23. Connection of control and safety alarm unit to sensors and control valves under Division 23.
~~a. Audible alarm signal tone: A minimum of 85 decibels at 10 centimeters. Provide visual alarm signal as a flashing or continuous glowing red light. Provide alarm design to permit silencing of tone signal, but maintain glow of red visual signal light until unsafe condition is corrected. Provide with circuitry and a pushbutton to test alarm circuits.~~
~~b. Monitor: Utilize an air velocity sensor mounted on the interior side liner of the hood, easily accessible for cleaning. Provide with input/output accessory to send alarm signal to a remote location and for silencing alarm remotely.~~
~~c. Electrical: 9 volt DC, maximum of 1 amp. Provide 120 VAC to 9 VDC transformer, UL listed.~~

2.4 ACCESSIBLE BENCH TOP CHEMICAL FUME HOODS

A. Accessible bench top chemical fume hoods shall be as detailed on the Drawings and as described under Article 2.4, Benchtop Chemical Fume Hoods, unless modified under this Article.

B. Service Fixtures: Mount on fume hood side posts. Top-most service fixture handle to be no higher than 48 inches above finished floor. Fixture outlet within fume hood to be within 20 inches of the front face of the fume hood.
1. Service fixture handles exceeding 48 inch reach range to be located in cabinet apron below fume hood with those services pre-piped between the handle and the outlet.

C. Light Switch: Mount on fume hood side post no higher than 48 inches above finished floor.

2.5 METAL FINISH FOR FUME HOOD

A. Refer to Section 123553.

2.6 SOURCE QUALITY CONTROL TESTING OF EPOXY RESIN WORK SURFACE

A. Refer to Section 123553.

2.7 SOURCE QUALITY CONTROL TESTING OF POLY RESIN LINER

A. Test Procedure:
1. Test Number 1 - Spills and Splashes:
a. Suspend in a vertical plane a 42 inch (1070 mm) horizontal by 12 inch (300 mm) vertical panel divided into 3/4 inch (20 mm) wide vertical columns.
b. Apply 5 drops of each reagent listed with an eye dropper.
c. Apply liquid reagents at top of panel and allow to flow down full panel height. "CAUTION! Flush away any reagent drops."
2. Test Number 2 - Fumes and Gases:

a. Divide 24 inch by 12 inch (600 mm by 300 mm) panel into 2 inch (50 mm) squares.
b. Place 25 milliliters of reagent into 100 milliliter beakers and position panel over beaker tops in the proper sequence. Note: Beaker pouring lip permits atmospheric oxygen to enter and participate in the reaction of the reagent fumes.

3. After 24 hours remove panel, flush with water, clean with naphtha and detergent, rinse, wipe dry and evaluate.

B. Evaluation ratings: Change in surface finish and function shall be described by the following ratings:
1. No Effect: No detectable change in surface material.
2. Excellent: Slight detectable change in color or gloss, but no change to the function or life of the work surface material.
3. Good: Clearly discernible change in color or gloss, but no significant impairment of work surface function or life.
4. Fair: Objectionable change in appearance due to surface discoloration or etch, possibly resulting in deterioration of function over an extended period.
5. Failure: Pitting, cratering or erosion of work surface material; obvious and significant deterioration.

C. Test Results: Submit a report of the test results. The results shall be equal to or better than the following:

Reagent List	Test1	Test 2
Concentrations by Weight	Rating Spills	Fumes
Sodium Hydroxide	No Effect	No Effect
Sodium Hydroxide, 40%	No Effect	No Effect
Sodium Hydroxide, 20 percent	No Effect	No Effect
Sodium Hydroxide, 10 percent	No Effect	No Effect
Ammonium Hydroxide, 28 percent	No Effect	No Effect
Methylene Chloride	No Effect	No Effect
Chloroform	No Effect	No Effect
Carbon Tetrachloride	No Effect	No Effect
Monochlorobenzene	No Effect	No Effect
Tincture of Iodine	No Effect	Good
Methyl Alcohol	No Effect	No Effect
Ethyl Alcohol	No Effect	No Effect
Butyl Alcohol	No Effect	No Effect
Phenol, 85 percent	No Effect	Excellent
Cresol	No Effect	No Effect
Sodium Sulfide	No Effect	No Effect
Furfural	Excellent	Excellent
Dioxane	No Effect	No Effect
Zinc Chloride	No Effect	Excellent
Benzene	No Effect	No Effect
Toluene	No Effect	No Effect
Xylene	No Effect	No Effect
Gasoline	No Effect	No Effect
Naphthalene	No Effect	No Effect
Methylethyl Ketone	No Effect	No Effect
Acetone	No Effect	No Effect
Ethyl Acetate	No Effect	No Effect
Amyl Acetate	No Effect	No Effect
Ethyl Ether	No Effect	No Effect
Silver Nitrate, 10 percent	Excellent	Excellent
Dimethylformamide	Excellent	Excellent
Formaldehyde, 37 percent	No Effect	No Effect
Formic Acid, 88 percent	No Effect	Excellent
Acetic Acid, Glacial	No Effect	No Effect
Dichloroacetic Acid	No Effect	Excellent
Chromic Acid, 60 percent	No Effect	No Effect
Phosphoric Acid, 85 percent	No Effect	No Effect
Sulfuric Acid, 33 percent	No Effect	Excellent

Sulfuric Acid, 77 percent	No Effect	No Effect
Sulfuric Acid, 93 percent	No Effect	No Effect
Hydrogen Peroxide, 30 percent	No Effect	No Effect
Acid Dichromate	No Effect	No Effect
Nitric Acid, 20 percent	No Effect	Excellent
Nitric Acid, 30 percent	No Effect	No Effect
40 & 47 Equal Parts	No Effect	Good
Nitric Acid, 70 percent	No Effect	Good
Hydrofluoric Acid, 48 percent	No Effect	Excellent
Hydrochloric Acid, 37 percent	No Effect	Excellent

2.8 SOURCE QUALITY CONTROL TESTING OF FUME HOODS

A. Submit a test report, for each type and size of hood, for the standard product previously tested, if the product is identical to equipment being provided for this project.

B. Conduct an evaluation of standard product in the manufacturer's test facility in accordance with the method prescribed in ANSI/ASHRAE 110 latest edition. Provide test results for both the standard and modified tests.

C. Hoods: Achieve a rating of 4.0 AM 0.05 with 4.0 being the tracer gas release rate in liters per minute, AM identifying an "as manufactured" test, and 0.05 indicating the maximum level of tracer gas, in parts per million, in the breathing zone.

2.9 SOURCE TESTING OF FUME HOOD SOUND LEVELS

A. Provide the following historic certified sound test data for each size and type of fume hood.

B. Background sound pressure level readings for the test facility with exhaust system operating but without connection to the fume hood.

C. A second set of readings recorded with the fume hood connected and operating and the sensor located 36 inches (900 mm) in front of the sash assembly.

D. Certified report: Octave band sound pressure level, Db re 20 micro Pa in the 31.5 to 8,000 Hertz frequency range, for the fume hood operating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Refer to Section 123553.

3.2 DELIVERY

A. Refer to Section 123553.

3.3 INSTALLATION

A. Refer to Section 123553 and as modified below.

B. Install fume hoods and equipment in accordance with manufacturer's instructions.

C. Install equipment plumb, square, and straight with no distortion and securely anchored as required.

D. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.

3.4 FIELD QUALITY CONTROL TESTING OF FUME HOODS

A. Refer to Section ~~123553 and as modified below.~~ 23 0595 Certification of Fume Hoods for “As Installed” testing requirements. Fume hood manufacturer’s representative to coordinate with Division 23 representative and provide a minimum of 2 visits to the site at 4 hours each to coordinate with Division 23 representative. Fume hood manufacturer’s representative to provide additional site visits as required until all fume hoods pass “As Installed” testing requirements.

~~B. All Article numbers referenced below refer to the latest edition of ANSI/ASHRAE 110.~~

~~C. Fume Hood Testing Companies:~~
~~1. B & V Testing, Inc.~~
~~2. Exposure Control Technologies, Inc.~~
~~3. Technical Safety Services, Inc.~~

~~D. Testing Requirements:~~
~~1. Commission each fume hood in accordance with the test procedures prescribed in American National Standard ANSI/ASHRAE 110 latest edition.~~
~~2. The fume hood commissioning agent: A third party and not a representative of the manufacturer or installation contractor.~~
~~3. Provide the Owner's Representative two weeks prior notice of the testing start date.~~

~~E. Testing Conditions:~~
~~1. Conduct tests under conditions as specified under Article 5.1 and 5.2.~~
~~2. Commence fume hood commissioning immediately after the final Test and Balance Report has been approved and before the Owner has occupied the laboratory.~~
~~3. Verify that the building makeup air system is in operation, the doors and windows are in normal operating position, and that all other hoods and exhaust devices are operating at design conditions.~~
~~4. Correct any unsafe conditions disclosed by these tests before request of test procedures.~~

~~F. Instrumentation and Equipment: Employ instrumentation and equipment as specified under Article 4.~~

~~G. Face Velocity Measurement Test: Provide face velocity measurements as outlined under Article 6.~~

~~H. Flow Visualization Test:~~
~~1. Conduct both Local Visualization Challenge and Large Volume Visualization Challenge in accordance with Articles 7.3 and 7.4 respectively.~~
~~2. If there is visible smoke flow out of the front of the hood, the hood fails the test.~~

~~I. Tracer Gas Test:~~
~~1. Provide a tracer gas test for each fume hood in accordance with the procedures specified under Article 8.~~
~~2. Tracer gas shall be nitrous oxide. Sulfur hexafluoride is not allowed.~~
~~3. Provide Sash Movement Containment Testing as indicated in Article 8.3~~
~~4. Hoods shall achieve a rating of 4.0 AI 0.10, with 4.0 being the tracer gas release rate in liters per minute, AI identifying an "as installed" test, and 0.10 indicating the maximum level of tracer gas, in parts per million, in the breathing zone~~

~~J. Test Reports: Provide a test report for each test for each hood. Include in report a record of all measurements and an indication of test "pass" or "failure".~~

3.5 ADJUSTING

A. Refer to Section 123553 and as modified below.

B. Adjust sash, fixtures, accessories and other moving or operating parts to function smoothly.

3.6 CLEANING AND PROTECTION

A. Refer to Section 123553.

3.7 TRAINING

A. Upon completion of the installation of the fume hoods, manufacturer must conduct a training seminar for the Owner's users at the job site discussing proper operation of the fume hood, fume hood features and best use practices. Training session must be at least one hour in length, not including a question-and-answer session. Training session must be scheduled within 30 days on completion of the installation

END OF SECTION

SECTION 12 93 00
SITE FURNITURE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide site furnishings and installation including anchoring assemblies as indicated on the drawings and specified herein for:
   1. Bike racks
   2. Trash receptacle
   3. 4’x10’ Tree Grate
   4. Concrete Bollard

1.02 SUBMITTALS

A. Submittals shall be in accordance with Division 01 specifications.

B. Prior to fabrication, Contractor shall submit for approval four sets of prints for the site furniture elements.

C. Prints shall indicate location, manufacturer, materials, finish, color, connection details, dimensions, and relationships to adjacent materials.

D. Contractor shall submit operation/maintenance recommendations, spare parts, manuals and warrantees to the Owner.

1.03 PRODUCT HANDLING AND STORAGE

A. Provide blocking and lateral support during transport and storage of site furniture units which is clean, non-staining, and will not cause harm to exposed finishes.

B. Protect edges of exposed members to prevent staining, chipping, or spalling.

PART 2 PRODUCTS

2.01 ~~BIKE RACKS~~

A. ~~BIKE RACKS design based on Forms + Surfaces “Twist Bike Rack”, Model number SKTWS-AL-SST-SFM with the following characteristics:~~
   1. ~~Mounting: Surface Mount~~
   2. ~~Finish: Powedercoat, Color: TBD~~
   3. ~~Capacity: 2 bikes~~
   4. ~~Other manufacturers’ products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.~~

2.02 BIKE RACKS

A. BIKE RACKS design based on Division of Glow International, LLC “Rib Rack Bike Rack”, Model number RibRack-BR8 with the following characteristics:
   1. Mounting: Surface Mount
   2. Finish: BH-Powedercoat
   3. Color: Black
   4. Capacity: 8 bikes
   5. Other manufacturers’ products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.

2.03 ~~TRASH RECEPTACLE~~

A. ~~TRASH RECEPTACLE design based on Landscapeforms "Central Park Conservancy", Model number BB100-006 with the following characteristics:~~
   1. ~~Mounting: Surface mount~~
   2. ~~Finish: Powdercoat, Color: TBD~~
   3. ~~Other manufacturers' products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.~~

2.04 TRASH RECEPTACLE

A. TRASH RECEPTACLE design based on Landscapeforms "Scarborough", Model number SC179-02-HOL, STD with the following characteristics:
   1. Mounting: Surface mount
   2. Size: 30 Gallon, Side Opening
   3. Finish: Powdercoat
   4. Color: Silver
   5. Other manufacturers' products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.
   6.

2.05 TREE GRATE

A. TREE GRATE design based on Ironsmith "4'x10' Tree Grate", Model number 12072 METRO Tree Grate with the following characteristics:
   1. Finish: Powdercoat
   2. Color: Natural (Allow iron to patina)
   3. Size: 4'x10'
   4. Other manufacturers' products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.

2.06 BOLLARD

A. BOLLARD design based on QCP "Square Bollard", Model number QS-SHR-B with the following characteristics:
   1. Mounting: Studded imbedded mount.
   2. Finish: TBD
   3. Size: 10" square
   4. Other manufacturers' products will be considered subject to meeting the design and performance characteristics described above and indicated on the drawings.

PART 3 EXECUTION

3.01 PREPARATION

A. All surfaces shall be properly prepared and level prior to the installation and placement of site furniture. Contractor shall coordinate placement of site furnishings with work of other trades.

3.02 INSTALLATION

A. Each piece of site furniture shall be installed and placed in accordance with manufacturer's standards and specifications and in accordance with the plans. Any changes from manufacturer's specifications must be approved by the Owner's Representative.

B. Surface mounted furnishings shall be securely mounted to concrete paving with tamperproof anchorage assemblies.

C. All site furniture shall be installed plumb and level.

3.03 CLEANING

A. The area shall be kept clean at all times, and following installation, all materials and debris shall be removed from the area.

B. Marred areas on metal finishes shall be touched-up with primer and two coats of paint.

C. Exposed mounting hardware shall be touched-up with primer and two coats of approved paint.

D. Acid solutions, steel or any other wool, or any other harsh abrasives shall not be used.

END OF SECTION 12 93 00

SECTION 23 0500
COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Piping materials and installation instructions common to most piping systems.
   2. Dielectric fittings.
   3. Mechanical sleeve seals.
   4. Sleeves.
   5. Penetration sealing.
   6. Protective shield plates.
   7. Escutcheons.
   8. Grout.
   9. HVAC demolition, cutting and patching.
   10. Equipment installation requirements common to equipment sections.
   11. Painting and finishing.
   12. Concrete bases.
   13. Supports and anchorages.
   14. Roof curbs.
   15. Equipment supports.
   16. Division 23 specific requirements for submittals, overall coordination, inspections, TAB/Startup/Commissioning coordination, cleaning and protection, and Training.

1.03 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above solid ceilings and within chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for rubber materials:
   1. EPDM: Ethylene-propylene-diene terpolymer rubber.
   2. NBR: Acrylonitrile-butadiene rubber.

1.04 SUBMITTALS

A. Product Data:

1. Dielectric fittings.
2. Mechanical sleeve seals.
3. Escutcheons.
4. Supports and anchorages.
5. Roof curbs.
6. Equipment supports.

1.05 DIVISION 23 SUBMITTALS

1.06 DIVISION 23 OPERATIONS MANUAL: INCLUDE THE FOLLOWING:

1. Final processed submittals of all Division 23 specification sections.
   a. Label and arrange in ascending numerical sequence the Manual sections by the Division 23 specification number.
   b. The final processed submittals are those submittals with the BSA stamp and BSA comments annotated onto the submittal pdf page.
   c. The final processed submittals include those submittals processed: “No Exceptions Taken”, “Note Markings and Comments, no resubmittal required”, “Note Markings and Comments, provide additional 23xxxx submittal information for this same Section as noted”, or similar.
   d. The final processed submittals include those submittals processed: “Note Markings and Comments, provide Record Submittals” where the Record Submittal is also included in the Manual for that Division 23 section.
   e. The final process submittals do not include those versions of the submittal processed “Revise and Resubmit” or “Note Markings and Comments, resubmittal requested” or similar.
2. Subcontractor contact list including name, phone number and e-mail contact information.
3. Valve tag charts listing tag number, piping system, and location..
4. Field reports, including ductwork leakage testing and piping pressure testing.
5. Startup reports for all mechanical equipment.
6. Certifications of piping systems, equipment or systems if specified in the individual specification section.
7. Testing, adjusting and balancing reports.
8. ASME Stamp Certification and Reports: “A”, “S”, or “PP” stamp certificates of authorization.
9. Operations and maintenance information for all equipment furnished by the project..
10. All of the above Manual components compiled into a single pdf of no more than 80 MB size when flattened, with sections in order matching a Table of Contents. Projects with extensive Manual information may be split into no more than three separate volumes for Division 23. Do not include Division 22 or other Division information in the Division 23 Manual.

B. Division 23 Submittals Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer’s receipt of submittal.
   1. Initial review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal must be delayed for coordination.
   2. Concurrent review: Where concurrent review of submittals by Architect/Engineer’s Consultants, Owner or other parties is required, allow 21 days for initial review of each submittal.

C. Division 23 Submittal Schedule:

1. Contractor shall submit all submittals to the Engineer for initial review within 30 days of award of contract, or within the first 10% of the duration of the project, whichever is less. Submittals which require processing completion prior to 45 days after award of contract shall be scheduled with the Engineer at least 14 days in advance of their requested due date.

D. Division 23 Common Submittal Requirements:
1. All submittals shall be clearly labeled as to the equipment being proposed to be furnished for this project. Equipment not proposed to be furnished for this specific project shall be marked with a strikethrough or otherwise removed from this project's submittal.
2. Data of a general nature will not be accepted. Indicate each specific option proposed to be furnished for this project when the project data sheet contains multiple options. Product options not proposed to be furnished for this specific project shall be marked with a strikethrough or otherwise removed from the submittal.
3. Provide equipment tag notations on the submittal information which match the equipment tag notations on this Project's drawings. Provide piping system notations on the submittal information which match the piping system notations on this Project's drawings and specifications. Provide duct system notations on the submittal information which match the duct system notations on this Project's drawings and specifications.
4. The first submittal for a given specification section shall contain complete product data on each of the products contained in that specification section which are proposed to be furnished for the project at the time of the first submission. As an exception to this, if on the first page of the first submittal a statement is added that a second submittal for this specification section is proposed at a future date, the written statement shall provide a detailed list of exactly which components are proposed to be contained in the second submittal. Multiple periodic submittals of individual components within a specified section will be returned to the Contractor unreviewed.
5. Arrange product data, drawings, and product information for submission in complete and separate sets for each Project Manual specification section listed. Number the submittal entries and the submittal attachments with the Project Manual specification section (e.g. 233600) rather than just a sequential number (e.g. Submittal #11). Additional submittals related to that Project Manual specification section (e.g. testing reports, startup reports) shall be numbered with the same Project Manual specification section and a modifier (e.g. 233600-02). Submittals for items without a separate Project Manual section shall be submitted under the 230500 specification. Submittal content from subcontractors (insulators, TAB Agents, valve suppliers, etc.) who have content applicable to both Division 22 and Division 23 shall be submitted as two submittals, one in each Division, as specified. Under no circumstance shall product data for two or more separate specification sections be combined into a common submittal; separate submittals are required for each specification section.
6. For each of the individual submittals, furnish information which adequately addresses each requirement of the individual specification sections Part 1 paragraph titled "Submittals".
7. Indicate the name and telephone number on each submittal of the person at the manufacturer's representative organization responsible for editing the submittal content for this project.

1.07 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

D. Roofing Standards: Comply with the following:
   1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication including flanges and cap flashing to coordinate with type of roofing indicated.
   2. NRCA's "Roofing and Waterproof Manual" details for installing units.
   3. Existing roofs: Maintain existing roof warranty.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture into the pipe.

B. Deliver, store and install materials and equipment (including supports and hangers) such that they are maintaining "as-new" condition (e.g. no rust) upon installation and up through the date of Substantial Completion. Account for environmental conditions of the construction site and schedule work accordingly.

C. Do not allow any materials nor equipment to be stored in standing water from a rainstorm.

1.09 COORDINATION

A. Complete demolition and removal of all items to be removed prior to installing any new items. In this way, the coordination and access to the new installations can be maximized. Do not install any new items (ductwork, conduit, piping, cable tray, partition walls, etc.) until the demolition is 100% complete.

B. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for HVAC installations.

C. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

D. Coordinate installation of floor drains, floor sinks, and other items related to maintenance and operation of HVAC installations in poured-in-place concrete and other structural components before and during their construction. Coordinate this effort with all trades performing any installation work or BIM coordination work associated with determining the final locations of the HVAC equipment and the plumbing items, all Construction Managers under contract within the boundaries of the construction site, all plumbing contractors working within the boundaries of the construction site, all tradespeople on the construction site placing concrete equipment pads, sumps, and/or trenches, all tradespeople on and off the construction site locating underground utilities outside the boundaries of the building or underslab utilities which could impact the proposed location and functionality of the floor drains and floor sinks, and all electrical contractors working within the boundaries of the construction site.

1. Perform this coordination to obtain the following finished installation results. In no case shall a floor sink be located directly in front of an electrical enclosure (equipment control panel, Variable Frequency Controller, power disconnect, motor starter, etc.) In no case shall a floor sink nor a floor drain which will have piping extended to the floor drain be located within a personnel walking pathway. In no case shall piping routing to a floor drain or floor sink be routed less than 8'-0" AFF into a personnel walking pathway. Provide and submit a Request For Information for all installations which are tentatively proposed to not meet these required contractual requirements for coordination. Coordinate to achieve these end results within a tolerance of +/- 2":
    a. Floor drains and floor sinks at Air Handling Units: The edge of the floor sink/drain closest to the AHU support steel or concrete equipment pad is located 3" perpendicular from the AHU support steel or concrete equipment pad. The centerline of the floor sink/drain is located 12" from the AHU drain connection as measured parallel to the AHU such that no part of the floor drain/sink body is directly in front of any AHU access door.
    b. Floor drains at exhaust fans: The edge of the floor drain closest to the fan support steel/inertia base or concrete equipment pad is located 3" perpendicular from the fan support steel/inertia base or concrete equipment pad.
    c. Floor drains at individual base mounted pumps: The edge of the floor drain closest to the pump inertia base or concrete equipment pad is located 3" perpendicular from the pump support steel/inertia base or concrete equipment pad. The floor drain is located centered beneath the pump suction piping connection.
    d. Floor drains centered between two adjoining pumps: The edge of the floor drain meant to serve two adjoining pumps is located centered in the clear floor area between those two adjoining pumps as measured perpendicular from each of the pump support steel/inertia bases or concrete equipment pads. The floor drain is located along a line connecting the two pump suction piping connections.
    e. Floor drains at chillers: The edge of the floor drain closest to the chiller inertia base or concrete equipment pad is located 3" perpendicular from the chiller support steel/inertia base or concrete equipment pad. The floor drain is located centered beneath the chiller piping connections
    f. Floor drains at hydronic boilers: The edge of the floor drain closest to the boiler concrete equipment pad is located 3" perpendicular from the boiler concrete equipment pad. The floor drain is located centered beneath the boiler drain connections(s).
    g. Floor sinks at steam boiler manual blowdown discharge: The edge of the floor sink closest to the boiler concrete equipment pad is located 3" perpendicular from the boiler concrete equipment pad. The floor sink is located centered beneath the boiler blowdown discharge.
    h. Floor drains at outdoor air intake plenums and casings: The edge of the floor drain closest to the plenum is located 3" perpendicular from the plenum wall or the adjoining building wall.
    i. Floor drains and floor sinks at humidifier and other condensate coolers: The edge of the floor sink/drain closest to the AHU support steel or concrete equipment pad is located 3" perpendicular from the AHU support steel or concrete equipment pad. The centerline of the floor sink/drain is located 12" from the AHU humidifier drain connection as measured parallel to the AHU such that no part of the floor drain/sink body is directly in front of any AHU access door.

j. Floor sinks at filter blowdowns: The edge of the floor sink closest to the filter concrete equipment pad is located 3” perpendicular from the filter concrete equipment pad. The floor sink is located centered beneath the filter discharge.
k. Floor sinks at elevated system strainer blowdown and air-dirt separator blowdown: The edge of the floor sink closest to the equipment is located 3” perpendicular from the adjoining building wall or directly below the elevated equipment such that pipe routing to that floor sink does not impede equipment access.
l. Floor drains at elevated heat exchangers: The edge of the floor drain closest to the equipment is located 3” perpendicular from the equipment pad supporting the heat exchangers and directly below the elevated heat exchanger hydronic piping connections such that pipe routing to that floor sink does not impede equipment access.
m. Floor sinks at pad mounted heat exchangers: The edge of the floor drain closest to the heat exchanger concrete equipment pad is located 3” perpendicular from the heat exchanger concrete equipment pad. The floor drain is located centered beneath the heat exchanger drain connection(s).

E. Coordinate requirements for with all trades for the location and size of access panels and doors and frames necessary to gain access to for HVAC items. requiring access Coordinate these requirements for all HVAC items that are concealed behind finished surfaces. Access panels and access doors are specified in Division 8 Section "Access Doors and Frames."

F. As required to achieve coordinated maintenance access, provide a ceiling grid system in the area immediately adjacent to the maintenance access point which can be readily removed and reinstalled without damage. Coordinate this requirement with all trades to provide additional ceiling member main tees, cross beams, and runners such that a rectangle free of any grid members is provided for maintenance access. Locate grid hangers such that hangers do not require removal when these grid members are removed. Demonstrate to the Construction Manager that the removal and reinstallation of these ceiling grid members is achieved without the requirement to bend metal components which after multiple removal and reinstallation cycles could fatigue and break.

G. Existing Utilities: Do not interrupt utilities serving facilities occupied or partially occupied by the Owner or others unless specifically allowed under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify Owner at least seven days in advance of proposed utility interruptions. Identify extent and duration of utility interruptions.
2. Indicate method of proposed utility interruptions in detail.
3. Do not proceed with proposed utility interruptions without Owner’s permission.
4. All new air handling units, rooftop units, exhaust fans, pumps, chillers, refrigeration equipment, boilers, heat exchangers, fan coil units, cabinet unit heaters, fin tube radiation, steam system components, and unit heaters are to remain disabled and off unless TAB personnel are on-site actively testing that particularthe piece of equipment.

5. Utilization of the permanent installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated and under what limiting conditions along withand written agreement to compensate the Owner for utility usage. Limiting conditions shall include specific written listing of all of these features: filtration requirements for all airstreams; fire alarm/smoke detection for all air streams; schedule for preventative maintenance for bearings, seals and other operated equipment features; hours of operation and which hours will be supervised by contractor personnel on site; written confirmation of operability of all equipment control sequences safeties and alarms; and written maintenance recordkeeping at a minimum.

H. New Equipment:
   1. All air handling units, rooftop units, exhaust fans, pumps, chillers, refrigeration equipment, boilers, heat exchangers, fan coil units, cabinet unit heaters, fin tube radiation, steam system components and unit heaters are to remain disabled and off unless TAB personnel are on-site actively testing that particular piece of equipment.
   2. Utilization of the permanent installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated and under what limiting conditions along with written agreement to compensate the Owner for utility usage. Limiting conditions shall include specific written listing of all of these features: filtration requirements for all airstreams; fire alarm/smoke detection for all air streams; schedule for preventative maintenance for bearings, seals and other operated equipment features; hours of operation and which hours will be supervised by contractor personnel on site; written confirmation of operability of all equipment control sequences safeties and alarms; and written maintenance recordkeeping at a minimum.

I. Coordinate new installations with the existing installations which will remain in place and be reutilized or those that are abandoned in place. Provide transitions and fittings in ductwork and piping, as well as extra lengths of ductwork and piping as required to route around these existing installations. Illustrate all such ductwork fittings, as well as top of duct and bottom of duct dimensions above finished floor on the sheet metal duct shop drawing submittal.

J. Existing installations include plumbing, piping, electrical and other building systems components including, but not limited to, roof drain piping, sanitary piping, plumbing piping, fire protection piping, fire protection heads, heating and cooling water piping, condensate drains, steam and condensate return piping, conduit, cable tray, electrical pull boxes, projectors, booms, etc.

K. Coordinate new installations with the existing structural installations which will remain in place and be reutilized. Provide transitions and fittings in ductwork and piping, as well as extra lengths of ductwork and piping as required to route around these existing structural installations. Illustrate all such ductwork fittings, as well as top of duct and bottom of duct dimensions above finished floor on the sheet metal duct shop drawing submittal.

L. Coordinate new installations with the existing structural installations' fireproofing. Provide in the bid to remove existing fireproofing and replace the fireproofing with new fireproofing which is of a lesser dimensional size. Provide for this removal and reinstallation of fireproofing in all areas in which the coordinated installation effort would require a lower installed ceiling height than is indicated on the architectural contract documents. The components, which are adjacent to the structure, shall be adjusted upward in location after the new fireproofing installation is complete. All other components shall then also be adjusted upward by an amount which is at least as great as the thickness of the fireproofing which was removed. Provide transitions and fittings in ductwork and piping, as well as extra lengths of ductwork and piping as required to route around these existing structural installations. Illustrate all such ductwork fittings, as well as top of duct and bottom of duct dimensions above finished floor on the sheet metal duct shop drawing submittal.

M. Coordinate installation of floor mounted components and devices and wall mounted components and devices such that maintenance access is achieved at the completion of the project when all adjoining components by all other trades are installed. Coordinate installation of elevated (e.g. hung/suspended) mounted components in areas without ceilings such that maintenance access is achieved at the completion of the project when all adjoining components are installed which meets the same detailed requirements in the following paragraph for above ceiling components.

N. Coordinate installation of wall mounted components and devices and other trade's wall mounted components and devices such that maintenance access is achieved at the completion of the project when all adjoining components by all other trades are installed.

O. Coordinate installation of above ceiling components and devices such that maintenance access is achieved at the completion of the project when all ceiling mounted components are installed. Coordinate installation of all mechanical equipment and components and devices and all the surrounding components adjacent to the mechanical equipment and devices such that maintenance access is achieved at the completion of the project when all components are installed in the ceiling and above the ceiling. Coordinate with all trades and all components and devices installed by all trades. Ultimate responsibility for any rework required to achieve maintenance access is the responsibility responsibility of the Contractor responsible for coordination as noted in Division 01 Sections. The required maintenance access is defined here for this contract:

1. A person with a 24" arm length who weighs at least 190 pounds can stand on a folding ladder rated for at least 250 pounds load which rests on the finished floor where the top of the ladder and which does not extend through the ceiling grid when defining maintenance access. All light fixtures and supply/return/exhaust/transfer diffusers and grilles remain in the ceiling grid in their final installed positions when defining maintenance access. Ceiling tiles with sprinkler heads, smoke detectors, fire alarm devices, occupancy sensors, speakers, and other system devices remain in the ceiling grid in their final installed positions when defining maintenance access. Multiple ceiling tile openings may be utilized to provide the required maintenance access as long as each ceiling tile opening meets the requirements. Light fixtures and diffusers/grilles remain in the ceiling grid when defining maintenance access.

2. While standing on a step of this ladder which is rated for standing upon and while not leaning against the ceiling grid, nor any part of their body touching the ceiling grid, and with neither of their arms nor their head nor their shoulders touching any above ceiling components (e.g. conduit, conduit hangers, electrical junction boxes, electrical junction box hangers, ceiling grid hangers, piping, pipe hangers, sprinkler piping, sprinkler piping flexible connectors, cable tray, cable tray hangers, bulkhead support studs, equipment (e.g. snorkels, booms, arms) supports, etc.) this person can touch each of the following items with both hands at the same time:
    a. Terminal unit/terminal box damper actuators.
    b. Terminal unit/terminal box hydronic reheating valve actuators.
    c. Terminal unit/terminal box electric heating controller sensors, switches, and dials.
    d. Terminal unit/terminal box airflow controller and differential pressure sensor.
    e. Terminal unit/terminal box electrical transformers, EP switches, temperature sensor, and all other control components.
    f. Terminal unit/terminal box control enclosure cover. The control enclosure cover shall be readily removeable and reinstallable, with a zone of 3” clear in all directions of any and all installations of hangers, conduit, piping, supports, etc.
    g. Terminal unit/terminal box piped accessories – strainer, strainer blowdown valve, PT ports, air vents, drains, shutoff valves, unions and calibrated balance valves. Provide a 6” clear space in front of the strainer blowdown valve and in front of the system drain valves to allow for attachment of a hose.
    h. Terminal unit/terminal box discharge duct low pressure manual volume dampers on diffuser runouts.
    i. Return duct manual volume dampers on diffuser runouts and on the duct mains.
    j. Terminal unit (airflow control valves, exhaust air valves, fume hood exhaust valves, etc.) inlet duct manual volume dampers on duct runouts.
    k. Terminal unit/terminal box piped accessories – strainer, PT ports, air vents, drains, shutoff valves, unions and calibrated balance valves.
    l. Piped hydronic system shutoff valves, calibrated balance valves, control valves, vents, and drains.
    m. Steam system traps, shutoff valves, strainers, control valves, humidifier components and humidifier control components.
    n. Fire damper, smoke damper,r and fire/smoke damper duct access doors.
    o. Fire damper, smoke damper, and fire/smoke damper fusible links located inside of ducts as reached through the duct access doors..
    p. Fire damper, smoke damper, and fire/smoke damper actuators and control devices.
    q. Control damper actuators.
    r. Control instruments and sensors (e.g. differential pressure sensors) mounted on/in or attached to ductwork and piping.
    s. Equipment (e.g. fan coil units, unit heaters, soffit heaters, fan powered terminal boxes, inline fans, pumps, etc.) electrical disconnects.
    t. Equipment access doors and access panels (to access interior components of the equipment).
    u. Equipment grease fittings (e.g. all motorized equipment and equipment with bearings).
    v. Equipment motors (after equipment access doors are removed if a motor is housed within the equipment).

w. Filters (e.g. from fan coil units) such that they can be removed and replaced without removing any installations nor bending the filters (e.g. a 1" thick filter that is 20" tall and 30" wide will have a clear space free of any installations immediately in front of the filter access point that is 20" tall by 30" wide by 1" thick. Use bottom access filter doors where necessary and provide for removeable/replaceable ceiling grid where the filter needs to pass through the grid.)

x. Fan belts or fan speed controllers (e.g. from fan coil units) such that they can be removed and replaced.

P. Coordinate the installation of all air terminals/terminal boxes/lab air valves such that the top of each air terminal is no more than 36" above the finished ceiling. In areas without a ceiling, install all air terminals such that the top of each air terminal is no more than 36" above the required "clear height" denoted on the Drawings (or the height of the four nearest light fixtures in the space where the equipment is installed if no clear height is noted).

Q. Coordinate the installation of all duct mounted heating coils controls and piped accessories, piped system isolation valves, and other items requiring maintenance access such that the top of each item is no more than 36" above the finished ceiling. In areas without a ceiling, install all items such that the top of item is no more than 36" above the "clear height" denoted on the Drawings (or the height of the four nearest light fixtures in the space where the equipment is installed if no clear height is noted).

R. Inspections:

1. Inspection scheduling: The Contractor shall schedule HVAC system inspections, and HVAC system inspection corrective action verification completion checks with all parties involved such that all HVAC inspection corrective action verifications are fully completed prior to Owner occupancy of any portion of the building served by those HVAC systems/subsystems which have had inspections by the Engineer. Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.
   a. "Fully completed HVAC inspection correction action verification completion checks" is defined such that all HVAC inspection corrective action verification completion checks have been completed by the Contractor on all of the HVAC systems which have material revisions or have control related revision scope by this project, and the results of the follow-up and corrective action verification required have been fully reviewed with the Owner and the Engineer of Record, with the Owner determining acceptability of the HVAC inspection corrective action verification completion checks results.
   b. Owner occupancy is defined as the physical presence, for more than eight hours per week, of any single Owner (or Owner's tenant) direct employee or contracted non-construction related personnel within a space or spaces served by the HVAC systems which have material system revisions or control related scope by this project.
2. Preliminary inspection procedures: The Contractor shall prepare a list of items to be completed and corrected by each of the installing trades. Proceed to complete all incomplete items on the list prior to submitting a request for inspection. Proceed to have each trade rework items necessary to obtain the required maintenance access.
3. Submit a written request for inspection upon completion of the preliminary inspection when noted incomplete items are complete. Provide a list to the Engineer of the specific rework items not yet complete, itemized by room.

4. Three days prior to the beginning of the requested inspection window, provide a pdf of a floorplan that illustrates room names and numbers to the Engineer with a bold line around the specific rooms requested for inspection. Also include bold notation of those portions of hallways and specific rooms or portions of specific rooms (e.g. where a temporary building enclosure opening occurred) in the general area identified for inspection which are not yet ready for inspection.
5. Readiness for inspection for a given space or area is defined as:
    a. Preliminary inspection is completed by the Contractor. Incomplete items noted on the preliminary list have been physically completed.
    b. All rework items necessary to obtain required maintenance access have been identified.
    c. Ceiling grid is fully installed. Ceiling tiles are not installed except as noted below.
    d. All diffusers and grilles are installed in the ceiling grid and final flex duct connections are complete.
    e. Piping insulation and ductwork insulation is fully installed and damaged insulation has been reworked.
    f. Rod hangers have been trimmed to a maximum exposed threaded length of 1” below the bottom nut.
    g. Piping, duct, and conduit penetrations of walls have been sealed on both sides of the wall.
    h. Piping, duct, and conduit penetrations of fire-rated walls have been firestopped and the firestop sticker applied to the wall adjacent to the penetration.
    i. All ductwork access doors are installed and labeled.
    j. All Identification devices are installed, including:
        1) Equipment Identification devices (e.g. terminal box labels and airflow control valve labels).
        2) Piping Identification devices (e.g. pipe labels and flow direction arrows).
            (a) Small rooms: All pipes labeled once.
            (b) Medium rooms: Additionally labeled at each wall penetration
            (c) Larger rooms: Additionally spaced per spec.
        3) Duct Identification devices (e.g. duct labels, duct access door labels).
        4) Valve tags.
        5) Ceiling labels are installed in the location proposed for the required maintenance access through a specific ceiling grid opening. Note that there shall not be a sprinkler head nor occupancy sensor nor speaker or other ceiling mounted device in the proposed maintenance access ceiling tile. Relocate sprinkler heads as required to obtain the required maintenance access.
        6) Raceway identification materials (e.g. control circuit labels and control conduit labels).
        7) Warning labels and warning flags.
    k. All lighting fixtures are installed in the ceiling grid.
    l. All sprinkler heads are installed in the ceiling tile.
    m. All occupancy sensors are installed in the ceiling tile.
    n. All speakers are installed in the ceiling tile.
    o. Cut ceiling tiles around the perimeter of the room may be installed at the Contractor’s option.
6. Spaces with hard ceilings and inaccessible ceilings shall have access door locations denoted prior to request for inspection of items above the ceiling.

7. Follow-up inspection procedures: The Contractor shall prepare a list of items to be completed and corrected by each of the installing trades. Proceed to complete all incomplete items on the list prior to submitting a request for Substantial Completion. Proceed to have each trade rework items necessary to obtain the required maintenance access. Where the Engineer of Record has stated in the Inspection Report to relocate/revise/rework/reconfigure the installed trades components to achieve the required coordinated maintenance access, this relocation/revisions/rework shall be completed at no cost to the Owner.

S. TAB, Startup, and Commissioning:
1. Coordinate HVAC system installation, HVAC system installation checkout, HVAC system startup, HVAC system TAB, HVAC system temperature controls checkout, HVAC system controls programming startup and testing and tuning, HVAC commissioning functional testing, and HVAC commissioning corrective action verification testing with all parties involved such that all HVAC commissioning corrective action verification testing (as required by the Commissioning Agent) is fully completed prior to Owner occupancy of any portion of the building served by HVAC systems which have work included in this project. Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.
   a. “Fully completed HVAC commissioning functional testing and correction action verification testing” is defined such that all initial commissioning functional verification testing has been completed on all of the HVAC systems which have material revisions or have control related revision scope by this project, follow-up HVAC commissioning corrective action testing required by the Commissioning Agent as a result of initial HVAC commissioning functional verification testing has been fully completed, and the results of the follow-up and corrective action verification testing required have been fully reviewed with the Owner and the Engineer of Record, with the Owner determining acceptability of the HVAC commissioning corrective action testing results.
   b. Owner occupancy is defined as the physical presence, for more than eight hours per week, of any single Owner (or Owner’s tenant) direct employee or contracted non-construction related personnel within a space or spaces served by the HVAC systems which have material system revisions or control related scope by this project.

T. Owner Training and Maintenance Turnover to Owner:
1. Coordinate completion of the HVAC commissioning verification testing (described above) to be substantially complete before beginning Owner training. Coordinate the work such that training of Owner maintenance personnel is fully completed prior to Owner occupancy of any portion of the building served by HVAC systems which have work included in this project. Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.
2. Coordinate completion of the HVAC Operation and Maintenance Manuals and Startup Reports prior to sustained operation of any of the Owner’s permanent HVAC systems equipment which are being utilized for the construction process (HVAC TAB, HVAC controls testing, HVAC commissioning verification testing, Owner Training). Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.

3. Maintain the Owner's equipment properly, and in accordance with the equipment manufacturer's written operating instructions and Operations and Maintenance Manual, during the entire Construction process. Maintain a written maintenance log for each piece of equipment with the dates and descriptions of the maintenance activities performed. Maintain a written operating log of the dates and hours of sustained operation of the Owner's equipment (e.g. to determine bearing greasing intervals, etc.) Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.
4. Coordinate completion and turnover to the Owner of Operation and Maintenance Manuals, Startup Reports, written maintenance logs, written operating logs, and As-Built drawings to the Owner Maintenance personnel prior to beginning Owner Training. Provide materials, scheduling, supervision, and staffing necessary to meet this coordination requirement.

U. Locate buried utility and distribution services within the project area.

V. Provide temporary connections to maintain existing systems in service during the construction. This may include ductwork, piping, power, controls, water, as well as other connections as required.

W. Provide the Owner a schedule prior to the start of demolition with phased selected demolition identified by system and by floor. Identify required outages on the schedule and any temporary measures required to maintain existing systems in service.

X. Coordinate the HVAC demolition with all aspects of demolition and temporary construction (including dust barriers) by other trades.

Y. Coordinate the placement of piping in exterior walls with the location of the exterior envelope insulation. No portion of the piping nor piping insulation shall be encased within the exterior envelope insulation. The thickness of the exterior envelope insulation shall not be decreased from the architecturally prescribed minimum thickness due to piping location/interferences. All pipe hangers and wall standoff pipe supports shall be located on the interior side of the exterior envelope insulation. No portion of the pipe supports shall be encased within the exterior envelope insulation.

Z. Coordinate directly with the engineer who created the HVAC contract documents for all Request For Interpretation (RFI). Contact this Engineer via telephone to verbally discuss the proposed RFI Question and the RFI proposed solution prior to formally submitting the written RFI into the projects construction management system.

1.10 CONTRACT DOCUMENTS

A. The drawings indicate the general arrangement and scope of the systems and shall be followed insofar as possible. If deviations from the layout are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted in writing to the Engineer for approval before proceeding with the Work.

B. The drawings are not intended to show every vertical offset or horizontal offset that may be necessary to complete the system or clear obstructions and/or the Work of other Contractors and other trades. Contractors shall anticipate during bidding that additional offsets may be required and include same in their proposals.

C. The Drawings, Schedules and Specifications shall be considered to be cooperative and anything appearing in the Specifications that may not be indicated on the Drawings or vice-versa, shall be considered as part of the Contract and must be executed by the Contractor the same as though indicated by both. Clarify conflicting statements with the Engineer prior to submitting a bid.

D. Measurements: Contractor shall make all his own measurements in the field and shall be responsible for correct fitting. He shall coordinate this Work with all other branches and trades in such a manner as to cause a minimum of conflict or delay. The Contractor shall coordinate his work in advance with all other trades and report immediately any difficulty which can be anticipated and propose solutions to resolve the potential difficulty.

E. Adjustments to Work in the Field:
   1. The Engineer reserves the right to make minor adjustments (maximum of 10'-0") in location of sensors, valving, ductwork, dampers, conduit, drains, piping, hangers and/or equipment at no additional charge if so directed prior to their installation or if indicated on the submittals and the installation has already occurred.
   2. Where the Drawings show equipment, casework, structure, fire rated construction, or the like, Contractors shall lay out the work to avoid conflicts.
   3. Where offsets in piping, additional fittings, necessary drains, minor valves, traps and devices are required to complete the installation, to clear obstructions, or for the proper operation of the system (including air vents and drains), these shall be deemed to be included in the Contract and shall be furnished and installed complete by the Contractor at no additional charge.
   4. Where offsets in ductwork, additional fittings, necessary transitions, minor fittings, dampers, accessories and devices are required to complete the installation, to clear obstructions, or for the proper operation of the system, these shall be deemed to be included in the Contract and shall be furnished and installed complete by the Contractor at no additional charge.

F. Clearances: All installations shall be made to maintain maximum headroom and clearance around equipment. When space and/or headroom appear inadequate, the Contractor shall notify the Engineer prior to proceeding with the installation. No claims for additional compensation will be approved for failure on the part of the Contractor or his Subcontractor to comply with this requirement.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

B. Provide all materials necessary for demolition work to occur, including cutting, capping, removing walls for access, and repairing finishes.

2.02 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

C. Hex bushings, face bushings, and plugs are not acceptable in any Division 23 piping system.

2.03 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. Steam service: ASME B16.20, 1, nonmetallicspiral wound gasket with stainless steel metal winding strip, flat, asbestos-free, graphite filler, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated. Suitable for pressure class of service and a minimum operating temperature of 600 deg F. Similar to Flexitallic Style CG.
2. All other services: Thermoseal C-4401, 1/16” thick.
3. Do not apply compounds, adhesives, or anti-stick lubricants to gasket surface.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.04 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.
1. Manufacturers:
a. Capitol Manufacturing Co.
b. Central Plastics Company.
c. Drake Specialties.
d. Epco Sales, Inc.
e. Watts Industries, Inc.; Water Products Div.

D. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
1. Manufacturers:
a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Central Plastics Company.
d. Drake Specialties.
e. Pipeline Seal and Insulator, Inc.
f. ???Insert manufacturer's name.???
2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig (1035- or 2070-kPa) minimum working pressure where required to suit system pressures.

E. Dielectric Couplings: Galvanized-steel coupling with inert and non-corrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).
1. Manufacturers:
a. Calpico, Inc.
b. Lochinvar Corp.

F. Dielectric Nipples: Electroplated steel nipple with inert and non-corrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).
   1. Manufacturers:
      a. Perfection Corp., Clearflow Dielectric Fittings.
      b. Precision Plumbing Products, Inc.
      c. Sioux Chief Manufacturing Co., Inc.
      d. Victaulic Co. of America.

2.05 MECHANICAL SLEEVE SEALS

A.
   1. Manufacturers:
      a. Advance Products & Systems, Inc.
      b. Calpico, Inc.
      c. Metraflex Co.
      d. GPT/Pipeline Seal and Insulator/Link-Seal/Enpro Industries.
   2. Sealing elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   3. Pressure plattes: Glass reinforced nylon polymer or stainless steel. Include two for each sealing element.
   4. Connecting bolts and nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.06 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40 up to 10" NPS, standard weight for 12" NPS and larger, galvanized, plain ends, fabricated with 2" integral seal welded water-stop. Touch up cut ends of galvanzied pipe sleeves with zinc-rich coating prior to installation.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral water-stop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

E. Stainless Steel Sheet: Fabricated 304L stainless steel, 0.078" minimum thickness, round tube closed with welded longitudinal joint, fabricated with 2" integral seal welded water-stop.

2.07 PROTECTIVE SHIELD PLATES

A. Minimum sixty-two thousandths (0.062) -inch-thick steel, minimum 16 gage with pre-cut nail holes for attachment to framing members.

2.08 PENETRATION SEALING

A. Penetrations in Horizontal Assemblies:
   1. Annular space fill:
      a. Resists the free passage of flame and the products of combustion.PVC sleeves in first two paragraphs below may be prohibited by fire authorities having jurisdiction.
      b. Approved non-combustible material.
   2. Penetration firestopping:
      a. Fill, voidce or cavity material that is tested and classified for use in through penetration firestop systems.

B. Penetrations in monolithic ceilings:
   1. Approved non-combustible material.

C. Refer to Division 7 Section “Joint Sealants” for materials and installation. Where no Joint Sealant specification is indicated and an acoustical sealant is required for wall penetrations, utilize an acrylic latex sealant designed for sealing through-penetrations of interior walls which is non-halogenated, paintable when dry, remains flexible/allows movement of pipe, water resistant/will not re-emulsify when dry, Class A finish requirements for Flame Spread and Smoke Development when tested in accordance with ASTM E84, and has an STC rating minimum 62 (ASTM E90/ASTM C919).

2.09 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.
   1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
   1. Finish: Polished chrome-plated.

E. One-Piece, Stamped-Steel Type: With set screw and chrome-plated finish.

2.10 GROUT

A. Description: ASTM C 1107, Grade B, non-shrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post-hardening, volume-adjusting, non-staining, non-corrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mmix: 5000-psi (34.5-MPa), 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

2.11 ROOF CURBS

A. General: If not specified in individual Division 23 specification sections, provide roof curbs capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Coordinate dimensions with rough-in information or shop drawings of equipment to be supported.

B. Seismically Restrained Equipment: Provide roof curbs capable of supporting and restraining super imposed live and dead loads to resist seismic forces. Roof curbs to be seismically restrained shall meet the design requirements of Section 23 05 48 “Seismic Controls” if roof curbs are furnished by the equipment manufacturer.

C. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified:
   1. Creative Metals, Inc.
   2. Custom Curb, Inc.
   3. Greenheck.
   4. Pate Co. (The).
   5. Thybar CorporationCurb, Inc.

D. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.0747 inch (1.9 mm) thick, structural quality steel sheet and tube, hot dip galvanized or aluminum zinc alloy coated steel sheet, factory primed and prepared for painting with welded or sealed mechanical corner joints.
   1. Provide hot dip galvanized fully welded construction for all roof curbs.
   2. Provide fire retardant treated wood nailers at tops of curbs and formed flanges at perimeter bottom for mounting to roof.
   3. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
   4. Provide manufacturer's standard rigid or semi-rigid insulation, 1.5" thickness and metal liners.
   5. Provide solid metal interior liner over the insulation as indicated on the drawings and for each curb where:
      a. The airstream is directly exposed to the curb (e.g.e.g., an air intake hood curb).
      b. The equipment mounted on the curb is seismically restrained.
      c. The curb has a solid top (metal and/or wood with metal) spanning across the interior width of the curb.
   6. Provide formed cants and base profile coordinated with roof insulation thickness.
   7. Fabricate units to minimum height of 16 inches (400 mm) unless otherwise indicated.
   8. Sloping roofs: Where slop of roof deck exceeds 1/4-inch per foot (1:48) fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.
   9. Provide curbs suitable for equipment dead weight, wind loads, seismic lifting, and anchoring forces as required.
   10. Provide anchoring instructionswritten anchoring instructions for the curb to attach to the structure.

2.12 EQUIPMENT SUPPORTS

A. General: If not specified in individual Division 23 specification sections, provide equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction (e.g., ductwork) to be supported. Coordinate dimensions with rough-in information or shop drawings of equipment to be supported.

B. Fabricate exterior supports from galvanized or stainless materials which are compatible with the equipment, piping and ductwork being supported.

C. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
   1. Custom Curb, Inc.
   2. Pate Co. (The).
   3. ThyCurb, Inc.

D. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.0747 inch (1.9 mm) thick, structural quality steel sheet and tube, hot dip galvanized or aluminum zinc alloy coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.
   1. Provide hot dip galvanized fully welded construction for all equipment supports located outdoors.
   2. Provide indoor equipment supports with welded corner joints, factory primed and prepared for painting, or post-fabricated painted with an oil-based alkyd enamel rust inhibitor coating similar to Rust-oleum 7769. Provide the coating manufacturer's appropriate surface preparation, coating materials, and application methods for the operating temperature range.

3. Provide fire retardant treated wood nailers at tops of curbsroof mounted supports and formed flanged at perimeter bottom for mounting to roof.
4. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
5. Fabricate roof mounted units to minimum height of 162 inches (300 mm), unless otherwise indicated.
6. Sloping roofs: Where slope of roof deck exceeds 1/4-inch per foot (1:48), fabricate support units with water diverters and height tapered to match slope to level tops of units.
7. Provide supports suitable for equipment dead weight, wind loads, seismic lifting, and anchoring forces as required.
8. Provide anchoring instructions for the support to attach to the structure.

PART 3 EXECUTION

3.01 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. 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.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections. Utilize tee fittings for branch connections that have all three connection sizes of NPS 1-1/2” and larger. It is acceptable to utilize threadolet fittings with dielectric nipples on carbon steel piping of NPS 2-1/2” and larger when the branch connection size is NPS 1” or less and a bronze body ball valve is installed on the other end of the dielectric nipple.

J. Install piping and ductwork to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, , barriers, ceilings, and floors according to the following:in exposed areas. In Dietary, Kitchen, Cafeteria, Sterile Processing, Sterilizer, Sub-Sterile, Animal Holding, Operating Rooms, Procedure Rooms and other sterile areas do not install escutcheons, but seal pipe penetrations airtight with clear food grade silicone.

M. New concrete floors, walls, and roof penetrations are required to have sleeves cast-in-place (no core drilling is allowed unless specifically noted on the drawings).
   1. Core drilling in buildings that are occupied up to two floors above the construction area or two floors below the construction area or are occupied on the same floor within 100 linear feet shall be accomplished with wet core drilling machines with slurry extraction to reduce noise.

N. Install sleeves for pipes passing through concrete and masonry walls, fire rated gypsum-board partitions, and concrete floor and roof slabs.
   1. Cut sleeves to length for mounting flush with both surfaces of walls and partitions.
   2. Extend top of sleeves installed in all floors (including mechanical equipment areas / penthouses which are not technically a "floor" of the building) with the top of the sleeve at a height which is a minimum of 2.0" above the finished floor level. The sleeve water-stop shall be entirely contained within concrete with approximately 1-1/2-inch of concrete cover. Extend cast-iron sleeve fittings below the floor slab as required to secure clamping ring if ring is specified.
   3. Install sleeves in new walls and floor slabs as new walls and floor slabs are constructed. Do not core drill to install sleeves within floor slabs constructed during the project.
   4. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
      a. Steel Pipe Sleeves: For pipes smaller than NPS 6 (DN 150).
      b. Galvanized Steel Sheet Sleeves: For pipes NPS 6 (DN 150) and larger, penetrating gypsum-board partitions or walls.

O. Except for underground wall penetrations, seal the annular space between sleeve and pipe or between sleeve and pipe insulation or between pipe and wall construction (where no pipe sleeve is indicated), using joint sealants appropriate for the size, depth, and location of the joint.
   1. Install in accordance with the sealant manufacturer’s written installation instructions and to a minimum of 0.375” depth on both sides of the wall being penetrated. Provide joint backing in accordance with the sealant manufacturer’s written installation instructions at all penetrations to be sealed.
   2. Seal space outside of sleeve fittings with grout.

P. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
   2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
   3. Mechanical sleeve seal installationisntallationSleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

Q. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
   1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

R. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, barriers, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section "Penetration Firestopping" for materials.

S. Verify final equipment locations for roughing-in.

T. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

U. Install piping, hangers and equipment so that they do not interfere with fully opening the access panels on any part of the structure, any contractor installed access panels, nor access panels on any equipment (either contract provided or Owner provided or Owner installed equipment).

V. Install piping, hangers and equipment so that they do not interfere with personnel movement. Components shall be a minimum of 7’-6” above finished floor unless specifically noted to be installed lower. Provide personnel protection on components located less than 6’-6” above finished floor (elastomeric insulation, caution markings).

W. For all piping systems, other than cast iron or steel pipe, passing through the top track, bottom track, or located within the stud cavity and within 1-1/2” of the framing member edge shall be provided with a protective shield plate large enough to protect the pipe passing through. In no case shall the protective shield plate extend less than 2” from the edge of the pipe to the edge of the shield. Provide protective shield plates at each pipe penetration of each stud opening or penetration of the stud itself. Do not penetrate studs other than at the manufacturer’s engineered stud openings unless noted as being allowed by the stud manufacturer’s written installation instructions and the applicable Building Code. Provide protective shield plates at each pipe penetration of each stud wall top track. Provide protective shield plates at each pipe penetration of each stud wall bottom track.

3.02 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using brazing filler metal complying with AWS A5.8.

F. 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.

G. Welded Joints:
   1. Construct carbon steel joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
   2. Construct stainless steel joints according to AWS D10.4, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
   3. Construct aluminum joints according to AWS D10.7, using qualified process and welding operators according to Part 1 "Quality Assurance" Article.
   4. Utilize AWS D10.11 Guide for Root Pass Welding for all Welding Operations. Purge as required to obtain a smooth root surface.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.03 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
   1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry piping systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet piping systems: Install dielectric coupling and dielectric nipple fittings and dielectric flnage kits to connect piping materials of dissimilar metals. **Do not utilize dielectric unions with O-rings on wet piping systems.**

3.04 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated. Provide a minimum of 7’-2” headroom under all exposed equipment.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

E. Comply with the equipment manufacturer’s written installation instructions.

F. Provide access platforms on the side of equipment where the access level is more than 30 inches above the roof or floor. Provide handrail guards that extendt 42” above the platform in accordance with the International Building Code. Provide a permanent ladder or stairs to access the platform. All platforms, guards and stair/ladder materials shall be non-corrosive. Handrails shall be readily removable for removal of equipment components.

3.05 PAINTING

A. Painting of HVAC systems, equipment, and components is specified in Division 9 Sections "Interior Painting" and "Exterior Painting."

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.06 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project. If concrete bases are not detailed on the drawings, then furnish:
   1. Construct concrete bases of dimensions indicated, not less than 3.5 inches thick and but not less than 4 inches (100 mm) larger in both directions than supported unit.
   2. Install dowel rods bonding agent to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.Apply to 100% of the contactent area between base and floor.
   3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to supported equipment.

6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 3000-psi (20.7-MPa) ???Insert other???, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete. If not specified, utilize #4 reinforcing at 12” on center each way with #4 around the perimeter."

3.07 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 5 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.08 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.
   1. Provide and coordinate blocking within the wall cavity at wall mounted finned tube enclosures.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.09 GROUTING

A. Mix and install grout for HVAC equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases. Obtain pump manufacturer’s written installation instructions.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

3.10 ROOF CURBS AND EQUIPMENT SUPPORTS AND PIPE SUPPORTS AND DUCT SUPPORTS

A. General: Comply with manufacturer’s written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to support structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

B. All roof repairs shall be completed by a roofing contractor that is certified by the manufacturer of the existing and new roofing systems. All roof repairs shall be completed with materials and workmanship that is fully compatible with the roofing system and in full accordance with the roofing manufacturer’s written installation requirements to maintain the roof warranty.

C. Install roof accessory items according to construction details of NRCA’s “Roofing and Waterproofing Manual” unless otherwise indicated.

D. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces or at locations of contact, with bituminous coating or providing other permanent separation.

E. Flange Seals: Unless otherwise indicated, set flanges of accessory units with a thick bed of roofing cement to form a seal.

F. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counter-flashing). Seal overlap with thick bead of mastic sealant.

3.11 CUTTING AND PATCHING

A. Refer to Division 1 and Division 2 for general cutting and patching requirements and procedures.

B. Cut, channel and drill floors, walls, partitions, shafts, ceiling sand other surfaces required to permit electrical installations and demolition. Perform cutting by skilled mechanics of trades involved.

C. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanicstradespeople of the general trades involved in new construction of those materials and surfaces.

D. After removing mechanical work that penetrates new or existing walls, floors, or ceilings, the openings created in the walls/floors/ceilings by the removal shall be infilled and the adjoining surfaces repaired to match the existing adjoining construction and fire rating. Coordinate the completion of this patching work with all trades.

E. Where new mechanical work penetrates existing walls, floors, or ceilings to remain, the opening created shall be patched and repaired to match the existing construction, finishes, fire rating and smoke rating by general construction trades skilled in the work to be performed. See Pipe Penetration Details and Ductwork Penetration Details on the Drawings.

3.12 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for allelectrical installations to restore original fire-resistance rating of assembly. Apply firestopping to structure where demolition exposes the structure. Firestopping materials and installation requirements are specified in Division 7 Section “Firestopping”.

B. Apply firestopping as indicated to seal penetrations in Paragraph “Penetration Sealing”.

C. Apply firestopping to all penetrations of smoke barriers. Provide an approved through penetration firestop system installed and tested in accordance with the requirements of UL 1479 for air leakage. The L rating for each firestop system shall not exceed 5.0 cfm per square foot at 0.30 inches of water in both ambient and elevated temperature tests..

3.13 PENETRATION SEALING

A. Horizontal assembly protectionpenetrations of all floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies shall be sealed as follows:
   1. Non-fire resistance rated assemblies with non-combustible penetrating items shall utilize annular space fill or penetration firestopping.
   2. Fire resistance rated assemblies shall utilize penetration firestopping.

B. All Penthouse floor penetrations shall be sealed.

C. All attic floor penetrations shall be sealed.

D. All enclosed spaces which house HVAC equipment shall have all penetrations of the horizontal and vertical membranes which separate the space from occupied and unoccupied building spaces sealed.

E. Penetrations to be sealed shall include, at a minimum, all piping, ductwork, flues, vents, chimneys, conduit and cabling penetrations installed.

F. All penetrations of monolithic ceilings shall be sealed continuously around the entire perimeter of the individual penetration. Examples of penetration types include diffuser penetrations, Grille penetrations, piping penetrations, and equipment penetrations (e.g. Fan Filter Units).

G. The perimeter of the Primary Supply Diffusers and Exhaust Diffusers Array shall be sealed continuously where it adjoins the edge of a monolithic ceiling.

3.14 CLEANING AND PROTECTION

A. **Confirm with the Owner, which if any, supply, return or exhaust diffusers and grilles, or combustion air openings associated with systems which serve the project area may remain in use during construction prior to the start of Testing Adjusting and Balancing (TAB). Cover all in-use supply, return and exhaust diffusers and grilles, and combustion air openings with temporary synthetic air filter media, 1-inch thick, with non-oily tackified surface, with a dust holding capacity of at least 250 grams per square yard, an average dust spot arrestance of at least 85 percent, and a MERV rating of at least 6. Cover all in use permanent equpment filters with temporary synthetic air filter media, 1-inch thick, with non-oily tackified surface, with a dust holding capacity of at least 250 grams per square yard, an average dust spot arrestance of at least 85 percent, and a MERV rating of at least 6. Provide a chickenwire filter media support over air openings that do not have panel filters in place to support the temporary filter media such that the filtration media does not get sucked through air openings nor come out of place. Allow in the bid to replace the temporary synthetic air filter media at least once per month and more often as required for proper operation of the fan systems during the entire demolition period and construction period.**

B. On completion of installation, inspect exposed finishes of all permanent installations. Remove burrs, dirt, paint spots and construction debris from all installations. Clean all installations to “as-new” condition.
   1. This requirement applies for all installed suspended components (including piping insulation,and ductwork, ductwork insulation, terminal units, fan coil units, expansion tanks, air separators, etc.), which are located above lay-in ceilings and hard ceilings, as well as though same components located within spaces without ceilings, especially their upper surfaces prone to collect dust and debris during construction.
   2. This requirement applies for all installed floor mounted and pad mounted equipment, (e.g. pumps, air handling units, tanks, etc.) which are located within mechanical equipment spaces, especially their upper surfaces prone to collect dust and debris during construction. Sweep, vacuum, and mop the entire upper surface of all air handling units.
   3. This requirement applies for the inside surfaces of air handling units. Sweep, vacuum, and mop the entire inside floor area of all air handling units, including beneath fan bases and the inside surfaces of drain pans. Wipe down all AHU wall surfaces their entire height and the complete underside of all AHU roof surfaces. Clean access door windows and door handles. Clean the lens covers of all light fixtures (on the interior and exterior of the lens cover). Flush all AHU floor drains out with compressed air and then reinstall the floor drain caps. Flush drain AHU pan drains out with compressed air and remove all debris from condensate drain piping P traps.

4. This requirement applies for all installed floor mounted and suspended Electrical Equipment and Plumbing Equipment (e.g. panelboards, bus duct, air compressors, booster pumps, fire pumps, etc.) which are located within mechanical equipment spaces, especially their upper surfaces prone to collect dust and debris during construction. Sweep, vacuum, and mop the entire upper surface of all such equipment
5. Clean the top surface of all equipment pads and curbs installed by the mechanical trades to the same level of cleanliness that the finished flooring is specified to receive.
6. Remove all debris from the floor within the entire Mechanical Room where work occurred with a broom (including portions of the room where equipment was not demolished nor installed by this project). Vacuum the entire Mechanical Room floor completely after sweeping with a broom. Mop all discolorations of the entire Mechanical Room concrete floor to remove the discoloration and restore the original color of the concrete. Remove all debris from the gap between the building walls and all equipment which is situated closely adjacent to the building walls for all pieces of equipment. Where the distances of the gap between the building wall (or the column) exceeds 12” width in any location along it’s length additionally perform the following:
    a. Clean the back surface (wall) of the equipment. Wipe it down to remove dust from floor to 7’-0” AFF for the entire length of the gap.
    b. Clean the building wall. Wipe it down to remove dust from floor to 7’-0” AFF for the entire length of the gap.
    c. Clean the floor within the gap to the same level of cleanliness that the finished flooring in the room is specified to receive.
7. On renovation projects within existing buildings, these cleaning provisions above apply to the existing equipment, existing ductwork, existing ductwork insulation, existing piping (including fire protection and plumbing piping), existing conduit, and existing flooring/floor coating within the space which will have been exposed to construction dust and debris from the mechanical work.

C. Protect all new equipment and installations and maintain all existing equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion. Repair all coatings, finishes and cabinets to “as-new” conditions prior to Substantial Completion. Utilize the equipment manufacturer’s original touch up paint. Document and submit documentation of any existing conditions prior to beginning demolition of any existing installations which were already damaged prior to the start of construction.

D. Remove all un-utilized construction materials that are not a part of the finished permanent installation from the project area.

E. Trim rod hangers for ductwork, piping, and hung equipment to a maximum exposed threaded length of 1” below the bottom nut.

F. Protect all Owner provided spare parts. Palletize and neatly stack filters. Obtain written receipt of Owner acceptance of spare parts denoting the quantities received and the storage location by room number and area.

END OF SECTION 23 0500

SECTION 23 0523
GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Globe valves.
B. Ball valves.
C. Butterfly valves.
D. Check valves.
E. Chainwheels.

1.02 ABBREVIATIONS AND ACRONYMS

A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
D. NRS: Nonrising stem.
E. OS&Y: Outside screw and yoke.
F. PTFE: Polytetrafluoroethylene.
G. RS: Rising stem.
H. TFE: Tetrafluoroethylene.
I. WOG: Water, oil, and gas.

1.03 REFERENCE STANDARDS

A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch.
B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
C. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard.
D. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves.
E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
F. ASME B16.34 - Valves — Flanged, Threaded, and Welding End.
G. ASME B31.1 - Power Piping.
H. ASME B31.9 - Building Services Piping.
I. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators.
J. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
K. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
L. MSS SP-45 - Drain and Bypass Connections.
M. MSS SP-67 - Butterfly Valves.

N. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves.

O. MSS SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends.

P. MSS SP-125 - Check Valves: Gray Iron and Ductile Iron, In-Line, Spring-Loaded, Center-Guided.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

1.05 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain valves for each valve type from single manufacturer.

B. Welding Materials and Procedures: Comply with ASME BPVC-IX.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
   2. Protect valve parts exposed to piped medium against rust and corrosion.
   3. Protect valve piping connections such as weld ends, threads, and flange faces.
   4. Adjust globe, gate, and angle valves to the closed position to avoid clattering.
   5. Secure check valves in either the closed position or open position.
   6. Adjust butterfly valves to closed or partially closed position.

B. Use the following precautions during storage:
   1. Maintain valve end protection and protect flanges and specialties from dirt.
      a. Provide temporary inlet and outlet caps.
      b. Maintain caps in place until installation.

C. Exercise the following precautions for handling:
   1. Handle large valves with sling, modified to avoid damage to exposed parts.
   2. Avoid the use of operating handles or stems as rigging or lifting points.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. See drawings for specific valve locations. Valves shall be installed on the inlet and outlet of each coil, at each piece of equipment, on each piping line coming out of a shaft to serve a floor, on each side of control valves and elsewhere as shown on plan.

B. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).

C. Provide the following valves for the applications if not indicated on drawings:
   1. Throttling (Hydronic): Butterfly, Ball, and Globe.
   2. Throttling (Steam): Globe.
   3. Isolation (Shutoff): Butterfly and Ball.
   4. Swing Check (Pump Outlet):
      a. Size 2 inch and Smaller: Bronze with bronze disc.

b. Size 2-1/2 inch and Larger: Iron with lever and weight, lever and spring, center-guided metal, or center-guided with resilient seat.

5. Dead-End: Butterfly, single-flange (lug) type.

D. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.

E. Required Valve End Connections for Non-Wafer Types:
1. Steel Pipe:
a. Size 2 inch and Smaller: Threaded ends.
b. Size 2-1/2 inch and Larger: Flanged ends.
2. Copper Tube:
a. Size 2 inch and Smaller: Threaded ends, except solder-joint valve-ends.
b. Size 2-1/2 inch and Larger: Flanged ends.
3. Steam and Steam Condensate Pipe: Grooved ends not acceptable.

F. Chilled Water Valves:
1. Size 2 inch and Smaller, Brass and Bronze Valves:
a. Threaded ends.
b. Ball: Full port, one piece, brass trim.
c. Swing Check: Bronze disc, Class.
d. Globe: Bronze disc, Class 125.
2. Size 2-1/2 inch and Larger, Iron Valves:
a. 2-1/2 inch to 4 inch: Flanged ends.
b. Single-Flange Butterfly: 2-1/2 inch to 12 inch, aluminum-bronze disc, EPDM seat, 200 CWP.
c. Single-Flange Butterfly: 14 inch to 24 inch, aluminum-bronze disc, EPDM seat, 150 CWP.
d. Flanged-End Butterfly: 2-1/2 inch to 12 inch, 175 CWP.
e. Swing Check: Metal seats, Class 125.
f. Globe: Class 125.

G. Condenser Water Valves:
1. Size 2 inch and Smaller, Brass and Bronze Valves:
a. Threaded ends.
b. Ball: Full port, one piece, brass trim.
c. Swing Check: Bronze disc, Class 125.
d. Globe: Bronze disc, Class 125.
2. Size 2-1/2 inch and Larger, Iron Valves:
a. 2-1/2 inch to 4 inch: Flanged ends.
b. Single-Flange Butterfly: 2-1/2 inch to 12 inch, aluminum-bronze disc, EPDM seat, 200 CWP.
c. Single-Flange Butterfly: 14 inch to 24 inch, 150 CWP, aluminum-bronze disc, EPDM seat, 150 CWP.
d. Flanged-End Butterfly: 2-1/2 inch to 12 inch, 175 CWP.
e. Swing Check: Metal seats, Class 125.
f. Iron Globe: 2-1/2 inch to 12 inch, Class 125.

H. Heating Hot Water Valves:
1. Size 2 inch and Smaller, Brass and Bronze Valves:
a. Threaded ends.
b. Ball: Full port, one piece, brass trim.

c. Swing Check: Bronze disc, Class 125.
d. Globe: Bronze disc, Class 125.

2. Size 2-1/2 inch and Larger, Iron Valves:
   a. 2-1/2 inch to 4 inch: Flanged ends.
   b. Single-Flange Butterfly: 2-1/2 inch to 12 inch, aluminum-bronze disc, EPDM seat, 200 CWP.
   c. Single-Flange Butterfly: 14 inch to 24 inch, aluminum-bronze disc, EPDM seat, 150 CWP.
   d. Flanged-End Butterfly: 2-1/2 inch to 12 inch, 175 CWP.
   e. Swing Check: Metal seats, Class 125.
   f. Globe: 2-1/2 inch to 12 inch, Class 125.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.

B. Valve Sizes: Match upstream piping unless otherwise indicated.

C. Valve Actuator Types:
   1. Gear Actuator: Quarter-turn valves 8 inch and larger.
   2. Handwheel: Valves other than quarter-turn types.
   3. Hand Lever: Quarter-turn valves 6 inch and smaller.
   4. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator, of size and with chain for mounting height, as indicated in the "Valve Installation" Article.

D. Valves in Insulated Piping: Provide 2 inch stem extensions and the following features:
   1. Gate Valves: Rising stem.
   2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
   3. Butterfly Valves: Extended neck.
   4. Memory Stops: Fully adjustable after insulation is installed.

E. Memory Stops: Fully adjustable after insulation is installed.

F. Valve-End Connections:
   1. Threaded End Valves: ASME B1.20.1.
   2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
   3. Pipe Flanges and Flanged Fittings 1/2 inch through 24 inch: ASME B16.5.
   4. Solder Joint Connections: ASME B16.18.
   5. Flanged End Connections: AWWA C606.

G. General ASME Compliance:
   1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
   2. Power Piping Valves: ASME B31.1.
   3. Building Services Piping Valves: ASME B31.9.

H. Bronze Valves:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

I. Valve Bypass and Drain Connections: MSS SP-45.

J. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 BRONZE, GLOBE VALVES

A. CWP Rating: Class 125: 200 psi:
   1. Comply with MSS SP-80, Type 1.
   2. Body: Bronze; ASTM B62, with integral seat and screw in bonnet.
   3. Ends: Threaded or solder joint.
   4. Stem and Disc: Bronze or PTFE.
   5. Packing: Asbestos free.
   6. Handwheel: Malleable iron.
   7. Manufacturers:
      a. Hammond.
      b. Milwaukee.
      c. Nibco.
      d. Stockham.

2.04 IRON, GLOBE VALVES

A. CWP Ratings: Class 125: 200 psi and Class 250: 500 psi:
   1. Comply with MSS SP-85, Type I.
   2. Body: Gray iron; ASTM A126, with bolted bonnet.
   3. Ends: Flanged.
   4. Trim: Bronze.
   5. Packing and Gasket: Asbestos free.
   6. Operator: Handwheel or chainwheel.
   7. Manufacturers:
      a. Crane.
      b. Hammond.
      c. Milwaukee.
      d. Stockham.
      e. NIBCO INC: www.nibco.com/#sle.

2.05 BRONZE, BALL VALVES

A. General:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

B. Two Piece, Full Port with Bronze or Brass Trim:
   1. Comply with MSS SP-110.
   2. WSP Rating: 150 psi.
   3. WOG Rating: 400 psi.
   4. Body: Forged bronze or dezincified-brass alloy.
   5. End Connections: Pipe thread or solder.
   6. Seats: PTFE.
   7. Stem: Bronze or brass.
   8. Ball: Chrome plated brass.
   9. Operator: Provide lockable handle and stem extension.
   10. Manufacturers:
      a. Apollo Valves: www.apollovalves.com/#sle.
      b. NIBCO INC: www.nibco.com/#sle.
      c. Hammond.
      d. Milwaukee.

e. Stockham.
f. Watts.

2.06 IRON, FLANGED-END BUTTERFLY VALVES

A. CWP Rating: 175 psi.
1. Comply with MSS SP-67, Type I.
2. Body: Coated ductile iron.
3. Stem: Two-piece stainless steel.
4. Disc: Coated ductile iron.
5. Disc Seal: EPDM.
6. Manufacturers:
a. Grinnel.
b. Crane.
c. Nibco.
d. Apollo.
e. Bray.
f. Centerline.
g. Demco.
h. Keystone.
i. Milwaukee.
j. Watts.

2.07 BRONZE, SWING CHECK VALVES

A. Class 125:
1. Pressure and Temperature Rating: MSS SP-80, Type 3.
2. Design: Y-pattern, horizontal or vertical flow.
3. WSP Rating: 200 psi.
4. Body: Bronze, ASTM B62.
5. End Connections: Threaded or soldered.
6. Disc: Bronze.
7. Manufacturers:
a. Crane.
b. Hammond.
c. NIBCO INC: www.nibco.com/#sle.
d. Metraflex.
e. Milwaukee.
f. Stockham.

2.08 IRON, FLANGED END SWING CHECK VALVES

A. Class 125:
1. 150 psi with metal seats.
2. 200 psi with metal seats and nonmetallic-to-metal seats.

B. Manufacturers:
1. Hammond.
2. NIBCO INC: www.nibco.com/#sle.
3. Metraflex.
4. Milwaukee.
5. Stockham.

2.09 IRON, CENTER-GUIDED CHECK VALVES

A. Class 125, Compact-Wafer, Non-Slam:
   1. Comply with MSS SP-125.
   2. Sizes 2-1/2 to 12 inch: CWP Rating; 200 psi.
   3. Body Material: ASTM A126, gray iron.
   4. Metal Seat: Bronze.
   5. Manufacturers:
      a. Apollo Valves: www.apollovalves.com/#sle.
      b. Milwaukee.
      c. Mueller.
      d. Metraflex.

2.10 CHAINWHEELS

A. Description: Valve actuation assembly with sprocket rim, brackets, and chain.
   1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
   2. Attachment: For connection to ball and butterfly valve stems.
   3. Sprocket Rim with Chain Guides: Ductile iron include zinc coating.
   4. Chain: Hot-dip galvanized steel. Sized to fit sprocket rim.

B. Manufacturers:
   1. Babbitt Steam Specialty Company.
   2. Roto Hammer Industries.
   3. Trumball Industries.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges, are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

C. Install check valves where necessary to maintain direction of flow as follows:
   1. Lift Check: Install with stem plumb and vertical.
   2. Swing Check: Install horizontal maintaining hinge pin level.

D. Provide chainwheels on operators for valves 4 NPS and larger where located 96 inches or more above finished floor, terminating 60 inches above finished floor.

E. Do not install ball valves with the stems pointing down and handles on the bottom of the pipe. Ball valve stems may be installed with the stem oriented horizontally at the centerline of the horizontally oriented pipe and the handle on the side of the pipe if it meets the manufacturer's written installation instructions.

F. Butterfly valve stems shall be installed with the stem oriented horizontally at the centerline of the horizontally oriented pipe and the handle on the side of the pipe if it meets the manfacturer's written installation instructions. If not recommended by the manufacturer for horizontal stem installation, butterly valves shall be installed with the stem at or above 45 degrees from vertical from the centerline of the pipe.

SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Valve Tags.
C. Adhesive-backed duct markers.
D. Stencils.
E. Pipe markers/labels.
F. Duct Labels.
G. Access Panel and Access Door labels.
H. Ceiling Labels.
I. BAS sensor labels.
J. Raceway identification labels.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems.
B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
D. Equipment Label Schedule: Include a listing of all equipment to be labeled with proposed content for each label.
E. **Pipe Label Schedule: Include a listing of each piping system to be labeled with proposed alphanumeric content for each label and proposed color and size of each label.**
F. **Duct Label Schedule: Include a listing of each ductwork system to be labeled with proposed alphanumeric content for each label and proposed color and size of each label.**
G. **Temperature Sensor Label Schedule: Include a listing of each sensor to be labeled with proposed alphanumeric content for each label and proposed color and sizof each label.**
H. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Air Handling Units: Nameplates. Fans, blowers, primary balancing dampers, and mixing boxes.

B. Air Terminal Units: Nameplates or tags. Ceiling labels, where located above ~~lay-in~~ ceiling. Terminal units (supply air terminal boxes, exhaust air valves. Include Control Supplier furnished Fume Hood Exhaust Valves): For terminal units located above ceiling, locate equipment label on the bottom or side of the terminal unit where it will be visible from the designated ceiling access panel/tile. If utilizing manufacturer's labels, lettering shall be at least 1" tall. Permanent marker handwritten labels with 2" tall letters are also acceptable. Do not paint over manufacturer provided labels.

C. Control Panels: Nameplates.

D. Dampers: Ceiling labels, where located above **~~lay-in~~** ceiling. Fire dampers and fire/smoke dampers.

E. Ductwork: Duct markers or stencils.

F. Heat Transfer Equipment: Nameplates. Pumps, compressors, chillers, condensers, and similar motor-driven units. Heat exchangers, built-up coil banks, evaporators, cooling towers, heat recovery units, and similar equipment. Filters, humidifiers, and water-treatment systems.

G. Instrumentation: Tags.

H. Major Control Components: Nameplates.

I. Piping: Pipe markers.

J. Pumps: Nameplates.

K. Small-sized Equipment: Nameplates or tags. Humidifiers and pressure reducing valves.

L. Tanks: Nameplates. Tanks and pressure vessels.

M. Thermostats: Temperature sensor labels.

N. Valves: TagsTags and ceiling tacks where located above **~~lay-in~~** ceiling **and at access doors.**

O. Water Treatment Devices: Nameplates.

P. Access Doors: Install access panel and door labels on ceiling access panel and shaft access panels.

2.02 NAMEPLATES

A. Letter Color: Black.

B. Letter Height: 1/2 inch.

C. Background Color: white.

D. Plastic: Comply with ASTM D709.

E. Equipment Labels: Engraved, color-coded, multi-layer, multi-color laminated plastic for mechanical engraving. Include contact-type, permanent adhesive. suitable for surface temperature of equipment.

F. Terminology: Match Owner's numbering scheme or drawing schedules with unique equipment number.

G. Size: Length and width vary for required label content, but not less than 4-1/2 by 6 inches (115 by 150 mm) for equipment, 1/8 inch thick.

2.03 TAGS

A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

B. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame. For each piping system, on standard-size bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space),

C. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; faucets; convenience hose connections; at HVAC terminal devices and at similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

2.04 ADHESIVE-BACKED DUCT MARKERS

A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.

B. Style: Individual Label.

C. Color: ASME A13.1 if Owner does not have color scheme. **Utilize the following otherwise:**
   1. **Blue: For cold-air supply ducts.**
   2. **Yellow: For lab (fume hood) exhaust ducts.**
   3. **Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.**
   4. **Red: For bio-hazard and isolation room exhaust ducts.**
   5. **Letter Size: Minimum 1- inch and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.**

D. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 15 feet in each space where ducts are exposed or concealed by ~~removable~~ ceiling system. Duct marker identification shall indicate the associated fan system (e.g., “EF-3 exhaust”). Install permanent duct labels at each duct access door to each fire damper, smoke damper or fire/smoke damper. These labels shall have letters at least 0.75” tall. The labels shall read “FIRE DAMPER”, “SMOKE DAMPER” or “FIRE/SMOKE DAMPER” as applicable.

E. **Locate lables at a minimum of once over each room for each duct system present over that room. Center the label in the duct run over the room if duct length over the room is less than 15 feet rather than install labels at each wall penetration.**

2.05 DUCT STENCILS

A. Stencils: With clean cut symbols and letters of following size:
   1. Ductwork: 2-1/2 inch high letters.

B. Stencil Paint: As specified in Section 09 9123, semi-gloss enamel, colors complying with ASME A13.1.

C. **Locate stencils near points where ducts enter into concealed spaces and at maximum intervals of 15 feet in each space where ducts are exposed or concealed by ceiling system. Duct marker identification shall indicate the associated fan system (e.g., “EF-3 exhaust”). Install permanent duct stencils at each duct access door to each fire damper, smoke damper or fire/smoke damper. These stencils shall have letters at least 0.75” tall. The stencils shall read “FIRE DAMPER”, “SMOKE DAMPER” or “FIRE/SMOKE DAMPER” as applicable.**

D. **At a minimum of once over each room for each duct system present over that room. Center the stencil in the duct run over the room if duct length over the room is less than 15 feet rather than install stencils at each wall penetration.**

2.06 PIPE MARKERS

A. Color: Comply with ASME A13.1 if Owner does not have color scheme.

B. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

D. Underground Plastic Pipe Markers: Bright-colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.

E. Locate pipe labels as follows:
   1. Near (within 24" of) each valve and control device.
   2. Near each branch connection, excluding short takeoffs less than ten feet long for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Each side of penetrations through walls, floors, ceilings, and non-accessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 15 feet along each run.
   7. At a minimum of once over each room for each piping system present over that room. Center the label in the pipe run over the room if pipe length over the room is less than 15 feet rather than install labels at each wall penetration.

2.07 LABELS

A. Ceiling labels.
   1. Description: 1/2-inch wide clear extra strength tape with 1/4-inch high black letters. Extra strength adhesive suitable for use on rough, textured, or uneven surfaces, as well as painted and powder coated surfaces.
   2. Provide ceiling labels to locate items T-bar type lay-in panel ceilings and to locate items above gypboard ceilings. Locate at corner of T-Bar grid closest to the equipment. Locate at the access door frame on gypboard ceilings. Items which are scheduled on the drawings shall have labels which indicate their scheduled tag (e.g. “TB-201”). Items which are not scheduled on the drawings shall have labels which indicate their name (e.g. “Fire damper”). ~~**Provide ceiling labels for the following:**~~
      a. **HVAC terminal units (terminal boxes, fan powered terminal boxes, fan coil units, reheat coils, etc.).**
      b. **Fire dampers and fire/smoke dampers. Utilize ceiling tags “fire damper”, “fire/smoke damper”, etc. if not provided individual tag names by the Owner.**
      c. **Steam traps, humidifiers and steam pressure reducing valves. Utilize ceiling tags “steam trap”, “humidifier”, etc.**
      d. **Controls components: Control panels, duct static pressure sensors, humidifier sensors, control valves, control dampers, control air reducing valves, etc. Utilize ceiling tags “control panel”, “pressure sensor”, etc.**
      e. **Duct smoke detectors. Utilize ceiling tag “duct detector”.**
      f. **Each valve which receives a valve tag. Utilize valve tag nomenclature for ceiling tag (e.g. “CHWP-7”).**

B. Temperature sensor labels.
   1. Description: 1/4-inch wide clear extra strength tape with 1/8-inch high black letters. Extra strength adhesive suitable for use on rough, textured, or uneven surfaces, as well as painted and powder coated surfaces.

2. Provide thermostat labels on the inside cover of all thermostats with removable covers and on the face of the plate type temperature sensors. For other sensors, install label on top exterior surface. Label shall indicate equipment tag of controlled device (e.g., TB-311). Clarify location **and exact text to utilize for** thermostat label with the controls (BAS) submittal and the Owner's BAS personnel.

2.08 RACEWAY (EMT AND CONDUIT) IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size. Temperature controls: White letters on a purple field.

B. System Identification Color Banding for Raceways: Each color band shall completely encircle cable or conduit. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

C. ~~**All control raceways and junction boxes shall be identified with preprinted self-adhesive vinyl labels. All cables not located within raceways shall be identified at maximum 25 foot intervals. Control raceways shall be identified at maximum 15 foot intervals within rooms with no ceiling and at a minimum once over each room the raceway passes through.**~~

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 9123 for stencil painting.

3.02 INSTALLATION

A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive **on or immediately adjacent (within 6") of each piece of mechanical equipment**. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
   1. Locate labels and nameplates where accessible and visible.
   2. Locate labels on the exterior surface of equipment that receives insulation attached to the insulation. Do not label the equipment and then cover up the label with insulation.
   3. For insulated equipment which has an uninsulated base (e.g. pump base) attach the permanent equipment label to the uninsulated base if a location on the base can be found that is accessible and visible.
   4. **Include markers labels for each piece of mechanical equipment and for the following general categories of equipment:**
      a. **Pumps, compressors, chillers, condensers, and similar motor-driven units.**
      b. **Heat exchangers, built-up coil banks, evaporators, cooling towers, heat recovery units, and similar equipment.**
      c. **Fans, blowers, primary balancing dampers, and mixing boxes.**
      d. **Packaged HVAC central-station and zone-type units.**
      e. **Tanks and pressure vessels.**
      f. **Filters, humidifiers, and water-treatment systems.**
      g. **Fire dampers and fire/smoke dampers.**
      h. **Humidifiers and pressure reducing valves.**

i. **Terminal units (terminal boxes, exhaust air valves) including air valves supplied by the Control Supplier: For terminal units located above ceiling, locate equipment label on the bottom or side of the terminal unit where it will be visible from the designated ceiling access panel/tile. If utilizing manufacturer's labels, lettering shall be at least 1" tall. Permanent marker handwritten labels with 2" tall letters are also acceptable on the bottom of these terminal units. Do not paint over manufacturer provided labels.**

5. **Install access panel labels and access door labels all all equipment behind/above the access panel. Include labels on all shaft access panels and general trades wall access doors.**

B. Install valve tags with corrosion resistant chain **for each valve as specified herein. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; faucets; conveniencehose connections; at HVAC terminal devices and at similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.**

C. Apply stencil painting in accordance with Section 09 9123.

D. Install plastic pipe markers **and duct labels** in accordance with manufacturer's instructions **for each piping system and for each ductwork system as specified herein.**

E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
   1. Identify service, flow direction, and pressure.
   2. Install in clear view and align with axis of piping.
   3. Locate identification not to exceed 15 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
   4. Locate near each branch connection, excluding short takeoffs less than ten feet long for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   5. Locate each side of penetrations through walls, floors, ceilings, and non-accessible enclosures.
   6. Locate at access doors, manholes, and similar access points that permit view of concealed piping.
   7. Locate at a minimum of once over each room for each piping system present over that room. Center the label in the pipe run over the room. If pipe length over the room is more than 15 feet, install labels at each wall penetration and approximately in the center of the room.
   8. Locate each side of the piping that passes over a "cloud ceiling" (a ceiling which does not span from wall to wall within the room); once on the side where it goes above the cloud ceiling, and once on the side where it comes out from being above the cloud ceiling. Repeat for every cloud ceiling within the room where rooms have multiple cloud ceilings. Cloud ceilings located less than 10 feet from closest edge to closest edge may "share" a pipe label located approximately equidistant from each cloud ceiling.

F. Install ductwork with duct markers or stencils. Identify with air handling unit identification number and area served.
   1. Locate identification at air handling unit, at each side of penetration of structure or enclosure or shaft, and at each fire damper.

2. Locate at a minimum of once over each room for each ductwork system present over that room. Center the label in the duct run over the room. If duct length over the room is more than 15 feet, install labels at each wall penetration and approximately in the center of the room.
3. Locate each side of the ductwork that passes over a "cloud ceiling" (a ceiling which does not span from wall to wall within the room); once on the side where it goes above the cloud ceiling, and once on the side where it comes out from being above the cloud ceiling. Repeat for every cloud ceiling within the room where rooms have multiple cloud ceilings. Cloud ceilings located less than 10 feet from closest edge to closest edge may "share" a duct label located approximately equidistant from each cloud ceiling.

G. **Install permanent duct labels at each duct access door to each fire damper, smoke damper or fire/smoke damper. These labels shall have letters at least 0.75" tall. The labels shall read "FIRE DAMPER", "SMOKE DAMPER" or "FIRE/SMOKE DAMPER" as applicable..**

H. Locate ceiling tacks to locate valves or dampers **and other items specifed herein** above ~~**lay-in panel**~~ ceilings **for each item located above a ceiling**. Locate in corner of panel closest to equipment.

I. Provide ceiling labels tacks to locate itemsvalves or dampers above T-bar type lay-in panel ceilings and to locate items above gypboard ceilings. Locate at corner of T-bBar grid closest to the equipment. Locate at the access door frame on gypboard ceilings. Items which are scheduled on the drawings shall have labels which indicate their scheduled tag (e.g. "TB-201"). Items which are not scheduled on the drawings shall have labels which indicate their name (e.g. "Fire damper"). Provide ceiling labels for the following:
   1. **HVAC terminal units (terminal boxes, fan powered terminal boxes, fan coil units, reheat coils, etc.).**
   2. **Fire dampers and fire/smoke dampers. Utilize ceiling tags "fire damper", "fire/smoke damper", etc. if not provided individual tag names by the Owner.**
   3. **Steam traps, humidifiers and steam pressure reducing valves. Utilize ceiling tags "steam trap", "humidifier", etc.**
   4. **Controls components: Control panels, duct static pressure sensors, humidifier sensors, control valves, control dampers, control air reducing valves, etc. Utilize ceiling tags "control panel", "pressure sensor", etc.**
   5. **Duct smoke detectors. Utilize ceiling tag "duct detector".Each valve which receives a valve tag. Utilize valve tag nomenclature for ceiling tag (e.g. "CHWP-7").**
   6. **Each valve which receives a valve tag. Utilize valve tag nomenclature for ceiling tag (e.g. "CHWP-7").**

J. **Provide thermostat label on the inside cover of all thermostats with removable covers and on the face of the plate type temperature sensors (this includes all thermostats furnished by all Control Suppliers). For other sensors, install label on top exterior surface. Label shall indicate equipment tag of controlled device (e.g., TB-311). Clarify location of label with controls submittal.**

K. **Provide Temperature Control (BAS) raceway labels for all temperature control raceway (EMT and conduit). All control raceways and junction boxes shall be identified with preprinted self-adhesive vinyl labels. All control raceways shall be identified at maximum 15 foot intervals within rooms with no ceiling and at a minimum once over each room the raceway passes through.**

END OF SECTION 23 0553

230906.1.01.A.6.b

Apr 20, 2026 Addendum 01

6. Bidding Instructions:
   a. The Control Supplier (also referred to as the Temperature Controls Contractor) installation diagrams for control and interlock wiring represent the basis of control system operation for this contract.
   b. The Control Supplier installation drawings will be issued in Addendum under The Control Supplier's title block. BSA LifeStructures temperature control drawings are for description only and shall not be used as basis for bid.

SIEMENS

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04/15/26

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ENGINEERING DATA FOR
IU LAUNCH ACCELERATOR FOR BIO

IU# 20250072, IN
USA

44OP-412785

SMITHGROUP
ARCHITECT

BSA LIFE STRUCTURES
ENGINEER

INDIANA UNIVERSITY
CONTRACTOR

DWG	DESCRIPTION
	GENERAL
CVRST	COVER SHEET
RVH	REVISION HISTORY
CIC	C.I.C CONTRACTOR NOTES
ABAC	ANIXTER BLDG AUTO. CABLES
DWIR1	DXR Wiring Specification
DWIR2	DXR Wiring Specification2
FLCT	FLNC Termination Specification
FTRM	FLN Termination Specification
TTRM1	TX-I/O Termination Spec.
TTRM2	TX-I/O Termination Spec. 2
TTRM3	TX-I/O Termination Spec. 3
ALN	ALN COMMUNICATION
DXR	DXR COMMUNICATION
MSTP	MSTP COMMUNICATION
	VALVE SUBMITTAL
FHV	FH AIR VALVE SCHEDULE
LTB	LAB ROOM SCHEDULE
TB	NON-LAB ROOM SCHEDULE
COND	CHILLED BEAM COND SCHEDULE
VLV	CONTROL VALVE SCHEDULE
	CONTROL DRAWINGS
R01	SYSTEM ARCHITECTURE
R01A	DDC PANEL SCHEDULE
R02	1ST FLR MSTP DXR NETWORK
R02A	PNL-1F LAYOUT
R02B	1ST FLR MSTP DXR NETWORK BOM
R03	PH MSTP DXR NETWORK
R03A	PNL-PH LAYOUT
R03B	PH MSTP DXR NETWORK BOM
R04	1ST FLR ETHERNET DXR NETWORK
R04A	PNL-LAB1 UPS WIRING
R04B	1ST FLR E. DXR NETWORK BOM
R05	2ND FLR ETHERNET DXR NETWORK
R05A	PNL-LAB2 UPS WIRING
R05B	2ND FLR E.DXR NETWORK BOM
R06	3RD FLR ETHERNET DXR NETWORK
R06A	PNL-LAB3 UPS WIRING
R06B	3RD FLR E.DXR NETWORK BOM
R07	4TH FLR ETHERNET DXR NETWORK
R07A	PNL-LAB4 UPS WIRING
R07B	4TH FLR E.DXR NETWORK BOM
R08	5TH FLR ETHERNET DXR NETWORK
R08A	PNL-LAB5 UPS WIRING
R08B	5TH FLR E.DXR NETWORK BOM
R09	PNL-PH-E LAYOUT
R09A	PNL-PH-E UPS WIRING
R09B	PNL-PH-E PANEL BOM
R10	PNL-SW-1 LAYOUT
R10A	PNL-SW-1 PANEL BOM
R11	PNL-SW-2 LAYOUT
R11A	PNL-SW-2 PANEL BOM
R20	POWER TRUNKS
R20A	POWER TRUNKS BOM
100	CHILLED WATER SYSTEM
100A	CHW SYS ELEC. WIRING 1
100B	CHW SYS ELEC. WIRING 2
100C	CHW SYS ELEC. WIRING 3
100D	CHW SYS ELEC. WIRING 4
100E	CHW SYS ELEC. WIRING 5
100F	CHW SYS ELEC. WIRING 6
100G	CHW SYS ELEC. WIRING 7
100H	CHW SYS ELEC. WIRING 8
100I	CHW SYS ELEC. WIRING 9
100J	CHW SYS ELEC. WIRING 10
100K	CHW SYS ELEC. WIRING 11
100L	CW SYS ELEC WIRING 1
100M	CW SYS ELEC WIRING 2
100N	CHW AUX PANEL LAYOUT
100O	CW AUX PANEL LAYOUT
100P	CHW SYS BOM & SOO 1
100Q	CHW SYS CNTRL SOO 2
100R	CHW SYS CNTRL SOO 3
100S	CHW SYS CNTRL SOO 4
110	HEATING HOT WATER SYSTEM
110A	HHW SYS ELEC. WIRING 1
110B	HHW SYS ELEC. WIRING 2
110C	HHW SYS ELEC. WIRING 3
110D	HHW SYS ELEC. WIRING 4
110E	HHW AUX PANEL LAYOUT
110F	HHW SYS BOM & SOO 1
110G	HHW SYS CNTRL SOO 2
	CONTROL DRAWINGS
200	AHU-1 CONTROL
200A	AHU-1 ELEC WIRING 1
200B	AHU-1 ELEC WIRING 2
200C	AHU-1 ELEC WIRING 3
200D	AHU-1 ELEC WIRING 4
200E	AHU-1 ELEC WIRING 5
200F	AHU-1 AUX PANEL LAYOUT
200G	AHU-1 CONTROL BOM
210	AHU-2 CONTROL
210A	AHU-2 ELEC WIRING 1
210B	AHU-2 ELEC WIRING 2
210C	AHU-2 ELEC WIRING 3
210D	AHU-2 ELEC WIRING 4
210E	AHU-2 ELEC WIRING 5
210F	AHU-2 AUX PANEL LAYOUT
210G	AHU-2 CONTROL BOM
220	AHU-3 CONTROL
220A	AHU-3 ELEC WIRING 1
220B	AHU-3 ELEC WIRING 2
220C	AHU-3 ELEC WIRING 3
220D	AHU-3 ELEC WIRING 4
220E	AHU-3 ELEC WIRING 5
220F	AHU-3 AUX PANEL LAYOUT
220G	AHU-3 CONTROL BOM
230	AHU-4 CONTROL
230A	AHU-4 ELEC WIRING 1
230B	AHU-4 ELEC WIRING 2
230C	AHU-4 ELEC WIRING 3
230D	AHU-4 ELEC WIRING 4
230E	AHU-4 ELEC WIRING 5
230F	AHU-4 AUX PANEL LAYOUT
230G	AHU-4 CONTROL BOM

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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DWG	DESCRIPTION
	CONTROL DRAWINGS
240	AHU-5 CONTROL
240A	AHU-5 ELEC WIRING 1
240B	AHU-5 ELEC WIRING 2
240C	AHU-5 ELEC WIRING 3
240D	AHU-5 ELEC WIRING 4
240E	AHU-5 ELEC WIRING 5
240F	AHU-5 AUX PANEL LAYOUT
240G	AHU-5 CONTROL BOM
241A	AHU-1 THRU AHU-5 SOO 1
241B	AHU-1 THRU AHU-5 SOO 2
241C	AHU-1 THRU AHU-5 SOO 3
250	AHU-6A/B CONTROL
250A	AHU-6A ELEC. WIRING 1
250B	AHU-6A ELEC. WIRING 2
250C	AHU-6B ELEC. WIRING 1
250D	AHU-6B ELEC. WIRING 2
250E	DSF-11&12 ELEC WIRING
250F	AHU-6A&B AUX PANEL LAYOUT
250G	AHU-6A/B CNTRL BOM & SOO 1
250H	AHU-6A/B CONTROL SOO 2
260	AHU-7 CONTROL
260A	AHU-7 ELEC WIRING 1
260B	AHU-7 ELEC WIRING 2
260C	AHU-7 ELEC WIRING 3
260D	AHU-7 AUX PANEL LAYOUT
260E	AHU-7 CNTRL BOM & SOO 1
260F	AHU-7 CONTROL SOO 2
270	AHU-8 CONTROL
270A	AHU-8 ELEC WIRING 1
270B	AHU-8 ELEC WIRING 2
270C	AHU-8 AUX PANEL LAYOUT
270D	AHU-8 CONTROL
270E	AHU-8 CONTROL
280	FUTURE AHU-9
280A	FUTURE AHU-9 CONTROL
280B	FUTURE AHU-9 BOM
300	FUME HOOD EXH FAN SYSTEM
300A	FH EXH FAN ELEC. WIRING 1
300B	FH EXH FAN ELEC. WIRING 2
300C	FH EXH FAN ELEC. WIRING 3
300D	FHEF AUX PANEL LAYOUT
300E	FH EXH FAN SYS BOM & SOO

DWG	DESCRIPTION
	CONTROL DRAWINGS
310	CH ROOM FAN CONTROL
310A	CH ROOM FAN ELEC. WIRING
310B	CH ROOM FAN CTRL BOM & SOO
400	LAB ROOM SCENARIO_1
401	LAB ROOM SCENARIO_2
402	LAB ROOM SCENARIO_3
403	LAB ROOM SCENARIO_4
404	LAB ROOM SCENARIO_5
405	LAB ROOM SCENARIO_6
406	LAB ROOM SCENARIO_7
407	LAB ROOM SCENARIO_8
408	LAB ROOM SCENARIO_9
409	LAB ROOM SCENARIO_10
410	LAB ROOM SCENARIO_11
411A	LAB ROOM SEQUENCE 1
411B	LAB ROOM SEQUENCE 2
430	LTB-LGEV-FAST-CB-RAD-P70-OCC
430A	LTB-LGEV-FAST-CB-RAD-P70-OCC BOM
431	LTB-LGEV-FAST-CB-P70-OCC
431A	LTB-LGEV-FAST-CB-P70-OCC BOM
432	LTB-LGEV-FAST-RAD-P70-OCC
432A	LTB-LGEV-FAST-RAD-P70-OCC BOM
433	LTB-LGEV-FAST-P70-OCC
433A	LTB-LGEV-FAST-P70-OCC BOM
434	LTB-LGEV-FAST-P30-OCC
434A	LTB-LGEV-FAST-P30-OCC BOM
435	LTB-SLOW-P30-OCC
435A	LTB-SLOW-P30-OCC BOM
436	LTB-LGEV-SLOW-CB-P70-OCC
436A	LTB-LGEV-SLOW-CB-P70-OCC BOM
437	LTB-LGEV-SLOW-CB-P30-OCC
437A	LTB-LGEV-SLOW-CB-P30-OCC BOM
438	LTB-LGEV-SLOW-P70-OCC
438A	LTB-LGEV-SLOW-P70-OCC BOM
439	LTB-LGEV-SLOW-P30-OCC
439A	LTB-LGEV-SLOW-P30-OCC BOM
440	TB-EV-SLOW-CB-RAD-P70-OCC
440A	TB-EV-SLOW-CB-RAD-P70-OCC BOM
441	TB-EV-SLOW-CB-RAD-P30-OCC

DWG	DESCRIPTION
	CONTROL DRAWINGS
441A	TB-EV-SLOW-CB-RAD-P30-OCC BOM
442	TB-EV-SLOW-CB-P70-OCC
442A	TB-EV-SLOW-CB-P70-OCC BOM
443	TB-EV-SLOW-CB-P30-OCC
443A	TB-EV-SLOW-CB-P30-OCC BOM
444	TB-EV-SLOW-RAD-P70-OCC
444A	TB-EV-SLOW-RAD-P70-OCC BOM
445	TB-EV-SLOW-CLG-P30-OCC
445A	TB-EV-SLOW-CLG-P30-OCC BOM
446	TB-EV-SLOW-P70-OCC
446A	TB-EV-SLOW-P70-OCC BOM
447	TB-EV-SLOW-P30-OCC
447A	TB-EV-SLOW-P30-OCC BOM
448	TB-EV-SLOW-RR-OCC
448A	TB-EV-SLOW-RR-OCC BOM
449A	TB-EV SEQUENCE 1
449B	TB-EV SEQUENCE 2
450	VAV w/HW REHEAT-P70-IP DXR
450A	VAV w/HW REHEAT-P70-IP DXR BOM
451	VAV w/HW REHEAT-P30-IP DXR
451A	VAV w/HW REHEAT-P30-IP DXR BOM
452	VAV w/HW REHEAT MSTP DXR
452A	VAV w/HW REHEAT MSTP DXR BOM
453	VAV COOLING ONLY
453A	VAV COOLING ONLY BOM & SOO
454	INJECTION VAV BOX
454A	INJECTION VAV BOX BOM
455	VAV w/HW RH-CB-P30-IP DXR
455A	VAV w/HW RH-CB-P30-IP DXR BOM
456	PUMP RM DMP CONTROL
456A	PUMP RM DMP CONTROL
460	FUME HOOD CONTROL
460A	FUME HOOD CONTROL BOM
461	LAB EQUIPMENT EXHAUST
461A	LAB EQUIPMENT EXHAUST BOM
470	DUCT HUMIDIFIER CONTROL
470A	H-502 ELEC. WIRING
470B	H-509 ELEC. WIRING
470C	H-536 ELEC. WIRING

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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DWG	DESCRIPTION
	CONTROL DRAWINGS
470D	H-534 ELEC. WIRING
470E	H-540 ELEC. WIRING
470F	AHU STATUS INTLK WIRING
470G	DUCT HUMIDIFIER BOM & SOO
471	4-PIPE HYDRONIC BEAM
471A	4-PIPE HYDRONIC BEAM BOM & SOO
480	4-PIPE FCU CONTROL
480A	4-PIPE FCU CTRL BOM & SOO
481	4-PIPE FCU 3PH FAN CONTROL
481A	4-PIPE FCU 3PH FANBOM & SOO
482	2-PIPE FCU CONTROL
482A	2-PIPE FCU CTRL BOM & SOO
490	CABINET UH CONTROL
490A	CABINET UH CTROL BOM & SOO
491	UNIT HEATER CONTROL
491A	UNIT HEATER CTRL BOM & SOO
492	ELECTRIC UH CONTROL
492A	ELECTRIC UH CTRL WIRING
492B	ELECTRIC UH CTRL BOM & SOO
600	DOMESTIC WATER HEATERS
600A	DHW-1 & 2 ELEC. WIRING
600B	DWH AUX LAYOUT PANEL
600C	DW HEATERS BOM & SOO
610	MISCELLANEOUS
610A	MISC. ELEC. WIRING 1
610B	MISC. ELEC. WIRING 2
610C	MISCELLANEOUS BOM & SOO
	DDC PANEL LAYOUTS
E02	1FL MS/TP DEVICES
E02A	1FL MS/TP DEVICES BOM
E03	PH MS/TP DEVICES
E03A	PH MS/TP DEVICES BOM
E09	E DXR SUPERVISORY
E09A	LA17.PXCA BOM
E100B	CHW SYSTEM
E100C	LA12.PXCAp002
E100D	LA12.PXCAp003
E100E	LA12.PXCAp004
E100F	LA12.PXCAp005
E100G	LA12.PXCAp006
E100H	LA12.PXCAp007

DWG	DESCRIPTION
	DDC PANEL LAYOUTS
E100I	LA12.PXCAp008
E100J	LA12.PXCAp009
E100K	LA12.PXCA BOM
E101A	CONDENSER WTR SYSTEM
E101B	LA13.PXCAp002
E101C	LA13.PXCA BOM
E110A	HHW SYSTEM
E110B	LA14.PXCAp002
E110C	LA14.PXCAp003
E110D	LA14.PXCA BOM
E200A	AHU-1 & GEF-1
E200B	LA01.PXCAp002
E200C	LA01.PXCAp003
E200D	LA01.PXCAp004
E200E	LA01.PXCA BOM
E210A	AHU-2 & GEF-2
E210B	LA02.PXCAp002
E210C	LA02.PXCAp003
E210D	LA02.PXCAp004
E210F	LA02.PXCA BOM
E220A	LA03.PXCA BOM
E220B	LA03.PXCAp002
E220C	LA03.PXCAp003
E220D	LA03.PXCAp004
E220E	AHU-3 & GEF-3
E230A	AHU-4 & GEF-4
E230B	LA04.PXCAp002
E230C	LA04.PXCAp003
E230D	LA04.PXCAp004
E230E	LA04.PXCA BOM
E240A	AHU-5 & GEF-5
E240B	LA05.PXCAp002
E240C	LA05.PXCAp003
E240D	LA05.PXCAp004
E240E	LA05.PXCA BOM
E250A	AHU-6A & 6B
E250B	LA06.PXCAp002
E250C	LA06.PXCAp003
E250D	LA06.PXCAp004

DWG	DESCRIPTION
	DDC PANEL LAYOUTS
E250E	LA06.PXCA BOM
E260A	AHU-7
E260B	LA07.PXCAp002
E260C	LA07..PXCA BOM
E270A	AHU-8
E270B	LA08.PXCAp002
E270C	LA08.PXCA BOM
E300A	FHEF-10A/B/C
E300B	LA11.PXCAp002
E300C	LA11.PXCA BOM
E470A	HUMIDIFIERS 534 & 540
E470B	LA18.PXCAp002
E470C	LA18.PXCA BOM
E470E	HUMIDIFIERS 502 509 536
E470F	LA19.PXCAp002
E470G	LA19.PXCA BOM
E610A	MISCELLANOUS
E610B	LA10.PXCAp002
E610C	LA10.PXCA BOM
	DDC PANEL INSTALLATION DRAWINGS
E100	LA12.PXCA INSTALLATION
E100A	LA12.PXCA EXP. INSTALLATION
E101	LA13.PXCA INSTALLTION
E110	LA14.PXCA INSTALLATION
E200	LA01.PXCA INSTALLATION
E210	LA02.PXCA INSTALLATION
E220	LA03.PXCA INSTALLATION
E230	LA04.PXCA INSTALLATION
E240	LA05.PXCA INSTALLATION
E250	LA06.PXCA INSTALLATION
E260	LA07..PXCA INSTALLATION
E270	LA08.PXCA INSTALLATION
E300	LA11.PXCA INSTALLATION
E470	LA18.PXCA INSTALLATION
E470D	LA19.PXCA INSTALLATION
E610	LA10.PXCA INSTALLATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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REV	DATE	DESCRIPTION	DWG	SYSTEM DWG

REV	DATE	DESCRIPTION	DWG	SYSTEM DWG

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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, CAT6A	See Specification for type and color required.	Ethernet Network Communication cabling See Specification for type and color required.
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, CAT6A	See Specification for type and color required.	Ethernet Network Communication cabling See Specification for type and color required.
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

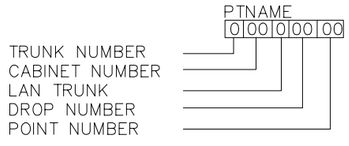
Description	Part Number	Application
ETHERNET 23AWG, CAT6A	See Specification for type and color required.	Ethernet Network Communication cabling See Specification for type and color required.
24-1p (STR) SHD Cable-Plenum	5200BLN	BLN trunks
24-1p (STR) SDH Cable-Plenum	5200FLN	FLN trunks
24-1.5p (STR) 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

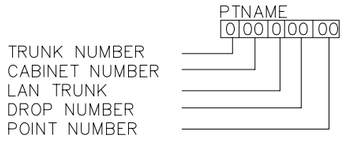
30. CIC shall create and keep an up to date list of DXR Bar Codes in a binder that is accessible to Siemens. CIC will create a list of terminal equipment that is controlled by DXR Controllers. CIC will remove the Bar Code from the DXR Controllers at the time of controls installation for each DXR and 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.

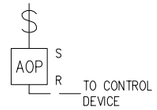
CONTROL SYMBOL	CONTROL SYMBOL DESCRIPTION
AC	AIR COMPRESSOR
AD	AIR DRYER
ADXR	ACTUATOR DXR
AE	ACTUATOR ELECTRIC
AEM	APOGEE ETHERNET MICROSERVER
AF	AIR FILTER
AFS	AIR FLOW STATION
AOP	ANALOG OUTPUT, PNEUMATIC
AP	ACTUATOR PNEUMATIC
APS	AUX. POWER SUPPLY
AT	AUTOMATIC TRAP
ATD	AUTO TANK DRAIN
ATEC	ACTUATOR 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
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 ETHERNETIP-MS/TP
RBC	REMOTE BUILDING CONTROLLER
RC	RECEIVER CONTROLLER
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

DDC ELECTRICAL POINT

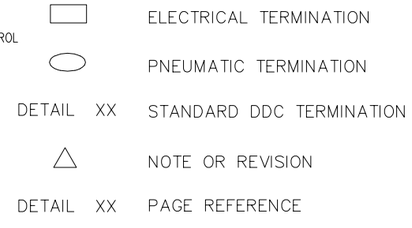


DDC PNEUMATIC POINT

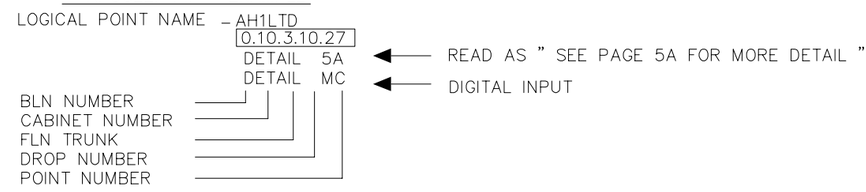




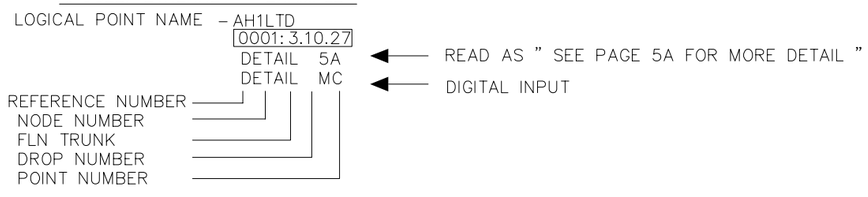
DETAILS



APOGEE: PII – EXAMPLE



APOGEE: ETHERNET – EXAMPLE



REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

Legend & Abbreviations

440P412785
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LEG

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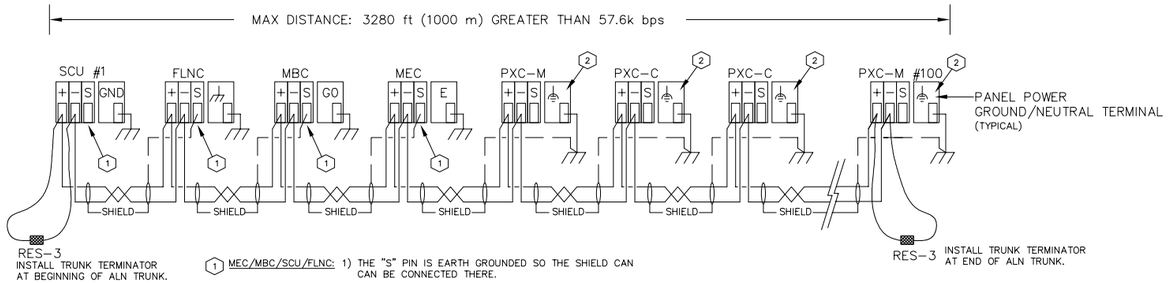
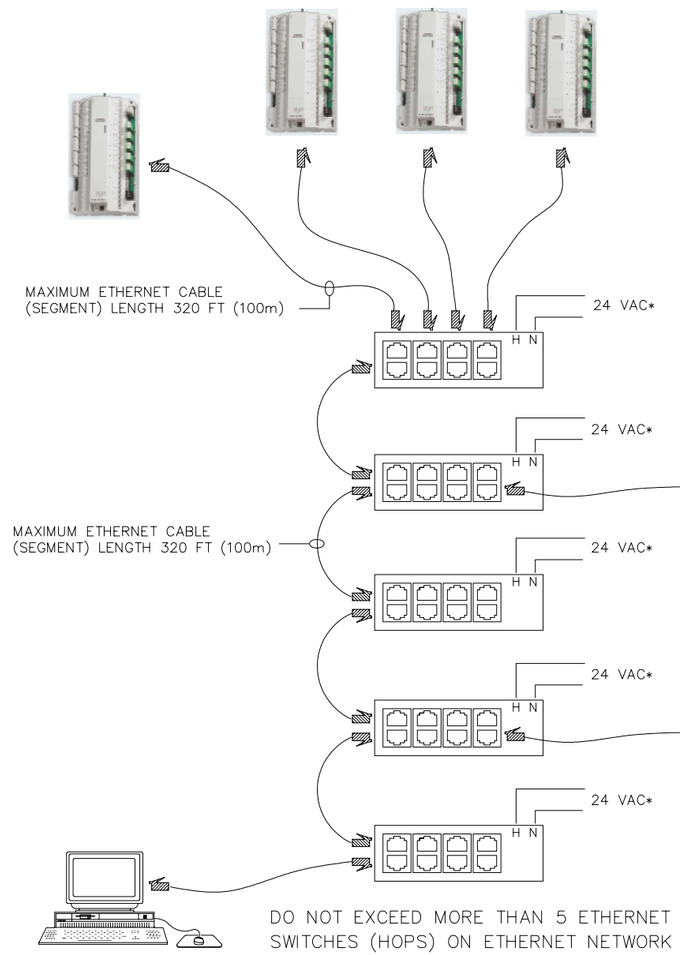


RES-3
538-664
BLN TRUNK TERMINATOR

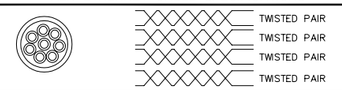
1/011 SIEMENS P2 ALN (BLN) NETWORK
SIEMENS P2 AUTOMATED LEVEL NETWORK (ALN)
COMMUNICATION PROTOCOL: RS-485



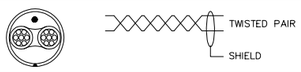
APPLICABLE TO:
MLN (WORKSTATION TO ETHERNET)
ALNs (ETHERNET, BACnet/IP, AEM)
HUBS, SWITCHES, ROUTERS
NETWORK INTERFACE CARD

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

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 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

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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ALN COMMUNICATION

440P412785
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ALN

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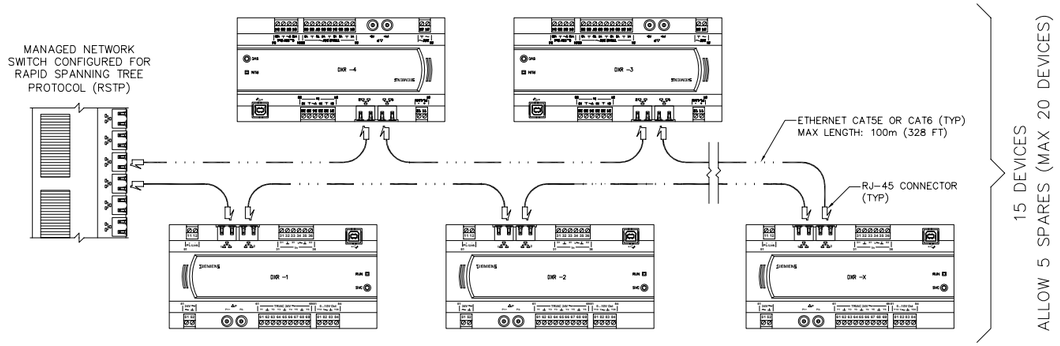
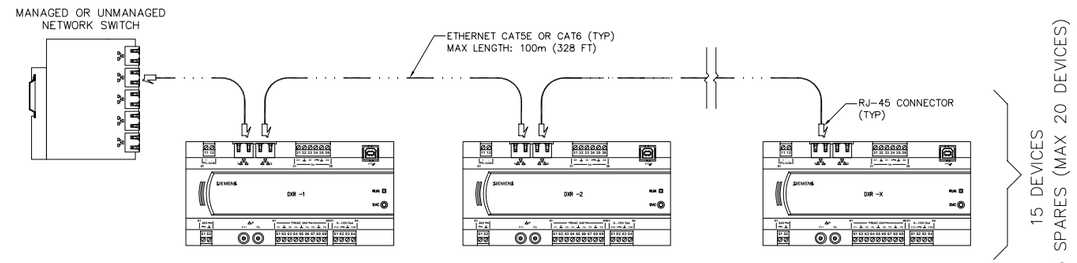
INSTALLATION NOTES

1. NEVER RUN NETWORK CABLING CLOSER THAN 160cm (5 FT) FROM VARIABLE-FREQUENCY DRIVES (VFDs) EXCEPT AT THE POINT WHERE THE NETWORK MUST CONNECT TO THE VFD. NETWORK ENTRY INTO A VFD MUST BE THROUGH A SEPARATE CONDUIT AND ALL NETWORK WIRING MUST BE KEPT AS FAR AS POSSIBLE FROM HIGH-POWER CABLING IN THE DRIVE.
2. NEVER RUN NETWORK CABLE CLOSER THAN 160cm (5 FT) FROM CONDUITS CARRYING 100KVA OR GREATER. ALWAYS CROSS HIGH POWER CABLES (AT A DISTANCE OF 155cm / 5 FT) AT A 90° ANGLE.
3. NETWORK RUN IN OPEN CABLE TRAYS WITH CIRCUITS CARRYING 20 AMPS SHOULD BE NO CLOSER THAN 65cm (26 IN) TO THE HIGHER POWER CABLES.
4. NETWORK RUN IN ENCLOSED TRAYS WITH CONDUITS CARRYING OVER 20 AMPS SHOULD BE NO CLOSER THAN 45cm (18 IN) TO THE HIGHER POWER CABLES.
5. SPANNING-TREE TOPOLOGY MAY ONLY BE USED WITH MANAGED SWITCHES CONFIGURED TO SUPPORT RAPID SPANNING TREE PROTOCOL
6. NO MORE THAN 20 DXR DEVICES MAY BE CONNECTED IN A SINGLE LOOP
7. NO MORE THAN 15 DXR DEVICES MAY BE CONNECTED IN A SINGLE LINE
8. MAXIMUM ETHERNET CABLE LENGTH BETWEEN DEVICES IS 100m (328 FT)



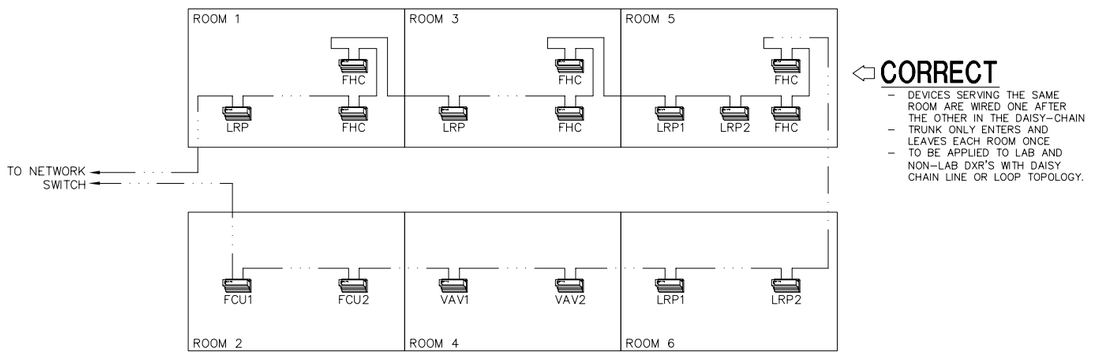
1/012 "CRITICAL ENVIRONMENTS" LOOP TOPOLOGY
BACNET IP FLOOR LEVEL NETWORK
FAULT-TOLERANT TOPOLOGY



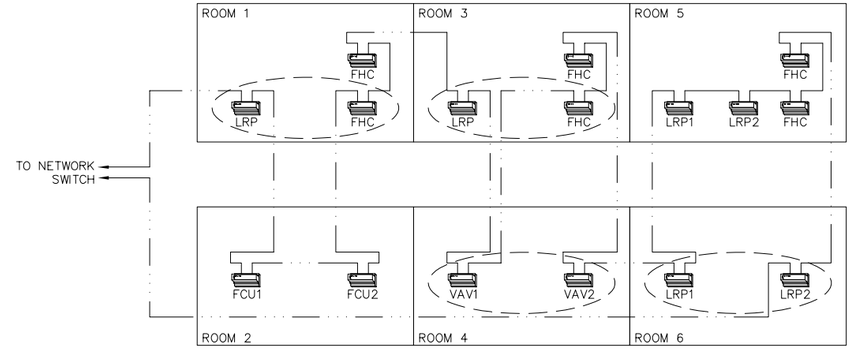
2/012 LINE TOPOLOGY (DAISY CHAIN)
BACNET IP FLOOR LEVEL NETWORK

INSTALLATION NOTES

1. DXRS WHICH SERVE THE SAME SPACE OR THAT ARE GROUPED (e.g. FUME HOOD & LAB ROOM PRESSURIZATION CONTROLLERS) SHALL BE CONNECTED DIRECTLY WITHOUT ANY INTERPOSING UNRELATED DEVICES. ALL NETWORK CABLING SHALL REMAIN WITHIN THE ROOM ENVELOPE.
2. THIS IS TO ENSURE THAT COMMUNICATIONS WITHIN A ROOM WILL STAY RUNNING IF A DEVICE OUTSIDE THE ROOM FAILS
3. CONTACT SIEMENS IF THESE REQUIREMENTS CANNOT BE MET FOR ANY REASON



CORRECT
- DEVICES SERVING THE SAME ROOM ARE WIRED ONE AFTER THE OTHER IN THE DAISY-CHAIN
- TRUNK ONLY ENTERS AND LEAVES EACH ROOM ONCE
- TO BE APPLIED TO LAB AND NON-LAB DXR'S WITH DAISY CHAIN LINE OR LOOP TOPOLOGY.



INCORRECT
- DEVICES SERVING THE SAME ROOM HAVE UNRELATED DEVICES BETWEEN THEM IN THE DAISY-CHAIN
- TRUNK ENTERS AND LEAVES SOME ROOMS MORE THAN ONCE

3/012 PHYSICAL LAYOUT
FOR MULTIPLE DXRs SERVING A COMMON SPACE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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HB	HB	KR	04/02/26	04/02/26

DXR COMMUNICATION

440P412785
0
DXR

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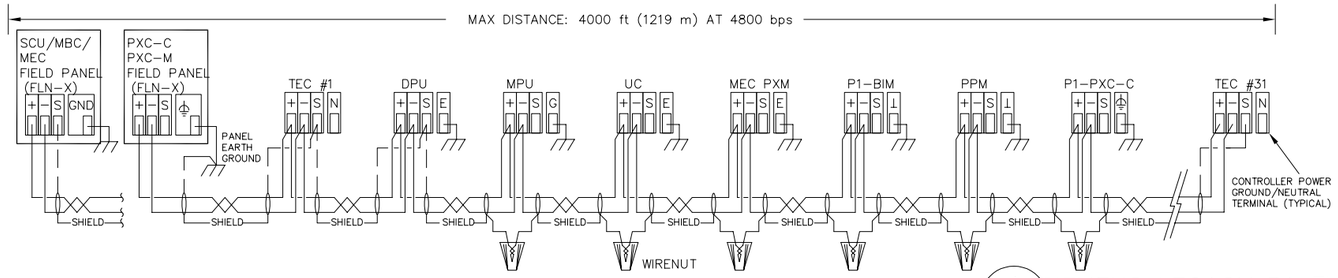
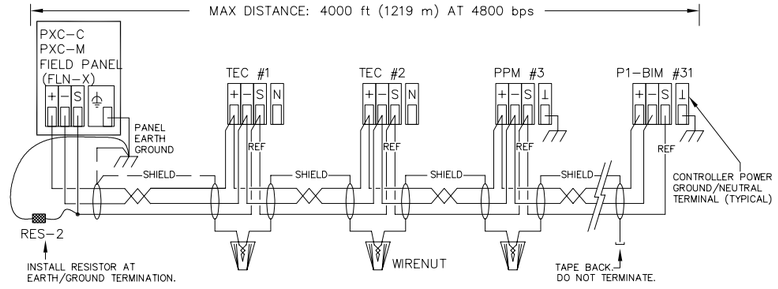


1 MSTP

SIEMENS LEGACY P1 FLN NETWORK

SIEMENS P1 FLOOR LEVEL NETWORK (FLN)
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1 PAIR (2 CONDUCTOR TSP)

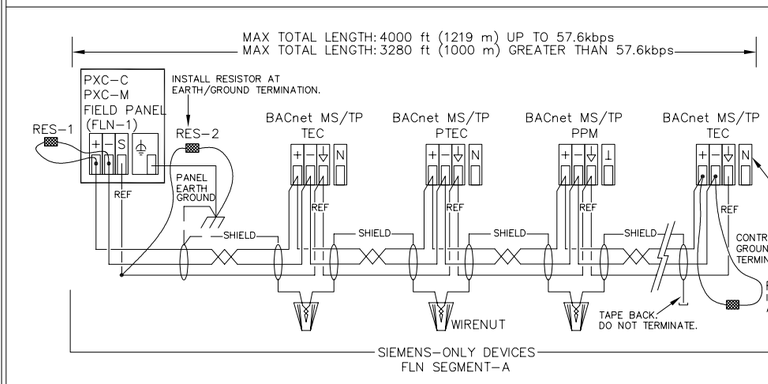


RES-2
550-974P10
EARTH TERMINATOR RESISTOR

2 MSTP

SIEMENS P1 FLN NETWORK

SIEMENS P1 FLOOR LEVEL NETWORK (FLN)
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1.5 PAIR (2 CONDUCTOR TSP, & 1 CONDUCTOR)



NOTES:

1) FLN WIRING MUST BE CONNECTED IN A DAISY-CHAIN.
2) FOR SIEMENS-ONLY FLN NETWORK, WIRE AS SHOWN FOR FLN SEGMENT-A. INSTALL END-OF-LINE RESISTOR RES-1 AT FIELD PANEL AND ON LAST TEC.
3) FOR FLN NETWORK WITH SIEMENS & THIRD-PART DEVICES, WIRE AS SHOWN WITH FLN SEGMENT-A AND SEGMENT-B. INSTALL END-OF-LINE RESISTOR RES-1 ON LAST TEC AND ON LAST THIRD-PARTY DEVICE. DO NOT INSTALL E-O-L RESISTOR ON FIELD PANEL.

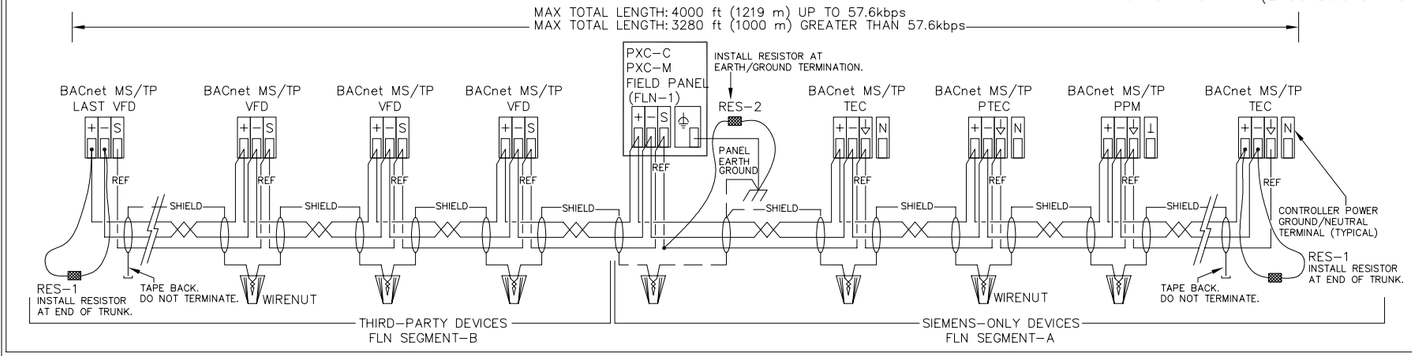
RES-1
550-975P100
120 OHM 1/2W RESISTOR

RES-2
550-974P10
EARTH TERMINATOR RESISTOR

3 MSTP

BACnet MS/TP FLN NETWORK

BACnet MASTER/SLAVE TOKEN PASSING NETWORK
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1.5 PAIR (2 CONDUCTOR TSP, & 1 CONDUCTOR)



FLN TSP CABLE SPECIFICATIONS

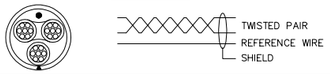
TWISTED PAIR
24 AWG (STRANDED)
12 PICOFARAD/FT CAPACITANCE OR LESS
4 TWISTS PER FOOT.

SHIELD
100% OVERALL FOIL

PART NUMBERS

ANNIXTER
PART NUMBER: H-AF-TSP24LC-CMPBX-P
DESCRIPTION: ALN/FLN24AWG,STR,TSP,LOCAP,CMP (FT-6)

FLN 1.5 PAIR CABLE SPECIFICATIONS



TWISTED PAIR
24 AWG (STRANDED)
11 PICOFARAD/FT CAPACITANCE CONDUCTOR TO CONDUCTOR.
24 PICOFARAD/FT CAPACITANCE CONDUCTOR TO SHIELD.
4 TWISTS PER FOOT.

REFERENCE WIRE
24 AWG (STRANDED), 3 INCH LAY WITH TWISTED PAIR

SHIELD
100% OVERALL FOIL WITH DRAIN WIRE

PART NUMBERS

ANNIXTER
PART NUMBER: H-A-1.5TSP24LC-CMP-Y
DESCRIPTION: 24-1.5PR STR TC FFEP FT6 SHD YEL (FT-6)

CERCO
PART NUMBER: 8304R
DESCRIPTION: 22AWG 3C STR FT6 ORG (FT-6)

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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MSTP COMMUNICATION

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MSTP

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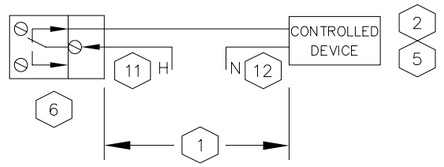

A
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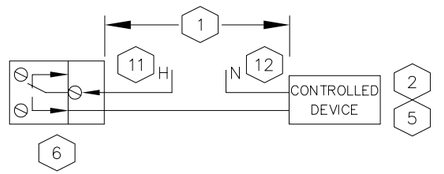
DIGITAL OUTPUT (6R) NC
PULSED OR LATCHED



B
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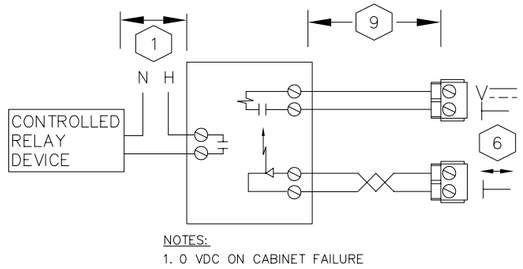
DIGITAL OUTPUT (6R) NO
PULSED OR LATCHED



C
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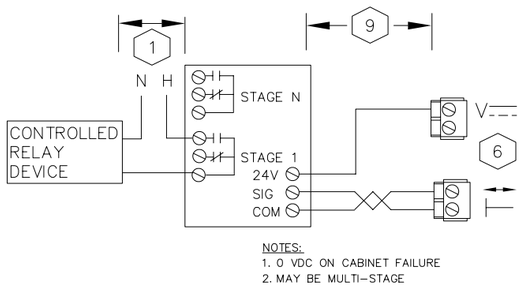
DIGITAL OUTPUT (8U,8X) Latched
VOLTAGE TO SOLID STATE RELAY



D
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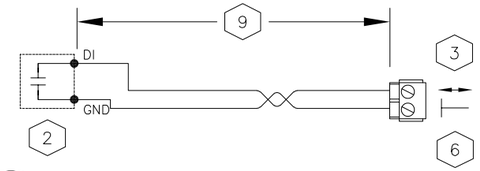
DIGITAL OUTPUT (8U,8X) Sequenced
VOLTAGE TO SEQUENCING MODULE



E
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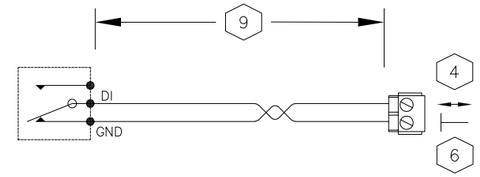
DIGITAL INPUT (8D,16D,8U,8x)
DRY CONTACT



F
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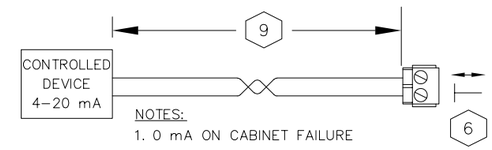
DIGITAL INPUT (8D,16D,8U,8X)
PULSE ACCUMULATOR



H
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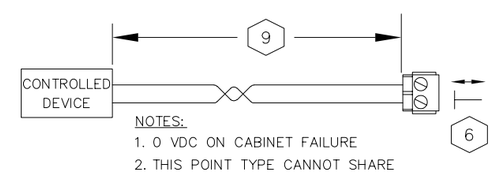
ANALOG OUTPUT (8X) 4-20 mA



I
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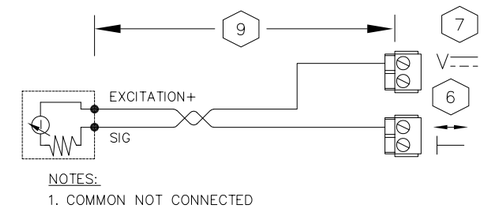
ANALOG OUTPUT (8U,8X) 0-10VDC



M
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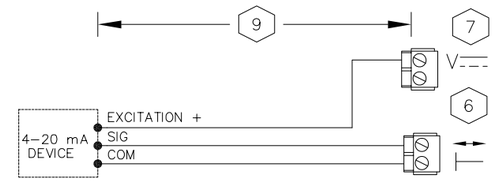
ANALOG INPUT (8X) 4-20 mA
2-WIRE INTERNAL POWERED



N
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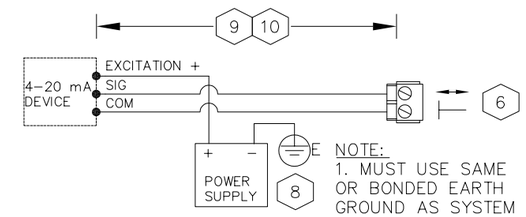
ANALOG INPUT (8X) 4-20mA
3-WIRE INTERNAL POWERED



O
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ANALOG INPUT (8X) 4-20mA
3-WIRE EXTERNAL POWERED

NOTES:

1. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAGE. SEE DRAWING TWIR.
2. SEE CONTROL DRAWINGS FOR NORMAL DE-ENERGIZED CONTACT STATE
3. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
   8D, 16d EXCITATION = 24VDC, 8mA
   8U, 8X EXCITATION = 24VDC, 8mA, 20ms, 100mA
4. 8D, 16D MAXIMUM PULSE RATE = 10Hz (50ms PER STATE, 100ms PER PULSE)
   8U, 8X MAXIMUM PULSE RATE = 20Hz (25ms PER STATE, 50ms PER PULSE)
5. PXC MODULAR DO CONTACT RATINGS
   AC OPERATION:
   4A @ 240VAC (RESISTIVE)
   3A @ 240VAC (INDUCTIVE)
   SIZE 4 MOTOR STARTER
   DC OPERATION:
   40W @ < 50VDC
   20W @ > 50VDC
6. REFER TO PXC MODULAR PANEL FOR ACTUAL POINT ADDRESSES. REFER TO TXMI TERMINATION TABLES FOR ACTUAL TERMINALS FOR EACH PANEL ADDRESS. COMMON TERMINAL MAY BE SHARED BY 2 POINTS.
7. REFER TO DRAWING P1 ON TWIR FOR MAXIMUM CURRENT PROVIDED BY THE 24VDC SENSOR SUPPLY ON P1 BIM OR BUS POWER SUPPLY
8. EXTERNAL POWER SUPPLY CAN EITHER BE A 24VDC POWER SUPPLY OR A 24VAC TRANSFORMER DEPENDING ON THE SENSOR SELECTED. IF NOT AN ISOLATED NC CLASS 2 CIRCUIT THEN POWER SOURCE, NEUTRAL AND PXC MODULAR COMMON MUST BE BOTH CONNECTED TO THE SAME OR BONDED BUILDING APPROVED EARTH GROUND. FOR FURTHER DETAILS SEE EARTH GROUNDING RULES (125-3002) APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS.
9. 50mA OR LESS – 750ft/230m
   50mA TO 100mA – 375ft/115m
10. 100mA TO 150mA – 250ft/76m
    150mA TO 200mA – 187ft/57m
    200mA TO 250mA – 150ft/46m
11. 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.
12. WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TX-I/O Termination Spec.

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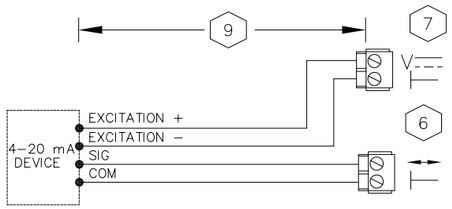
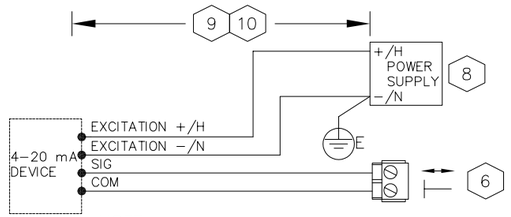


P 00 — ANALOG INPUT (8X) 4–20mA

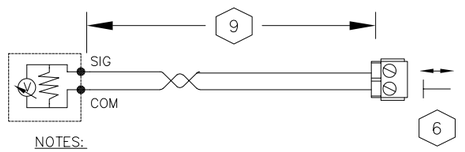
4–WIRE INTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

Q 00 — ANALOG INPUT (8X) 4–20mA

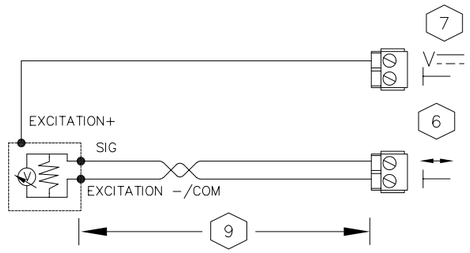
4–WIRE EXTERNAL POWERED



NOTES:
1. TRANSDUCER POWERED FROM ISOLATED INPUT
2. TRANSDUCER OUTPUT VOLTAGE

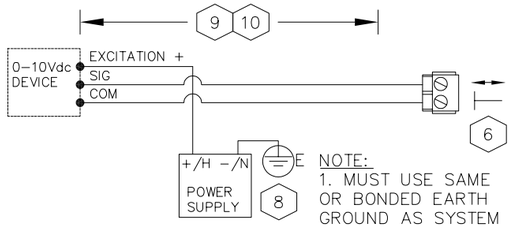
R 00 — ANALOG INPUT (8U,8X) 0–10 Vdc

SELF POWERED TRANSDUCER



S 00 — ANALOG INPUT (8U,8X) 0–10VDC

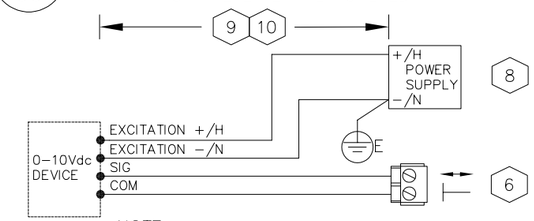
3–WIRE INTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

T 00 — ANALOG INPUT (8U,8X) 0–10VDC

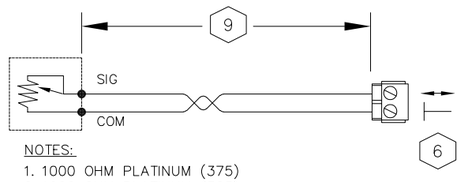
3–WIRE EXTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

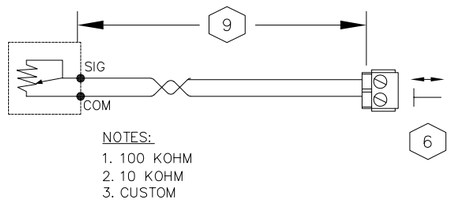
U 00 — ANALOG INPUT (8U,8X) 0–10VDC

4–WIRE EXTERNAL POWERED



NOTES:
1. 1000 OHM PLATINUM (375)
2. 1000 OHM PLATINUM (385)
3. 1000 OHM NICKEL
4. CUSTOM

V 00 — ANALOG INPUT (8X,8U) RTD



NOTES:
1. 100 KOHM
2. 10 KOHM
3. CUSTOM

W 00 — ANALOG INPUT (8X,8U) THERMISTOR

TXM1 TERMINATION TABLES

1. ALL TXM1 TERMINALS (MEASURING, NEUTRAL, RELAY, SUPPLY) ARE CONNECTED IN THE PLUG–IN I/O MODULE, NOT IN THE TERMINAL BUS.

		TXM1.8D, TXM1.16D							
I/O POINT		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL[1]	⊥ (–)	1	3	5	7	9	11	13	15
DIGITAL INPUT	⏐ (+)	2	4	6	8	10	12	14	16

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

		TXM1.16D							
I/O POINT		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
SYSTEM NEUTRAL	⊥ (–)	18	20	22	24	26	28	30	32
DIGITAL INPUT[1]	⏐ (+)	19	21	23	25	27	29	31	33

1. NO PULSE ACCUMULATOR

		TXM1.8U, TXM1.8U–ML							
I/O POINT		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL	⊥ (–)	2	6	10	14	19	23	27	31
UNIVERSAL I/O	⏐ (+)	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY[1]	~		7		15		24		32

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

		TXM1.8X, TXM1.8X–ML							
I/O POINT		(1)	(2)	(3)	(4)	(5)[1]	(6)[1]	(7)[1]	(8)[1]
SYSTEM NEUTRAL	⊥ (–)	2	6	10	14	19	23	27	31
UNIVERSAL I/O	⏐ (+)	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY[2]	~		7		15		24		32
24V DC SENSOR SUPPLY[3]	⎓	3		11		20		28	

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.

		TXM1.6R, TXM1.6R–M					
I/O POINT		(1)	(2)	(3)	(4)	(5)	(6)
COMMON[1]	⏐ (C)	3	9	15	20	26	32
NORMALLY CLOSED	⌐ (NC)	4	10	16	19	25	31
NORMALLY OPEN	⏐ (NO)	2	8	14	21	27	33

1. COMMONS ARE NOT INTERNALLY CONNECTED.

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

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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TX-I/O Termination Spec. 2

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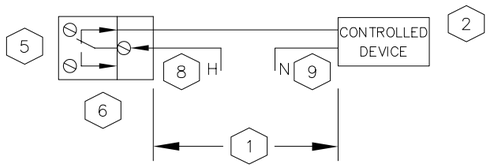

A
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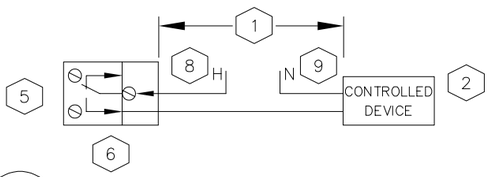
DIGITAL OUTPUT (1.4D3R, 1.8T) NC
PULSED OR LATCHED



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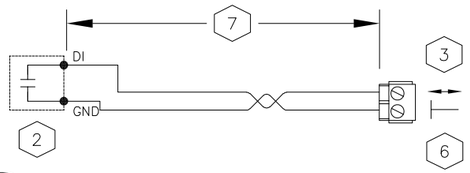
DIGITAL OUTPUT (1.4D3R, 1.8T) NO
PULSED OR LATCHED



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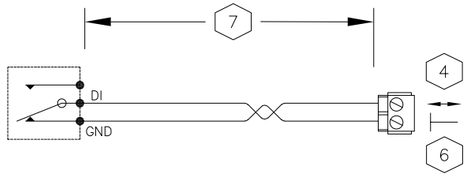
DIGITAL INPUT (1.4D3R)
DRY CONTACT



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DIGITAL INPUT (1.4D3R)
PULSE ACCUMULATOR

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.
7. 50mA OR LESS – 750ft/230m
   50mA TO 100mA – 375ft/115m
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]	⊥ (–)	26	28	30	32
DIGITAL INPUT	(+)	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 ⊥ (SYSTEM NEUTRAL).

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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TX-I/O Termination Spec. 3

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Important Safety Information

System–specific:

The electrical safety for building automation and control systems by Siemens Building Technologies is essentially based on safely separating low voltage from mains voltage.

Application as per SELV or PELV pursuant to HD 384 "Electrical installation of buildings" depending on the grounding (24V AC) of the low voltage:

Ungrounded = Safety Extra–Low Voltage (SELV).

Grounded = Protection by Extra Low Voltage (PELV).

Device–related safety is guaranteed, among others, by:

1. Low–voltage power supply 24V AC per SELV or PELV
2. Comply with specific regulations for electrical wiring per the following sections.
3. Observe the following points when grounding 24V AC (system neutral):
4. Operating voltage of 24V AC is permitted in principle for both grounded as well as non–grounded system neutral. Local regulations and customers apply accordingly.
5. Grounding may be required or not allowed for functional reasons.
6. 24V AC systems are generally grounded unless disadvised by the manufacturer.
7. In order to avoid ground loops, connect systems with PELV to the ground at one location only (especially for transformers), if no other indication exists.

Mains and operating voltage:

Operating voltage 24V AC:

1. It must meet requirements for SELV or PELV. Permitted deviation for nominal voltage 24V AC on the device: –10 +/– 20%.

Transformer specification 24V AC:

1. Use safety insulating transformers as per EN 61558 with double insulation designed for 100% duty to supply SELV or PELV circuits..
2. Power taken from the transformer should be at least 50% of nominal load for efficiency reasons (effectiveness).
3. Transformer nominal power should be at least 25VA. For smaller transformers, the ratio of open circuit voltage to full load is unfavorable (> + 20%).

Operational voltage fuse 24V AC:

Transformers on the secondary side correspond to the actual load of all connected devices as per transformer sizing:

1. 24V AC line (system potential) must always be fused.
2. There required, also line (system neutral).

Mains filter:

Spikes and high–frequency interference may occur in areas with high levels of interference. The disturbances not only impact the transformer on the primary side, but may also influence secondary connected components.

A mains filter should be attached on the primary transformer if such interference is anticipated. Mains filters should be installed as close to the network transformer as possible and grounded.

Device–specific :

Devices using different power circuits:

Devices must have the required insulation of the power circuits from each other to be able to connect them directly without additional insulation.

Interfaces for different voltage circuits :

Connections via interfaces increase the risk of distributing dangerous voltage through the building. Ensure that the required insulation is available at all times and installed per applicable regulations.

DXR2 with 24V AC supply:

1. A class 2 transformer or an external T4 A fuse is compulsory.
2. Max. 100VA per transformer / per fuse circuit.

Installation:

Mounting position:

Recommended:

1. Wall, horizontal from left to right or from right to left.
2. Wall, vertical from bottom to top.
3. Ambient temperature 23 to 122°F (–5 to 50 °C)

AC 24V power lines:

1. DXR2 room automation stations with 24V AC supply are limited to a consumption of 4A/100VA.
2. Supply: Class 2 transformer OR external 4A fuse OR transformer >100VA for more than one DXR2. (In this case a separate 4A fuse is required for every 100VA).
3. DXR2 room automation stations with 24V AC supply can only be wired in star topology.
4. An external power supply of field devices should be fused separately for secure operation.

24V AC Transformer :

Operating voltage :

1. The operating voltage is 24V AC. It must comply with SELV or PELV to HD 60364–4–41 (2007–01–01) requirements.
2. The acceptable deviation of the 24V AC nominal voltage connected to the transformer is +20%/–10%. This means that after taking account of the cable and contact resistances, a tolerance of +/–20% for the field device supply can be guaranteed in the field devices.

Specification for 24V AC transformers:

1. Double–insulated safety transformers to EN 61558, designed for continuous operation, to supply SELV or PELV circuits.
2. The rated transformer output must be at least 50VA. In smaller transformers the ratio of no–load voltage to full–load voltage is unfavorable (> +20%).
3. For reasons of power efficiency the rated transformer output should not exceed 200 % of the maximum load.

Wiring DXR2:

The 24V AC can only be wired in star distribution for the DXR2 room automation stations. 24V AC must be fused with max. 4A (or Class 2 transformer).

Power consumption DXR2 24V AC:

Max. permissible input current 24V AC (through terminals 5 and 6) = Total max. 4A.

Base load (without loading by field devices)

DXR2.M11, DXR2.x12P	9VA
DXR2.M18	11VA
DXR2.E18	13VA
KNX PL–Link supply	5VA/3W

29V DC / Max. 50 mA

The bus supply can be switched off manually via tool if not used. Transit power 24V AC

Field supply 24V AC	Max. 6VA
Field supply 24V DC (DXR2.E18 only)	Max. 2.4W
Digital output (triac active)	6VA (250mA)

Note: Certain applications ensure that only one triac at a time is active: No simultaneous heating and cooling. Two heating outputs are alternatively on 50% of the time, the same with two cooling outputs. This can be considered in the transformer sizing.

Unconfigured triac	6VA (250mA)

Cable lengths 24V AC

The permissible voltage drop of 0.6 V on the power wire between the transformer and the most distant power point (room automation station, power module, bus interface module) is the basis for calculations.

Permissible load [VA]

	Cable length for 24V AC (SI)				
Cable X–section	2.5m	5.0m	10m	20m	50m
AWG16	200VA	100VA	50VA	25VA	10VA
AWG14	320VA	160VA	80VA	40VA	16VA
	Cable length for 24V AC (US)				
Cable X–section	8.2ft	16.4ft	32.8ft	65.6ft	164ft
AWG16	200VA	100VA	50VA	25VA	10VA
AWG14	320VA	160VA	80VA	40VA	16VA

Notes :

1. The supply wire (24V AC) and return lines can each have the indicated lengths.
2. Power is added together for multiple back–to–back looped PXC3 or DXR2 ("daisy chain") which reduces the cable length accordingly.
3. Each supply point (room automation stations/power module/bus interface module) is either connected separately to the transformer's terminal block (star wiring) or looped via the room automation station.
4. Cables may be wired in parallel to increase the cross section.

Wiring of field devices (without bus)

As a rule, comply with local regulations for electrical installations. These take precedence over any notes in this document.

Wiring for Triac outputs 24V AC.

The following applies for wiring to actuating devices such as valves, damper actuators or protection connected to the Triac outputs:

1. Use stranded, 2 or multiple core round cables, screened (standard off–the–shelf installation cable).
2. Single wires may not be used.
3. Wiring may be laid together with power lines (230V AC). They must be isolated from the power lines per regulations. Isolation must meet PELV requirements.
4. Wiring can not be led in the same cable as the power lines.
5. See table below for maximum single cable lengths. However, the length must not exceed 984ft (300m) (EM interference). DXR2: 262ft (80m).

DXR2 room automation stations with 24V AC supply:

Use cable cross section suited for 4A according to local regulations (T 4A fuse external / Class 2 transformer). Cable cross section >= AWG18. Triacs are not protected and are destroyed if overloaded.

2. Cable length <= 262ft (80m)

Signal wiring

The following applies in common for signal wiring of field devices such as temperature sensors, window switches, presence detectors, dew point sensors or electrical buttons:

1. Use stranded, 2 or multiple core round cables, without screen (standard off–the–shelf installation cable).
2. Single wires or ribbon cables may not be used.
3. Signal wiring may be laid together with power lines (230V AC). They must be isolated from the power lines per regulations. Isolation must meet PELV requirements.
4. Signal wiring can not be led in the same cable as the power lines.
5. The length must not exceed the following value (measuring errors, EM interference): DXR2: 262ft (80m).
6. All system neutral terminals of a device are interconnected. TX–I/O: The connection is not in the terminal base but in the plug–in module. When this unit is unplugged there is no connection.
7. The system neutral of a digital input can be connected to any signal neutral terminal of the device.
8. It is also permissible to combine the system neutral conductors of several digital inputs in order to save wire. TX–I/O: However, system ground must be connected at least once per module.
9. With analog inputs and outputs, the measuring neutral must always be connected to the terminal associated with that specific I/O point to avoid possible measurement errors.
10. 0 to 10V DC actuators with 0 to 10V DC feedback: System neutral of output and feedback may be in the same conductor due to the small current of the U10 and Y10 signals. However, output and feedback must be on the same device and there is no 24V DC supply current admissible on the system neutral conductor.

Relay outputs

1. External fuse of max. 10A for protection of the PCB tracks.
2. Relays have volt–free relay contacts. The mains voltage / switching voltage (230V AC / 24V AC/DC) must be supplied as an external voltage to the terminals.
3. The maximum load of the relay contracts must be observed (see data sheets for the corresponding devices)
4. The sizing and fusing of the power lines are oriented to overall connected load and local regulations.
5. The fused electrical values must therefore be reviewed in the data sheets for the corresponding devices.
6. The lines must be secured on the device with strain relief.
7. Cable length: as per load and local regulations.
8. The maximum current of the relays is limited to 4 (3)A.

Inputs and Outputs

Digital inputs

Cable length

The permissible length of the cables connected to the status contacts, regardless of the thickness of the wire (min. diameter 0.024in / 0.6mm) is restricted to 262ft (80m).

Common conductor with multiple contacts:

When several status or counter contacts are to be connected, a common conductor may be used. This saves wiring. However, system ground must be connected at least once per module. Digital inputs are not electrically isolated from the system electronics. Mechanical contacts must be volt–free. Electronic switches must comply with SELV or PELV standards.

Analog inputs

Cable length:

The maximum permissible cable length for passive resistance sensors and transmitters depends on the permissible measuring error due to the line resistance. The maximum cable length for DXR2 is 262ft (80m).

Active sensors 0 – 10V DC

Cable length:

The maximum cable length for DXR2 is 262ft (80m). The permissible length of 10V DC cables for measured signals, and of the cables to supply the sensors from the TRA device, have to be calculated on the following basis for each active sensor.

1. Max. 7% voltage drop (1.68V) on the cables due to the sensor supply current. Reason: to ensure sufficient voltage for the sensor supply.
2. Measuring error of max. 0.5% of the measuring range due to line resistance on the measuring conductor (not critical, as the measuring current is only 0.1mA)
3. Longer cables are permissible provided larger measuring errors are acceptable.
4. If the active sensor is supplied locally from a transformer, the sensor cable can be up to 984ft (300m) long (DXR2: 262ft (80m)) with a wire diameter of greater than or equil to 0.024in (0.6mm). The local transformer MUST NOT be earthed (earth loop)!
5. In case of active sensors with 24V AC supply, use cable cross section suited for 10A according to local regulations .
6.

Digital outputs (relays, triacs)

Cable length:

The cable between the switching outputs and the equipment to be switched may be up to 262ft (80m) for DXR2.

The permissible lengths of the cables between the relay outputs / triacs and the actuators depend on the type of actuator in use and are calculated as follows:

Relays: Voltage drop of max. 7% (1.68V) on the 24V AC operating voltage for the actuator.

Triacs: Voltage drop of max. 3% (0.72V) on the 24V AC operating voltage for the actuator (the triac itself has already 4% voltage drop).

Analog outputs

Cable length

The permissible cable lengths for 0 – 10V DC control signals and for the 24V AC operating voltage are given in the data sheets of the individual actuators.

Where the actuators are supplied locally with 24V AC, the control signal cable may be up to 984ft (300m) long (DXR2: 262ft (80m)) with a diameter of greater than or equil to 0.024in (0.6mm).

The local transformer MUST NOT be earthed (earth loop)!

0 – 10V DC actuators with 0 – 10V DC feedback: System neutral of output and feedback may be in the same conductor due to the small current. However, output and feedback must be on the same device.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

DXR Wiring Specification

440P412785
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DWIR1

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Ethernet network:

Network topologies
1. Star topology (general).
2. Line topology (for room automation).
3. DXR2 and PXC3 can be mixed.
4. The number of room automation stations is limited to 20 for a line topology (daisy chain).
5. The next device has no 24V AC power when a room automation station is removed. The connection exists only on the board, but not on the terminal block.
6. The Ethernet switch is inactive when a room automation station has no 24V AC power. The next devices, if in line topology, are disconnected from the network. For secure operation of the system it is recommended to supply each room automation station separately with 24V AC.

Cables – Room automation stations are connected to one another via switches and Ethernet cables with RJ45 connectors. The following conditions must be met:
1. Standard Ethernet cable min. category 5
2. Shielded or unshielded STP (Shielded Twisted Pair) or UTP (Unshielded Twisted Pair).
3. Length between switch and Room automation station max. 328ft (100m).
4. Length between Room automation stations Max. 328ft (100m).
5. Number of devices under a line topology max. 20.
6. Standard IT product at 100MB or 1GB.

Power over Ethernet (PoE) – Power over Ethernet (PoE) is a simple solution to supply power to room operator units consuming only little power. This saves a power cable and associated installation costs. PoE allows for installing Ethernet devices also in hard-to-access locations or areas where too many cables are an issue. In PoE, power sourcing equipment (PSE) supplies power to powered devices (PD, here: end devices). Voltage is supplied via the RJ45 plugs and a twisted-pair cable (TP) to the devices either:
1. Via data transmission lines
2. Or via unused lines of the RJ45 connection.
PoE requires a star topology. Standard PoE switches have between 4 and 16 outputs. In large plants (e.g. different rooms in a hotel) require use of multiple switches in a line topology.

Specifications:

Standard Ethernet cable	min category 5
Screened or unscreened	STP / UTP
STP (Shielded Twisted Pair)	
or UTP (Unshielded Twisted Pair)	

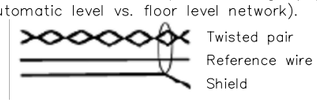
Distance between switch and station = max 328ft (100m).
Distance between switch and end unit = max 328ft (100m).

MS/TP networks:

Network topologies – MS/TP networks for Desigo TRA can only be wired in line topology. The network distance for a fully or partially loaded network is 4000ft (1220m) at a maximum network speed of 76,800 bps. Lower speeds do not mean longer network sections are possible. DXR2 controller support up to 115,200 bps. Network repeaters can be used to extend this distance.
To determine how many devices can be on a network section, add up all the loading numbers and do not exceed 32. Many third-party devices have full load interfaces. Check the manufacturer's literature for network loading information. The RS-485 specification allows 32 full load devices on a section of network cable before a repeater is required. Desigo TRA devices are 1/8 load devices, so, in theory, you could place 256 on a network section.

Response times normally limit the maximum number of devices on a network to lower values of around 96 devices.
1. Two 120Ohm ½W resistors between + and – at BOTH ends of the network section.
2. OneSpecial PTC thermistor between Reference () and earth at ONE end of the network section. This prevents the cable from being damaged by high ground currents that may occur if the reference wire is accidentally grounded to earth ground at a second location.

Technical data BACnet MS/TP – Inter-node protocol communications on BACnet MS/TP networks take place over RS-485 physical media.
Desigo TRA devices use the 3-wire interface.
1. By providing the RS-485 ground signal of the interface to the network termination plug, all node communication ports can be referenced together providing a high degree of noise immunity.
2. The RS-485 common reference wire is terminated at one point (and only one point) to earth ground.
3. An overall foil shield and drain wire provide additional noise protection.
4. The decision to use the orange jacket cable or orange jacket with blue stripe cable is up to the user/customer. The only difference in the cables is the addition of the blue stripe, which can be useful to indicate a different protocol usage (e.g. Automatic level vs. floor level network).



Cable Specifications

Transmission medium (bus cable)	1.5-Pair (1 TP & 1 conductor) with overall Shield and drain wire
Gauge (pair)	24 AWG (0.25 mm2) stranded
Capacitance	
conductor to conductor	12.5 pF/foot (41 pF/m)
conductor to shield	24 pF/foot (79 pF/m)
Impedance	120 Ohm
Twists	min. 4 per foot (13 per m)
Reference wire	24 AWG (0.25 mm2) stranded, 3 inch lay with twisted pair
Shield	100% overall foil with drain wire
NEC class	UL listed, CM, CMP (167°F (75°C or higher)
CEC class	FT4, FT6 (167°F (75°C) or higher)

KNX PL-Link room bus:

1. The KNX PL-Link bus must be conducted inside the building. The cables must never leave the building.
2. The KNX PL-Link bus facilities communications from the PXC3 room automation station to a maximum 64 devices on the KNX bus devices for various manufacturers.
3. Note: The number of devices is also limited by the number of data points and the available bus power. Data points and bus power are incremented during engineering with the ABT tool.
4. The KNX PL-Link bus basic version comprises one cable and two stranded bus wires.
5. The PXC3 has one internal bus power supply of 160mA.
6. The DXR2 has one internal bus power supply of 50mA.
7. The PXC3 also includes an 24V AC / 2A output for devices with increased power consumption that is supplied via 24V AC rather than via the KNX PL-Link bus.
8. The KNX PL-Link is physically based on the KNX bus (Konnex).
9. In KNX networks area/line couplers and IP routers are not admitted.
10. Interconnection of room automation stations via KNX PL-Link is not admissible; the connection is done exclusively via Ethernet switches (Section 9).
11. The polarity of the KNX PL-Link bus conductors must be respected (KNX terminals + and –).

Bus power supply – A bus power supply is required for bus communications. Throttled voltage 29V DC is used.

Internal KNX PL-Link Power Supply:
The room automation stations have an internal bus power supply. which is switched on by default. If an external supply is used, the internal supply must be switched off manually in the ABT (KNX PL-Link rail properties), as parallel operation is not permitted.
Bus power and the KNX bus are electrically isolated from device electronics for devices with bus power.
Parallel operation of the internal KNX PL-Link bus supply with an external bus power supply is not permitted.
The internal bus power supply must be switched off in the tool when an external bus power supply is used.

External bus supply:
An external bus power supply unit (PSU) is required when the 160mA of the PXC3 / the 50mA of the DXR2 is insufficient to cover the power demand of the connected devices.
Power supply units for 160, 320 and 640mA available in specialty stores. The total power supply for the devices must be calculated to determine the appropriate size. Comply with the corresponding details in the datasheet.
A 640mA power supply unit suffices for a line featuring 64 devices on the KNX bus with an average power demand of 10mA each.

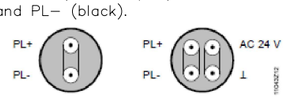
(Parallel operation)
5. In principle, parallel operation of external bus supplies among themselves is possible. However, check if the specific PSU is allowed to be operated in parallel with other PSUs. Refer to the technical specifications. The below mentioned Siemens devices are not submitted to this restriction.
6. A minimum cable distance is required between two PSU.

Bus topologies – Up to 64 devices with KNX PL-Link can be installed on one line (main line as well). No restrictions apply to the type mix.

Note:
1. There is no need to calculate the bus load number E for up to 64 devices.
2. A maximum of 64 devices may be installed even if devices requiring less power are used.

Permissible bus topologies are: Tree, line, and star topologies. These topologies can be mixed as needed. However, ring topologies are not allowed. The tree topology is advantageous if a large network must be created.

Cables
The bus lines (= wired pair) are connected via PL+ (red) and PL– (black).



24V AC can be provided in the same (2 x 2 stands) or in a separate cable.

Bus cable screening : In TRA plants, bus cables without screen are permitted. The screens available for bus cables do not need to be connected. If interference is expected on the KNX bus, use a cable with screen. Connect the screen as per standard installation rules.

Network with internal power supply: Comply with the following distances for a KNX network with the internal power supply from the room automation station:

1. Distance between device and internal supply, max 262ft (80m).
2. Distance between devices, max 262ft (80m).
3. Total length of all lines on one line, max 262ft (80m).

Network with external power supply: Comply with the following distances for a KNX network with external bus power supply (PSU)

1. Distance PSU to PXC3 with switched off internal supply, Min. 0ft (0m).
2. Distance device to next PSU, Max. 1148ft (350m).
3. Distance between two PSU operated in parallel Min. 656ft (200m), (Min. 0ft (0m) for the new Siemens power supply modules.).
4. Distance between devices, Max. 2297ft (700m).
5. Total length of all lines on one line, Max. 3281ft (1000m).

Polarity: Important – The bus conductors must NOT be inverted. (KNX terminals + and –).

Permissible load [VA] :

	Cable length for 24V AC				
AWG	32.8ft	65.6ft	164ft	328ft	656ft
AWG20	48VA	30VA	12VA	6VA	3VA
AWG18	48VA	48VA	20VA	10VA	5VA
AWG16	48VA	48VA	32VA	16VA	8VA
AWG14	48VA	48VA	48VA	24VA	12VA

Permissible load [VA] (SI):

	Cable length for AC 24V				
AWG	10m	20m	50m	100m	200m
AWG20	48VA	30VA	12VA	6VA	3VA
AWG18	48VA	48VA	20VA	10VA	5VA
AWG16	48VA	48VA	32VA	16VA	8VA
AWG14	48VA	48VA	48VA	24VA	12VA

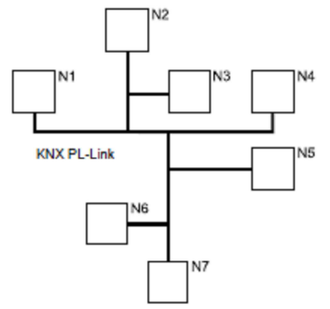
KNX PL-Link Technical data
KNX bus :
1. Transmission medium (bus cable),TP (twisted pair)
2. Baud rate, 9.6 kbps (fixed for TP)
3. Bus line polarity, PL+, PL– (not interchangeable)
4. Bus terminating resistor, Not required.

KNX bus cable:
1. Cable type, 20AWG two conductor, solid, communication cable (Anixter KNX-TSP20LC-CMP or similar).
2. Wire diameter, Min. 0.8 mm (AWG20), Max. 1.0 mm (AWG18).
3. Line resistance, 20 to 75 Ω/km.
4. Specific capacity, 10 to 100 nF/km at 10 kHz.
5. Specific inductivity, 450 to 850 µH/km at 10 kHz.
6. Screens, Not required.

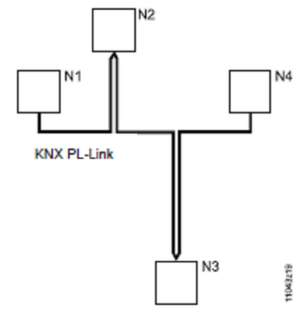
Bus power supply: DXR2 is 30V DC, 50mA for max. 5 KNX devices with 10mA each .

Max. number of devices: 64 devices in a KNX PL-Link network.

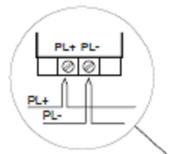
Tree Topology(with stub lines)



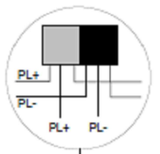
Line Topology (with loops)



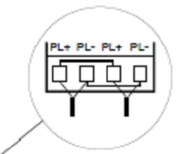
Device with screw terminals

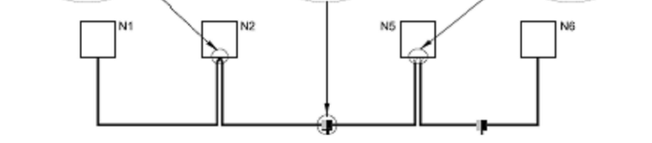


T branch with bus terminals



Device with spring cage terminals





REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

DXR Wiring Specification2

440P412785
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DWIR2

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EXHAUST AIR VALVES FOR FUME HOOD BY SIEMENS
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/15/2026
REVISION: 0

							FLOW DATA FROM PLANS			SIEMENS CONTROL DEVICES												
ROOM #	ROOM DESCRIPTION	TAG	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	INLET SIZE	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	BODY STYLE	INLET SIZE (INCH)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	PART NUMBER	MATERIAL	INTERNAL COATING	EXTERNAL CONSTRUCTION	CONTROLLER TYPE	ACTUATOR OPERATION	FAIL-SAFE	AIRFLOW PRESS SENSOR RANGE	COMMENT
103	INSTRUCTIONAL LAB SPACE	FHEV-1-106-1	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
103	INSTRUCTIONAL LAB SPACE	FHEV-1-106-2	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
103	INSTRUCTIONAL LAB SPACE	FHEV-1-106-3	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
106	ELECTRONICS & SENSORS STUDIO	FHEV-1-109	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
108A	ADVANCED WET LAB	FHEV-1-112-1	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
127	CHEM WASTE	FHEV-1-121	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
103	INSTRUCTIONAL LAB SPACE	FHEV-1-150-1	FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227H	WET LAB	FHEV-1-226	FUME HOOD	GEF-1/2/3	M102	2	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227C	WET LAB	FHEV-1-231	FUME HOOD	GEF-1/2/3	M102	2	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	WET LAB	FHEV-1-325	FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-9	FHEV-1-328	FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-6	FHEV-1-337	FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-12	FHEV-1-420-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	AREA B-9	FHEV-1-423-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	AREA B-9	FHEV-1-423-3	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	AREA B-8	FHEV-1-424-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-427-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-428-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-4	FHEV-1-434-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-5	FHEV-1-435-1	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-6	FHEV-1-436-2	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-11	FHEV-1-437-2	FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
527	WET LAB B-6	FHEV-1-537	FUME HOOD	GEF-1/2/3	M105	5	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
527	WET LAB B-11	FHEV-1-538	FUME HOOD	GEF-1/2/3	M105	5	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
FUTURE FUME HOOD VALVES																						
108A	ADVANCED WET LAB	FHEV-1-112--2	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
108B	SUPPORT	FHEV-1-143	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
118A	SUPPORT	FHEV-1-146	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
103	INSTRUCTIONAL LAB SPACE	FHEV-1-150-2	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227M	WET LAB	FHEV-1-220	FUTURE FUME HOOD	GEF-1/2/3	M102	2	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227G	WET LAB	FHEV-1-227	FUTURE FUME HOOD	GEF-1/2/3	M102	2	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-5	FHEV-1-332	FUTURE FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-4	FHEV-1-333	FUTURE FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-11	FHEV-1-338	FUTURE FUME HOOD	GEF-1/2/3	M103	3	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-12	FHEV-1-420-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	AREA B-9	FHEV-1-423-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	AREA B-8	FHEV-1-424-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-427-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-427-3	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-428-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-4	FHEV-1-434-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-5	FHEV-1-435-2	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-6	FHEV-1-436-1	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-11	FHEV-1-437-1	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB B-11	FHEV-1-437-3	FUTURE FUME HOOD	GEF-1/2/3	M104	4	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
527	WET LAB B-11	FHEV-1-523	FUTURE FUME HOOD	GEF-1/2/3	M105	5	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
527	WET LAB B-5	FHEV-1-530	FUTURE FUME HOOD	GEF-1/2/3	M105	5	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS
527	WET LAB B-4	FHEV-1-531	FUTURE FUME HOOD	GEF-1/2/3	M105	5	10	750	750	SINGLE	10	1000	60	AVD110MHVFOEO11	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-1 IN WC	FUME HOOD AIR VALVE BY SIEMENS

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/15/2026
REVISION: 0

													FLOW DATA FROM PLANS					SIEMENS CONTROL DEVICES								
ROOM #	ROOM DESCRIPTION	CONTROL DRAWING #	WIRING DRAWING #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	FLOW OFFSET (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITER RANGE	FAIL-SAFE	PAIRED	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
103	INSTRUCTIONAL LAB SPACE		460	106	FHEV-1-106-1			FUME HOOD	FHEF-10A/B/C	M101	1	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE		460	106	FHEV-1-106-2			FUME HOOD	FHEF-10A/B/C	M101	1	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE	407	460	106	FHEV-1-106-3			FUME HOOD	FHEF-10A/B/C	M101	1	B	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE		433	106	LGEV-1-106			EXHAUST	GEF-1/2/3	M101	1	B	8		665	60			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
103	INSTRUCTIONAL LAB SPACE			106	LTB-1-106			SUPPLY	AHU-1/2/3	M101	1	B	14	2085	2085	720		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
				106																						
107	IMAGING LAB		461	107	LEEV-1-107			EQUIPMENT EXHAUST	FHEF-10A/B/C	M101	1	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
107	IMAGING LAB	408	433	107	LGEV-1-107			EXHAUST	GEF-1/2/3	M101	1	A	12		1210	120	-150		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
107	IMAGING LAB			107	LTB-1-107			SUPPLY	AHU-1/2/3	M101	1	A	12	585	1125	585		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
				107																						
107	IMAGING LAB		461	108	LEEV-1-108			EQUIPMENT EXHAUST	FHEF-10A/B/C	M101	1	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
107	IMAGING LAB	408	433	108	LGEV-1-108			EXHAUST	GEF-1/2/3	M101	1	A	14		2050	120	-150		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
107	IMAGING LAB			108	LTB-1-108			SUPPLY	AHU-1/2/3	M101	1	A	14	1220	1965	1220		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
				108																						
106	ELECTRONICS & SENSORS STUDIO		460	109	FHEV-1-109			FUME HOOD	FHEF-10A/B/C	M101	1	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
106	ELECTRONICS & SENSORS STUDIO		461	109	LEEV-1-109			EQUIPMENT EXHAUST	FHEF-10A/B/C	M101	1	A	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
106	ELECTRONICS & SENSORS STUDIO	406	433	109	LGEV-1-109			EXHAUST	GEF-1/2/3	M101	1	A	12		1230	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
106	ELECTRONICS & SENSORS STUDIO			109	LTB-1-109			SUPPLY	AHU-1/2/3	M101	1	A	12	835	1420	760		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				109																						
106	ELECTRONICS & SENSORS STUDIO		461	110	LEEV-1-110			EQUIPMENT EXHAUST	FHEF-10A/B/C	M101	1	A	6					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
106	ELECTRONICS & SENSORS STUDIO	408	433	110	LGEV-1-110			EXHAUST	GEF-1/2/3	M101	1	A	14		1665	120	-75		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
106	ELECTRONICS & SENSORS STUDIO			110	LTB-1-110			SUPPLY	AHU-1/2/3	M101	1	A	14	1110	1785	1035		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				110																						
108A	ADVANCED WET LAB		438	111	LGEV-1-111			EXHAUST	GEF-1/2/3	M101	1	A	10		1015	120	-50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
108A	ADVANCED WET LAB	410		111	LTB-1-111			SUPPLY	AHU-1/2/3	M101	1	A	12	610	965	560		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				111																						
108A	ADVANCED WET LAB		460	112	FHEV-1-112-1			FUME HOOD	FHEF-10A/B/C	M101	1	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
108A	ADVANCED WET LAB		460	112	FHEV-1-112--2			FUTURE FUME HOOD	FHEF-10A/B/C	M101	1	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
108A	ADVANCED WET LAB	406	461	112	LEEV-1-112			EQUIPMENT EXHAUST	FHEF-10A/B/C	M101	1	A	4				-50	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
108A	ADVANCED WET LAB		433	112	LGEV-1-112			EXHAUST	GEF-1/2/3	M101	1	A	8		525	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
108A	ADVANCED WET LAB			112	LTB-1-112			SUPPLY	AHU-1/2/3	M101	1	A	12	1495	1495	430		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				112																						
127	CHEM WASTE		460	121	FHEV-1-121			FUME HOOD	FHEF-10A/B/C	M101	1	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
127	CHEM WASTE	407	434	121	LGEV-1-121			EXHAUST	GEF-1/2/3	M101	1	A	8		250	50	-50		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
127	CHEM WASTE			121	LTB-1-121			SUPPLY	AHU-1/2/3	M101	1	A	9	700	700	200		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				121																						
113	CHEM STOR		439	122	LGEV-1-122			EXHAUST	GEF-1/2/3	M101	1	A	6		125	125	-50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
113	CHEM STOR	410		122	LTB-1-122			SUPPLY	AHU-1/2/3	M101	1	A	4	75	75	75		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				122																						
111	BIO WASTE		439	124	LGEV-1-124			EXHAUST	GEF-1/2/3	M101	1	A	6		125	125	-50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
111	BIO WASTE	410		124	LTB-1-124			SUPPLY	AHU-1/2/3	M101	1	A	4	75	75	75		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				124																						
118	INFO TECH & DATA SCIENCE CORE		436	130	LGEV-1-130			EXHAUST	GEF-1/2/3	M101	1	A	9		750	400	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
118	INFO TECH & DATA SCIENCE CORE	409		130	LTB-1-130	CB-130		SUPPLY	AHU-1/2/3	M101	1	A	9	400	750	400		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				130																						
118	INFO TECH & DATA SCIENCE CORE		436	131	LGEV-1-131			EXHAUST	GEF-1/2/3	M101	1	A	9		750	400	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
118	INFO TECH & DATA SCIENCE CORE	409		131	LTB-1-131	CB-131		SUPPLY	AHU-1/2/3	M101	1	A	9	400	750	400		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				131																						
108B	SUPPORT		460	143	FHEV-1-143			FUTURE FUME HOOD	FHEF-10A/B/C	M101	1	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
108B	SUPPORT	407	433	143	LGEV-1-143			EXHAUST	GEF-1/2/3	M101	1	A	8		480	60	-50		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
108B	SUPPORT			143	LTB-1-143			SUPPLY	AHU-1/2/3	M101	1	A	9	710	710	230		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				143																						
108BA	EQUIPMENT ROOM		439	144	LGEV-1-144			EXHAUST	GEF-1/2/3	M101	1	A	8		480	300	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
108BA	EQUIPMENT ROOM	410		144	LTB-1-144			SUPPLY	AHU-1/2/3	M101	1	A	8	300	480	300		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				144																						
118A	SUPPORT		460	146	FHEV-1-146			FUTURE FUME HOOD	FHEF-10A/B/C	M101	1	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
118A	SUPPORT	407	434	146	LGEV-1-146			EXHAUST	GEF-1/2/3	M101	1	B	6		200	50	-50		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
118A	SUPPORT			146	LTB-1-146			SUPPLY	AHU-1/2/3	M101	1	B	9	700	700	95		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				146																						
118B	SUPPORT		439	147	LGEV-1-147			EXHAUST	GEF-1/2/3	M101	1	B	8		105	95	+50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
118B	SUPPORT	410		147	LTB-1-147			SUPPLY	AHU-1/2/3	M101	1	B	5	45	155	45		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				147																						
118C	SUPPORT		439	148	LGEV-1-148			EXHAUST	GEF-1/2/3	M101	1	B	8		420	80	+50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
118C	SUPPORT	410		148	LTB-1-148			SUPPLY	AHU-1/2/3	M101	1	B	8	80	470	80		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				148																						
103	INSTRUCTIONAL LAB SPACE		460	150	FHEV-1-150-1			FUME HOOD	FHEF-10A/B/C	M101	1	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE		460	150	FHEV-1-150-2			FUTURE FUME HOOD	FHEF-10A/B/C	M101	1	B	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE	407	433	150	LGEV-1-150			EXHAUST	GEF-1/2/3	M101	1	B	12		1245	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
103	INSTRUCTIONAL LAB SPACE			150	LTB-1-150			SUPPLY	AHU-1/2/3	M101	1	B	12	1375	1375	1050		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
				150																						
227N	LAB SUPP		439	219	LGEV-1-219			EXHAUST	GEF-1/2/3	M102	2	B	8		135	90	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
227N	LAB SUPP	410		219	LTB-1-219			SUPPLY	AHU-1/2/3	M102	2	B	6	90	135	90		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	No information provided, assuming TEMP. SENSOR ONLY, NO DISPLAY	YES	
				219																						
227M	WET LAB		460	220	FHEV-1-220			FUTURE FUME HOOD	FHEF-10A/B/C	M102	2	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/15/2026
REVISION: 0

													FLOW DATA FROM PLANS					SIEMENS CONTROL DEVICES								
ROOM #	ROOM DESCRIPTION	CONTROL DRAWING #	WIRING DRAWING #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	FLOW OFFSET (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITER RANGE	FAIL-SAFE	PAIRED	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
227M	WET LAB	406	461	220	LEEV-1-220			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	B	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227M	WET LAB		433	220	LGEV-1-220			EXHAUST	GEF-1/2/3	M102	2	B	8		565	60			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227M	WET LAB			220	LTB-1-220			SUPPLY	AHU-1/2/3	M102	2	B	9	750	750	170		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				220																						
227L	AUTO CLAVE		438	221	LGEV-1-221			EXHAUST	GEF-1/2/3	M102	2	B	10		900	250	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
227L	AUTO CLAVE	410		221	LTB-1-221			SUPPLY	AHU-1/2/3	M102	2	B	10	250	900	250		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				221																						
227JB	EQUIPMENT ROOM		439	223	LGEV-1-223			EXHAUST	GEF-1/2/3	M102	2	B	8		155	105	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
227JB	EQUIPMENT ROOM			223	LTB-1-223			SUPPLY	AHU-1/2/3	M102	2	B	5	105	155	105		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				223																						
227JA	EQUIPMENT ROOM		437	224	LGEV-1-224			EXHAUST	GEF-1/2/3	M102	2	B	8		300	140	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
227JA	EQUIPMENT ROOM	409		224	LTB-1-224	CB-224		SUPPLY	AHU-1/2/3	M102	2	B	6	140	300	140		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				224																						
227J	WET LAB	405	461	225	LEEV-1-225			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	B	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227J	WET LAB		431	225	LGEV-1-225			EXHAUST	GEF-1/2/3	M102	2	B	8		310	40			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227J	WET LAB			225	LTB-1-225	CB-225		SUPPLY	AHU-1/2/3	M102	2	B	6	170	300	170		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				225																						
227H	WET LAB		460	226	FHEV-1-226			FUME HOOD	FHEF-10A/B/C	M102	2	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227H	WET LAB		461	226	LEEV-1-226			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	B	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227H	WET LAB	406	433	226	LGEV-1-226			EXHAUST	GEF-1/2/3	M102	2	B	10		1065	100			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227H	WET LAB			226	LTB-1-226			SUPPLY	AHU-1/2/3	M102	2	B	12	430	1255	430		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				226																						
227G	WET LAB		460	227	FHEV-1-227			FUTURE FUME HOOD	FHEF-10A/B/C	M102	2	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227G	WET LAB		461	227	LEEV-1-227			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	A	6					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227G	WET LAB	406	433	227	LGEV-1-227			EXHAUST	GEF-1/2/3	M102	2	A	12		1460	120	-100		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227G	WET LAB			227	LTB-1-227			SUPPLY	AHU-1/2/3	M102	2	A	14	665	1690	665		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				227																						
227F	CELL CULTURE	405	461	228	LEEV-1-228			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	A	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227F	CELL CULTURE		431	228	LGEV-1-228			EXHAUST	GEF-1/2/3	M102	2	A	8		670	0			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227F	CELL CULTURE			228	LTB-1-228	CB-228		SUPPLY	AHU-1/2/3	M102	2	A	9	430	660	430		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				228																						
227E	WET LAB	401	461	229	LEEV-1-229			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	A	4				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227E	WET LAB		430	229	LGEV-1-229			EXHAUST	GEF-1/2/3	M102	2	A	8		560	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227E	WET LAB			229	LTB-1-229	CB-229-1/2	FTRP-229	SUPPLY	AHU-1/2/3	M102	2	A	8	395	550	395		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				229																						
227D	WET LAB	401	461	230	LEEV-1-230			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227D	WET LAB		430	230	LGEV-1-230			EXHAUST	GEF-1/2/3	M102	2	A	8		310	40			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227D	WET LAB			230	LTB-1-230	CB-230	FTRP-230	SUPPLY	AHU-1/2/3	M102	2	A	6	155	300	155		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				230																						
227C	WET LAB	400	460	231	FHEV-1-231			FUME HOOD	FHEF-10A/B/C	M102	2	A	10				-100	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227C	WET LAB		461	231	LEEV-1-231			EQUIPMENT EXHAUST	FHEF-10A/B/C	M102	2	A	6					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
227C	WET LAB		430	231	LGEV-1-231			EXHAUST	GEF-1/2/3	M102	2	A	9		750	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
227C	WET LAB			231	LTB-1-231	CB-231-1/2/3	FTRP-231	SUPPLY	AHU-1/2/3	M102	2	A	12	660	980	660		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				231																						
227	LAB HALL WAY		435	232	LTB-1-232			SUPPLY	AHU-1/2/3	M102	2	B	7	425	425	425	+425	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				232																						
227A	COMMON CHEM ROOM		439	234	LGEV-1-234			EXHAUST	GEF-1/2/3	M102	2	A	8		350	350	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
227A	COMMON CHEM ROOM	410		234	LTB-1-234			SUPPLY	AHU-1/2/3	M102	2	A	7	350	350	350		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				234																						
327F	LAB SUPP		439	324	LGEV-1-324			EXHAUST	GEF-1/2/3	M103	3	B	8		650	90	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
327F	LAB SUPP			324	LTB-1-324			SUPPLY	AHU-1/2/3	M103	3	B	9	90	650	90		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				324																						
327	WET LAB		460	325	FHEV-1-325			FUME HOOD	FHEF-10A/B/C	M103	3	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	WET LAB	407	433	325	LGEV-1-325			EXHAUST	GEF-1/2/3	M103	3	B	10		1095	120	-75		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	WET LAB			325	LTB-1-325			SUPPLY	AHU-1/2/3	M103	3	B	12	745	1220	485		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				325																						
327E	FREEZER RM		437	326	LGEV-1-326			EXHAUST	GEF-1/2/3	M103	3	B	8		440	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
327E	FREEZER RM	409		326	LTB-1-326	CB-326		SUPPLY	AHU-1/2/3	M103	3	B	7	180	440	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				326																						
327D	LAB SUPP		439	327	LGEV-1-327			EXHAUST	GEF-1/2/3	M103	3	B	8		260	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				YES
327D	LAB SUPP	410		327	LTB-1-327			SUPPLY	AHU-1/2/3	M103	3	B	6	180	260	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				327																						
327	AREA B-9		460	328	FHEV-1-328			FUME HOOD	FHEF-10A/B/C	M103	3	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-9		461	328	LEEV-1-328			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	B	6				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-9	406	433	328	LGEV-1-328			EXHAUST	GEF-1/2/3	M103	3	B	12		1405	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-9			328	LTB-1-328			SUPPLY	AHU-1/2/3	M103	3	B	14	875	1660	655		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				328																						
327	AREA B-8		461	329	LEEV-1-329			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-8	408	433	329	LGEV-1-329			EXHAUST	GEF-1/2/3	M103	3	A	12		1535	120	-75		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-8			329	LTB-1-329			SUPPLY	AHU-1/2/3	M103	3	A	14	610	1525	610		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				329																						
327C	CELL CULTURE	405	461	330	LEEV-1-330			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	A						DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327C	CELL CULTURE		431	330	LGEV-1-330			EXHAUST	GEF-1/2/3	M103	3	A	8		270	180	+50		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327C	CELL CULTURE			330	LTB-1-330	CB-330-1/2		SUPPLY	AHU-1/2/3	M103	3	A	7	130	320	130		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				330																						

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
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													FLOW DATA FROM PLANS					SIEMENS CONTROL DEVICES								
ROOM #	ROOM DESCRIPTION	CONTROL DRAWING #	WIRING DRAWING #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	FLOW OFFSET (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITER RANGE	FAIL-SAFE	PAIRED	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
327B	CONSUMABLES		439	331	LGEV-1-331			EXHAUST	GEF-1/2/3	M103	3	A	8		220	60	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
327B	CONSUMABLES	410		331	LTB-1-331			SUPPLY	AHU-1/2/3	M103	3	A	5	60	220	60		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				331																						
327	AREA B-5	400	460	332	FHEV-1-332			FUTURE FUME HOOD	FHEF-10A/B/C	M103	3	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-5		461	332	LEEV-1-332			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-5		430	332	LGEV-1-332			EXHAUST	GEF-1/2/3	M103	3	A	10		760	100			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-5			332	LTB-1-332	CB-322	FTRP-332	SUPPLY	AHU-1/2/3	M103	3	A	9	750	750	750		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				332																						
327	AREA B-4	400	460	333	FHEV-1-333			FUTURE FUME HOOD	FHEF-10A/B/C	M103	3	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-4		461	333	LEEV-1-333			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-4		430	333	LGEV-1-333			EXHAUST	GEF-1/2/3	M103	3	A	10		1030	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-4			333	LTB-1-333	CB-333-1/2	FTRP-333	SUPPLY	AHU-1/2/3	M103	3	A	12	945	1020	945		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				333																						
327A	COMMON CHEM ROOM		439	335	LGEV-1-335			EXHAUST	GEF-1/2/3	M103	3	A	8		350	350	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
327A	COMMON CHEM ROOM	410		335	LTB-1-335			SUPPLY	AHU-1/2/3	M103	3	A	7	350	350	350		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				335																						
327	AREA B-6		460	337	FHEV-1-337			FUME HOOD	FHEF-10A/B/C	M103	3	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-6	407	433	337	LGEV-1-337			EXHAUST	GEF-1/2/3	M103	3	A	10		1010	120	0		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-6			337	LTB-1-337			SUPPLY	AHU-1/2/3	M103	3	A	12	525	1210	525		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				337																						
327	AREA B-11		460	338	FHEV-1-338			FUTURE FUME HOOD	FHEF-10A/B/C	M103	3	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-11		461	338	LEEV-1-338			EQUIPMENT EXHAUST	FHEF-10A/B/C	M103	3	B	4				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
327	AREA B-11	406	433	338	LGEV-1-338			EXHAUST	GEF-1/2/3	M103	3	B	12		1145	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
327	AREA B-11			338	LTB-1-338			SUPPLY	AHU-1/2/3	M103	3	B	12	885	1210	515		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				338																						
407	LAB SUPP		438	405	LGEV-1-405			EXHAUST	GEF-1/2/3	M104	4	B	12		1220	120	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
407	LAB SUPP	410		405	LTB-1-405			SUPPLY	AHU-1/2/3	M104	4	B	12	725	1220	725		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				405																						
427H	LAB SUPP		439	419	LGEV-1-419			EXHAUST	GEF-1/2/3	M104	4	B	8		580	90	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427H	LAB SUPP	410		419	LTB-1-419			SUPPLY	AHU-1/2/3	M104	4	B	9	90	580	90		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				419																						
427	WET LAB B-12		460	420	FHEV-1-420-1			FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-12	407	460	420	FHEV-1-420-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-12		433	420	LGEV-1-420			EXHAUST	GEF-1/2/3	M104	4	B	10		660	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB B-12			420	LTB-1-420			SUPPLY	AHU-1/2/3	M104	4	B	12	1405	1405	345		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				420																						
427G	FREEZER RM		437	421	LGEV-1-421			EXHAUST	GEF-1/2/3	M104	4	B	8		440	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427G	FREEZER RM	409		421	LTB-1-421	CB-421		SUPPLY	AHU-1/2/3	M104	4	B	7	180	440	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				421																						
427F	LAB SUPP		439	422	LGEV-1-422			EXHAUST	GEF-1/2/3	M104	4	B	7		300	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427F	LAB SUPP	410		422	LTB-1-422			SUPPLY	AHU-1/2/3	M104	4	B	6	180	300	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				422																						
427	AREA B-9		460	423	FHEV-1-423-1			FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-9		460	423	FHEV-1-423-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-9	407	460	423	FHEV-1-423-3			FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-9		433	423	LGEV-1-423			EXHAUST	GEF-1/2/3	M104	4	B	10		660	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	AREA B-9			423	LTB-1-423			SUPPLY	AHU-1/2/3	M104	4	B	16	2105	2105	340		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				423																						
427	AREA B-8		460	424	FHEV-1-424-1			FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-8		460	424	FHEV-1-424-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-8		461	424	LEEV-1-424			EQUIPMENT EXHAUST	FHEF-10A/B/C	M104	4	B	6					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	AREA B-8		433	424	LGEV-1-424			EXHAUST	GEF-1/2/3	M104	4	B	14		1865	200			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427'	AREA B-8	406		424	LTB-1-424			SUPPLY	AHU-1/2/3	M104	4	B	16	1005	2130	1005		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				424																						
427E	CELL CULTURE		436	425	LGEV-1-425			EXHAUST	GEF-1/2/3	M104	4	A	6		270	180	+50		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427E	CELL CULTURE	409		425	LTB-1-425	CB-425-1/2		SUPPLY	AHU-1/2/3	M104	4	A	7	130	320	130		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				425																						
427D	CONSUMABLES		439	426	LGEV-1-426			EXHAUST	GEF-1/2/3	M104	4	A	6		215	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427D	CONSUMABLES	410		426	LTB-1-426			SUPPLY	AHU-1/2/3	M104	4	A	5	180	215	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				426																						
427	WET LAB		460	427	FHEV-1-427-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB		460	427	FHEV-1-427-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB	407	460	427	FHEV-1-427-3			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB		433	427	LGEV-1-427			EXHAUST	GEF-1/2/3	M104	4	A	12		1250	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB			427	LTB-1-427			SUPPLY	AHU-1/2/3	M104	4	A	16	2145	2145	450		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				427																						
427	WET LAB		460	428	FHEV-1-428-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB		460	428	FHEV-1-428-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB	402	461	428	LEEV-1-428			EQUIPMENT EXHAUST	FHEF-10A/B/C	M104	4	A	4				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB		432	428	LGEV-1-428			EXHAUST	GEF-1/2/3	M104	4	A	14		2010	200			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB			428	LTB-1-428		FTRP-428	SUPPLY	AHU-1/2/3	M104	4	A	16	1665	2275	790		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				428																						
427C	COMMON CHEM ROOM		439	429	LGEV-1-429			EXHAUST	GEF-1/2/3	M104	4	A	8		350	350	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427C	COMMON CHEM ROOM	410		429	LTB-1-429			SUPPLY	AHU-1/2/3	M104	4	A	7	350	350	350		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				429																						

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/15/2026
REVISION: 0

													FLOW DATA FROM PLANS					SIEMENS CONTROL DEVICES								
ROOM #	ROOM DESCRIPTION	CONTROL DRAWING #	WIRING DRAWING #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	FLOW OFFSET (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITER RANGE	FAIL-SAFE	PAIRED	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
407	LAB SUPP		438	430	LGEV-1-430			EXHAUST	GEF-1/2/3	M104	4	A	12		1070	210	+150		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
407	LAB SUPP	410		430	LTB-1-430			SUPPLY	AHU-1/2/3	M104	4	A	12	725	1220	725		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				430																						
427B	LAB SUPP		439	431	LGEV-1-431			EXHAUST	GEF-1/2/3	M104	4	B	8		390	245	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
427B	LAB SUPP	410		431	LTB-1-431			SUPPLY	AHU-1/2/3	M104	4	B	7	245	390	245		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				431																						
427	WET LAB B-4		460	434	FHEV-1-434-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-4		460	434	FHEV-1-434-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-4	403	432	434	LGEV-1-434			EXHAUST	GEF-1/2/3	M104	4	A	10		690	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB B-4			434	LTB-1-434		FTRP-434	SUPPLY	AHU-1/2/3	M104	4	A	12	1405	1405	215		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				434																						
427	WET LAB B-5		460	435	FHEV-1-435-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-5		460	435	FHEV-1-435-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-5	407	433	435	LGEV-1-435			EXHAUST	GEF-1/2/3	M104	4	A	10		605	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB B-5			435	LTB-1-435			SUPPLY	AHU-1/2/3	M104	4	A	12	1480	1480	280		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				435																						
427	WET LAB B-6		460	436	FHEV-1-436-1			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-6		460	436	FHEV-1-436-2			FUME HOOD	FHEF-10A/B/C	M104	4	A	10				-125	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-6	407	433	436	LGEV-1-436			EXHAUST	GEF-1/2/3	M104	4	A	12		1155	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB B-6			436	LTB-1-436			SUPPLY	AHU-1/2/3	M104	4	A	12	1395	1395	400		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				436																						
427	WET LAB B-11		460	437	FHEV-1-437-1			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-11		460	437	FHEV-1-437-2			FUME HOOD	FHEF-10A/B/C	M104	4	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-11		460	437	FHEV-1-437-3			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-11	404	461	437	LEEV-1-437			EQUIPMENT EXHAUST	FHEF-10A/B/C	M104	4	B	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
427	WET LAB B-11		431	437	LGEV-1-437			EXHAUST	GEF-1/2/3	M104	4	B	12		1445	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
427	WET LAB B-11			437	LTB-1-437	CB-437		SUPPLY	AHU-1/2/3	M104	4	B	16	2285	2285	765		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				437																						
504	ANALYXIN GENOMICS CORE		438	502	LGEV-1-502			EXHAUST	GEF-1/2/3	M105	5	B	14		750	0	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
504	ANALYXIN GENOMICS CORE	410		502	LTB-1-502			SUPPLY	AHU-1/2/3	M105	5	B	14	1000	1625	1000		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				502																						
504A	LAB SUPP		437	507	LGEV-1-507			EXHAUST	GEF-1/2/3	M105	5	B	6		200	115	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
504A	LAB SUPP	409		507	LTB-1-507	CB-507		SUPPLY	AHU-1/2/3	M105	5	B	5	115	200	115		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
				507																						
504B	LAB SUPP		437	508	LGEV-1-508			EXHAUST	GEF-1/2/3	M105	5	B	6		220	120	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
504B	LAB SUPP	409		508	LTB-1-508	CB-508		SUPPLY	AHU-1/2/3	M105	5	B	5	120	220	120		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
				508																						
504	ANALYXIN GENOMICS CORE		461	509	LEEV-1-509			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
504	ANALYXIN GENOMICS CORE	408	433	509	LGEV-1-509			EXHAUST	GEF-1/2/3	M105	5	B	14		850	0	0		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
504	ANALYXIN GENOMICS CORE			509	LTB-1-509			SUPPLY	AHU-1/2/3	M105	5	B	14	1000	1765	1000		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				509																						
527	WET LAB		461	521	LEEV-1-521			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	B	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB	408	433	521	LGEV-1-521			EXHAUST	GEF-1/2/3	M105	5	B	14		2385	200	-150		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB			521	LTB-1-521			SUPPLY	AHU-1/2/3	M105	5	B	16	585	2300	585		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				521																						
527J	AUTO CLAVE		438	522	LGEV-1-522			EXHAUST	GEF-1/2/3	M105	5	B	8		585	90	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
527J	AUTO CLAVE	410		522	LTB-1-522			SUPPLY	AHU-1/2/3	M105	5	B	9	90	585	90		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	No information provided, assuming CHT. SENSOR ONLY, NO DISPLAY	YES	
				522																						
527	WET LAB B-11		460	523	FHEV-1-523			FUTURE FUME HOOD	FHEF-10A/B/C	M105	5	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-11	407	433	523	LGEV-1-523			EXHAUST	GEF-1/2/3	M105	5	B	10		1315	120	-75		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB B-11			523	LTB-1-523			SUPPLY	AHU-1/2/3	M105	5	B	12	480	1240	480		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				523																						
527H	FREEZER RM		437	524	LGEV-1-524			EXHAUST	GEF-1/2/3	M105	5	B	8		440	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
527H	FREEZER RM	409		524	LTB-1-524	CB-524		SUPPLY	AHU-1/2/3	M105	5	B	7	180	440	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				524																						
527	AREA B-8		461	526	LEEV-1-526			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	B	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	AREA B-8	408	433	526	LGEV-1-526			EXHAUST	GEF-1/2/3	M105	5	B	14		2365	200	-125		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	AREA B-8			526	LTB-1-526			SUPPLY	AHU-1/2/3	M105	5	B	16	615	2305	615		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				526																						
527F	CELL CULTURE	405	461	528	LEEV-1-528			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	A						DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527F	CELL CULTURE		431	528	LGEV-1-528			EXHAUST	GEF-1/2/3	M105	5	A	6		270	230	+50		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527F	CELL CULTURE			528	LTB-1-528	CB-528-1/2		SUPPLY	AHU-1/2/3	M105	5	A	7	180	320	180		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				528																						
527E	CONSUMABLES		439	529	LGEV-1-529			EXHAUST	GEF-1/2/3	M105	5	A	6		225	180	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
527E	CONSUMABLES	410		529	LTB-1-529			SUPPLY	AHU-1/2/3	M105	5	A	5	180	225	180		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				529																						
527	WET LAB B-5		460	530	FHEV-1-530			FUTURE FUME HOOD	FHEF-10A/B/C	M105	5	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-5		461	530	LEEV-1-530			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-5		430	530	LGEV-1-530			EXHAUST	GEF-1/2/3	M105	5	A	8		760	80			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB B-5			530	LTB-1-530	CB-530	FTRP-530	SUPPLY	AHU-1/2/3	M105	5	A	9	780	780	780		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				530																						
527	WET LAB B-4	400	460	531	FHEV-1-531			FUTURE FUME HOOD	FHEF-10A/B/C	M105	5	A	10				-75	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-4		461	531	LEEV-1-531			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	A	4					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-4		430	531	LGEV-1-531			EXHAUST	GEF-1/2/3	M105	5	A	10		1030	120			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB B-4			531	LTB-1-531	CB-531-1/2	FTRP-531	SUPPLY	AHU-1/2/3	M105	5	A	12	1070	1070	1070		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				531																						
527D	SHARED EQUIPMENT		437	532	LGEV-1-532			EXHAUST	GEF-1/2/3	M105	5	A	9		770	490	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				

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													FLOW DATA FROM PLANS					SIEMENS CONTROL DEVICES								
ROOM #	ROOM DESCRIPTION	CONTROL DRAWING #	WIRING DRAWING #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	AIRFLOW MAX. (CFM)	AIRFLOW MIN. (CFM)	FLOW OFFSET (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITER RANGE	FAIL-SAFE	PAIRED	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
527D	SHARED EQUIPMENT	409	457	532	LTB-1-532	CB-532		SUPPLY	AHU-1/2/3	M105	5	A	10	490	770	490		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	PAIRED	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				532																						
527C	COMMON CHEM ROOM		439	533	LGEV-1-533			EXHAUST	GEF-1/2/3	M105	5	A	8		350	350	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
527C	COMMON CHEM ROOM	410		533	LTB-1-533			SUPPLY	AHU-1/2/3	M105	5	A	7	350	350	350		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				533																						
509	BIOMARKER T/H LAB		438	534	LGEV-1-534			EXHAUST	GEF-1/2/3	M105	5	B	14		2000	575	+150		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
509	BIOMARKER T/H LAB	410		534	LTB-1-534			SUPPLY	AHU-1/2/3	M105	5	B	16	725	2150	725		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				534																						
527B	LAB CIRCULATION		439	535	LGEV-1-535			EXHAUST	GEF-1/2/3	M105	5	B	6		270	175	0		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
527B	LAB CIRCULATION	410		535	LTB-1-535			SUPPLY	AHU-1/2/3	M105	5	B	7	255	410	255		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				535																						
504	ANALYXIN GENOMICS CORE		461	536	LEEV-1-536			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
504	ANALYXIN GENOMICS CORE	408	433	536	LGEV-1-536			EXHAUST	GEF-1/2/3	M105	5	B	14		600	0	-75		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
504	ANALYXIN GENOMICS CORE			536	LTB-1-536			SUPPLY	AHU-1/2/3	M105	5	B	14	1075	1740	1075		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				536																						
527	WET LAB B-6		460	537	FHEV-1-537			FUME HOOD	FHEF-10A/B/C	M105	5	A	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-6		461	537	LEEV-1-537			EQUIPMENT EXHAUST	FHEF-10A/B/C	M105	5	A	10				0	DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-6	406	433	537	LGEV-1-537			EXHAUST	GEF-1/2/3	M105	5	A	10		1045	100			HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB B-6			537	LTB-1-537			SUPPLY	AHU-1/2/3	M105	5	A	12	435	1045	435		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				537																						
527	WET LAB B-11		460	538	FHEV-1-538			FUME HOOD	FHEF-10A/B/C	M105	5	B	10					DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NO					
527	WET LAB B-11	407	433	538	LGEV-1-538			EXHAUST	GEF-1/2/3	M105	5	B	10		980	100	0		HIGH SPEED	0/1 IN WG	SR-NO	PAIRED				
527	WET LAB B-11			538	LTB-1-538			SUPPLY	AHU-1/2/3	M105	5	B	12	505	1180	505		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				538																						
509	BIOMARKER T/H LAB		438	540	LGEV-1-540			EXHAUST	GEF-1/2/3	M105	5	A	14		2000	575	+150		STANDARD SPEED	0/1 IN WG	SR-NO	PAIRED				
509	BIOMARKER T/H LAB	410		540	LTB-1-540			SUPPLY	AHU-1/2/3	M105	5	A	16	725	2150	725		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	

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ROOM #	ROOM DESCRIPTION	WIRING DWG #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	COOLING MAX. (CFM)	MIN. (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITTER RANGE	FAIL-SAFE	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
199	LOBBY HALL WAY	450	4-101	TB-4-101			SUPPLY	AHU-4/5	M101	1	B	7	305	400	305	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
199C	LEARNING LIVING ROOM	446	4-102	TB-4-102			SUPPLY	AHU-4/5	M101	1	B	12	1200	1200	600	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
199C	LEARNING LIVING ROOM		4-102	EV-4-102			EXHAUST	GEF-4/5	M101	1	B	10		800	200								
199C	LEARNING LIVING ROOM	471	4-102	CB-102	CB-102 (4-PIPE)		4-PIPE CB			1	A					DXR2.E18-101B							
100	LARGE MULTIPURPOSE	442	4-103	TB-4-103	CB-103		SUPPLY	AHU-4/5	M101	1	B	10	240	880	240	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
100	LARGE MULTIPURPOSE		4-103	EV-4-103			EXHAUST	GEF-4/5	M101	1	B	8		680	40								
100	LARGE MULTIPURPOSE	440	4-104	TB-4-104	CB-104	FTRP-104	SUPPLY	AHU-4/5	M101	1	B	14	1295	1760	350	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
100	LARGE MULTIPURPOSE		4-104	EV-4-104			EXHAUST	GEF-4/5	M101	1	B	14		1560	150								
199G	HALL WAY	455	4-105	TB-4-105	CB-105		SUPPLY	AHU-4/5	M101	1	B	9	300	620	300	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199	LOBBY FORUM	444	113	TB-4-113		FTRP-113	SUPPLY	AHU-4/5	M101	1	B	12	455	1305	455	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY, BLACK COLORED	YES	
199	LOBBY FORUM		113	EV-4-113			EXHAUST	GEF-4/5	M101	1	B	10		1055	205								
199L	CIRCULATION	444	114	TB-4-114		FTRP-114	SUPPLY	AHU-4/5	M101	1	B	14	780	1530	400	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
199L	CIRCULATION		114	EV-4-114			EXHAUST	GEF-4/5	M101	1	B	12		1280	150								
199L	CIRCULATION	447	115	TB-4-115			SUPPLY	AHU-4/5	M101	1	B	7	440	440	120	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199L	CIRCULATION		115	EV-4-115			EXHAUST	GEF-4/5	M101	1	B	6		300	20								
199L	CIRCULATION	471	199	CB-115	CB-115 (4-PIPE)		4-PIPE CB			1	A					DXR2.E18-101B							
199G	CIRCULATION	447	116	TB-4-116			SUPPLY	AHU-4/5	M101	1	A	7	120	400	120	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199G	CIRCULATION		116	EV-4-116			EXHAUST	GEF-4/5	M101	1	A	6		300	20								
115	OFFICE	447	117	TB-4-117			SUPPLY	AHU-4/5	M101	1	A	4	35	75	35	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
115	OFFICE		117	EV-4-117			EXHAUST	GEF-4/5	M101	1	A	4		75	30								
126	CYL STOR	447	118	TB-1-118			SUPPLY	AHU-1/2/3	M101	1	A	4	100	100	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
126	CYL STOR		118	EV-1-118			EXHAUST	GEF-1/2/3	M101	1	A	6		150	150								
124	BIO STO	447	119	EV-1-119			EXHAUST	GEF-1/2/3	M101	1	A	6		125	125								
124	BIO STO		119	TB-1-119			SUPPLY	AHU-1/2/3	M101	1	A	4	75	75	75	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
109	LAB STORAGE	447	123	TB-1-123			SUPPLY	AHU-1/2/3	M101	1	A	6	200	260	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
109	LAB STORAGE		123	EV-1-123			EXHAUST	GEF-1/2/3	M101	1	A	6		160	100								
198G	HOUSE KEEPING/STOR	447	125	TB-4-125			SUPPLY	AHU-4/5	M101	1	A	5	30	200	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
198G	HOUSE KEEPING/STOR		125	EV-4-125			EXHAUST	GEF-4/5	M101	1	A	6		200	30								
199G	CIRCULATION	447	127	TB-4-127			SUPPLY	AHU-4/5	M101	1	A	8	150	500	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199G	CIRCULATION		127	EV-4-127			EXHAUST	GEF-4/5	M101	1	A	6		300	20								
122	BREAK AREA	446	132	TB-4-132			SUPPLY	AHU-4/5	M101	1	A	9	205	570	205	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
122	BREAK AREA		132	EV-4-132			EXHAUST	GEF-4/5	M101	1	A	8		470	105								
122A	STOR	447	133	TB-4-133			SUPPLY	AHU-4/5	M101	1	A	7	160	380	160	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
122A	STOR		133	EV-4-133			EXHAUST	GEF-4/5	M101	1	A	6		330	110								
198J	MAINT STOR	447	134	TB-4-134			SUPPLY	AHU-4/5	M101	1	A	4	50	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
198J	MAINT STOR		134	EV-4-134			EXHAUST	GEF-4/5	M101	1	A	4		50	50								
196	MEN/WOMEN	448	135	TB-4-135			SUPPLY	AHU-4/5	M101	1	B	12	975	975	975	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
196	MEN/WOMEN		135	EV-4-135			EXHAUST	GEF-4/5	M101	1	B	12		1150	1150								
135	FUTURE RETIAL / COFFEE	447	136	TB-1-136			SUPPLY	AHU-1/2/3	M101	1	B	9	200	580	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
135	FUTURE RETIAL / COFFEE		136	EV-1-136			EXHAUST	GEF-1/2/3	M101	1	B	8		580	200								
133	WELLNESS ROOM	447	137	TB-4-137			SUPPLY	AHU-4/5	M101	1	B	4	30	100	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
133	WELLNESS ROOM		137	EV-4-137			EXHAUST	GEF-4/5	M101	1	B	4		100	30								
104	CLASSROOM	442	138	TB-4-138	CB-138		SUPPLY	AHU-4/5	M101	1	B	7	100	405	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
104	CLASSROOM		138	EV-4-138			EXHAUST	GEF-4/5	M101	1	B	6		305	20								
102	CLASSROOM	442	139	TB-4-139	CB-139		SUPPLY	AHU-4/5	M101	1	B	7	100	405	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
102	CLASSROOM		139	EV-4-139			EXHAUST	GEF-4/5	M101	1	B	6		305	20								
199H	RECEIVING	447	140	TB-4-140			SUPPLY	AHU-4/5	M101	1	A	9	600	600	160	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199H	RECEIVING		140	EV-4-140			EXHAUST	GEF-4/5	M101	1	A	6		250	20								
198F	SECURITY	445	141	TB-1-141			SUPPLY	AHU-1/2/3	M101	1	A	8		600	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	YES	
198F	SECURITY		141	EV-1-141			EXHAUST	GEF-1/2/3	M101	1	A	8		500	50								
198C	MDF	445	142	TB-1-142			SUPPLY	AHU-1/2/3	M101	1	A	12		1360	120	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	

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DATE: 4/15/2026
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ROOM #	ROOM DESCRIPTION	WIRING DWG #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	COOLING MAX. (CFM)	MIN. (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITTER RANGE	FAIL-SAFE	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
198C	MDF	[illegible]	142	EV-1-142			EXHAUST	GEF-1/2/3	M101	1	A	12		1285	45								
108	VESTUBULE	447	145	TB-1-145			SUPPLY	AHU-1/2/3	M101	1	A	5	250	250	250	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
108	VESTUBULE		145	EV-1-145			EXHAUST	GEF-1/2/3	M101	1	A	6		50	50								
101	FURN STOR	447	149	TB-4-149			SUPPLY	AHU-4/5	M101	1	B	5	100	200	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
101	FURN STOR		149	EV-4-149			EXHAUST	GEF-4/5	M101	1	B	6		150	50								
198D	PUMP ROOM	447	152	TB-1-152			SUPPLY	AHU-1/2/3	M101	1	A	8	60	480	60	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
198D	PUMP ROOM		152	EV-1-152			EXHAUST	GEF-1/2/3	M101	1	A	8		480	60								
N/A	INJECTION VAV BOX	454	153	TB-4-153			SUPPLY	AHU-4/5	M101	1	B	14	2000	2000	0	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	INJECTION VAV BOX	NO	
199L	CIRCULATION	447	199	TB-4-199			SUPPLY	AHU-4/5	M101	1	A	9	600	600	400	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
199L	CIRCULATION		199	EV-4-199			EXHAUST	GEF-4/5	M101	1	A	6		300	100								
199L	CIRCULATION	471	199	CB-199	CB-199 (4-PIPE)		4-PIPE CB			1	A					DXR2.E18-101B							
299	ELEVATOR	451	201	TB-4-201			SUPPLY	AHU-4/5	M102	2	B	7	130	400	130	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
200	IU LAB OFFICE	440	203	TB-4-203	CB-203-1/2	FTRP-203	SUPPLY	AHU-4/5	M102	2	B	9	565	710	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
200	IU LAB OFFICE		203	EV-4-203			EXHAUST	GEF-4/5	M102	2	B	8		610	100								
296B	MEN/WOMEN	448	204	TB-4-204			SUPPLY	AHU-4/5	M102	2	B	6	300	300	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
296B	MEN/WOMEN		204	EV-4-204			EXHAUST	GEF-4/5	M102	2	B	8		525	525								
202	& AMBASSODORS CO-WOR	442	205	TB-4-205	CB-205-1		SUPPLY	AHU-4/5	M102	2	B	12	1050	1050	350	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
202	& AMBASSODORS CO-WOR		205	EV-4-205			EXHAUST	GEF-4/5	M102	2	B	10		850	150								
202	& AMBASSODORS CO-WOR	471	205	CB-205-2	CB-205-2(4-PIPE)		4-PIPE CB		M102	2	B					DXR2.E18-101B							
202A/B	OFFICE	447	206	TB-4-206			SUPPLY	AHU-4/5	M102	2	B	4	40	140	40	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
202A/B	OFFICE		206	EV-4-206			EXHAUST	GEF-4/5	M102	2	B	4		140	40								
202C	MTG ROOM	446	208	TB-4-208			SUPPLY	AHU-4/5	M102	2	B	5	10	210	10	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
202C	MTG ROOM		208	EV-4-208			EXHAUST	GEF-4/5	M102	2	B	6		210	30								
207	CENTRAL COLAB	446	209	TB-4-209			SUPPLY	AHU-4/5	M102	2	A	10	175	880	175	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
207	CENTRAL COLAB		209	EV-4-209			EXHAUST	GEF-4/5	M102	2	A	10		780	75								
207	CENTRAL COLAB	446	210	TB-4-210			SUPPLY	AHU-4/5	M102	2	A	10	175	880	175	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
207	CENTRAL COLAB		210	EV-4-210			EXHAUST	GEF-4/5	M102	2	A	10		780	75								
	OFFICE	442	211	TB-4-211	CB-211		SUPPLY	AHU-4/5	M102	2	B	6	240	300	240	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
	OFFICE		211	EV-4-211			EXHAUST	GEF-4/5	M102	2	B	6		200	140								
212	OPEN OFFICE	440	212	TB-4-212	CB-212	FTRP-212	SUPPLY	AHU-4/5	M102	2	A	12	1050	1050	315	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
212	OPEN OFFICE		212	EV-4-212			EXHAUST	GEF-4/5	M102	2	A	10		900	165								
220	OPEN OFFICE	442	214	TB-4-214	CB-214		SUPPLY	AHU-4/5	M102	2	A	8	440	500	175	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
220	OPEN OFFICE		214	EV-4-214			EXHAUST	GEF-4/5	M102	2	A	8		400	75								
226	OPEN WORK ROOM	442	215	TB-4-215	CB-215		SUPPLY	AHU-4/5	M102	2	A	6	220	300	220	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
226	OPEN WORK ROOM		215	EV-4-215			EXHAUST	GEF-4/5	M102	2	A	6		200	120								
299E	CIRCULATION	451	216	TB-4-216			SUPPLY	AHU-4/5	M102	2	B	5	60	155	60	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
231	MEETING ROOM	440	217	TB-4-217	CB-217	FTRP-217	SUPPLY	AHU-4/5	M102	2	B	7	120	370	130	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
231	MEETING ROOM		217	EV-4-217			EXHAUST	GEF-4/5	M102	2	B	6		270	30								
229	MEETING ROOM	440	218	TB-4-218	CB-218	FTRP-218	SUPPLY	AHU-4/5	M102	2	B	5	215	220	215	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
229	MEETING ROOM		218	EV-4-218			EXHAUST	GEF-4/5	M102	2	B	6		170	165								
			218																				
227B	SHARED LAB SUPPORT	447	235	TB-1-235			SUPPLY	AHU-1/2/3	M102	2	A	12	150	1440	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
227B	SHARED LAB SUPPORT		235	EV-1-235			EXHAUST	GEF-1/2/3	M102	2	A	12		1440	150								
205	WELLNESS ROOM	447	236	TB-4-236			SUPPLY	AHU-4/5	M102	2	B	4	30	100	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
205	WELLNESS ROOM		236	EV-4-236			EXHAUST	GEF-4/5	M102	2	B	4		100	30								
298B	MDF	445	237	TB-1-237			SUPPLY	AHU-1/2/3	M102	2	A	12		1360	120	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
298B	MDF		237	EV-1-237			EXHAUST	GEF-1/2/3	M102	2	A	12		1285	45								
298E	SECURITY	445	1-238	TB-1-238			SUPPLY	AHU-1/2/3	M102	2	A	6		300	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	YES	
298E	SECURITY		1-238	EV-1-238			EXHAUST	GEF-1/2/3	M102	2	A	6		200	50								
N/A	OFFICE	447	4-238	TB-4-238			SUPPLY	AHU-4/5	M102	2	B	4	10	125	10	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
N/A	OFFICE		4- 238	EV-4-238			EXHAUST	GEF-4/5	M102	2	B	4		125	10								
N/A	MEETING ROOM	[illegible]	239	TB-4-239	CB-239		SUPPLY	AHU-4/5	M102	2	A	6	230	300	230	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/15/2026
REVISION: 0

ROOM #	ROOM DESCRIPTION	WIRING DWG #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	COOLING MAX. (CFM)	MIN. (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITTER RANGE	FAIL-SAFE	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
N/A	MEETING ROOM	[illegible]	239	EV-4-239			EXHAUST	GEF-4/5	M102	2	A	6		250	180								
N/A	INJECTION VAV BOX	454	240	TB-4-240			SUPPLY	AHU-4/5	M102	2	B	14	2000	2000	0	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	INJECTION VAV BOX	NO	
			240									7	90	400	90								
399	N/A	451	301	TB-4-301			SUPPLY	AHU-4/5	M103	3	B	7	90	400	90	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	No information provided, assuming TEMP. SENSOR ONLY, NO DISPLAY	YES	
300	DATA SCIENCE	440	303	TB-4-303	CB-303	FTRP-303	SUPPLY	AHU-4/5	M103	3	B	7	255	400	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
300	DATA SCIENCE		303	EV-4-303			EXHAUST	GEF-4/5	M103	3	B	6		350	50								
300	DATA SCIENCE	442	304	TB-4-304	CB-304		SUPPLY	AHU-4/5	M103	3	B	9	215	600	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
300	DATA SCIENCE		304	EV-4-304			EXHAUST	GEF-4/5	M103	3	B	8		550	50								
302	COMP LAB	442	305	TB-4-305	CB-305		SUPPLY	AHU-4/5	M103	3	B	8	285	550	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
302	COMP LAB		305	EV-4-305			EXHAUST	GEF-4/5	M103	3	B	8		550	100								
302	COMP LAB	442	306	TB-4-306	CB-306		SUPPLY	AHU-4/5	M103	3	B	8	285	550	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	NO	
302	COMP LAB		306	EV-4-306			EXHAUST	GEF-4/5	M103	3	B	8		550	100								
396B	MEN/WOMEN	448	307	TB-4-307			SUPPLY	AHU-4/5	M103	3	B	6	300	300	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
396B	MEN/WOMEN		307	EV-4-307			EXHAUST	GEF-4/5	M103	3	B	8		525	525								
303	NEXUS CENTRAL COLLAB	446	308	TB-4-308			SUPPLY	AHU-4/5	M103	3	B	10	115	780	115	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
303	NEXUS CENTRAL COLLAB		308	EV-4-308			EXHAUST	GEF-4/5	M103	3	B	10		775	115								
303	NEXUS CENTRAL COLLAB	446	309	TB-4-309			SUPPLY	AHU-4/5	M103	3	B	10	115	780	115	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
303	NEXUS CENTRAL COLLAB		309	EV-4-309			EXHAUST	GEF-4/5	M103	3	B	10		775	115								
398	SECURITY	445	311	TB-1-311			SUPPLY	AHU-1/2/3	M103	3	A	6		300	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	YES	
398	SECURITY		311	EV-1-311			EXHAUST	GEF-1/2/3	M103	3	A	6		200	50								
308	SHARED OFFICE SPACE	440	312	TB-4-312	CB-312	FTRP-312	SUPPLY	AHU-4/5	M103	3	A	10	835	900	225	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
308	SHARED OFFICE SPACE		312	EV-4-312			EXHAUST	GEF-4/5	M103	3	A	10		775	100								
306	HOTELING OFFICE	441	313	TB-4-313	CB-313	FTRP-313	SUPPLY	AHU-4/5	M103	3	A	5	135	220	135	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
306	HOTELING OFFICE		313	EV-4-313			EXHAUST	GEF-4/5	M103	3	A	6		170	85								
310	MEETING ROOM	442	314	TB-4-314	CB-314		SUPPLY	AHU-4/5	M103	3	A	6	250	300	250	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
310	MEETING ROOM		314	EV-4-314			EXHAUST	GEF-4/5	M103	3	A	6		250	200								
312	OFFICE	443	315	TB-4-315	CB-315		SUPPLY	AHU-4/5	M103	3	A	4	75	110	75	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
312	OFFICE		315	EV-4-315			EXHAUST	GEF-4/5	M103	3	A	4		110	75								
314	OFFICE	443	316	TB-4-316	CB-316		SUPPLY	AHU-4/5	M103	3	A	4	75	110	75	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
314	OFFICE		316	EV-4-316			EXHAUST	GEF-4/5	M103	3	A	4		110	75								
316	OFFICE	443	317	TB-4-317	CB-317		SUPPLY	AHU-4/5	M103	3	A	4	75	110	75	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
316	OFFICE		317	EV-4-317			EXHAUST	GEF-4/5	M103	3	A	4		110	75								
318	OFFICE	443	318	TB-4-318	CB-318		SUPPLY	AHU-4/5	M103	3	A	4	80	110	80	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
318	OFFICE		318	EV-4-318			EXHAUST	GEF-4/5	M103	3	A	4		110	80								
320	SHARED OFFICE SPACE	442	319	TB-4-319	CB-319-1/2		SUPPLY	AHU-4/5	M103	3	A	7	305	340	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
320	SHARED OFFICE SPACE		319	EV-4-319			EXHAUST	GEF-4/5	M103	3	A	6		240	50								
326	OPEN WORK ROOM	442	320	TB-4-320	CB-320		SUPPLY	AHU-4/5	M103	3	A	6	300	300	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
326	OPEN WORK ROOM		320	EV-4-320			EXHAUST	GEF-4/5	M103	3	A	6		250	50								
329	PROJECT ROOM	440	321	TB-4-321	CB-321	FTRP-321	SUPPLY	AHU-4/5	M103	3	B	7	220	400	220	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
329	PROJECT ROOM		321	EV-4-321			EXHAUST	GEF-4/5	M103	3	B	6		325	115								
329A	HOTELING OFFICE	444	322	TB-4-322		FTRP-322	SUPPLY	AHU-4/5	M103	3	B	4	150	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
329A	HOTELING OFFICE		322	EV-4-322			EXHAUST	GEF-4/5	M103	3	B	4		150	50								
398B	MDF	445	336	TB-1-336			SUPPLY	AHU-1/2/3	M103	3	A	12		1360	120	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
398B	MDF		336	EV-1-336			EXHAUST	GEF-1/2/3	M103	3	A	12		1285	120								
301	WELLNESS ROOM	447	337	TB-4-338			SUPPLY	AHU-4/5	M103	3	B	4	30	30	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
301	WELLNESS ROOM		337	EV-4-337			EXHAUST	GEF-4/5	M103	3	B	4		100	30								
499	ELEVATOR	451	401	TB-4-401			SUPPLY	AHU-4/5	M104	4	B	6	110	110	110	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	No information provided, assuming TEMP. SENSOR ONLY, NO DISPLAY	YES	
402	P3 LAB	442	402	TB-1-402	CB-402		SUPPLY	AHU-1/2/3	M104	4	B	8	450	550	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
402	P3 LAB		402	EV-1-402			EXHAUST	GEF-1/2/3	M104	4	B	8		400	50								
400	MEETING ROOM	440	403	TB-4-403	CB-403	FTRP-403	SUPPLY	AHU-4/5	M104	4	B	6	175	100	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
400	MEETING ROOM		403	EV-4-403			EXHAUST	GEF-4/5	M104	4	B	8		250	50								

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/15/2026
REVISION: 0

ROOM #	ROOM DESCRIPTION	WIRING DWG #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	COOLING MAX. (CFM)	MIN. (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITTER RANGE	FAIL-SAFE	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
496B	MEN/WOMEN	448	404	TB-4-404			SUPPLY	AHU-4/5	M104	4	B	6	300	300	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
496B	MEN/WOMEN		404	EV-4-404			EXHAUST	GEF-4/5	M104	4	B	8		525	525								
402A	LAB SUPP	447	406	TB-1-406			SUPPLY	AHU-1/2/3	M104	4	B	9	290	640	125	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
402A	LAB SUPP		406	EV-1-406			EXHAUST	GEF-1/2/3	M104	4	B	8		635	125								
402	P3 LAB	442	407	TB-1-407	CB-407		SUPPLY	AHU-1/2/3	M104	4	B	8	450	550	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
402	P3 LAB		407	EV-1-407			EXHAUST	GEF-1/2/3	M104	4	B	8		400	50								
402B	LAB SUPP	447	408	TB-1-408			SUPPLY	AHU-1/2/3	M104	4	B	9	230	610	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
402B	LAB SUPP		408	EV-1-408			EXHAUST	GEF-1/2/3	M104	4	B	8		610	100								
404	STUDIO C/D	442	409	TB-1-409	CB-409		SUPPLY	AHU-1/2/3	M104	4	B	8	415	550	200	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
404	STUDIO C/D		409	EV-1-409			EXHAUST	GEF-1/2/3	M104	4	B	8		400	50								
408	OPEN OFFICE	440	410	TB-4-410	CB-410	FTRP-410	SUPPLY	AHU-4/5	M104	4	A	10	885	150	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
408	OPEN OFFICE		410	EV-4-410			EXHAUST	GEF-4/5	M104	4	A	10		850	150								
498D	SECURITY	445	412	TB-1-412			SUPPLY	AHU-1/2/3	M103	4	A	6		300	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	YES	
498D	SECURITY		412	EV-1-412			EXHAUST	GEF-1/2/3	M103	4	A	6		200	50								
420	OPEN OFFICE	442	413	TB-4-413	CB-413		SUPPLY	AHU-4/5	M104	4	A	7	425	100	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
420	OPEN OFFICE		413	EV-4-413			EXHAUST	GEF-4/5	M104	4	A	8		400	100								
420	OPEN OFFICE	442	414	TB-4-414	CB-414		SUPPLY	AHU-4/5	M104	4	A	9	400	125	125	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
420	OPEN OFFICE		414	EV-4-414			EXHAUST	GEF-4/5	M104	4	A	8		550	125								
426	OPEN WORK ROOM	442	415	TB-4-415	CB-415		SUPPLY	AHU-4/5	M104	4	A	6	250	100	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
426	OPEN WORK ROOM		415	EV-4-415			EXHAUST	GEF-4/5	M104	4	A	6		300	100								
429	PROJECT ROOM	440	415	EV-4-416			EXHAUST	GEF-4/5	M104	4	B	8		325	145								
429	PROJECT ROOM		416	TB-4-416	CB-416	FTRP-416	SUPPLY	AHU-4/5	M104	4	B	7	220	220	220	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
429A	HOTELING OFFICE	440	417	TB-4-417	CB-417	FTRP-417	SUPPLY	AHU-4/5	M104	4	B	4	150	150	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
429A	HOTELING OFFICE		417	EV-4-417			EXHAUST	GEF-4/5	M104	4	B	4		100	100								
498A	MDF	445	433	TB-1-433			SUPPLY	AHU-1/2/3	M104	4	A	12		1360	0	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
498A	MDF		433	EV-1-433			EXHAUST	GEF-1/2/3	M104	4	A	12		1285	45								
403	WELLNESS ROOM	447	434	TB-4-434			SUPPLY	AHU-4/5	M104	4	B	4	30	30	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
403	WELLNESS ROOM		434	EV-4-434			EXHAUST	GEF-4/5	M104	4	B	4		100	30								
406	OFFICE	441	437	TB-4-437	CB-437	FTRP-437	SUPPLY	AHU-4/5	M104	4	A	5	145	145	145	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
406	OFFICE		437	EV-4-438			EXHAUST	GEF-4/5	M104	4	A	6		200	145								
401	STORAGE	447	439	TB-4-439			SUPPLY	AHU-4/5	M104	4	B	6	25	25	25	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
401	STORAGE		439	EV-4-439			EXHAUST	GEF-4/5	M104	4	B	4		100	25								
599	ELEVATOR	451	501	TB-4-501			SUPPLY	AHU-4/5	M105	5	B	7	80	80	80	DXR2.E12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	No information provided, assuming TEMP. SENSOR ONLY, NO DISPLAY	YES	
500	MEETING ROOM	440	503	TB-4-503	CB-503	FTRP-503	SUPPLY	AHU-4/5	M105	5	B	7	270	150	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
500	MEETING ROOM		503	EV-4-503			EXHAUST	GEF-4/5	M105	5	B	6		350	150								
596B	MEN/WOMEN	448	504	TB-4-504			SUPPLY	AHU-4/5	M105	5	B	6	300	300	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
596B	MEN/WOMEN		504	EV-4-504			EXHAUST	GEF-4/5	M105	5	B	8		525	525								
503	WELLNESS ROOM	447	505	TB-4-505			SUPPLY	AHU-4/5	M105	5	B	4	20	30	30	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
503	WELLNESS ROOM		505	EV-4-505			EXHAUST	GEF-4/5	M105	5	B	4		100	30								
502	ANALYXIN GENOMICS LAB	442	506	TB-1-506	CB-506		SUPPLY	AHU-1/2/3	M105	5	B	9	300	660	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
502	ANALYXIN GENOMICS LAB		506	EV-1-506			EXHAUST	GEF-1/2/3	M105	5	B	8		460	50								
508	OPEN OFFICE	440	510	TB-4-510	CB-510-1/2	FTRP-510	SUPPLY	AHU-4/5	M105	5	A	12	1060	300	300	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
508	OPEN OFFICE		510	EV-4-510			EXHAUST	GEF-4/5	M105	5	A	12		1380	200								
598D	SECURITY	445	512	TB-1-512			SUPPLY	AHU-1/2/3	M105	5	A	6		300	150	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	YES	
598D	SECURITY		512	EV-1-512			EXHAUST	GEF-1/2/3	M105	5	A	6		200	50								
598A	IDF	445	513	TB-1-513			SUPPLY	AHU-1/2/3	M105	5	A	12		1360	0	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
598A	IDF		513	EV-1-513			EXHAUST	GEF-1/2/3	M105	5	A	12		1285	45								
508	OPEN OFFICE	442	514	TB-4-514	CB-514		SUPPLY	AHU-4/5	M105	5	A	9	450	125	125	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
508	OPEN OFFICE		514	EV-4-514			EXHAUST	GEF-4/5	M105	5	A	8		570	125								
526	OPEN CONFERENCE ROOM	442	515	TB-4-515	CB-515		SUPPLY	AHU-4/5	M105	5	A	6	270	100	100	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
526	OPEN CONFERENCE ROOM		515	EV-4-515			EXHAUST	GEF-4/5	M105	5	A	6		250	50								

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/15/2026
REVISION: 0

ROOM #	ROOM DESCRIPTION	WIRING DWG #	ZONE	TAG	CHILLED BEAM ASSOCIATED	FINTUBE ASSOCIATED	SERVICE	EQUIPMENT ASSOCIATED	MECH DWG	FLOOR	AREA	INLET SIZE	HEATING MAX. (CFM)	COOLING MAX. (CFM)	MIN. (CFM)	CONTROLLER TYPE	ACTUATOR OPERATION	AIRFLOW PRESSURE TRANSMITTER RANGE	FAIL-SAFE	REHEAT VALVE STYLE	ROOM SENSOR TYPE	OCC SENSOR(S)	COMMENT
599E	CIRCULATION	447	516	TB-4-516			SUPPLY	AHU-4/5	M105	5	B	5	55	55	55	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
599E	CIRCULATION		516	EV-4-516			EXHAUST	GEF-4/5	M105	5	B	6		175	55								
535	OFFICE	441	517	TB-4-517	CB-517	FTRP-517	SUPPLY	AHU-4/5	M105	5	B	4	150	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
535	OFFICE		517	EV-4-517			EXHAUST	GEF-4/5	M105	5	B	4		125	25								
533	OFFICE	443	518	TB-4-518	CB-518		SUPPLY	AHU-4/5	M105	5	B	4	100	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
533	OFFICE		518	EV-4-518			EXHAUST	GEF-4/5	M105	5	B	4		75	25								
531	OFFICE	443	519	TB-4-519	CB-519		SUPPLY	AHU-4/5	M105	5	B	4	100	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
531	OFFICE		519	EV-4-519			EXHAUST	GEF-4/5	M105	5	B	4		75	25								
529	OFFICE	440	520	TB-4-520	CB-520	FTRP-520	SUPPLY	AHU-4/5	M105	5	B	5	160	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
529	OFFICE		520	EV-4-520			EXHAUST	GEF-4/5	M105	5	B	4		150	35								
506	OFFICE	441	539	TB-4-539	CB-539	FTRP-539	SUPPLY	AHU-4/5	M105	5	A	5	155	50	50	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
506	OFFICE		539	EV-4-539			EXHAUST	GEF-4/5	M105	5	A	4		170	25								
501	STORAGE	447	541	TB-4-541			SUPPLY	AHU-4/5	M105	5	A	6	25	25	25	DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
501	STORAGE		541	EV-4-541			EXHAUST	GEF-4/5	M105	5	A	4		100	25								
698C	ELEV CTRL	453	601	TB-4-601			SUPPLY	AHU-4/5	M106	6	A	8		430	0	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
	PENTHOUSE EAST	452	602	TB-4-602			SUPPLY	AHU-4/5	M106	6	B	24X16	3200	3200	3200	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	NO	
198H	PLUMBING	453	7-101	TB-7-101			SUPPLY	AHU-7	M101	1	A	8		300	50	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
198L	ELECTRICAL	453	7-102	TB-7-102			SUPPLY	AHU-7	M101	1	A	16		2800	200	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
198K	EMERGENCY ELECTRIC	453	7-103	TB-7-103			SUPPLY	AHU-7	M101	1	A	10		600	50	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	
198R	SOLAR EQUIP RM	453	7-104	TB-7-104			SUPPLY	AHU-7	M101	1	A	6		150	10	DXR2.M12	STANDARD SPEED	0/1 IN WG	SR-NC	NO HTG VALVE	TEMP. SENSOR ONLY, NO DISPLAY	NO	

CHILLED BEAM CONDENSATE SENSOR SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 1/28/2026
REVISION: 0

ZONE	TAG	SERVICE	EQUIPMENT ASSOCIATED	CONDENSATE SENSOR	FLOOR
4-102	CB-102	4-PIPE CHILLED BEAM	TB-4-102	X	1
4-103	CB-103	CHILLED BEAM	TB-4-103	X	1
4-104	CB-104	CHILLED BEAM	TB-4-104	X	1
115	CB-115	4-PIPE CHILLED BEAM	TB-4-115	X	1
131	CB-131	CHILLED BEAM	LTB-1-131	X	1
138	CB-138	CHILLED BEAM	TB-4-138	X	1
139	CB-139	CHILLED BEAM	TB-4-139	X	1
199	CB-199	4-PIPE CHILLED BEAM	TB-4-199	X	1
205	CB-205-2	4-PIPE CHILLED BEAM	TB-4-205	X	2
211	CB-211	CHILLED BEAM	TB-4-211	X	2
212	CB-212	CHILLED BEAM	TB-4-212	X	2
217	CB-217-1	CHILLED BEAM	TB-4-217	X	2
218	CB-218	CHILLED BEAM	TB-4-218	X	2
306	CB-306	CHILLED BEAM	TB-4-306	X	3
314	CB-314	CHILLED BEAM	TB-4-314	X	3
321	CB-321	CHILLED BEAM	TB-4-321	X	3
402	CB-402	CHILLED BEAM	TB-1-402	X	4
413	CB-413-1	CHILLED BEAM	TB-4-413	X	4
416	CB-416	CHILLED BEAM	TB-4-416	X	4
503	CB-503	CHILLED BEAM	TB-4-503	X	5
506	CB-506	CHILLED BEAM	TB-1-506	X	5

Siemens Industry, Inc.
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

Valve Schedule

System: CHW Valves

Num	Unit ID	Mech Dwg.	Valve Tag	Description	QTY	Product Number	Manufacturer	Line Size (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Valve Cv	Failsafe	Flow GPM	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Power Input	Power VA	Comment
1	CT-1	M802	V-01	CT-1 CWR ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
2	CT-1	M802	V-02	CT-1 CWR BLEED VALVE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
3	CT-2	M802	V-03	CT-2 CWR ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
4	CT-2	M802	V-04	CT-2 CWR BLEED VAVLE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
5	CT-3	M802	V-05	CT-3 CWR ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
6	CT-3	M802	V-06	CT-3 CWR BLEED VAVLE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
7	CT-1	M802	V-07	CT-1 CWS ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
8	CT-1	M802	V-08	CT-1 CWR BLEED VALVE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
9	CT-2	M802	V-09	CT-2 CWS ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
10	CT-2	M802	V-10	CT-2 CWR BLEED VALVE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
11	CT-3	M802	V-11	CT-3 CWS ISO VALVE	1	B212FO-SA226.5K	SIEMENS	12.00	12.00	2W	BUTTERFLY	N/A	8,077.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
12	CT-3	M802	V-12	CT-3 CWR BLEED VALVE	1	171E-10330S	SIEMENS	2.00	2.00	2W	BALL	N/A	160.00	NO-SR	LINE	N/A	N/A	200	ON/OFF	24 VAC	5.00	Selected the valve size to equal the line size.
13	WWHP-4	M802	V-13	WWHP-4 HW VALVE	1	B204FO-SA226.600	SIEMENS	4.00	4.00	2W	BUTTERFLY	N/A	841.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	120.00	Selected the valve size to equal the line size.
14	HE-2	M802	V-14	HE-2 CWS VALVE	1	B204FO-SA226.600	SIEMENS	4.00	4.00	2W	BUTTERFLY	N/A	841.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	120V/1P/60HZ	120.00	Selected the valve size to equal the line size.
15	CH-1	M802	V-15	CH-1 CWS VALVE	1	B210FO-SA266.3K	SIEMENS	10.00	10.00	2W	BUTTERFLY	N/A	1,710.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
16	CH-1	M802	V-16	CH-1 CHWS VALVE	1	B208FO-SA266.2K	SIEMENS	8.00	8.00	2W	BUTTERFLY	N/A	1,081.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	252.00	Selected the valve size to equal the line size.
17	CH-2	M802	V-17	CH-2 CWS VALVE	1	B210FO-SA266.3K	SIEMENS	10.00	10.00	2W	BUTTERFLY	N/A	1,710.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
18	CH-2	M802	V-18	CH-2 CHWS VALVE	1	B208FO-SA266.2K	SIEMENS	8.00	8.00	2W	BUTTERFLY	N/A	1,081.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	252.00	Selected the valve size to equal the line size.
19	CH-3	M802	V-19	CH-3 CWS VALVE	1	B210FO-SA266.3K	SIEMENS	10.00	10.00	2W	BUTTERFLY	N/A	1,710.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	360.00	Selected the valve size to equal the line size.
20	CH-3	M802	V-20	CH-3 CHWS VALVE	1	B208FO-SA266.2K	SIEMENS	8.00	8.00	2W	BUTTERFLY	N/A	1,081.00	NO-F.I.P	LINE	N/A	N/A	175	0-10 VDC	120V/1P/60HZ	252.00	Selected the valve size to equal the line size.
21	CHW	M802	V-21	CHILLED WATER BYPASS VALVE	1	B225FO-GIB161.3U	SIEMENS	N/A	2.50	2W	BUTTERFLY	67.61	107.00	NO-F.I.P	400.00	35.00	13.98	175	0-10 VDC	24 VAC	8.00	Valve Cv at 60 degree opening angle.
22	CB	M802	V-22	CB SYS TEMP CONTROL VALVE	1	B202FO-GIB161.3U	SIEMENS	N/A	2.00	2W	BUTTERFLY	42.26	61.00	NO-F.I.P	250.00	35.00	16.80	175	0-10 VDC	24 VAC	8.00	Valve Cv at 60 degree opening angle.
23	CB	M802	V-23	CB BYPASS VALVE	1	B202FO-GIB161.3U	SIEMENS	N/A	2.00	2W	BUTTERFLY	42.26	61.00	NO-F.I.P	250.00	35.00	16.80	175	0-10 VDC	24 VAC	8.00	Valve Cv at 60 degree opening angle.
24	CT	M802	V-24	TOWER BYPASS VALVE	1	B205FO-SA166.600	SIEMENS	N/A	5.00	2W	BUTTERFLY	404.15	428.00	NO-F.I.P	700.00	3.00	2.67	175	0-10 VDC	24 VAC	50.00	Valve Cv at 60 degree opening angle.
25	CHW	M802	V-25	MAKEUP WATER	1	274-03186	SIEMENS	N/A	1.25	2W	GLOBE	13.41	16.00	NC-SR	60.00	20.00	14.06	117	0-10 VDC	24 VAC	17.00	

Notes:

All control valves and wells shall be installed by the mechanical contractor

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe, F.I.P = Fail In Place
NO-SR = Normally Open-Spring Return, NC-SR = Normally Closed-Spring Return.

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

System: HHW Valves

Num	Unit ID	Mech Dwg.	Valve Tag	Description	QTY	Product Number	Manufacturer	Line Size (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Valve Cv	Failsafe	Flow GPM	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Power Input	Power VA	Comment
1	HB-1	M801	HB-1 ISOV	BOILER ISOLATION VALVE	1	B206FO-SA126.600	SIEMENS	6.00	6.00	2W	BUTTERFLY	N/A	1,850.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	24 VAC	43.20	Selected the valve size to equal the line size.
2	HB-2	M801	HB-2 ISOV	BOILER ISOLATION VALVE	1	B206FO-SA126.600	SIEMENS	6.00	6.00	2W	BUTTERFLY	N/A	1850.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	24 VAC	43.20	Selected the valve size to equal the line size.
3	HB-3	M801	HB-3 ISOV	BOILER ISOLATION VALVE	1	B206FO-SA126.600	SIEMENS	6.00	6.00	2W	BUTTERFLY	N/A	1,850.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	24 VAC	43.20	Selected the valve size to equal the line size.
4	BOILERS	M801	BLR BPV	BOILER BYPASS VALVE	1	B206FO-SA126.600	SIEMENS	6.00	6.00	2W	BUTTERFLY	N/A	1850.00	NO-F.I.P	LINE	N/A	N/A	175	ON/OFF	24 VAC	43.20	Selected the valve size to equal the line size.
5	HHW	M801	HHW BPV	HHW BYPASS VALVE	1	267-03169	SIEMENS	N/A	1.50	2W	GLOBE	23.5	25.00	NO-F.I.P	105.00	20.00	17.64	80	ON/OFF	24 VAC	17.00	

Notes:

All control valves and wells shall be installed by the mechanical contractor

For HX 1/3 and 2/3 Steam Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**

Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING

Job Number: 44OP-412785

Revision: 0

Date: 4/2/2026

System: AHUs

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	ANSI	Comment
1	AHU-1	CC-1	1	294-06612	N/A	4.00	2W/Sng	Globe	100.62	160.00	NO-SR	225.00	5.00	1.98	200	0-10 VDC	24 VAC	154-067	125	Cooling Coil Valve
2	AHU-1	HC-1	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Heating Coil Valve
3	AHU-2	CC-2	1	294-06612	N/A	4.00	2W/Sng	Globe	100.62	160.00	NO-SR	225.00	5.00	1.98	200	0-10 VDC	24 VAC	154-067	125	Cooling Coil Valve
4	AHU-2	HC-2	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Heating Coil Valve
5	AHU-3	CC-3	1	294-06612	N/A	4.00	2W/Sng	Globe	100.62	160.00	NO-SR	225.00	5.00	1.98	200	0-10 VDC	24 VAC	154-067	125	Cooling Coil Valve
6	AHU-3	HC-3	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Heating Coil Valve
7	AHU-4	CC-4	1	291-05981	N/A	3.00	2W/Sng	Globe	84.97	100.00	NO-SR	190.00	5.00	3.61	101	0-10 VDC	24 VAC	155-776	125	Cooling Coil Valve
8	AHU-4	HC-4	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Heating Coil Valve
9	AHU-5	CC-5	1	291-05981	N/A	3.00	2W/Sng	Globe	84.97	100.00	NO-SR	190.00	5.00	3.61	101	0-10 VDC	24 VAC	155-776	125	Cooling Coil Valve
10	AHU-5	HC-5	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Heating Coil Valve
11	AHU-6A	CC-6A	1	274-03168	N/A	1.25	2W/Sng	Globe	15.65	16.00	NO-SR	35.00	5.00	4.79	124	0-10 VDC	24 VAC	155-772	250	Cooling Coil Valve
12	AHU-6A	HC-6A	1	274-03167	N/A	1.00	2W/Sng	Globe	8.94	10.00	NO-SR	20.00	5.00	4.00	201	0-10 VDC	24 VAC	155-772	250	Heating Coil Valve
13	AHU-6B	CC-6B	1	274-03168	N/A	1.25	2W/Sng	Globe	15.65	16.00	NO-SR	35.00	5.00	4.79	124	0-10 VDC	24 VAC	155-772	250	Cooling Coil Valve
14	AHU-6A	HC-6A	1	274-03167	N/A	1.00	2W/Sng	Globe	8.94	10.00	NO-SR	20.00	5.00	4.00	201	0-10 VDC	24 VAC	155-772	250	Heating Coil Valve
15	AHU-7	CC-7	1	274-03169	N/A	1.50	2W/Sng	Globe	17.89	25.00	NO-SR	40.00	5.00	2.56	80	0-10 VDC	24 VAC	155-772	250	Cooling Coil Valve
16	AHU-8	CC-8	1	291-05980	N/A	2.50	2W/Sng	Globe	40.25	63.00	NO-SR	90.00	5.00	2.04	153	0-10 VDC	24 VAC	155-776	125	Cooling Coil Valve

Notes:

All control valves and wells shall be installed by the mechanical contractor

For FCU Humidifier Steam Isolation Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**

Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING

Job Number: 44OP-412785

Revision: 0

Date: 4/2/2026

System: FCUs

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
1	FCU-E1	NO HEATING COIL																	
2	FCU-E1	FCU-E1 CCV	1	262-02036	N/A	0.50	2W/Sng	Globe	1.43	1.60	NO-SR	3.20	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
3	FCU-FP	FCU-FP HCV	1	262-02036	N/A	0.50	2W/Sng	Globe	1.43	1.60	NO-SR	3.20	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
4	FCU-FP	FCU-FP CCV	1	262-02036	N/A	0.50	2W/Sng	Globe	1.34	1.60	NO-SR	3.00	5.00	3.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
5	FCU-B1	FCU-B1 HCV	1	262-02041	N/A	0.50	2W/Sng	Globe	3.35	4.00	NO-SR	7.50	5.00	3.52	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
6	FCU-B1	FCU-B1 CCV	1	262-02044	N/A	0.75	2W/Sng	Globe	6.26	6.30	NO-SR	14.00	5.00	4.94	55	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
7	FCU-P1	FCU-P1 HCV	1	262-02041	N/A	0.50	2W/Sng	Globe	3.35	4.00	NO-SR	7.50	5.00	3.52	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
8	FCU-P1	FCU-P1 CCV	1	262-02044	N/A	0.75	2W/Sng	Globe	6.26	6.30	NO-SR	14.00	5.00	4.94	55	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
9	FCU-P2	FCU-P2 HCV	1	262-02041	N/A	0.50	2W/Sng	Globe	3.35	4.00	NO-SR	7.50	5.00	3.52	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
10	FCU-P2	FCU-P2 CCV	1	262-02044	N/A	0.75	2W/Sng	Globe	6.26	6.30	NO-SR	14.00	5.00	4.94	55	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
11	FCU-P3	FCU-P3 HCV	1	262-02041	N/A	0.50	2W/Sng	Globe	3.35	4.00	NO-SR	7.50	5.00	3.52	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
12	FCU-P3	FCU-P3 CCV	1	262-02044	N/A	0.75	2W/Sng	Globe	6.26	6.30	NO-SR	14.00	5.00	4.94	55	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve

Notes:

All control valves and wells shall be installed by the mechanical contractor

For FCU Humidifier Steam Isolation Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

System: FCUs

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
2	CUH-1	CUH-1 HCV	1	262-02038	N/A	0.50	2W/Sng	Globe	1.83	2.50	NO-SR	4.10	5.00	2.69	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
3	CUH-2	CUH-2 HCV	1	262-02038	N/A	0.50	2W/Sng	Globe	1.83	2.50	NO-SR	4.10	5.00	2.69	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
4	CUH-3	CUH-3 HCV	1	262-02038	N/A	0.50	2W/Sng	Globe	1.83	2.50	NO-SR	4.10	5.00	2.69	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
5	UH-1	UH-1 HCV	1	262-02038	N/A	0.50	2W/Sng	Globe	2.10	2.50	NO-SR	4.70	5.00	3.53	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
6	UH-2	UH-2 HCV	1	262-02038	N/A	0.75	2W/Sng	Globe	2.10	2.50	NO-SR	4.70	5.00	3.53	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
7	UH-3	UH-3 HCV	1	262-02038	N/A	0.50	2W/Sng	Globe	2.10	2.50	NO-SR	4.70	5.00	3.53	65	0-10VDC	24 VAC	155-306P25	Heating Coil Valve

Notes:

All control valves and wells shall be installed by the mechanical contractor

For FCU Humidifier Steam Isolation Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc.

Valve Schedule

Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING

Job Number: 44OP-412785

Revision: 0

Date: 4/2/2026

System: FCUs

Number	Unit ID	Valve Tag	FINTUBE TYPE	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
1	FTRP-104	FTRP-104 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
2	FTRP-113	FTRP-113 VLV	3x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
3	FTRP-114	FTRP-114 VLV	3x FTRP-1	1	259-02041	N/A	0.50	2W/Sng	Globe	2.68	4.00	NO-NSR	6.00	5.00	2.25	65	Floating	24 VAC	155-306P25	Heating Coil Valve
4	FTRP-212	FTRP-212 VLV	3x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
5	FTRP-203	FTRP-203 VLV	FTRP-1	1	259-02034	N/A	0.75	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
6	FTRP-217	FTRP-217 VLV	FTRP-2	1	259-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	Floating	24 VAC	155-306P25	Heating Coil Valve
7	FTRP-218	FTRP-218 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
8	FTRP-231	FTRP-231 VLV	3x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
9	FTRP-230	FTRP-230 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
10	FTRP-229	FTRP-229 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
11	FTRP-312	FTRP-312 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
12	FTRP-313	FTRP-313 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
13	FTRP-303	FTRP-303 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
14	FTRP-321	FTRP-321 VLV	FTRP-2	1	259-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	Floating	24 VAC	155-306P25	Heating Coil Valve
15	FTRP-322	FTRP-322 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
16	FTRP-332	FTRP-332 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
17	FTRP-333	FTRP-333 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
18	FTRP-410	FTRP-410 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
19	FTRP-437	FTRP-437 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
20	FTRP-403	FTRP-403 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
21	FTRP-416	FTRP-416 VLV	FTRP-2	1	259-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	Floating	24 VAC	155-306P25	Heating Coil Valve
22	FTRP-417	FTRP-417 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
23	FTRP-428	FTRP-428 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
24	FTRP-434	FTRP-434 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
25	FTRP-510	FTRP-510 VLV	2x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
26	FTRP-539	FTRP-539 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
27	FTRP-503	FTRP-503 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
28	FTRP-517	FTRP-517 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
29	FTRP-520	FTRP-520 VLV	FTRP-1	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	Heating Coil Valve
30	FTRP-531	FTRP-531 VLV	3x FTRP-2	1	259-02041	N/A	0.50	2W/Sng	Globe	3.58	4.00	NO-NSR	8.00	5.00	4.00	65	Floating	24 VAC	155-306P25	Heating Coil Valve
31	FTRP-530	FTRP-530 VLV	FTRP-2	1	259-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	Floating	24 VAC	155-306P25	Heating Coil Valve

Notes:

All control valves and wells shall be installed by the mechanical contractor

For FCU Humidifier Steam Isolation Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

System: CHILLED BEAM

Number	Chilled Beam ID	Chilled Beam GPM	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
1	CB-102	2.00	CB-102 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-102	1.50	CB-102 HWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
2	CB-103	1.50	CB-103 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
3	CB-104	1.50	CB-104 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
4	CB-105	1.50	CB-105 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
5	CB-115	1.50	CB-115 CWV	1	261-02034	N/A	0.75	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-115	1.50	CB-115 HWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
6	CB-130	2.00	CB-130 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
7	CB-131	2.00	CB-131 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
8	CB-138	2.00	CB-138 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
9	CB-139	2.00	CB-139 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
10	CB-199	1.50	CB-199 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-199	1.50	CB-199 HWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
11	CB-203-1	2.00	CB-203 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-203-2	1.50																		
12	CB-205-1	1.50	CB-205 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.34	1.60	NO-NSR	3.00	5.00	3.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-205-2	1.50																		
	CB-205-2	1.50	CB-205-2 HWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Heating Coil Valve
13	CB-211	2.00	CB-211 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
14	CB-212	2.00	CB-212 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
15	CB-214	1.50	CB-214 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
16	CB-215	1.50	CB-215 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
17	CB-217-1	2.00	CB-217 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-217-2	1.50																		
18	CB-218	1.50	CB-218 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
19	CB-224	1.50	CB-224 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
20	CB-225	1.00	CB-225 CWV	1	261-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
21	CB-228	1.50	CB-228 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
22	CB-229-1	2.00	CB-229 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-229-2	1.50																		
23	CB-230	1.00	CB-230 CWV	1	261-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
24	CB-231-1	2.00	CB-231 CWV	1	261-02038	N/A	0.50	2W/Sng	Globe	2.46	2.50	NO-NSR	5.50	5.00	4.84	65	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-231-2	1.50																		
	CB-231-3	2.00																		
25	CB-239	2.00	CB-239 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
26	CB-303	1.50	CB-303 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
27	CB-304	2.00	CB-304 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
28	CB-305	1.50	CB-305 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
29	CB-306	1.50	CB-306 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
30	CB-312	2.00	CB-312 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
31	CB-313	1.50	CB-313 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
32	CB-314	1.50	CB-314 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
33	CB-315	1.50	CB-315 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
34	CB-316	1.50	CB-316 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
35	CB-317	1.50	CB-317 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
36	CB-318	1.50	CB-318 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
37	CB-319-1	1.50	CB-319 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.45	1.60	NO-NSR	3.25	5.00	4.13	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-319-2	1.75																		
38	CB-320	1.50	CB-320 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
39	CB-321	1.50	CB-321 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
40	CB-322	2.00	CB-322 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve

System: CHILLED BEAM

Number	Chilled Beam ID	Chilled Beam GPM	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
41	CB-326	1.50	CB-326 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
42	CB-330-1	1.50	CB-330 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-330-2	1.00																		
43	CB-332	2.00	CB-332 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
44	CB-333-1	2.00	CB-333 CWV	1	261-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-333-2	2.00																		
45	CB-402	1.50	CB-402 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
46	CB-403	1.50	CB-403 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
47	CB-407	1.50	CB-407 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
48	CB-409	1.50	CB-409 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
49	CB-410	2.00	CB-410 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
50	CB-413-1	2.00	CB-413 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-413-2	1.50																		
51	CB-414	2.00	CB-414 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
52	CB-415	1.50	CB-415 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
53	CB-416	1.50	CB-416 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
54	CB-417	2.00	CB-417 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
55	CB-421	1.50	CB-421 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
56	CB-425-1	1.50	CB-425 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-425-2	1.00																		
57	CB-437	1.50	CB-437 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
58	CB-503	1.50	CB-503 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
59	CB-506	1.50	CB-506 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
60	CB-507	1.00	CB-507 CWV	1	261-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
61	CB-508	1.50	CB-508 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
62	CB-510-1	1.50	CB-510 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.45	1.60	NO-NSR	3.25	5.00	4.13	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-510-2	1.75																		
63																				
64	CB-514-1	1.75	CB-514 CWV	1	261-02036	N/A	0.50	2W/Sng	Globe	1.45	1.60	NO-NSR	3.25	5.00	4.13	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-514-2	1.50																		
65	CB-515	1.50	CB-515 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	
66	CB-517	2.00	CB-517 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
67	CB-518	1.00	CB-518 CWV	1	261-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
68	CB-519	1.00	CB-519 CWV	1	261-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
69	CB-520	1.50	CB-520 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
70	CB-524	1.50	CB-524 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
71	CB-528	1.50	CB-528 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
72	CB-530	2.00	CB-530 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
73	CB-531-1	2.00	CB-531 CWV	1	261-02038	N/A	0.50	2W/Sng	Globe	1.79	2.50	NO-NSR	4.00	5.00	2.56	65	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
	CB-531-2	2.00																		
74	CB-532	1.50	CB-532 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve
75	CB-539	1.50	CB-539 CWV	1	261-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	0-10VDC	24 VAC	155-306P25	Cooling Coil Valve

Notes:

All control valves and wells shall be installed by the mechanical contractor

For FCU Humidifier Steam Isolation Valves - Install temperature control valves with the valve stem at 45˚ above the horizontal center line of the pipe.

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

System: CHILLED BEAM

Number	Chilled Beam ID	Chilled Beam GPM	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

System: LAB Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
1	LTB-1-106	LTB-1-106	1	259-02038	N/A	0.50	2W/Sng	Globe	2.37	2.50	NO-NSR	5.30	5.00	4.49	65	Floating	24 VAC	155-306P25	
2	LTB-1-107	LTB-1-107	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
3	LTB-1-108	LTB-1-108	1	259-02036	N/A	0.50	2W/Sng	Globe	1.39	1.60	NO-NSR	3.10	5.00	3.75	120	Floating	24 VAC	155-306P25	
4	LTB-1-109	LTB-1-109	1	259-02034	N/A	0.50	2W/Sng	Globe	0.94	1.00	NO-NSR	2.10	5.00	4.41	120	Floating	24 VAC	155-306P25	
5	LTB-1-110	LTB-1-110	1	259-02036	N/A	0.50	2W/Sng	Globe	1.25	1.60	NO-NSR	2.80	5.00	3.06	120	Floating	24 VAC	155-306P25	
6	LTB-1-111	LTB-1-111	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
7	LTB-1-112	LTB-1-112	1	259-02038	N/A	0.50	2W/Sng	Globe	1.70	2.50	NO-NSR	3.80	5.00	2.31	65	Floating	24 VAC	155-306P25	
8	LTB-1-121	LTB-1-121	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
9	LTB-1-122	LTB-1-122	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
10	LTB-1-124	LTB-1-124	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
11	LTB-1-130	LTB-1-130	1	259-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	Floating	24 VAC	155-306P25	
12	LTB-1-131	LTB-1-131	1	259-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	Floating	24 VAC	155-306P25	
13	LTB-1-143	LTB-1-143	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
14	LTB-1-144	LTB-1-144	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
15	LTB-1-146	LTB-1-146	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
16	LTB-1-147	LTB-1-147	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
17	LTB-1-148	LTB-1-148	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
18	LTB-1-150	LTB-1-150	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
19	LTB-1-219	LTB-1-219	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
20	LTB-1-220	LTB-1-220	1	259-02034	N/A	0.50	2W/Sng	Globe	0.85	1.00	NO-NSR	1.90	5.00	3.61	120	Floating	24 VAC	155-306P25	
21	LTB-1-221	LTB-1-221	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
22	LTB-1-223	LTB-1-223	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
23	LTB-1-224	LTB-1-224	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
24	LTB-1-225	LTB-1-225	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
25	LTB-1-226	LTB-1-226	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
26	LTB-1-227	LTB-1-227	1	259-02034	N/A	0.50	2W/Sng	Globe	0.76	1.00	NO-NSR	1.70	5.00	2.89	120	Floating	24 VAC	155-306P25	
27	LTB-1-228	LTB-1-228	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
28	LTB-1-229	LTB-1-229	1	259-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	Floating	24 VAC	155-306P25	
29	LTB-1-230	LTB-1-230	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
30	LTB-1-231	LTB-1-231	1	259-02034	N/A	0.50	2W/Sng	Globe	0.76	1.00	NO-NSR	1.70	5.00	2.89	120	Floating	24 VAC	155-306P25	
31	LTB-1-232	LTB-1-232	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
32	LTB-1-234	LTB-1-234	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
33	LTB-1-324	LTB-1-324	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
34	LTB-1-325	LTB-1-325	1	259-02034	N/A	0.50	2W/Sng	Globe	0.85	1.00	NO-NSR	1.90	5.00	3.61	120	Floating	24 VAC	155-306P25	
35	LTB-1-326	LTB-1-326	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
36	LTB-1-327	LTB-1-327	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
37	LTB-1-328	LTB-1-328	1	259-02034	N/A	0.50	2W/Sng	Globe	0.98	1.00	NO-NSR	2.20	5.00	4.84	120	Floating	24 VAC	155-306P25	
38	LTB-1-329	LTB-1-329	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
39	LTB-1-330	LTB-1-330	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
40	LTB-1-331	LTB-1-331	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
41	LTB-1-332	LTB-1-332	1	259-02034	N/A	0.50	2W/Sng	Globe	0.85	1.00	NO-NSR	1.90	5.00	3.61	120	Floating	24 VAC	155-306P25	
42	LTB-1-333	LTB-1-333	1	259-02036	N/A	0.50	2W/Sng	Globe	1.07	1.60	NO-NSR	2.40	5.00	2.25	120	Floating	24 VAC	155-306P25	
43	LTB-1-335	LTB-1-335	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
44	LTB-1-337	LTB-1-337	1	259-02032	N/A	0.50	2W/Sng	Globe	0.58	0.63	NO-NSR	1.30	5.00	4.26	120	Floating	24 VAC	155-306P25	
45	LTB-1-338	LTB-1-338	1	259-02034	N/A	0.50	2W/Sng	Globe	0.98	1.00	NO-NSR	2.20	5.00	4.84	120	Floating	24 VAC	155-306P25	
46	LTB-1-405	LTB-1-405	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
47	LTB-1-419	LTB-1-419	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
48	LTB-1-420	LTB-1-420	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	

System: LAB Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
49	LTB-1-421	LTB-1-421	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
50	LTB-1-422	LTB-1-422	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
51	LTB-1-423	LTB-1-423	1	259-02038	N/A	0.50	2W/Sng	Globe	2.37	2.50	NO-NSR	5.30	5.00	4.49	65	Floating	24 VAC	155-306P25	
52	LTB-1-424	LTB-1-424	1	259-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	Floating	24 VAC	155-306P25	
53	LTB-1-425	LTB-1-425	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
54	LTB-1-426	LTB-1-426	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
55	LTB-1-427	LTB-1-427	1	259-02038	N/A	0.50	2W/Sng	Globe	2.41	2.50	NO-NSR	5.40	5.00	4.67	65	Floating	24 VAC	155-306P25	
56	LTB-1-428	LTB-1-428	1	259-02038	N/A	0.50	2W/Sng	Globe	1.88	2.50	NO-NSR	4.20	5.00	2.82	65	Floating	24 VAC	155-306P25	
57	LTB-1-429	LTB-1-429	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
58	LTB-1-430	LTB-1-430	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
59	LTB-1-431	LTB-1-431	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
60	LTB-1-434	LTB-1-434	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
61	LTB-1-435	LTB-1-435	1	259-02038	N/A	0.50	2W/Sng	Globe	1.65	2.50	NO-NSR	3.70	5.00	2.19	65	Floating	24 VAC	155-306P25	
62	LTB-1-436	LTB-1-436	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
63	LTB-1-437	LTB-1-437	1	259-02041	N/A	0.50	2W/Sng	Globe	2.59	4.00	NO-NSR	5.80	5.00	2.10	65	Floating	24 VAC	155-306P25	
64	LTB-1-502	LTB-1-502	1	259-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	Floating	24 VAC	155-306P25	
65	LTB-1-507	LTB-1-507	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
66	LTB-1-508	LTB-1-508	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
67	LTB-1-509	LTB-1-509	1	259-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	Floating	24 VAC	155-306P25	
68	LTB-1-521	LTB-1-521	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
69	LTB-1-522	LTB-1-522	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
70	LTB-1-523	LTB-1-523	1	259-02032	N/A	0.50	2W/Sng	Globe	0.54	0.63	NO-NSR	1.20	5.00	3.63	120	Floating	24 VAC	155-306P25	
71	LTB-1-524	LTB-1-524	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
72	LTB-1-526	LTB-1-526	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
73	LTB-1-528	LTB-1-528	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
74	LTB-1-529	LTB-1-529	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
75	LTB-1-530	LTB-1-530	1	259-02034	N/A	0.50	2W/Sng	Globe	0.85	1.00	NO-NSR	1.90	5.00	3.61	120	Floating	24 VAC	155-306P25	
76	LTB-1-531	LTB-1-531	1	259-02036	N/A	0.50	2W/Sng	Globe	1.16	1.60	NO-NSR	2.60	5.00	2.64	120	Floating	24 VAC	155-306P25	
77	LTB-1-532	LTB-1-532	1	259-02032	N/A	0.50	2W/Sng	Globe	0.54	0.63	NO-NSR	1.20	5.00	3.63	120	Floating	24 VAC	155-306P25	
78	LTB-1-533	LTB-1-533	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
79	LTB-1-534	LTB-1-534	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	
80	LTB-1-535	LTB-1-535	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
81	LTB-1-536	LTB-1-536	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
82	LTB-1-537	LTB-1-537	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
83	LTB-1-538	LTB-1-538	1	259-02032	N/A	0.50	2W/Sng	Globe	0.58	0.63	NO-NSR	1.30	5.00	4.26	120	Floating	24 VAC	155-306P25	
84	LTB-1-540	LTB-1-540	1	259-02034	N/A	0.50	2W/Sng	Globe	0.80	1.00	NO-NSR	1.80	5.00	3.24	120	Floating	24 VAC	155-306P25	

System: LAB Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment

Notes:

All control valves and wells shall be installed by the mechanical contractor

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

Siemens Industry, Inc. **Valve Schedule**
Job Name: IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES BUILDING
Job Number: 44OP-412785
Revision: 0
Date: 4/2/2026

System: Standrad Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
A. AHU-4/5 TERMINAL BOX																			
1	TB-4-101	TB-4-101 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
2	TB-4-102	TB-4-102 RHV	1	259-02038	N/A	0.50	2W/Sng	Globe	1.61	2.50	NO-NSR	3.60	5.00	2.07	65	Floating	24 VAC	155-306P25	
3	TB-4-103	TB-4-103 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
4	TB-4-104	TB-4-104 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
5	TB-4-105	TB-4-105 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
6	TB-4-113	TB-4-113 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.54	0.63	NO-NSR	1.20	5.00	3.63	120	Floating	24 VAC	155-306P25	
7	TB-4-114	TB-4-114 RHV	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	
8	TB-4-115	TB-4-115 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
9	TB-4-116	TB-4-116 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
10	TB-4-117	TB-4-117 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
11	TB-4-125	TB-4-125 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
12	TB-4-127	TB-4-127 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
13	TB-4-132	TB-4-132 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
14	TB-4-133	TB-4-133 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
15	TB-4-134	TB-4-134 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
16	TB-4-135	TB-4-135 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.16	1.60	NO-NSR	2.60	5.00	2.64	120	Floating	24 VAC	155-306P25	
17	TB-4-137	TB-4-137 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
18	TB-4-138	TB-4-138 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
19	TB-4-139	TB-4-139 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
20	TB-4-140	TB-4-140 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
21	TB-4-149	TB-4-149 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
22	TB-4-153	TB-4-153 RHV	1	259-02038	N/A	0.50	2W/Sng	Globe	2.33	2.50	NO-NSR	5.20	5.00	4.33	65	Floating	24 VAC	155-306P25	
23	TB-4-199	TB-4-199 RHV	1	259-02034	N/A	0.50	2W/Sng	Globe	0.89	1.00	NO-NSR	2.00	5.00	4.00	120	Floating	24 VAC	155-306P25	
24	TB-4-201	TB-4-201 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
25	TB-4-203	TB-4-203 RHV	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
26	TB-4-204	TB-4-204 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
27	TB-4-205	TB-4-205 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.12	1.60	NO-NSR	2.50	5.00	2.44	120	Floating	24 VAC	155-306P25	
28	TB-4-206	TB-4-206 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
29	TB-4-208	TB-4-208 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
30	TB-4-209	TB-4-209 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
31	TB-4-210	TB-4-210 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
32	TB-4-211	TB-4-211 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
33	TB-4-212	TB-4-212 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.21	1.60	NO-NSR	2.70	5.00	2.85	120	Floating	24 VAC	155-306P25	
34	TB-4-214	TB-4-214 RHV	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
35	TB-4-215	TB-4-215 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
36	TB-4-216	TB-4-216 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
37	TB-4-217	TB-4-217 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
38	TB-4-218	TB-4-218 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
39	TB-4-236	TB-4-236 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
40	TB-4-238	TB-4-238 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
41	TB-4-239	TB-4-239 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
42	TB-4-240	TB-4-240 RHV	1	259-02038	N/A	0.50	2W/Sng	Globe	2.33	2.50	NO-NSR	5.20	5.00	4.33	65	Floating	24 VAC	155-306P25	
43	TB-4-301	TB-4-301 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
44	TB-4-303	TB-4-303 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
45	TB-4-304	TB-4-304 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
46	TB-4-305	TB-4-305 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	

System: Standrad Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
47	TB-4-306	TB-4-306 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
48	TB-4-307	TB-4-307 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
49	TB-4-308	TB-4-308 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
50	TB-4-309	TB-4-309 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
51	TB-4-312	TB-4-312 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.25	1.60	NO-NSR	2.80	5.00	3.06	120	Floating	24 VAC	155-306P25	
52	TB-4-313	TB-4-313 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
53	TB-4-314	TB-4-314 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
54	TB-4-315	TB-4-315 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
55	TB-4-316	TB-4-316 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
56	TB-4-317	TB-4-317 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
57	TB-4-318	TB-4-318 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
58	TB-4-319	TB-4-319 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	Floating	24 VAC	155-306P25	
59	TB-4-320	TB-4-320 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
60	TB-4-321	TB-4-321 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
61	TB-4-322	TB-4-322 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
62	TB-4-338	TB-4-338 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
63	TB-4-401	TB-4-401 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
64	TB-4-403	TB-4-403 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
65	TB-4-404	TB-4-404 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
66	TB-4-410	TB-4-410 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.03	1.60	NO-NSR	2.30	5.00	2.07	120	Floating	24 VAC	155-306P25	
67	TB-4-413	TB-4-413 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.63	0.63	NO-NSR	1.40	5.00	4.94	120	Floating	24 VAC	155-306P25	
68	TB-4-414	TB-4-414 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.63	0.63	NO-NSR	1.40	5.00	4.94	120	Floating	24 VAC	155-306P25	
69	TB-4-415	TB-4-415 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
70	TB-4-416	TB-4-416 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
71	TB-4-417	TB-4-417 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
72	TB-4-434	TB-4-434 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
73	TB-4-437	TB-4-437 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
74	TB-4-439	TB-4-439 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
75	TB-4-501	TB-4-501 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
76	TB-4-503	TB-4-503 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
77	TB-4-504	TB-4-504 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	
78	TB-4-505	TB-4-505 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
79	TB-4-510	TB-4-510 RHV	1	259-02036	N/A	0.50	2W/Sng	Globe	1.57	1.60	NO-NSR	3.50	5.00	4.79	120	Floating	24 VAC	155-306P25	
80	TB-4-514	TB-4-514 RHV	1	259-02034	N/A	0.50	2W/Sng	Globe	0.67	1.00	NO-NSR	1.50	5.00	2.25	120	Floating	24 VAC	155-306P25	
81	TB-4-515	TB-4-515 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.40	0.63	NO-NSR	0.90	5.00	2.04	120	Floating	24 VAC	155-306P25	
82	TB-4-516	TB-4-516 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
83	TB-4-517	TB-4-517 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
84	TB-4-518	TB-4-518 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
85	TB-4-519	TB-4-519 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
86	TB-4-520	TB-4-520 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
87	TB-4-539	TB-4-539 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
88	TB-4-541	TB-4-541 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
89	TB-4-602	TB-4-602 RHV	1	259-02044	N/A	0.75	2W/Sng	Globe	4.47	6.30	NO-NSR	10.00	5.00	2.52	55	Floating	24 VAC	155-306P25	
B. AHU-1/2/3 TERMINAL BOX																			
1	TB-1-118	TB-1-118 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
2	LTB-1-119	LTB-1-119 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
3	TB-1-123	TB-1-123 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
4	TB-1-136	TB-1-136 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
5	TB-1-145	TB-1-145 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
6	TB-1-152	TB-1-152 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
7	TB-1-235	TB-1-235 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
8	TB-1-402	TB-1-402 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	
9	TB-1-406	TB-1-406 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.31	0.40	NO-NSR	0.70	5.00	3.06	120	Floating	24 VAC	155-306P25	
10	TB-1-407	TB-1-407 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.49	0.63	NO-NSR	1.10	5.00	3.05	120	Floating	24 VAC	155-306P25	

System: Standrad Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment
11	TB-1-408	TB-1-408 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.27	0.40	NO-NSR	0.60	5.00	2.25	120	Floating	24 VAC	155-306P25	
12	TB-1-409	TB-1-409 RHV	1	259-02032	N/A	0.50	2W/Sng	Globe	0.45	0.63	NO-NSR	1.00	5.00	2.52	120	Floating	24 VAC	155-306P25	
13	TB-1-506	TB-1-506 RHV	1	259-02030	N/A	0.50	2W/Sng	Globe	0.36	0.40	NO-NSR	0.80	5.00	4.00	120	Floating	24 VAC	155-306P25	

System: Standrad Air Terminal Unit

Number	Unit ID	Valve Tag	Q'ty	Product Number	Line Sizes (in.)	Valve Sizes (in.)	Configuration	Body Style	Calculated Cv	Actual Cv	Failsafe	Flow (GPM)	Design P.D	Actual P.D	Close-Off (psi)	Control Signal	Voltage	Document Number	Comment

Notes:

All control valves and wells shall be installed by the mechanical contractor

For all valves with electronic actuators – Do not rotate valve actuator. Install valve with the actuator in the original factory position.

Flow units are in GPM (Water) lbs/hr (Steam)

Failsafe Notation: NSR = Non-Spring Return, SR = Spring Return, FS = Failsafe

Valve Configuration Notation: 2W = 2-Way, 3W = 3-Way

Seating Notation: Sng = Single Seated, Dbl = Double Seated

INSTALLATION NOTES:

1. REFER TO PLANS FOR MORE DETAIL ON CONTROL PANEL LOCATIONS.
2. POWER TO IDC PANEL AND PVR PANEL BY DIVISION 26 ELECTRICAL AS STATED IN CONTRACT DOCUMENTS. POWER THAT IS NOT INDICATED IN CONTRACT DOCUMENTS BUT IS REQUIRED FOR BAS SHALL BE RESPONSIBILITY OF THE O/C.
   EMERGENCY POWER TO IDC PANELS BY DIVISION 26 ELECTRICAL (TYPICAL). UPS REQUIRED AT EACH CONTROL PANEL.
3. O/C TO PROVIDE BARRIER FOR SEPARATION WITHIN THE ELECTRIC TROUGH OF LOW VOLTAGE AND 120V POWER WIRING.
4. DIV 26 TO PROVIDE A DEDICATED MINIMUM 3/4" CONDUIT(S) 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 PXCM CONTROLLER. COORDINATE WITH IU FOR LOCATION OF IDF/MDF ROOM.
5. SINGLE NETWORK IP DROP TO BE PROVIDED BY OWNER.
6. LOCATE SV-1 PANEL NEXT TO AUX-13. LOCATE SV-2 PANEL NEXT TO AUX-4.

PENTHOUSE

- PANEL NAME :LA01.PXCA, INSTANCE : 34701, MSTP NETWORK: 34701 — ELECTRICAL TROUGH — PNL-1 (PXCA-1, AHU-1 & GEF-1 CONTROL PANEL) | AUX-1 (AHU-1 & GEF-1) — 120 VAC (2) — UPS — PWR-1
- PANEL NAME :LA02.PXCA, INSTANCE : 34702, MSTP NETWORK: 34702 — ELECTRICAL TROUGH — PNL-2 (PXCA-2, AHU-2 & GEF-2 CONTROL PANEL) | AUX-2 (AHU-2 & GEF-2) — 120 VAC (2) — UPS — PWR-2
- PANEL NAME :LA03.PXCA, INSTANCE : 34703, MSTP NETWORK: 34703 — ELECTRICAL TROUGH — PNL-3 (PXCA-3, AHU-3 & GEF-3 CONTROL PANEL) | AUX-3 (AHU-3 & EF-3) — 120 VAC (2) — UPS — PWR-3
- PANEL NAME :LA04.PXCA, INSTANCE : 34704, MSTP NETWORK: 34704 — ELECTRICAL TROUGH — PNL-4 (PXCA-4, AHU-4 & GEF-4 CONTROL PANEL) | AUX-4 (AHU-4 & GEF-4) — 120 VAC (2) — UPS — PWR-4
- PANEL NAME :LA05.PXCA, INSTANCE : 34705, MSTP NETWORK: 34705 — ELECTRICAL TROUGH — PNL-5 (PXCA-5, AHU-5 & GEF-5 CONTROL PANEL) | AUX-5 (AHU-5 & GEF-5) — 120 VAC (2) — UPS — PWR-5
- ELECTRICAL TROUGH — PNL-PH (PXCA-PH PENTHOUSE MS/TP PANEL) | PNL-PH-E (PXCA-PH-E LAB EXH SWPS SUPERVISORY) — 120 VAC (2) — UPS
- 120 VAC FROM UPS THAT SERVES PNL-4 — PNL-SW-2 (6)
- PANEL NAME :LA11.PXCA, INSTANCE : 34711, MSTP NETWORK: 34711 — ELECTRICAL TROUGH — PNL-11 (PXCA-11, FHEF-10A/B/C CONTROL PANEL) | AUX-11 (FHEF-10A/B/C) — 120 VAC (2) — UPS — PWR-11
- PANEL NAME :LA11.PXCA, INSTANCE : 34712, MSTP NETWORK: 34712 — ELECTRICAL TROUGH — PNL-12EXP (PXCA-12 EXPANSION PANEL) | PNL-12 (PXCA-12 CHW SYSTEM CONTROL PANEL) | AUX-12 (CHW SYSTEM) — 120 VAC (2) — UPS — PWR-12
- PANEL NAME :LA14.PXCA, INSTANCE : 34714, MSTP NETWORK: 34714 — ELECTRICAL TROUGH — PNL-14 (PXCA-14 HHW SYSTEM CONTROL PANEL) | AUX-14 (HHW SYSTEM) — 120 VAC (2) — UPS — PWR-14
- BOILER MANAGEMENT PANEL PROVIDED BY BOILER MFG. — 120 VAC (2) — UPS

5TH LEVEL

- LAB CIRCULATION 527B — ELECTRICAL TROUGH — PNL-H.1 (H-534 & H-540 CONTROL PANEL) — 120 VAC (2)
- ANALYXIN CORE 504 — ELECTRICAL TROUGH — PNL-H.2 (H-502, 509, 536 CONTROL PANEL) — 120 VAC (2)
- SECURITY ROOM 598D — ELECTRICAL TROUGH — PNL-LAB5 (LAB NETWORK SWITCH) — 120 VAC (2) — UPS

4TH LEVEL

- SECURITY ROOM 498D — ELECTRICAL TROUGH — PNL-LAB4 (LAB NETWORK SWITCH) — 120 VAC (2) — UPS

3RD LEVEL

- SECURITY ROOM 398E — ELECTRICAL TROUGH — PNL-LAB3 (LAB NETWORK SWITCH) — 120 VAC (2) — UPS
- MECH ROOM 398 — PANEL NAME :LA06.PXCA, INSTANCE : 34706, MSTP NETWORK: 34706 — ELECTRICAL TROUGH — PNL-6 (PXCA-6 AHU-6A & 6B CONTROL PANEL) | AUX-6 (AHU-6A & 6B) — 120 VAC (2) — UPS — PWR-6

2ND LEVEL

- SECURITY ROOM 298E — ELECTRICAL TROUGH — PNL-LAB2 (LAB NETWORK SWITCH) — 120 VAC (2) — UPS

1ST LEVEL MEZZANINE

- AHU-8 MECH MEZZANINE/ROOM — PANEL NAME :LA08.PXCA, INSTANCE : 34708, MSTP NETWORK: 34708 — ELECTRICAL TROUGH — PNL-8 (PXCA-8 AHU-8 CONTROL PANEL) | AUX-8 (AHU-8) — 120 VAC (2) — UPS — PWR-8

1ST LEVEL

- MECH ROOM 198M — PANEL NAME :LA07.PXCA, INSTANCE : 34707, MSTP NETWORK: 34707 — ELECTRICAL TROUGH — PNL-7 (PXCA-7 AHU-7 CONTROL PANEL) | AUX-7 (AHU-7) — 120 VAC (2) — UPS — PWR-7
- NEAR ROOM 108BA — PANEL NAME :LA09.PXCA, INSTANCE : 34709, MSTP NETWORK: 34709 — ELECTRICAL TROUGH — PNL-9 FOR FUTURE AHU-9 (PXCA-9 AHU-9 CONTROL PANEL) | AUX-9 FOR FUTURE AHU-9 (AHU-9) — 120 VAC (2) — UPS — PWR-9
- PLUMBING ROOM 198H — PANEL NAME :LA10.PXCA, INSTANCE : 34710, MSTP NETWORK: 34710 — ELECTRICAL TROUGH — PNL-10 (PXCA-10 MISC. BUILDING SYSTEMS) | AUX-10 (MISC. BUILDING SYSTEMS) — 120 VAC (2) — UPS — PWR-10
- SECURITY ROOM 198F — ELECTRICAL TROUGH — PNL-1F (PXCM-1F 1FL MS/TP PANEL) | PNL-LAB1 (LAB NETWORK SWITCH) — 120 VAC (2) — UPS
- 120 VAC FROM UPS THAT SERVES PNL-13 — PNL-SW-1 (6) — (4) (5) 3/4" CONDUIT W/PULL STRING
- TANK ROOM 198D — PANEL NAME :LA13.PXCA, INSTANCE : 34713, MSTP NETWORK: 34713 — ELECTRICAL TROUGH — PNL-13 (PXCA-13 CONDENSER WTR SYS CONTROL PANEL) | AUX-13 (CONDENSER WTR SYS CONTROL PANEL) — 120 VAC (2) — UPS — PWR-13

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IU LAUNCH ACCELERATOR FOR BIO
IU# 202500072, IN

DRAWN BY	CHECKED BY	WORK RELEASE	LAST EDIT DATE
HB	KR	04/02/26	04/06/26

SYSTEM ARCHITECTURE

440P412785
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REVISION HISTORY

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BUILDING #	Building Name	ALN NAME	Location	FIELD PANEL NUMBER	DEVICE NAME (DESIGO NAME/SYSTEM NAME)	Equipment ID	Device Type	Associated Device	IP ADDRESS	SUBNET MASK	GATEWAY	Device MAC Addresses	Device Network #	INSTANCE #	FLN-1 NETWORK #
1. FIELD PANEL															
347	IN347	BACNET.BLN1	Penthouse	1	LA01.PXCA	PNL-1	PXC7.E400.A	AHU-1 & GEF-1	TBD	TBD	TBD	N/A	N/A	34701	34701
347	IN347	BACNET.BLN1	Penthouse	2	LA02.PXCA	PNL-2	PXC7.E400.A	AHU-2 & GEF-2	TBD	TBD	TBD	N/A	N/A	34702	34702
347	IN347	BACNET.BLN1	Penthouse	3	LA03.PXCA	PNL-3	PXC7.E400.A	AHU-3 & GEF-3	TBD	TBD	TBD	N/A	N/A	34703	34703
347	IN347	BACNET.BLN1	Penthouse	4	LA04.PXCA	PNL-4	PXC7.E400.A	AHU-4 & GEF-4	TBD	TBD	TBD	N/A	N/A	34704	34704
347	IN347	BACNET.BLN1	Penthouse	5	LA05.PXCA	PNL-5	PXC7.E400.A	AHU-5 & GEF-5	TBD	TBD	TBD	N/A	N/A	34705	34705
347	IN347	BACNET.BLN1	Mech Room 398	6	LA06.PXCA	PNL-6	PXC7.E400.A	AHU-6A & 6B	TBD	TBD	TBD	N/A	N/A	34706	34706
347	IN347	BACNET.BLN1	Mech Room 198M	7	LA07.PXCA	PNL-7	PXC7.E400.A	AHU-7	TBD	TBD	TBD	N/A	N/A	34707	34707
347	IN347	BACNET.BLN1	Mech Mezzzanine Room	8	LA08.PXCA	PNL-8	PXC7.E400.A	AHU-8	TBD	TBD	TBD	N/A	N/A	34708	34708
347	IN347	BACNET.BLN1	Near Room 108BA	9	LA09.PXCA	PNL-9	PXC7.E400.A	FUTURE AHU-9	TBD	TBD	TBD	N/A	N/A	34709	34709
347	IN347	BACNET.BLN1	Plumbing Room 198H	10	LA10.PXCA	PNL-10	PXC7.E400.A	Misc Building System	TBD	TBD	TBD	N/A	N/A	34710	34710
347	IN347	BACNET.BLN1	Penthouse	11	LA11.PXCA	PNL-11	PXC7.E400.A	FHEF-10A/B/C	TBD	TBD	TBD	N/A	N/A	34711	34711
347	IN347	BACNET.BLN1	Penthouse	12	LA12.PXCA	PNL-12	PXC7.E400.A	CHW System	TBD	TBD	TBD	N/A	N/A	34712	34712
347	IN347	BACNET.BLN1	Tank Room 198D	13	LA13.PXCA	PNL-13	PXC7.E400.A	Condenser Water System	TBD	TBD	TBD	N/A	N/A	34713	34713
347	IN347	BACNET.BLN1	Penthouse	14	LA14.PXCA	PNL-14	PXC7.E400.A	Heating Hot Water System	TBD	TBD	TBD	N/A	N/A	34714	34714
347	IN347	BACNET.BLN1	MDF Room 198C	15	LA15.PXCA	PNL-1F	PXC7.E400.A	1FL MS/TP devices	TBD	TBD	TBD	N/A	N/A	34715	34715
347	IN347	BACNET.BLN1	Penthouse	16	LA16.PXCA	PNL-PH	PXC7.E400.A	PH MS/TP devices	TBD	TBD	TBD	N/A	N/A	34716	34716
347	IN347	BACNET.BLN1	Penthouse	17	LA17.PXCA	PNL-PH-E	PXC7.E400.A	Ethernet DXR's Supervisory	TBD	TBD	TBD	N/A	N/A	34717	34717
347	IN347	BACNET.BLN1	5th Floor	18	LA18.PXCA	PNL-H.1	PXC5.E24.A	Humidifier	TBD	TBD	TBD	N/A	N/A	34718	34718
347	IN347	BACNET.BLN1	5th Floor	19	LA19.PXCA	PNL-H.2	PXC5.E24.A	Humidifier	TBD	TBD	TBD	N/A	N/A	34719	34719

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DDC PANEL SCHEDULE

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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DDC PANEL SCHEDULE

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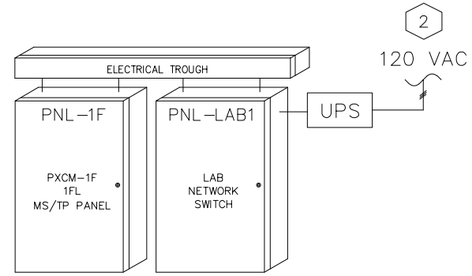
INSTALLATION NOTES:

1. SEE SYSTEM ARCHITECTURE DRAWING FOR DETAILS AND NOTES.

BLDG	PANEL	FLN	MAC ADDR	TAG	CONTROLLER	ROOM #	ROOM DESCRIPTION	SYSTEM NAME	INSTANCE NUMBER	FLOOR	MECH DWG	POWER SUPPLY	CIRCUIT	POWER VA
IN347	PNL-1F	1	1		DXR2.M18-101B		CENTRAL FUNCTION DXR	LA14_DXR-CF	3471401	1		SB-1		8.0
IN347	PNL-1F	1	9	TB-7-101	DXR2.M18-101B	198H	PLUMBING	LA14_TB-7-101	3471409	1	M101	PWR-1A2	5	13.0
IN347	PNL-1F	1	6	TB-7-102	DXR2.M18-101B	198L	ELECTRICAL	LA14_TB-7-102	3471406	1	M101	PWR-1A2	5	13.0
IN347	PNL-1F	1	10	TB-7-103	DXR2.M18-101B	198K	EMERGENCY ELECTRIC	LA14_TB-7-103	3471410	1	M101	PWR-1A2	5	13.0
IN347	PNL-1F	1	7	TB-7-104	DXR2.M18-101B	198R	SOLAR EQUIP RM	LA14_TB-7-104	3471407	1	M101	PWR-1A2	5	13.0
IN347	PNL-1F	1	13	FCU-E1	DXR2.M18-101B	199Y	N/A	LA14_FCU-E1	3471413	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	11	FCU-FP	DXR2.M18-101B	198P	N/A	LA14_FCU-FP	3471411	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	3	UH-1	DXR2.M18-101B	199H	RECEIVING	LA14_UH-1	3471403	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	4	UH-2	DXR2.M18-101B	199H	RECEIVING	LA14_UH-2	3471404	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	5	UH-3	DXR2.M18-101B	199H	RECEIVING	LA14_UH-3	3471405	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	12	CUH-1	DXR2.M18-101B	199B	ENTRY VESTIBULE	LA14_CUH-1	3471412	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	2	CUH-2	DXR2.M18-101B	199K	ENTRY VESTIBULE	LA14_CUH-2	3471402	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	14	CUH-3	DXR2.M18-101B	N/A	ENTRY VESTIBULE	LA14_CUH-3	3471414	1	M101	XFMR	XFMR	
IN347	PNL-1F	1	8	PMPRM-DMP	DXR2.M12P-102B	N/A	PUMP ROOM DAMPER	LA14_PMPRM-DMP	3471408	1	M101	PWR-1A2	5	18.0

SECURITY ROOM 198F



1 / R02 1ST FLOOR MS/TP NETWORK

SERVES: BACNET MS/TP

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1ST FLR MSTP DXR NETWORK

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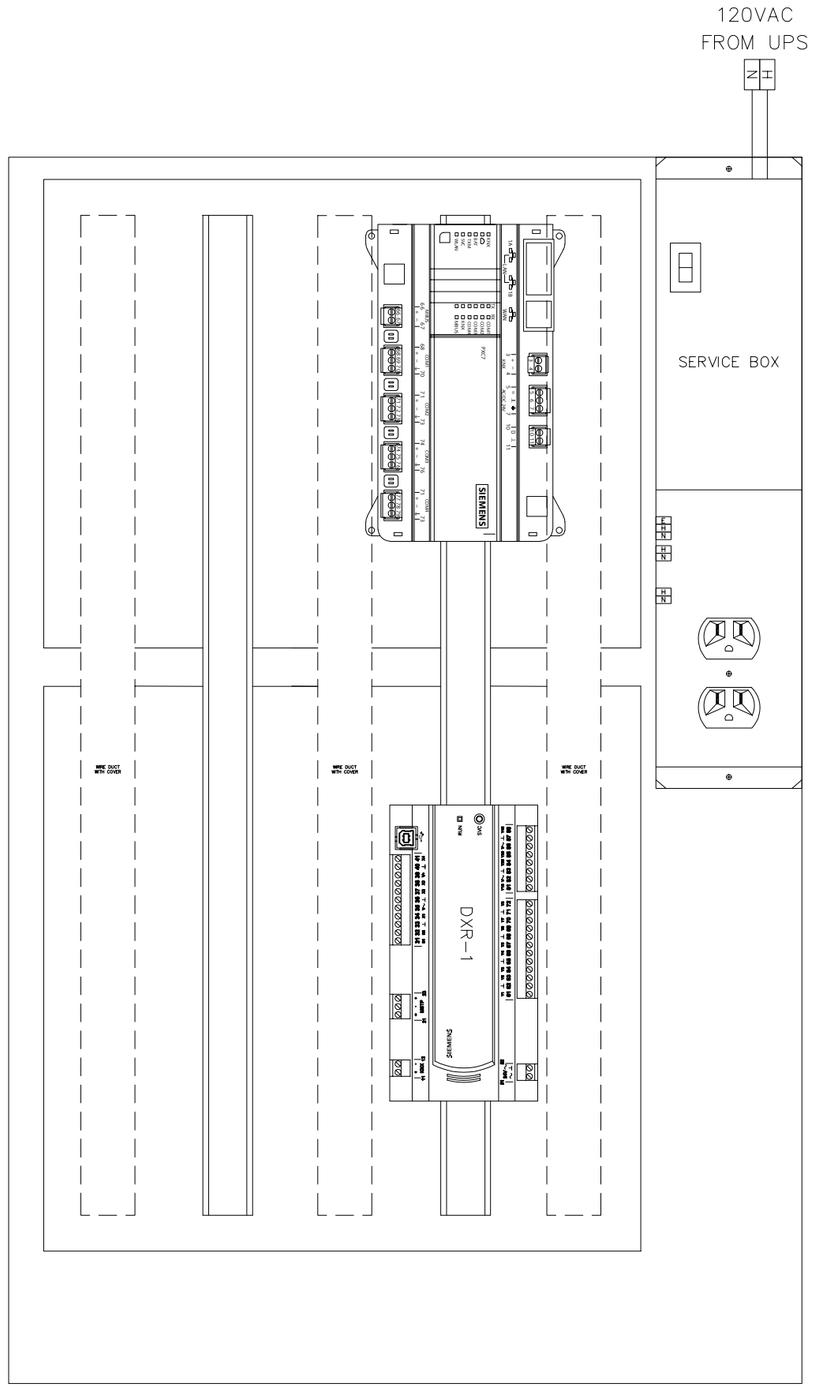

GENERAL NOTES:

1. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND DOES NOT REFLECT THE ACTUAL ARRANGEMENT OF EQUIPMENT, DUCTWORK, OR PIPING.

1 / R02A — PNL-1F PANEL LAYOUT

LCATION: SECURITY ROOM 198F

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00	4/2/2026	HB	SUBMITTAL SET

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PNL-1F LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
DXR 1	1	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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1ST FLR MSTP DXR NETWORK BOM

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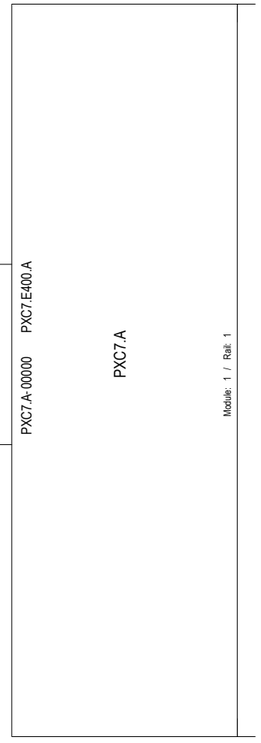

REVISION HISTORY			
00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

1FL MS/TP DEVICES

440P412785
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E02

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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1FL MS/TP DEVICES BOM

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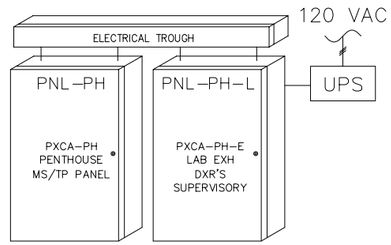
INSTALLATION NOTES:

(1) SEE SYSTEM ARCHITECTURE DRAWING FOR DETAILS AND NOTES.

BLDG	PANEL	FLN	MAC ADDR	TAG	CONTROLLER	ROOM #	ROOM DESCRIPTION	SYSTEM NAME	INSTANCE NUMBER	FLOOR	MECH DWG	POWER SUPPLY	CIRCUIT	POWER VA
IN347	PNL-PH	1	1		DXR2.M18-101B			LA15_DXR-CF	3471501	PH		SB-1		8
IN347	PNL-PH	1	3	TB-4-601	DXR2.M18-101B	698C	ELEV CTRL	LA15_TB-4-601	3471503	PH	M106	PWR-PH1	1	13
IN347	PNL-PH	1	5	TB-4-602	DXR2.M18-101B		PENTHOUSE EAST	LA15_TB-4-602	3471505	PH	M106	PWR-PH1	1	13
IN347	PNL-PH	1	4	FCU-P1	DXR2.M18-101B	PH	PENTHOUSE WEST	LA15_FCU-P1	3471504	PH	M106	XFMR	XFMR	
IN347	PNL-PH	1	2	FCU-P2	DXR2.M18-101B	PH	PENTHOUSE CENTRAL	LA15_FCU-P2	3471502	PH	M106	XFMR	XFMR	
IN347	PNL-PH	1	6	FCU-P3	DXR2.M18-101B	PH	PENTHOUSE EAST	LA15_FCU-P3	3471506	PH	M106	XFMR	XFMR	
IN347	PNL-PH	1	7	FCU-B1	DXR2.M18-101B	698A	MECH ROOM	LA15_FCU-B1	3471507	PH	M106	XFMR	XFMR	



1 R03 PENTHOUSE MS/TP NETWORK

SERVES: BACNET MS/TP

REVISION HISTORY

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IU# 20250072, IN

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PH MSTP DXR NETWORK

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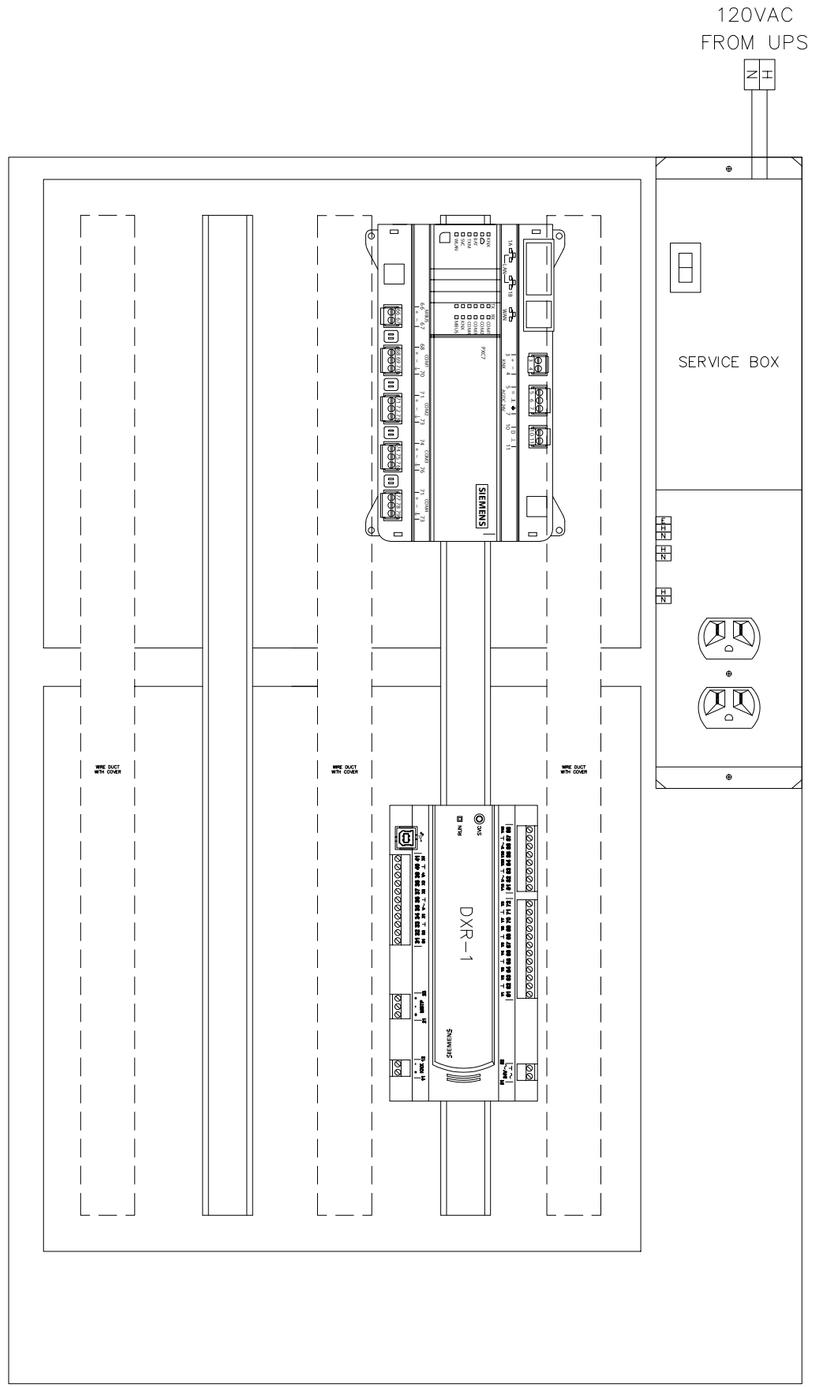

GENERAL NOTES:

1. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND DOES NOT REFLECT THE ACTUAL ARRANGEMENT OF EQUIPMENT, DUCTWORK, OR PIPING.

1 / R02A — PNL-PH PANEL LAYOUT
LCATION: PENTHOUSE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SMART INFRASTRUCTURE DIVISION

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PNL-PH LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
DXR 1	1	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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PH MSTP DXR NETWORK BOM

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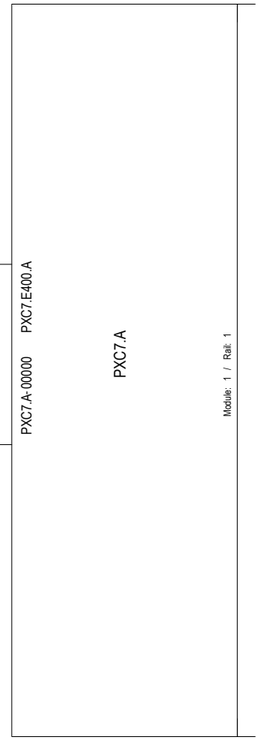

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IU# 20250072, IN

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PH MS/TP DEVICES

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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PH MS/TP DEVICES BOM

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1ST FLOOR LAB ROOM ETHERNET DXR SCHEDULE

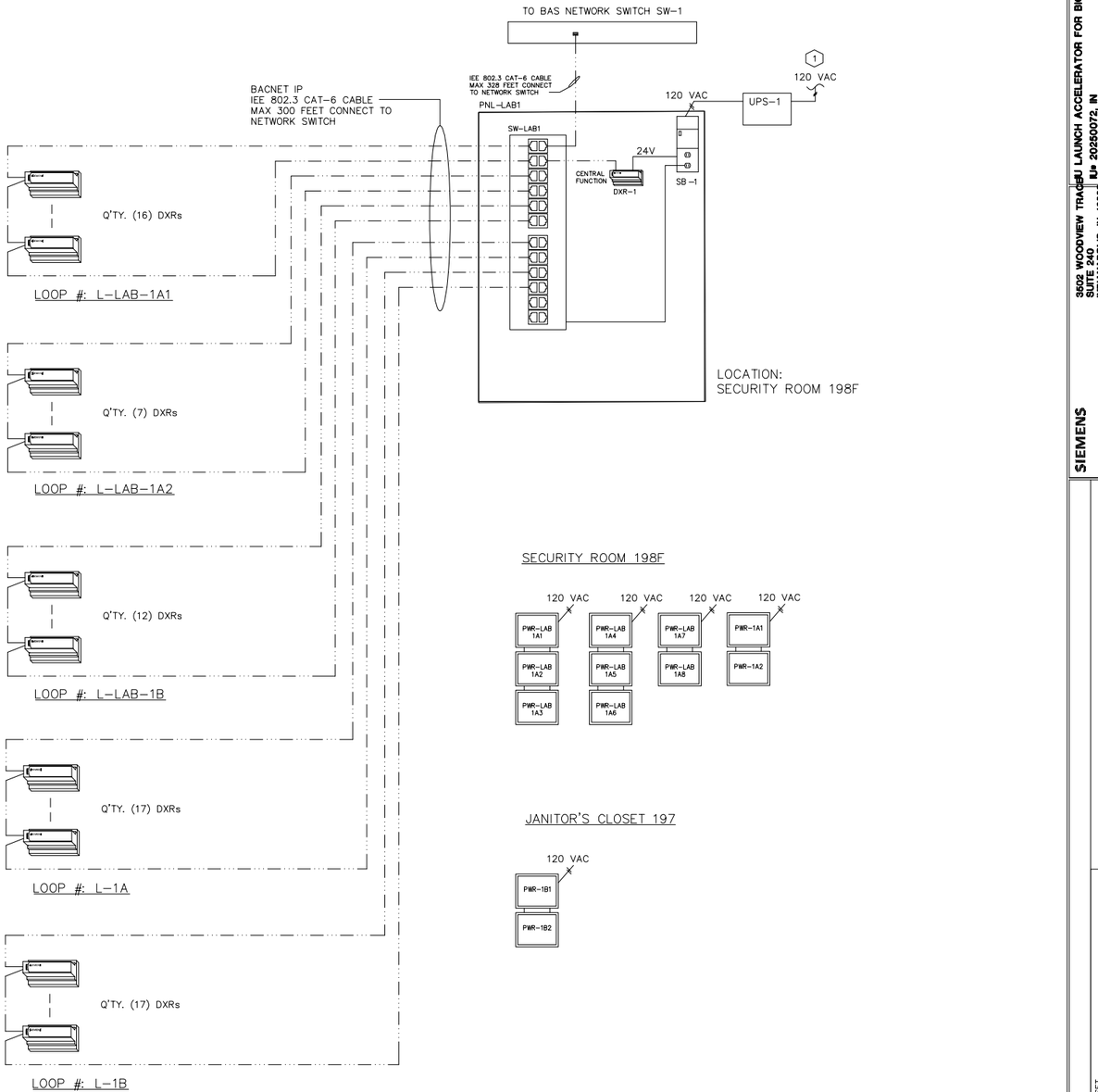
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA TRUNK_1	POWER VA TRUNK_2
IN347	SW-LAB1	L-LAB-1B				DXR2.E18-101B	LA01_DXR-CF	TBD	3470101				SB-1		8.0	
IN347	SW-LAB1	L-LAB-1B	106	LTB-1-106	LGEV-1-106	DXR2.E17C-103B	LA01_LTB-1-106	TBD	3470102	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A1	1	45.0	35.0
IN347	SW-LAB1	L-LAB-1B	106		FHEV-1-106-1	DXR2.E17C-103B	LA01_FHEV-1-106-1	TBD	3470103	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A1	2	44.0	
IN347	SW-LAB1	L-LAB-1B	106		FHEV-1-106-2	DXR2.E17C-103B	LA01_FHEV-1-106-2	TBD	3470104	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A1	3	44.0	
IN347	SW-LAB1	L-LAB-1B	106		FHEV-1-106-3	DXR2.E17C-103B	LA01_FHEV-1-106-3	TBD	3470105	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A1	4	44.0	
IN347	SW-LAB1	L-LAB-1B	107	LTB-1-107	LGEV-1-107	DXR2.E17C-103B	LA01_LTB-1-107	TBD	3470106	107	IMAGING LAB	M101	PWR-LAB1A2	1	45.0	35.0
IN347	SW-LAB1	L-LAB-1B	107		LEEV-1-107	DXR2.E17C-103B	LA01_LEEV-1-107	TBD	3470107	107	IMAGING LAB	M101	PWR-LAB1A2	2	43.0	
IN347	SW-LAB1	L-LAB-1B	108	LTB-1-108	LGEV-1-108	DXR2.E17C-103B	LA01_LTB-1-108	TBD	3470108	107	IMAGING LAB	M101	PWR-LAB1A2	3	45.0	35.0
IN347	SW-LAB1	L-LAB-1B	108		LEEV-1-108	DXR2.E17C-103B	LA01_LEEV-1-108	TBD	3470109	107	IMAGING LAB	M101	PWR-LAB1A2	4	43.0	
IN347	SW-LAB1	L-LAB-1A1	109	LTB-1-109	LGEV-1-109	DXR2.E17C-103B	LA01_LTB-1-109	TBD	3470110	106	ELECTRONICS & SENSORS STUDIO	M101	PWR-LAB1A3	1	45.0	35.0
IN347	SW-LAB1	L-LAB-1A1	109		FHEV-1-109	DXR2.E17C-103B	LA01_FHEV-1-109	TBD	3470111	106	ELECTRONICS & SENSORS STUDIO	M101	PWR-LAB1A3	2	44.0	
IN347	SW-LAB1	L-LAB-1A1	109		LEEV-1-109	DXR2.E17C-103B	LA01_LEEV-1-109	TBD	3470112	106	ELECTRONICS & SENSORS STUDIO	M101	PWR-LAB1A3	3	43.0	
IN347	SW-LAB1	L-LAB-1A1	110	LTB-1-110	LGEV-1-110	DXR2.E17C-103B	LA01_LTB-1-110	TBD	3470113	106	ELECTRONICS & SENSORS STUDIO	M101	PWR-LAB1A3	4	45.0	35.0
IN347	SW-LAB1	L-LAB-1A1	110		LEEV-1-110	DXR2.E17C-103B	LA01_LEEV-1-110	TBD	3470114	106	ELECTRONICS & SENSORS STUDIO	M101	PWR-LAB1A3	5	43.0	
IN347	SW-LAB1	L-LAB-1A1	111	LTB-1-111	LGEV-1-111	DXR2.E17C-103B	LA01_LTB-1-111	TBD	3470115	108A	ADVANCED WET LAB	M101	PWR-LAB1A4	1	35.0	
IN347	SW-LAB1	L-LAB-1A1	112	LTB-1-112	LGEV-1-112	DXR2.E17C-103B	LA01_LTB-1-112	TBD	3470116	108A	ADVANCED WET LAB	M101	PWR-LAB1A4	2	45.0	35.0
IN347	SW-LAB1	L-LAB-1A1	112		FHEV-1-112-1	DXR2.E17C-103B	LA01_FHEV-1-112-1	TBD	3470117	108A	ADVANCED WET LAB	M101	PWR-LAB1A4	3	44.0	
IN347	SW-LAB1	L-LAB-1A1	112		FHEV-1-112-2	DXR2.E17C-103B	LA01_FHEV-1-112-2	TBD	3470118	108A	ADVANCED WET LAB	M101	PWR-LAB1A4	4	44.0	
IN347	SW-LAB1	L-LAB-1A1	112		LEEV-1-112	DXR2.E17C-103B	LA01_LEEV-1-112	TBD	3470119	108A	ADVANCED WET LAB	M101	PWR-LAB1A4	5	43.0	
IN347	SW-LAB1	L-LAB-1A2	121	LTB-1-121	LGEV-1-121	DXR2.E17C-103B	LA01_LTB-1-121	TBD	3470121	127	CHEM WASTE	M101	PWR-LAB1A5	2	45.0	35.0
IN347	SW-LAB1	L-LAB-1A2	121		FHEV-1-121	DXR2.E17C-103B	LA01_FHEV-1-121	TBD	3470122	127	CHEM WASTE	M101	PWR-LAB1A5	3	44.0	
IN347	SW-LAB1	L-LAB-1A2	122	LTB-1-122	LGEV-1-122	DXR2.E17C-103B	LA01_LTB-1-122	TBD	3470123	113	CHEM STOR	M101	PWR-LAB1A5	4	35.0	
IN347	SW-LAB1	L-LAB-1A2	124	LTB-1-124	LGEV-1-124	DXR2.E17C-103B	LA01_LTB-1-124	TBD	3470124	111	BIO WASTE	M101	PWR-LAB1A5	4	35.0	
IN347	SW-LAB1	L-LAB-1A1	130	LTB-1-130	LGEV-1-130	DXR2.E17C-103B	LA01_LTB-1-130	TBD	3470125	118	INFO TECH & DATA SCIENCE CORE	M101	PWR-LAB1A5	5	38.5	
IN347	SW-LAB1	L-LAB-1A1	131	LTB-1-131	LGEV-1-131	DXR2.E17C-103B	LA01_LTB-1-131	TBD	3470126	118	INFO TECH & DATA SCIENCE CORE	M101	PWR-LAB1A6	1	38.5	
IN347	SW-LAB1	L-LAB-1A2	143	LTB-1-143	LGEV-1-143	DXR2.E17C-103B	LA01_LTB-1-143	TBD	3470127	108B	SUPPORT	M101	PWR-LAB1A6	2	45.0	35.0
IN347	SW-LAB1	L-LAB-1A2	143		FHEV-1-143	DXR2.E17C-103B	LA01_FHEV-1-143	TBD	3470128	108B	SUPPORT	M101	PWR-LAB1A6	3	44.0	
IN347	SW-LAB1	L-LAB-1A2	144	LTB-1-144	LGEV-1-144	DXR2.E17C-103B	LA01_LTB-1-144	TBD	3470129	108BA	EQUIPMENT ROOM	M101	PWR-LAB1A6	5	35.0	
IN347	SW-LAB1	L-LAB-1A1	146	LTB-1-146	LGEV-1-146	DXR2.E17C-103B	LA01_LTB-1-146	TBD	3470130	118A	SUPPORT	M101	PWR-LAB1A7	1,2	45.0	35.0
IN347	SW-LAB1	L-LAB-1A1	146		FHEV-1-146	DXR2.E17C-103B	LA01_FHEV-1-146	TBD	3470131	118A	SUPPORT	M101	PWR-LAB1A7	3	44.0	
IN347	SW-LAB1	L-LAB-1A1	147	LTB-1-147	LGEV-1-147	DXR2.E17C-103B	LA01_LTB-1-147	TBD	3470132	118B	SUPPORT	M101	PWR-LAB1A7	4	35.0	
IN347	SW-LAB1	L-LAB-1A1	148	LTB-1-148	LGEV-1-148	DXR2.E17C-103B	LA01_LTB-1-148	TBD	3470133	118C	SUPPORT	M101	PWR-LAB1A7	5	35.0	
IN347	SW-LAB1	L-LAB-1B	150	LTB-1-150	LGEV-1-150	DXR2.E17C-103B	LA01_LTB-1-150	TBD	3470134	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A8	1	45.0	35.0
IN347	SW-LAB1	L-LAB-1B	150		FHEV-1-150-1	DXR2.E17C-103B	LA01_FHEV-1-150-1	TBD	3470135	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A8	2	44.0	
IN347	SW-LAB1	L-LAB-1B	150		FHEV-1-150-2	DXR2.E17C-103B	LA01_FHEV-1-150-2	TBD	3470136	103	INSTRUCTIONAL LAB SPACE	M101	PWR-LAB1A8	3	44.0	

1ST FLOOR NON-LAB ROOM ETHERNET DXR SCHEDULE

BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCIATED	4-PIPE CHILLED BEAM	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA
IN347	SW-LAB1	L-1B	4-101	TB-4-101			DXR2.E12	LA04_TB-4-101	TBD	3470401	199	LOBBY HALL WAY	M101	PWR-1B1	1	12.3
IN347	SW-LAB1	L-1B	4-102	TB-4-102	EV-4-102		DXR2.E17C-103B	LA04_TB-4-102	TBD	3470402	199C	LEARNING LIVING ROOM	M101	PWR-1B1	1	38.5
IN347	SW-LAB1	L-1B	4-102			CB-102	DXR2.E18-101B	LA04_CB-102	TBD	3470403	199C	LEARNING LIVING ROOM	M101	PWR-1B1	1	16.0
IN347	SW-LAB1	L-1B	4-103	TB-4-103	EV-4-103		DXR2.E17C-103B	LA04_TB-4-103	TBD	3470404	100	LARGE MULTIPURPOSE	M101	PWR-1B1	2	38.5
IN347	SW-LAB1	L-1B	4-104	TB-4-104	EV-4-104		DXR2.E17C-103B	LA04_TB-4-104	TBD	3470405	100	LARGE MULTIPURPOSE	M101	PWR-1B1	2	39.5
IN347	SW-LAB1	L-1B	4-105	TB-4-105			DXR2.E12	LA04_TB-4-105	TBD	3470406	199G	HALL WAY	M101	PWR-1B1	3	16.8
IN347	SW-LAB1	L-1B	113	TB-4-113	EV-4-113		DXR2.E17C-103B	LA04_TB-4-113	TBD	3470407	199	LOBBY FORUM	M101	PWR-1B2	1	36.0
IN347	SW-LAB1	L-1B	114	TB-4-114	EV-4-114		DXR2.E17C-103B	LA04_TB-4-114	TBD	3470408	199L	CIRCULATION	M101	PWR-1B2	1	36.0
IN347	SW-LAB1	L-1B	115	TB-4-115	EV-4-115		DXR2.E17C-103B	LA04_TB-4-115	TBD	3470409	199L	CIRCULATION	M101	PWR-1B2	2	38.5
IN347	SW-LAB1	L-1B	115			CB-115	DXR2.E18-101B	LA04_CB-115	TBD	3470410	199L	CIRCULATION	M101	PWR-1B2	2	16.0
IN347	SW-LAB1	L-1B	135	TB-4-135	EV-4-135		DXR2.E17C-103B	LA04_TB-4-135	TBD	3470411	196	MEN	M101	PWR-1B1	3	35.0
IN347	SW-LAB1	L-1B	136	TB-1-136	EV-1-136		DXR2.E17C-103B	LA01_TB-4-136	TBD	3470137	135	FUTURE RETIAL / COFFEE	M101	PWR-1B1	5	35.0
IN347	SW-LAB1	L-1B	137	TB-4-137	EV-4-137		DXR2.E17C-103B	LA04_TB-4-137	TBD	3470412	133	WELLNESS ROOM	M101	PWR-1B1	5	35.0
IN347	SW-LAB1	L-1B	138	TB-4-138	EV-4-138		DXR2.E17C-103B	LA04_TB-4-138	TBD	3470413	104	CLASSROOM	M101	PWR-1B1	4	38.5
IN347	SW-LAB1	L-1B	139	TB-4-139	EV-4-139		DXR2.E17C-103B	LA04_TB-4-139	TBD	3470414	102	CLASSROOM	M101	PWR-1B1	4	38.5
IN347	SW-LAB1	L-1B	149	TB-4-149	EV-4-149		DXR2.E17C-103B	LA04_TB-4-149	TBD	3470415	101	FURN STOR	M101	PWR-1B2	3	35.0
IN347	SW-LAB1	L-1B	153	TB-4-153			DXR2.E12	LA06_TB-4-153	TBD	3470601	INJECTION VAV BOX	N/A	M101	PWR-1B1	3	16.5
IN347	SW-LAB1	L-1A	116	TB-4-116	EV-4-116		DXR2.E17C-103B	LA04_TB-4-116	TBD	3470416	199G	CIRCULATION	M101	PWR-1A1	1	35.0
IN347	SW-LAB1	L-1A	117	TB-4-117	EV-4-117		DXR2.E17C-103B	LA04_TB-4-117	TBD	3470417	115	OFFICE	M101	PWR-1A1	1	35.0
IN347	SW-LAB1	L-1A	118	TB-1-118	EV-1-118		DXR2.E17C-103B	LA01_TB-1-118	TBD	3470138	126	CYL STOR	M101	PWR-1A1	2	35.0
IN347	SW-LAB1	L-1A	119	TB-1-119	EV-1-119		DXR2.E17C-103B	LA01_TB-1-119	TBD	3470139	124	BIO STO	M101	PWR-1A1	2	35.0
IN347	SW-LAB1	L-1A	123	TB-1-123	EV-1-123		DXR2.E17C-103B	LA01_TB-1-123	TBD	3470140	109	LAB STORAGE	M101	PWR-1A2	4	35.0
IN347	SW-LAB1	L-1A	125	TB-4-125	EV-4-125		DXR2.E17C-103B	LA04_TB-4-125	TBD	3470418	198G	HOUSE KEEPING/STOR	M101	PWR-1A1	3	35.0
IN347	SW-LAB1	L-1A	127	TB-4-127	EV-4-127		DXR2.E17C-103B	LA04_TB-4-127	TBD	3470419	199G	CIRCULATION	M101	PWR-1A1	4	35.0
IN347	SW-LAB1	L-1A	132	TB-4-132	EV-4-132		DXR2.E17C-103B	LA04_TB-4-132	TBD	3470420	122	BREAK AREA	M101	PWR-1A1	5	35.0
IN347	SW-LAB1	L-1A	133	TB-4-133	EV-4-133		DXR2.E17C-103B	LA04_TB-4-133	TBD	3470421	122A	STOR	M101	PWR-1A1	5	35.0
IN347	SW-LAB1	L-1A	134	TB-4-134	EV-4-134		DXR2.E17C-103B	LA04_TB-4-134	TBD	3470422	198J	MAINT STOR	M101	PWR-1A1	4	35.0
IN347	SW-LAB1	L-1A	140	TB-4-140	EV-4-140		DXR2.E17C-103B	LA04_TB-4-140	TBD	3470423	199H	RECEIVING	M101	PWR-1A1	3	35.0
IN347	SW-LAB1	L-1A	141	TB-1-141	EV-1-141		DXR2.E17C-103B	LA01_TB-1-141	TBD	3470141	198F	SECURITY	M101	PWR-1A2	1	34.0
IN347	SW-LAB1	L-1A	142	TB-1-142	EV-1-142		DXR2.E17C-103B	LA01_TB-1-142	TBD	3470142	198C	MDF	M101	PWR-1A2	2	34.0
IN347	SW-LAB1	L-1A	145	TB-1-145	EV-1-145		DXR2.E17C-103B	LA01_TB-1-145	TBD	3470143	108	VESTUBULE	M101	PWR-1A2	1	35.0
IN347	SW-LAB1	L-1A	152	TB-1-152	EV-1-152		DXR2.E17C-103B	LA01_TB-1-152	TBD	3470144	198D	PUMP ROOM	M101	PWR-1A2	2	35.0
IN347	SW-LAB1	L-1A	199	TB-4-199	EV-4-199		DXR2.E17C-103B	LA04_TB-4-199	TBD	3470424	199L	CIRCULATION	M101	PWR-1A2	3	38.5
IN347	SW-LAB1	L-1A	199			CB-199	DXR2.E18-101B	LA04_CB-199	TBD	3470425	199L	CIRCULATION	M101	PWR-1A2	3	16.0

INSTALLATION NOTES:

1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.



SECURITY ROOM 198F

JANITOR'S CLOSET 197

1 R04 1ST FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

SIEMENS
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

GU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	ISSUED FOR PERMIT
HB	HB	KB		04/08/26

440P412785
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R04

1ST FLR ETHERNET DXR NETWORK

REVISION HISTORY

NO	DATE	BY	DESCRIPTION
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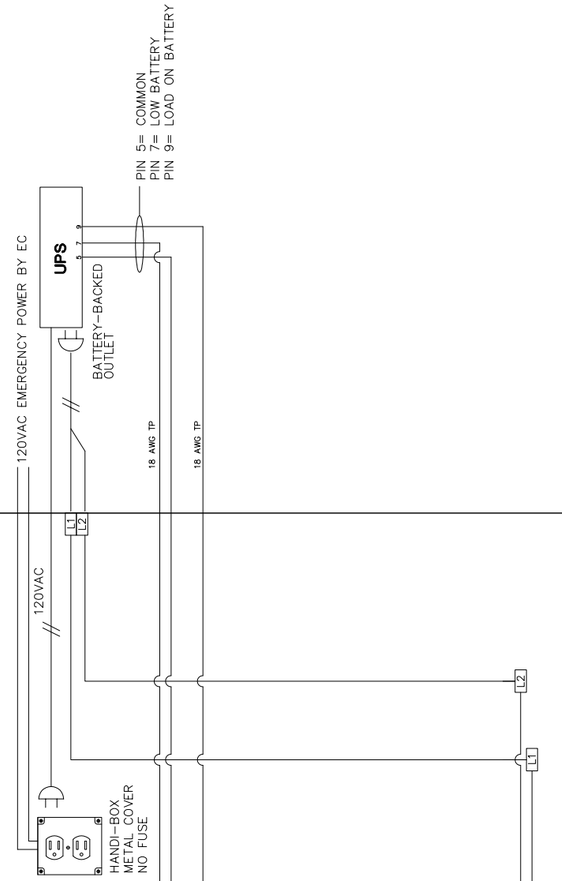
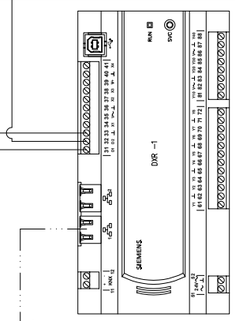
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



CAT 6 ETHERNET
TO NETWORK SWITCH

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.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

PNL-LAB1 UPS WIRING

440P412785
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R04A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station
PNL LAB1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW LAB1	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

1ST FLR E. DXR NETWORK BOM

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R04B

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2ND FLOOR LAB ROOM ETHERNET DXR SCHEDULE

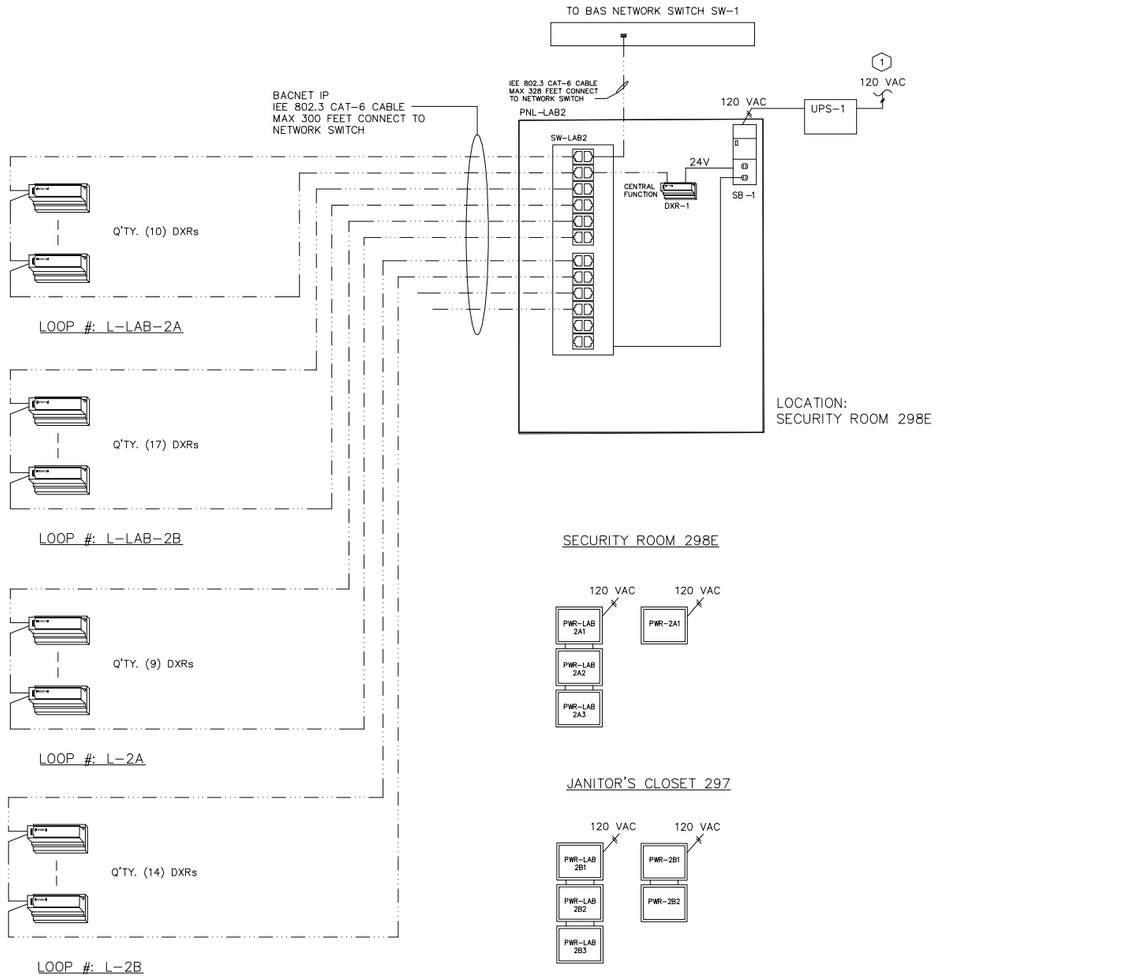
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASSOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA	
															TRUNK_1	TRUNK_2
IN347	SW-LAB2	L-LAB-2B				DXR2.E18-101B	LA02_DXR-CF	TBD	3470201				SB-1		8.0	
IN347	SW-LAB2	L-LAB-2B	219	LTB-1-219	LGEV-1-219	DXR2.E17C-103B	LA02_LTB-1-219	TBD	3470202	227N	LAB SUPP	M102	PWR-LAB2B1	1	35.0	
IN347	SW-LAB2	L-LAB-2B	220	LTB-1-220	LGEV-1-220	DXR2.E17C-103B	LA02_LTB-1-220	TBD	3470203	227M	WET LAB	M102	PWR-LAB2B1	2	45.0	35.0
IN347	SW-LAB2	L-LAB-2B	220		FHEV-1-220	DXR2.E17C-103B	LA02_FHEV-1-220	TBD	3470204	227M	WET LAB	M102	PWR-LAB2B1	3	44.0	
IN347	SW-LAB2	L-LAB-2B	220		LEEV-1-220	DXR2.E17C-103B	LA02_LEEV-1-220	TBD	3470205	227M	WET LAB	M102	PWR-LAB2B1	4	43.0	
IN347	SW-LAB2	L-LAB-2B	221	LTB-1-221	LGEV-1-221	DXR2.E17C-103B	LA02_LTB-1-221	TBD	3470206	227L	AUTO CLAVE	M102	PWR-LAB2B1	1	35.0	
IN347	SW-LAB2	L-LAB-2B	223	LTB-1-223	LGEV-1-223	DXR2.E17C-103B	LA02_LTB-1-223	TBD	3470207	227JB	EQUIPMENT ROOM	M102	PWR-LAB2B2	1	35.0	
IN347	SW-LAB2	L-LAB-2B	224	LTB-1-224	LGEV-1-224	DXR2.E17C-103B	LA02_LTB-1-224	TBD	3470208	227JA	EQUIPMENT ROOM	M102	PWR-LAB2B2	1	38.5	
IN347	SW-LAB2	L-LAB-2B	225	LTB-1-225	LGEV-1-225	DXR2.E17C-103B	LA02_LTB-1-225	TBD	3470209	227J	WET LAB	M102	PWR-LAB2B2	2,3	49.5	35.0
IN347	SW-LAB2	L-LAB-2B	225		LEEV-1-225	DXR2.E17C-103B	LA02_LEEV-1-225	TBD	3470210	227J	WET LAB	M102	PWR-LAB2B2	4	43.0	
IN347	SW-LAB2	L-LAB-2B	226	LTB-1-226	LGEV-1-226	DXR2.E17C-103B	LA02_LTB-1-226	TBD	3470211	227H	WET LAB	M102	PWR-LAB2B3	1,2	45.0	35.0
IN347	SW-LAB2	L-LAB-2B	226		FHEV-1-226	DXR2.E17C-103B	LA02_FHEV-1-226	TBD	3470212	227H	WET LAB	M102	PWR-LAB2B3	3	44.0	
IN347	SW-LAB2	L-LAB-2B	226		LEEV-1-226	DXR2.E17C-103B	LA02_LEEV-1-226	TBD	3470213	227H	WET LAB	M102	PWR-LAB2B3	4	43.0	
IN347	SW-LAB2	L-LAB-2B	227	LTB-1-227	LGEV-1-227	DXR2.E17C-103B	LA02_LTB-1-227	TBD	3470214	227G	WET LAB	M102	PWR-LAB2A1	1	45.0	35.0
IN347	SW-LAB2	L-LAB-2B	227		FHEV-1-227	DXR2.E17C-103B	LA02_FHEV-1-227	TBD	3470215	227G	WET LAB	M102	PWR-LAB2A1	2	44.0	
IN347	SW-LAB2	L-LAB-2B	227		LEEV-1-227	DXR2.E17C-103B	LA02_LEEV-1-227	TBD	3470216	227G	WET LAB	M102	PWR-LAB2A1	3	43.0	
IN347	SW-LAB2	L-LAB-2A	228	LTB-1-228	LGEV-1-228	DXR2.E17C-103B	LA02_LTB-1-228	TBD	3470217	227F	CELL CULTURE	M102	PWR-LAB2A1	4,5	49.5	35.0
IN347	SW-LAB2	L-LAB-2A	228		LEEV-1-228	DXR2.E17C-103B	LA02_LEEV-1-228	TBD	3470218	227F	CELL CULTURE	M102	PWR-LAB2A2	1	43.0	
IN347	SW-LAB2	L-LAB-2A	229	LTB-1-229	LGEV-1-229	DXR2.E17C-103B	LA02_LTB-1-229	TBD	3470219	227E	WET LAB	M102	PWR-LAB2A2	2,3	50.5	35.0
IN347	SW-LAB2	L-LAB-2A	229		LEEV-1-229	DXR2.E17C-103B	LA02_LEEV-1-229	TBD	3470220	227E	WET LAB	M102	PWR-LAB2A2	4	43.0	
IN347	SW-LAB2	L-LAB-2A	230	LTB-1-230	LGEV-1-230	DXR2.E17C-103B	LA02_LTB-1-230	TBD	3470221	227D	WET LAB	M102	PWR-LAB2A3	1,2	50.5	35.0
IN347	SW-LAB2	L-LAB-2A	230		LEEV-1-230	DXR2.E17C-103B	LA02_LEEV-1-230	TBD	3470222	227D	WET LAB	M102	PWR-LAB2A3	2	43.0	
IN347	SW-LAB2	L-LAB-2A	231	LTB-1-231	LGEV-1-231	DXR2.E17C-103B	LA02_LTB-1-231	TBD	3470223	227C	WET LAB	M102	PWR-LAB2A3	3,4	50.5	35.0
IN347	SW-LAB2	L-LAB-2A	231		FHEV-1-231	DXR2.E17C-103B	LA02_LEEV-1-231	TBD	3470224	227C	WET LAB	M102	PWR-LAB2A3	4	44.0	
IN347	SW-LAB2	L-LAB-2A	231		LEEV-1-231	DXR2.E17C-103B	LA02_LEEV-1-231	TBD	3470225	227C	WET LAB	M102	PWR-LAB2A3	5	43.0	
IN347	SW-LAB2	L-LAB-2B	232	LTB-1-232		DXR2.E17C-103B	LA02_LTB-1-232	TBD	3470226	227	LAB HALL WAY	M102	PWR-LAB2B2	4	22.0	
IN347	SW-LAB2	L-LAB-2A	234	LTB-1-234	LGEV-1-234	DXR2.E17C-103B	LA02_LTB-1-234	TBD	3470227	227A	COMMON CHEM ROOM	M102	PWR-LAB2A2	4	35.0	

2ND FLOOR NON-LAB ROOM ETHERNET DXR SCHEDULE

BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASSOCIATED	4-PIPE CHILLED BEAM	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA
IN347	SW-LAB2	L-2B	201	TB-4-201			DXR2.E12	LA04_TB-4-201	TBD	3470426	299	ELEVATOR	M102	PWR-2B1	1	12.3
IN347	SW-LAB2	L-2B	203	TB-4-203	EV-4-203		DXR2.E17C-103B	LA04_TB-4-203	TBD	3470427	200	IU LAB OFFICE	M102	PWR-2B1	1	39.5
IN347	SW-LAB2	L-2B	204	TB-4-204	EV-4-204		DXR2.E17C-103B	LA04_TB-4-204	TBD	3470428	296B	WOMEN	M102	PWR-2B1	4	35.0
IN347	SW-LAB2	L-2B	205	TB-4-205	EV-4-205		DXR2.E17C-103B	LA04_TB-4-205	TBD	3470429	202	RESIDENCES & AMBASSODORS	M102	PWR-2B1	2	38.5
IN347	SW-LAB2	L-2B	205			CB-205-2	DXR2.E18-101B	LA04_CB-205-2	TBD	3470430	202	RESIDENCES & AMBASSODORS	M102	PWR-2B1	2	16.0
IN347	SW-LAB2	L-2B	206	TB-4-206	EV-4-206		DXR2.E17C-103B	LA04_TB-4-206	TBD	3470431	202A/B	OFFICE	M102	PWR-2B1	3	35.0
IN347	SW-LAB2	L-2B	208	TB-4-208	EV-4-208		DXR2.E17C-103B	LA04_TB-4-208	TBD	3470432	202C	MTG ROOM	M102	PWR-2B2	1	35.0
IN347	SW-LAB2	L-2B	211	TB-4-211	EV-4-211		DXR2.E17C-103B	LA04_TB-4-211	TBD	3470433		OFFICE	M102	PWR-2B2	1	38.5
IN347	SW-LAB2	L-2B	216	TB-4-216			DXR2.E12	LA04_TB-4-216	TBD	3470434	299E	CIRCULATION	M102	PWR-2B1	1	12.3
IN347	SW-LAB2	L-2B	217	TB-4-217	EV-4-217		DXR2.E17C-103B	LA04_TB-4-217	TBD	3470435	231	MEETING ROOM	M102	PWR-2B1	5	39.5
IN347	SW-LAB2	L-2B	218	TB-4-218	EV-4-218		DXR2.E17C-103B	LA04_TB-4-218	TBD	3470436	229	MEETING ROOM	M102	PWR-2B1	5	39.5
IN347	SW-LAB2	L-2B	236	TB-4-236	EV-4-236		DXR2.E17C-103B	LA04_TB-4-236	TBD	3470437	205	WELLNESS ROOM	M102	PWR-2B1	4	35.0
IN347	SW-LAB2	L-2B	4-238	TB-4-238	EV-4-238		DXR2.E17C-103B	LA04_TB-4-238	TBD	3470438	N/A	OFFICE	M102	PWR-2B2	2	35.0
IN347	SW-LAB2	L-2B	240	TB-4-240			DXR2.E12	LA04_TB-4-240	TBD	3470439	INJECTION VAV BOX	INJECTION VAV BOX	M102	PWR-2B1	3	16.5
IN347	SW-LAB2	L-2A	209	TB-4-209	EV-4-209		DXR2.E17C-103B	LA04_TB-4-209	TBD	3470440	207	CENTRAL COLAB	M102	PWR-2A1	1	35.0
IN347	SW-LAB2	L-2A	210	TB-4-210	EV-4-210		DXR2.E17C-103B	LA04_TB-4-210	TBD	3470441	207	CENTRAL COLAB	M102	PWR-2A1	1	35.0
IN347	SW-LAB2	L-2A	212	TB-4-212	EV-4-212		DXR2.E17C-103B	LA04_TB-4-212	TBD	3470442	212	OPEN OFFICE	M102	PWR-2A1	2	39.5
IN347	SW-LAB2	L-2A	214	TB-4-214	EV-4-214		DXR2.E17C-103B	LA04_TB-4-214	TBD	3470443	220	OPEN OFFICE	M102	PWR-2A1	3	38.5
IN347	SW-LAB2	L-2A	215	TB-4-215	EV-4-215		DXR2.E17C-103B	LA04_TB-4-215	TBD	3470444	226	OPEN WORK ROOM	M102	PWR-2A1	4	38.5
IN347	SW-LAB2	L-2A	235	TB-1-235	EV-1-235		DXR2.E17C-103B	LA02_TB-4-235	TBD	3470228	227B	SHARED LAB SUPPORT	M102	PWR-2A1	4	35.0
IN347	SW-LAB2	L-2A	237	TB-1-237	EV-1-237		DXR2.E17C-103B	LA02_TB-4-237	TBD	3470229	298B	MDF	M102	PWR-2A1	2	34.0
IN347	SW-LAB2	L-2A	1-238	TB-1-238	EV-1-238		DXR2.E17C-103B	LA02_TB-4-238	TBD	3470230	298E	SECURITY	M102	PWR-2A1	5	34.0
IN347	SW-LAB2	L-2A	239	TB-4-239	EV-4-239		DXR2.E17C-103B	LA04_TB-4-239	TBD	3470445	N/A	MEETING ROOM	M102	PWR-2A1	3	38.5

INSTALLATION NOTES:

1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.



SECURITY ROOM 298E

JANITOR'S CLOSET 297

1 / R04 2ND FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

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GU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DRAWN BY	CHECKED BY	APPROVED BY	ISSUE DATE
HB	KR	04/02/26	04/02/26

2ND FLR ETHERNET DXR NETWORK

440P412785
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R05

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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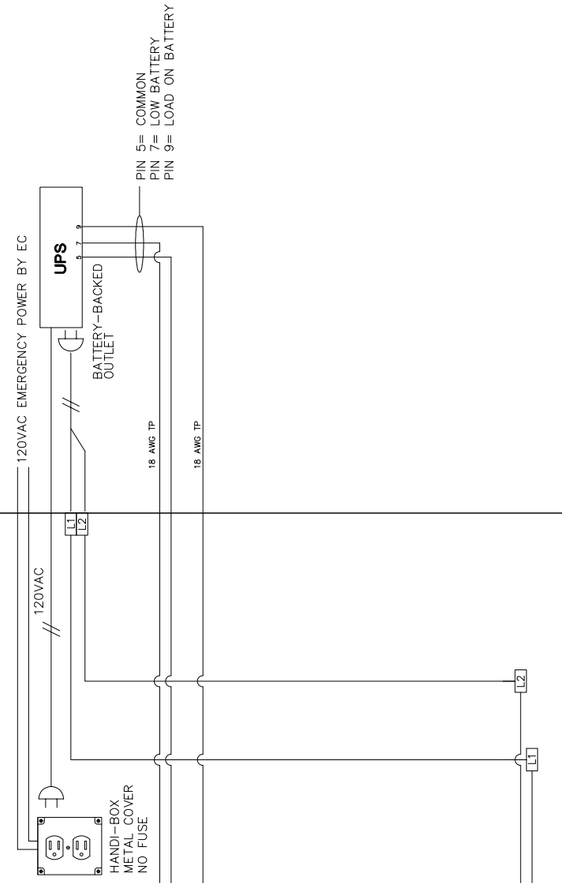
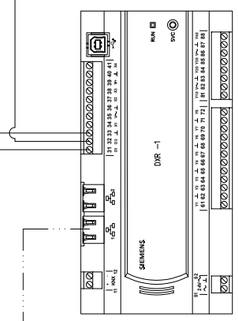
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



GENERAL NOTES:

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REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

PNL-LAB2 UPS WIRING

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R05A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station
PNL LAB2	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW LAB2	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

2ND FLR E.DXR NETWORK BOM

440P412785
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R05B

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3RD FLOOR LAB ROOM ETHERNET DXR SCHEDULE

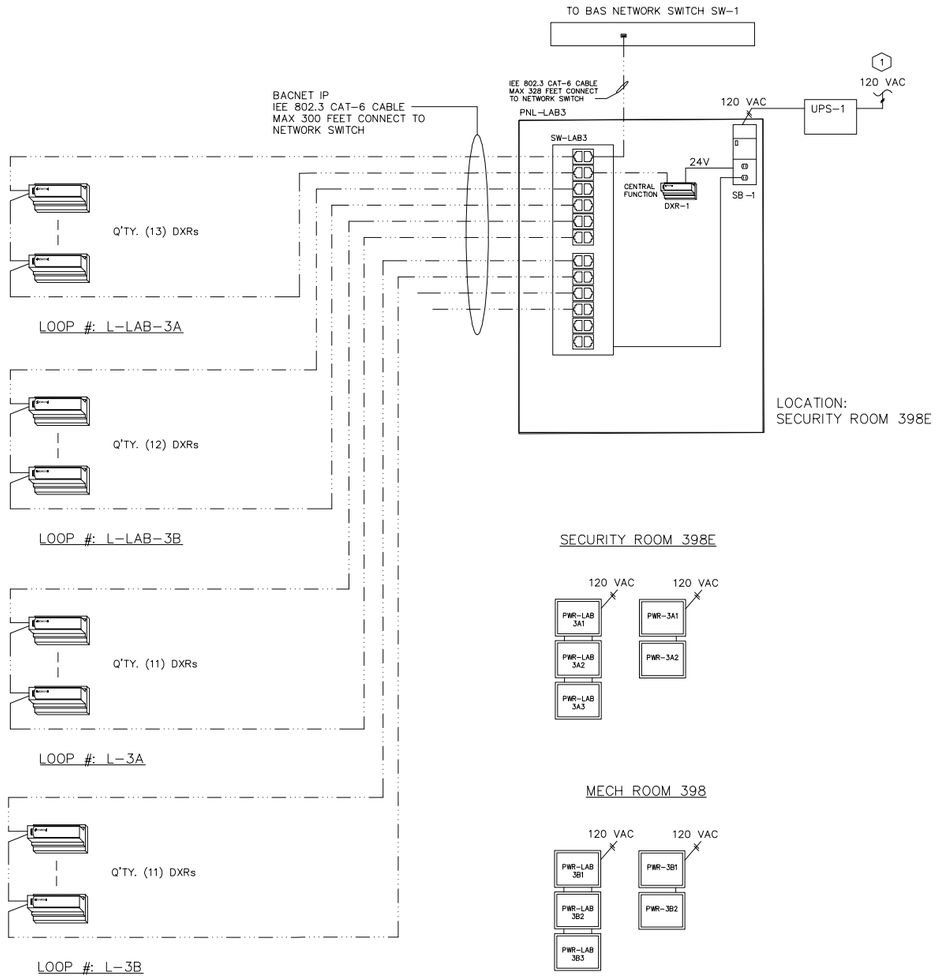
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA	
															TRUNK_1	TRUNK_2
IN347	SW-LAB3	L-LAB-3B				DXR2.E18-101B	LA03_DXR-CF	TBD	3470301				SB-1			
IN347	SW-LAB3	L-LAB-3B	324	LTB-1-324	LGEV-1-324	DXR2.E17C-103B	LA02_LTB-1-219	TBD	3470302	327F	LAB SUPP	M103	PWR-LAB3B1	1	35.0	
IN347	SW-LAB3	L-LAB-3B	325	LTB-1-325	LGEV-1-325	DXR2.E17C-103B	LA02_LTB-1-220	TBD	3470303	327	WET LAB	M103	PWR-LAB3B1	2	45.0	35.0
IN347	SW-LAB3	L-LAB-3B	325		FHEV-1-325	DXR2.E17C-103B	LA02_FHEV-1-220	TBD	3470304	327	WET LAB	M103	PWR-LAB3B1	3	44.0	
IN347	SW-LAB3	L-LAB-3B	326	LTB-1-326	LGEV-1-326	DXR2.E17C-103B	LA02_LEEV-1-220	TBD	3470305	327E	FREEZER RM	M103	PWR-LAB3B1	4	38.5	
IN347	SW-LAB3	L-LAB-3B	327	LTB-1-327	LGEV-1-327	DXR2.E17C-103B	LA02_LTB-1-221	TBD	3470306	327D	LAB SUPP	M103	PWR-LAB3B1	4	35.0	
IN347	SW-LAB3	L-LAB-3B	328	LTB-1-328	LGEV-1-328	DXR2.E17C-103B	LA02_LTB-1-223	TBD	3470307	327	AREA B-9	M103	PWR-LAB3B2	1,2	45.0	35.0
IN347	SW-LAB3	L-LAB-3B	328		FHEV-1-328	DXR2.E17C-103B	LA02_LTB-1-224	TBD	3470308	327	AREA B-9	M103	PWR-LAB3B2	3	44.0	
IN347	SW-LAB3	L-LAB-3B	328		LEEV-1-328	DXR2.E17C-103B	LA02_LTB-1-225	TBD	3470309	327	AREA B-9	M103	PWR-LAB3B2	4	43.0	
IN347	SW-LAB3	L-LAB-3A	329	LTB-1-329	LGEV-1-329	DXR2.E17C-103B	LA02_LEEV-1-225	TBD	3470310	327	AREA B-8	M103	PWR-LAB3A1	1	45.0	35.0
IN347	SW-LAB3	L-LAB-3A	329		LEEV-1-329	DXR2.E17C-103B	LA02_LTB-1-226	TBD	3470311	327	AREA B-8	M103	PWR-LAB3A1	2	43.0	
IN347	SW-LAB3	L-LAB-3A	330	LTB-1-330	LGEV-1-330	DXR2.E17C-103B	LA02_FHEV-1-226	TBD	3470312	327C	CELL CULTURE	M103	PWR-LAB3A1	3	38.5	
IN347	SW-LAB3	L-LAB-3A	331	LTB-1-331	LGEV-1-331	DXR2.E17C-103B	LA02_LEEV-1-226	TBD	3470313	327B	CONSUMABLES	M103	PWR-LAB3A1	4	35.0	
IN347	SW-LAB3	L-LAB-3A	332	LTB-1-332	LGEV-1-332	DXR2.E17C-103B	LA02_LTB-1-227	TBD	3470314	327	AREA B-5	M103	PWR-LAB3A2	1,2	50.5	35.0
IN347	SW-LAB3	L-LAB-3A	332		FHEV-1-332	DXR2.E17C-103B	LA02_FHEV-1-227	TBD	3470315	327	AREA B-5	M103	PWR-LAB3A2	2	44.0	
IN347	SW-LAB3	L-LAB-3A	332		LEEV-1-332	DXR2.E17C-103B	LA02_LEEV-1-227	TBD	3470316	327	AREA B-5	M103	PWR-LAB3A2	3	43.0	
IN347	SW-LAB3	L-LAB-3A	333	LTB-1-333	LGEV-1-333	DXR2.E17C-103B	LA02_LTB-1-228	TBD	3470317	327	AREA B-4	M103	PWR-LAB3A3	1,2	50.5	35.0
IN347	SW-LAB3	L-LAB-3A	333		FHEV-1-333	DXR2.E17C-103B	LA02_LEEV-1-228	TBD	3470318	327	AREA B-4	M103	PWR-LAB3A3	2	44.0	
IN347	SW-LAB3	L-LAB-3A	333		LEEV-1-333	DXR2.E17C-103B	LA02_LTB-1-229	TBD	3470319	327	AREA B-4	M103	PWR-LAB3A3	3	43.0	
IN347	SW-LAB3	L-LAB-3A	335	LTB-1-335	LGEV-1-335	DXR2.E17C-103B	LA02_LEEV-1-229	TBD	3470320	327A	COMMON CHEM ROOM	M103	PWR-LAB3A2	4	35.0	
IN347	SW-LAB3	L-LAB-3A	337	LTB-1-337	LGEV-1-337	DXR2.E17C-103B	LA02_LTB-1-230	TBD	3470321	327	AREA B-6	M103	PWR-LAB3A3	4	45.0	35.0
IN347	SW-LAB3	L-LAB-3A	337		FHEV-1-337	DXR2.E17C-103B	LA02_LEEV-1-230	TBD	3470322	327	AREA B-6	M103	PWR-LAB3A3	5	44.0	
IN347	SW-LAB3	L-LAB-3B	338	LTB-1-338	LGEV-1-338	DXR2.E17C-103B	LA02_LTB-1-231	TBD	3470323	327	AREA B-11	M103	PWR-LAB3B3	1	45.0	35.0
IN347	SW-LAB3	L-LAB-3B	338		FHEV-1-338	DXR2.E17C-103B	LA02_LEEV-1-231	TBD	3470324	327	AREA B-11	M103	PWR-LAB3B3	2	44.0	
IN347	SW-LAB3	L-LAB-3B	338		LEEV-1-338	DXR2.E17C-103B	LA02_LEEV-1-231	TBD	3470325	327	AREA B-11	M103	PWR-LAB3B3	3	43.0	

3RD FLOOR NON-LAB ROOM ETHERNET DXR SCHEDULE

BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA
IN347	SW-LAB3	L-3B	301	TB-4-301		DXR2.E12	LA04_TB-4-301	TBD	3470501	399	N/A	M103	PWR-3B2	1	12.3
IN347	SW-LAB3	L-3B	303	TB-4-303	EV-4-303	DXR2.E17C-103B	LA04_TB-4-303	TBD	3470502	300	DATA SCIENCE	M103	PWR-3B1	1	39.5
IN347	SW-LAB3	L-3B	304	TB-4-304	EV-4-304	DXR2.E17C-103B	LA04_TB-4-304	TBD	3470503	300	DATA SCIENCE	M103	PWR-3B1	1	38.5
IN347	SW-LAB3	L-3B	305	TB-4-305	EV-4-305	DXR2.E17C-103B	LA04_TB-4-305	TBD	3470504	302	COMP LAB	M103	PWR-3B1	2	38.5
IN347	SW-LAB3	L-3B	306	TB-4-306	EV-4-306	DXR2.E17C-103B	LA04_TB-4-306	TBD	3470505	302	COMP LAB	M103	PWR-3B1	2	38.5
IN347	SW-LAB3	L-3B	307	TB-4-307	EV-4-307	DXR2.E17C-103B	LA04_TB-4-307	TBD	3470506	396B	WOMEN	M103	PWR-3B1	4	35.0
IN347	SW-LAB3	L-3B	308	TB-4-308	EV-4-308	DXR2.E17C-103B	LA04_TB-4-308	TBD	3470507	303	NEXUS CENTRAL COLLAB	M103	PWR-3B1	3	35.0
IN347	SW-LAB3	L-3B	309	TB-4-309	EV-4-309	DXR2.E17C-103B	LA04_TB-4-309	TBD	3470508	303	NEXUS CENTRAL COLLAB	M103	PWR-3B1	3	35.0
IN347	SW-LAB3	L-3B	321	TB-4-321	EV-4-321	DXR2.E17C-103B	LA04_TB-4-321	TBD	3470509	329	PROJECT ROOM	M103	PWR-3B1	5	39.0
IN347	SW-LAB3	L-3B	322	TB-4-322	EV-4-322	DXR2.E17C-103B	LA04_TB-4-322	TBD	3470510	329A	HOTELING OFFICE	M103	PWR-3B1	5	36.0
IN347	SW-LAB3	L-3B	337	TB-4-337	EV-4-337	DXR2.E17C-103B	LA04_TB-4-337	TBD	3470511	301	WELLNESS ROOM	M103	PWR-3B1	4	35.0
IN347	SW-LAB3	L-3A	311	TB-1-311	EV-1-311	DXR2.E17C-103B	LA03_TB-1-311	TBD	3470326	398	SECURITY	M103	PWR-3A1	1	34.0
IN347	SW-LAB3	L-3A	312	TB-4-312	EV-4-312	DXR2.E17C-103B	LA05_TB-4-312	TBD	3470512	308	SHARED OFFICE SPACE	M103	PWR-3A1	2	39.5
IN347	SW-LAB3	L-3A	313	TB-4-313	EV-4-313	DXR2.E17C-103B	LA05_TB-4-313	TBD	3470513	306	HOTELING OFFICE	M103	PWR-3A1	2	39.5
IN347	SW-LAB3	L-3A	314	TB-4-314	EV-4-314	DXR2.E17C-103B	LA05_TB-4-314	TBD	3470514	310	MEETING ROOM	M103	PWR-3A1	3	38.5
IN347	SW-LAB3	L-3A	315	TB-4-315	EV-4-315	DXR2.E17C-103B	LA05_TB-4-315	TBD	3470515	312	OFFICE	M103	PWR-3A1	3	38.5
IN347	SW-LAB3	L-3A	316	TB-4-316	EV-4-316	DXR2.E17C-103B	LA05_TB-4-316	TBD	3470516	314	OFFICE	M103	PWR-3A1	4	38.5
IN347	SW-LAB3	L-3A	317	TB-4-317	EV-4-317	DXR2.E17C-103B	LA05_TB-4-317	TBD	3470517	316	OFFICE	M103	PWR-3A1	4	38.5
IN347	SW-LAB3	L-3A	318	TB-4-318	EV-4-318	DXR2.E17C-103B	LA05_TB-4-318	TBD	3470518	318	OFFICE	M103	PWR-3A1	5	38.5
IN347	SW-LAB3	L-3A	319	TB-4-319	EV-4-319	DXR2.E17C-103B	LA05_TB-4-319	TBD	3470519	320	SHARED OFFICE SPACE	M103	PWR-3A1	5	38.5
IN347	SW-LAB3	L-3A	320	TB-4-320	EV-4-320	DXR2.E17C-103B	LA05_TB-4-320	TBD	3470520	326	OPEN WORK ROOM	M103	PWR-3A2	1	38.5
IN347	SW-LAB3	L-3A	336	TB-1-336	EV-1-336	DXR2.E17C-103B	LA03_TB-1-336	TBD	3470327	398B	MDF	M103	PWR-3A1	1	34.0

INSTALLATION NOTES:

1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.



SECURITY ROOM 398E

MECH ROOM 398

1 / R04 3RD FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

440P412785
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R06

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GU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	ISSUE DATE	LAST DATE PLOTTED
HB		KR		04/02/26	04/06/26

3RD FLR ETHERNET DXR NETWORK

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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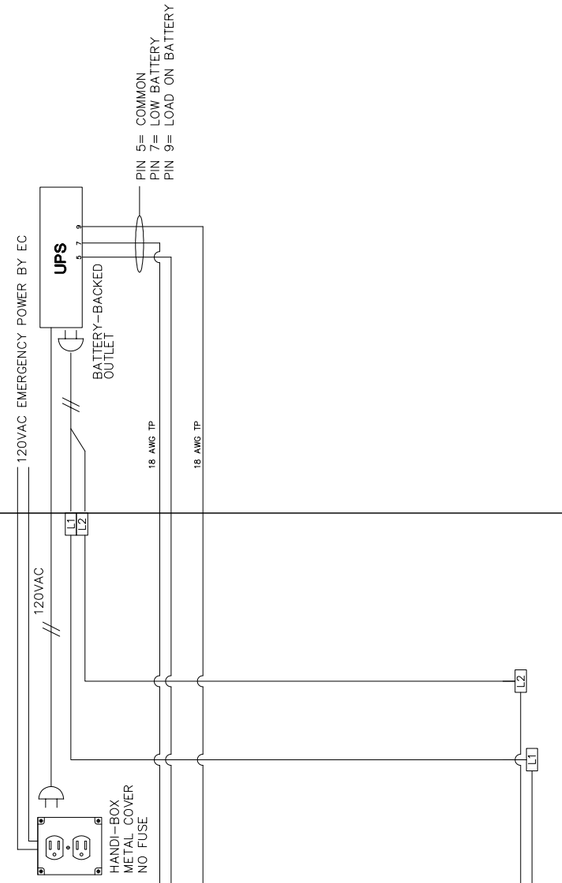
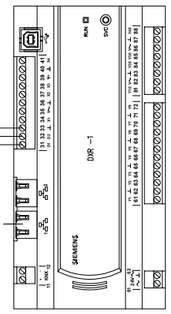
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



CAT 6 ETHERNET TO NETWORK SWITCH

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.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

PNL-LAB3 UPS WIRING

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station
PNL LAB3	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW LAB3	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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3RD FLR E.DXR NETWORK BOM

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4TH FLOOR LAB ROOM ETHERNET DXR SCHEDULE

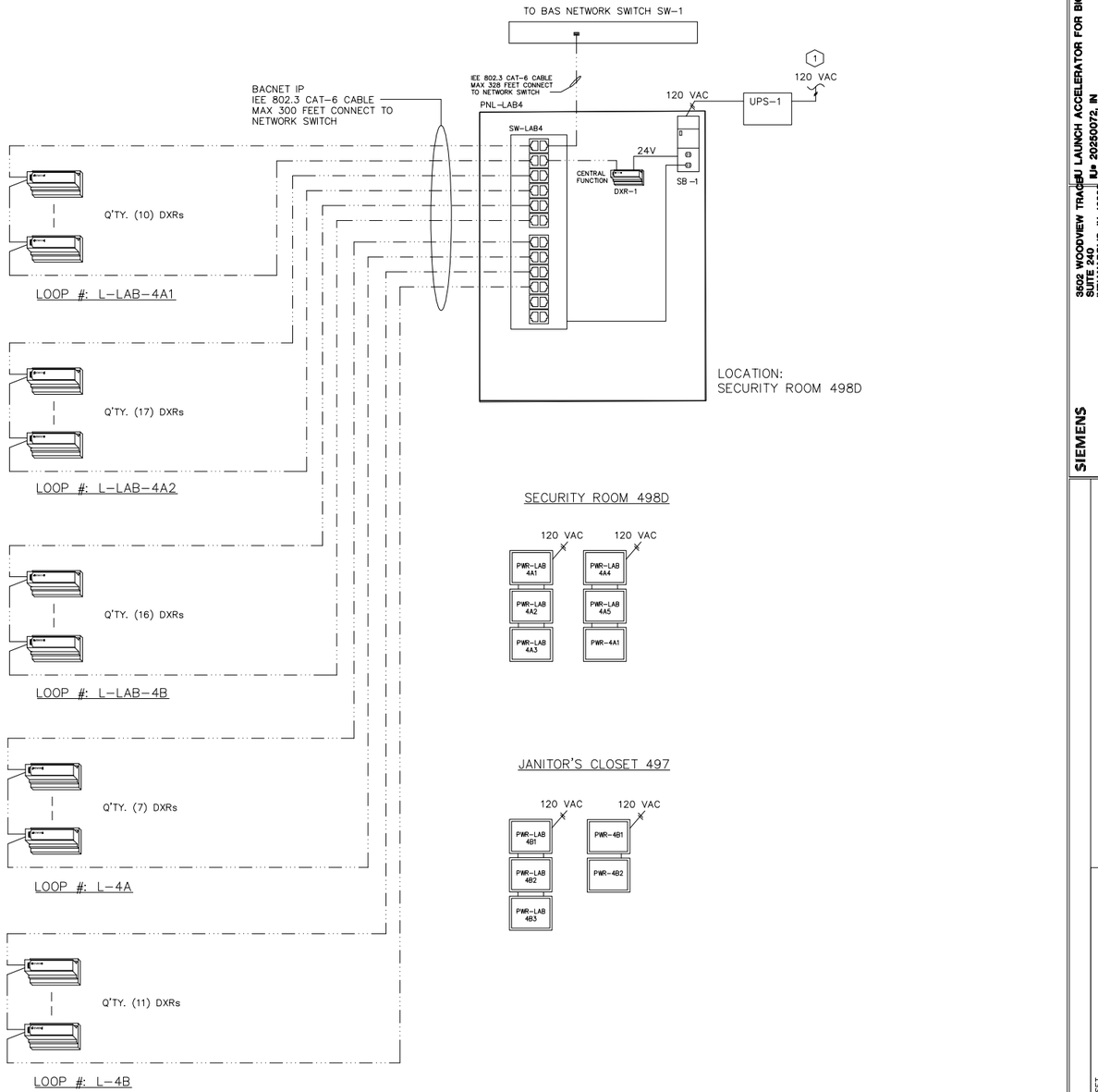
														POWER VA	
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASSOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	TRUNK_1	TRUNK_2
IN347	SW-LAB4	L-LAB-4B				DXR2.E18-101B	LA11_DXR-CF	TBD	3471101				SB-1			
IN347	SW-LAB4	L-LAB-4A1	405	LTB-1-405	LGEV-1-405	DXR2.E17C-103B	LA11_LTB-1-405	TBD	3471102	407	LAB SUPP	M104	PWR-LAB4A4	5	35.0	
IN347	SW-LAB4	L-LAB-4B	419	LTB-1-419	LGEV-1-419	DXR2.E17C-103B	LA11_LTB-1-419	TBD	3471103	427H	LAB SUPP	M104	PWR-LAB4B1	1	35.0	
IN347	SW-LAB4	L-LAB-4B	420	LTB-1-420	LGEV-1-420	DXR2.E17C-103B	LA11_LTB-1-420	TBD	3471104	427	WET LAB B-12	M104	PWR-LAB4B1	2	45.0	35.0
IN347	SW-LAB4	L-LAB-4B	420		FHEV-1-420-1	DXR2.E17C-103B	LA11_FHEV-1-420-1	TBD	3471105	427	WET LAB B-12	M104	PWR-LAB4B1	3	44.0	
IN347	SW-LAB4	L-LAB-4B	420		FHEV-1-420-2	DXR2.E17C-103B	LA11_FHEV-1-420-2	TBD	3471106	427	WET LAB B-12	M104	PWR-LAB4B1	4	44.0	
IN347	SW-LAB4	L-LAB-4B	421	LTB-1-421	LGEV-1-421	DXR2.E17C-103B	LA11_LTB-1-421	TBD	3471107	427	WET LAB B-12	M104	PWR-LAB4B1	5	38.5	
IN347	SW-LAB4	L-LAB-4B	422	LTB-1-422	LGEV-1-422	DXR2.E17C-103B	LA11_LTB-1-422	TBD	3471108	427G	FREEZER RM	M104	PWR-LAB4B2	1	35.0	
IN347	SW-LAB4	L-LAB-4B	423	LTB-1-423	LGEV-1-423	DXR2.E17C-103B	LA11_LTB-1-423	TBD	3471109	427F	LAB SUPP	M104	PWR-LAB4B2	1,2	45.0	35.0
IN347	SW-LAB4	L-LAB-4B	423		FHEV-1-423-1	DXR2.E17C-103B	LA11_FHEV-1-423-1	TBD	3471110	427	AREA B-9	M104	PWR-LAB4B2	3	44.0	
IN347	SW-LAB4	L-LAB-4B	423		FHEV-1-423-2	DXR2.E17C-103B	LA11_FHEV-1-423-2	TBD	3471111	427	AREA B-9	M104	PWR-LAB4B2	4	44.0	
IN347	SW-LAB4	L-LAB-4B	423		FHEV-1-423-3	DXR2.E17C-103B	LA11_FHEV-1-423-3	TBD	3471112	427	AREA B-9	M104	PWR-LAB4B2	5	43.0	
IN347	SW-LAB4	L-LAB-4A1	424	LTB-1-424	LGEV-1-424	DXR2.E17C-103B	LA11_LTB-1-424	TBD	3471113	427	AREA B-8	M104	PWR-LAB4A1	1	45.0	35.0
IN347	SW-LAB4	L-LAB-4A1	424		FHEV-1-424-1	DXR2.E17C-103B	LA11_FHEV-1-424-1	TBD	3471114	427	AREA B-8	M104	PWR-LAB4A1	2	44.0	
IN347	SW-LAB4	L-LAB-4A1	424		FHEV-1-424-2	DXR2.E17C-103B	LA11_FHEV-1-424-2	TBD	3471115	427	AREA B-8	M104	PWR-LAB4A1	3	44.0	
IN347	SW-LAB4	L-LAB-4A1	424		LEEV-1-424	DXR2.E17C-103B	LA11_LEEV-1-424	TBD	3471116	427	AREA B-8	M104	PWR-LAB4A1	4	43.0	
IN347	SW-LAB4	L-LAB-4A1	425	LTB-1-425	LGEV-1-425	DXR2.E17C-103B	LA11_LTB-1-425	TBD	3471117	427E	CELL CULTURE	M104	PWR-LAB4A1	5	38.5	
IN347	SW-LAB4	L-LAB-4A1	426	LTB-1-426	LGEV-1-426	DXR2.E17C-103B	LA11_LTB-1-426	TBD	3471118	427D	CONSUMABLES	M104	PWR-LAB4A1	5	35.0	
IN347	SW-LAB4	L-LAB-4A2	427	LTB-1-427	LGEV-1-427	DXR2.E17C-103B	LA11_LTB-1-427	TBD	3471119	427	WET LAB	M104	PWR-LAB4A2	1,2	46.0	35.0
IN347	SW-LAB4	L-LAB-4A2	427		FHEV-1-427-1	DXR2.E17C-103B	LA11_FHEV-1-427-1	TBD	3471120	427	WET LAB	M104	PWR-LAB4A2	3	44.0	
IN347	SW-LAB4	L-LAB-4A2	427		FHEV-1-427-2	DXR2.E17C-103B	LA11_FHEV-1-427-2	TBD	3471121	427	WET LAB	M104	PWR-LAB4A2	4	44.0	
IN347	SW-LAB4	L-LAB-4A2	427		FHEV-1-427-3	DXR2.E17C-103B	LA11_FHEV-1-427-3	TBD	3471122	427	WET LAB	M104	PWR-LAB4A2	5	44.0	
IN347	SW-LAB4	L-LAB-4A2	428	LTB-1-428	LGEV-1-428	DXR2.E17C-103B	LA11_LTB-1-428	TBD	3471123	427	WET LAB	M104	PWR-LAB4A3	1,2	46.0	35.0
IN347	SW-LAB4	L-LAB-4A2	428		FHEV-1-428-1	DXR2.E17C-103B	LA11_FHEV-1-428-1	TBD	3471124	427	WET LAB	M104	PWR-LAB4A3	3	44.0	
IN347	SW-LAB4	L-LAB-4A2	428		FHEV-1-428-2	DXR2.E17C-103B	LA11_FHEV-1-428-2	TBD	3471125	427	WET LAB	M104	PWR-LAB4A3	4	44.0	
IN347	SW-LAB4	L-LAB-4A2	428		LEEV-1-428	DXR2.E17C-103B	LA11_LEEV-1-428	TBD	3471126	427	WET LAB	M104	PWR-LAB4A3	5	43.0	
IN347	SW-LAB4	L-LAB-4A1	429	LTB-1-429	LGEV-1-429	DXR2.E17C-103B	LA11_LTB-1-429	TBD	3471127	427C	COMMON CHEM ROOM	M104	PWR-LAB4A3	2	35.0	
IN347	SW-LAB4	L-LAB-4A1	430	LTB-1-430	LGEV-1-430	DXR2.E17C-103B	LA11_LTB-1-430	TBD	3471128	407	LAB SUPP	M104	PWR-LAB4A4	5	35.0	
IN347	SW-LAB4	L-LAB-4A1	431	LTB-1-431	LGEV-1-431	DXR2.E17C-103B	LA11_LTB-1-431	TBD	3471129	427B	LAB SUPP	M104	PWR-LAB4B2	2	35.0	
IN347	SW-LAB4	L-LAB-4A2	434	LTB-1-434	LGEV-1-434	DXR2.E17C-103B	LA11_LTB-1-434	TBD	3471130	427	WET LAB B-4	M104	PWR-LAB4A4	1,2	46.0	35.0
IN347	SW-LAB4	L-LAB-4A2	434		FHEV-1-434-1	DXR2.E17C-103B	LA11_FHEV-1-434-1	TBD	3471131	427	WET LAB B-4	M104	PWR-LAB4A4	2	44.0	
IN347	SW-LAB4	L-LAB-4A2	434		FHEV-1-434-2	DXR2.E17C-103B	LA11_FHEV-1-434-2	TBD	3471132	427	WET LAB B-4	M104	PWR-LAB4A4	3	44.0	
IN347	SW-LAB4	L-LAB-4A2	435	LTB-1-435	LGEV-1-435	DXR2.E17C-103B	LA11_LTB-1-435	TBD	3471133	427	WET LAB B-5	M104	PWR-LAB4A5	1,2	46.0	35.0
IN347	SW-LAB4	L-LAB-4A2	435		FHEV-1-435-1	DXR2.E17C-103B	LA11_FHEV-1-435-1	TBD	3471134	427	WET LAB B-5	M104	PWR-LAB4A5	2	44.0	
IN347	SW-LAB4	L-LAB-4A2	435		FHEV-1-435-2	DXR2.E17C-103B	LA11_FHEV-1-435-2	TBD	3471135	427	WET LAB B-5	M104	PWR-LAB4A5	3	44.0	
IN347	SW-LAB4	L-LAB-4A2	436	LTB-1-436	LGEV-1-436	DXR2.E17C-103B	LA11_LTB-1-436	TBD	3471136	427	WET LAB B-6	M104	PWR-LAB4A5	4	45.0	35.0
IN347	SW-LAB4	L-LAB-4A2	436		FHEV-1-436-1	DXR2.E17C-103B	LA11_FHEV-1-436-1	TBD	3471137	427	WET LAB B-6	M104	PWR-LAB4A5	5	44.0	
IN347	SW-LAB4	L-LAB-4A2	436		FHEV-1-436-2	DXR2.E17C-103B	LA11_FHEV-1-436-2	TBD	3471138	427	WET LAB B-6	M104	PWR-LAB4A4	4	44.0	
IN347	SW-LAB4	L-LAB-4B	437	LTB-1-437	LGEV-1-437	DXR2.E17C-103B	LA11_LTB-1-437	TBD	3471139	427	WET LAB B-11	M104	PWR-LAB4B3	1	45.0	35.0
IN347	SW-LAB4	L-LAB-4B	437		FHEV-1-437-1	DXR2.E17C-103B	LA11_FHEV-1-437-1	TBD	3471140	427	WET LAB B-11	M104	PWR-LAB4B3	2	44.0	
IN347	SW-LAB4	L-LAB-4B	437		FHEV-1-437-2	DXR2.E17C-103B	LA11_FHEV-1-437-2	TBD	3471141	427	WET LAB B-11	M104	PWR-LAB4B3	3	44.0	
IN347	SW-LAB4	L-LAB-4B	437		FHEV-1-437-3	DXR2.E17C-103B	LA11_FHEV-1-437-3	TBD	3471142	427	WET LAB B-11	M104	PWR-LAB4B3	4	44.0	
IN347	SW-LAB4	L-LAB-4B	437		LEEV-1-437	DXR2.E17C-103B	LA11_LEEV-1-437	TBD	3471143	427	WET LAB B-11	M104	PWR-LAB4B3	5	43.0	

4TH FLOOR NON-LAB ROOM ETHERNET DXR SCHEDULE

BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASSOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA
IN347	SW-LAB4	L-4B	401	TB-4-401		DXR2.E12	LA05_TB-4-401	TBD	3470521	499	ELEVATOR	M104	PWR-4B2	1	12.3
IN347	SW-LAB4	L-4B	402	TB-1-402	EV-1-402	DXR2.E17C-103B	LA11_TB-4-402	TBD	3471144	402	P3 LAB	M104	PWR-4B1	1	38.5
IN347	SW-LAB4	L-4B	403	TB-4-403	EV-4-403	DXR2.E17C-103B	LA05_TB-4-403	TBD	3470522	400	MEETING ROOM	M104	PWR-4B1	2	39.5
IN347	SW-LAB4	L-4B	404	TB-4-404	EV-4-404	DXR2.E17C-103B	LA05_TB-4-404	TBD	3470523	496B	WOMEN	M104	PWR-4B1	3	35.0
IN347	SW-LAB4	L-4B	406	TB-1-406	EV-1-406	DXR2.E17C-103B	LA11_TB-1-406	TBD	3471145	402A	LAB SUPP	M104	PWR-4B1	2	35.0
IN347	SW-LAB4	L-4B	407	TB-1-407	EV-1-407	DXR2.E17C-103B	LA11_TB-1-407	TBD	3471146	402	P3 LAB	M104	PWR-4B1	1	38.5
IN347	SW-LAB4	L-4B	408	TB-1-408	EV-1-408	DXR2.E17C-103B	LA11_TB-1-408	TBD	3471147	402B	LAB SUPP	M104	PWR-4B1	4	35.0
IN347	SW-LAB4	L-4B	409	TB-1-409	EV-1-409	DXR2.E17C-103B	LA11_TB-1-409	TBD	3471148	404	STUDIO C/D	M104	PWR-4B1	4	38.5
IN347	SW-LAB4	L-4B	416	TB-4-416	EV-4-416	DXR2.E17C-103B	LA05_TB-4-416	TBD	3470524	429	PROJECT ROOM	M104	PWR-4B1	5	39.5
IN347	SW-LAB4	L-4B	417	TB-4-417	EV-4-417	DXR2.E17C-103B	LA05_TB-4-417	TBD	3470525	429A	HOTELING OFFICE	M104	PWR-4B1	5	39.5
IN347	SW-LAB4	L-4B	434	TB-4-434	EV-4-434	DXR2.E17C-103B	LA05_TB-4-434	TBD	3470526	403	WELLNESS ROOM	M104	PWR-4B1	3	35.0
IN347	SW-LAB4	L-4B	439	TB-4-439	EV-4-439	DXR2.E17C-103B	LA05_TB-4-439	TBD	3470527	401	STORAGE	M104	PWR-4B2	1	35.0
IN347	SW-LAB4	L-4A	410	TB-4-410	EV-4-410	DXR2.E17C-103B	LA05_TB-4-410	TBD	3470528	408	OPEN OFFICE	M104	PWR-4A1	1	39.5
IN347	SW-LAB4	L-4A	412	TB-1-412	EV-1-412	DXR2.E17C-103B	LA11_TB-1-412	TBD	3471149	498D	SECURITY	M104	PWR-4A1	1	34.0
IN347	SW-LAB4	L-4A	413	TB-4-413	EV-4-413	DXR2.E17C-103B	LA05_TB-4-413	TBD	3470529	420	OPEN OFFICE	M104	PWR-4A1	2	38.5
IN347	SW-LAB4	L-4A	414	TB-4-414	EV-4-414	DXR2.E17C-103B	LA05_TB-4-414	TBD	3470530	420	OPEN OFFICE	M104	PWR-4A1	2	38.5
IN347	SW-LAB4	L-4A	415	TB-4-415	EV-4-415	DXR2.E17C-103B	LA05_TB-4-415	TBD	3470531	426	OPEN WORK ROOM	M104	PWR-4A1	3	38.5
IN347	SW-LAB4	L-4A	433	TB-1-433	EV-1-433	DXR2.E17C-103B	LA11_TB-1-433	TBD	3471150	498A	MDF	M104	PWR-4A1	4	34.0
IN347	SW-LAB4	L-4A	437	TB-4-437	EV-4-437	DXR2.E17C-103B	LA05_TB-4-437	TBD	3470533	406	OFFICE	M104	PWR-4A1	4	39.5

INSTALLATION NOTES:

1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.



1 R04 4TH FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

SIEMENS
SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION
3502 WOODVIEW TRACE
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INDIANAPOLIS, IN 46268
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PHONE: 317-240-9980
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R07

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	ISSUED FOR PERMIT
KR	HB			04/06/26

4TH FLR ETHERNET DXR NETWORK

BJ LAUNCH ACCELERATOR FOR BIO
BJ# 202500072, IN

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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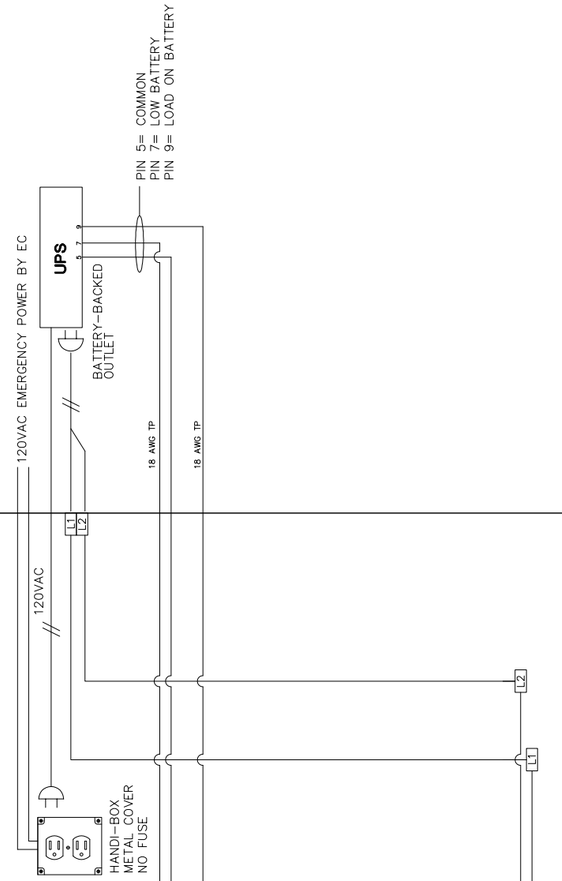
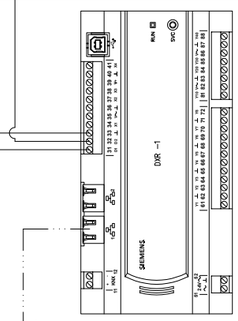
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



CAT 6 ETHERNET
TO NETWORK SWITCH

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.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

PNL-LAB4 UPS WIRING

440P412785
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R07A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station
PNL LAB4	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW LAB4	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

4TH FLR E.DXR NETWORK BOM

440P412785
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R07B

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5TH FLOOR LAB ROOM ETHERNET DXR SCHEDULE

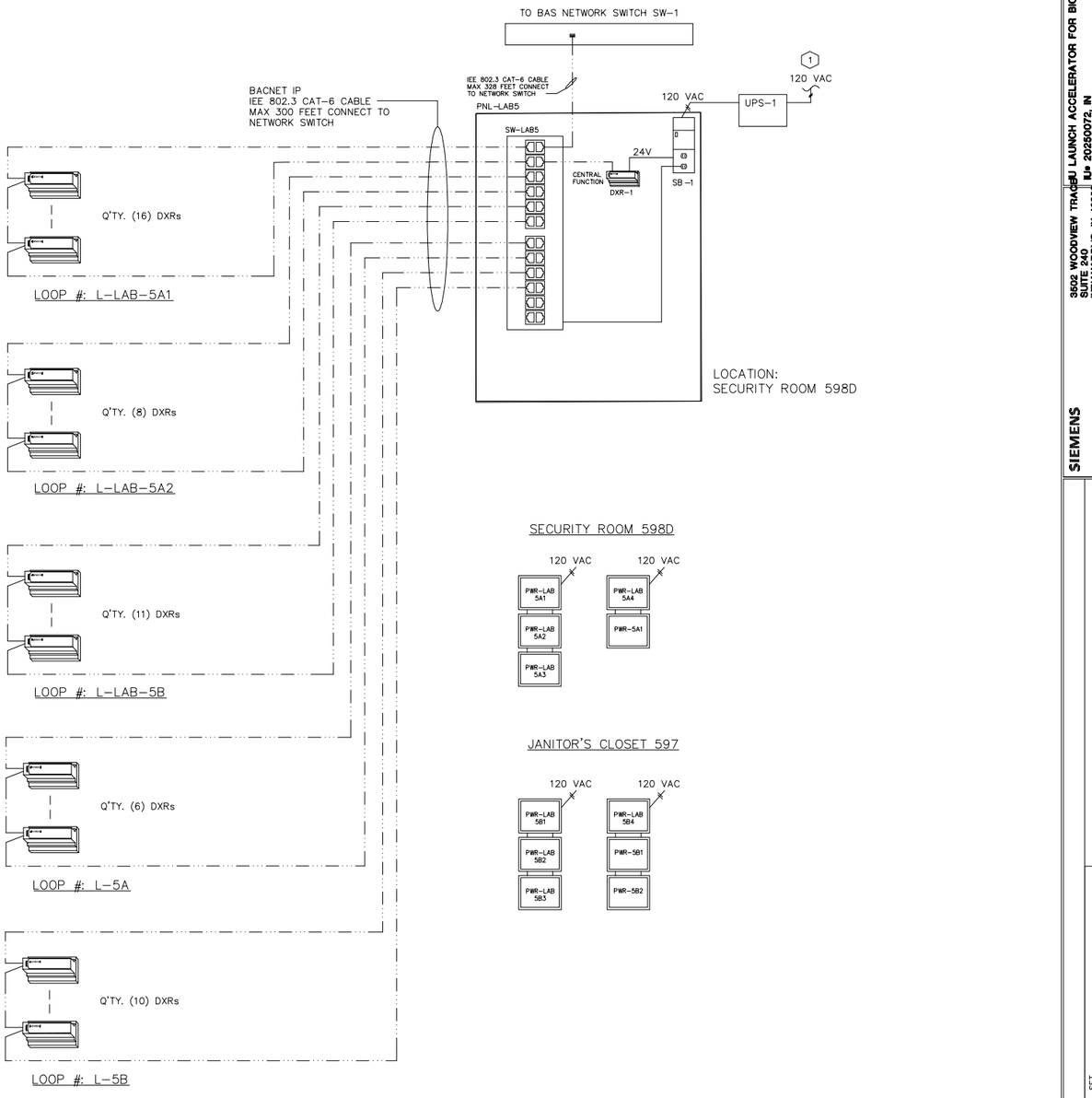
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA	
															TRUNK_1	TRUNK_2
IN347	SW-LAB5	L-LAB-5B				DXR2.E18-101B	LA17_DXR-CF	TBD	3471701				SB-1			
IN347	SW-LAB5	L-LAB-5B	502	LTB-1-502	LGEV-1-502	DXR2.E17C-103B	LA17_LTB-1-502	TBD	3471702	504	ANALYXIN GENOMICS CORE	M105	PWR-LAB5B1	1	35.0	
IN347	SW-LAB5	L-LAB-5B	507	LTB-1-507	LGEV-1-507	DXR2.E17C-103B	LA17_LTB-1-507	TBD	3471703	504A	LAB SUPP	M105	PWR-LAB5B1	5	38.5	
IN347	SW-LAB5	L-LAB-5B	508	LTB-1-508	LGEV-1-508	DXR2.E17C-103B	LA17_LTB-1-508	TBD	3471704	504B	LAB SUPP	M105	PWR-LAB5B2	1	45.0	35.0
IN347	SW-LAB5	L-LAB-5B	509	LTB-1-509	LGEV-1-509	DXR2.E17C-103B	LA17_LTB-1-509	TBD	3471705	504	ANALYXIN GENOMICS CORE	M105	PWR-LAB5B1	2,3	45.0	35.0
IN347	SW-LAB5	L-LAB-5B	509		LEEV-1-509	DXR2.E17C-103B	LA17_LEEV-1-509	TBD	3471706	504	ANALYXIN GENOMICS CORE	M105	PWR-LAB5B1	4	43.0	
IN347	SW-LAB5	L-LAB-5A1	521	LTB-1-521	LGEV-1-521	DXR2.E17C-103B	LA17_LTB-1-521	TBD	3471707	527	WET LAB	M105	PWR-LAB5B2	2	45.0	35.0
IN347	SW-LAB5	L-LAB-5A1	521		LEEV-1-521	DXR2.E17C-103B	LA17_LEEV-1-521	TBD	3471708	527	WET LAB	M105	PWR-LAB5B2	3	43.0	
IN347	SW-LAB5	L-LAB-5A1	522	LTB-1-522	LGEV-1-522	DXR2.E17C-103B	LA17_LTB-1-522	TBD	3471709	527J	AUTO CLAVE	M105	PWR-LAB5B3	3	35.0	
IN347	SW-LAB5	L-LAB-5A1	523	LTB-1-523	LGEV-1-523	DXR2.E17C-103B	LA17_LTB-1-523	TBD	3471710	527	WET LAB B-11	M105	PWR-LAB5B3	1	45.0	35.0
IN347	SW-LAB5	L-LAB-5A1	523		FHEV-1-523	DXR2.E17C-103B	LA17_FHEV-1-523	TBD	3471711	527	WET LAB B-11	M105	PWR-LAB5B3	2	44.0	
IN347	SW-LAB5	L-LAB-5A1	524	LTB-1-524	LGEV-1-524	DXR2.E17C-103B	LA17_LTB-1-524	TBD	3471712	527H	FREEZER RM	M105	PWR-LAB5B3	3	38.5	
IN347	SW-LAB5	L-LAB-5A1	526	LTB-1-526	LGEV-1-526	DXR2.E17C-103B	LA17_LTB-1-526	TBD	3471713	527	AREA B-8	M105	PWR-LAB5A1	1,2	45.0	35.0
IN347	SW-LAB5	L-LAB-5A1	526		LEEV-1-526	DXR2.E17C-103B	LA17_LEEV-1-526	TBD	3471714	527	AREA B-8	M105	PWR-LAB5A1	2	43.0	
IN347	SW-LAB5	L-LAB-5A1	528	LTB-1-528	LGEV-1-528	DXR2.E17C-103B	LA17_LTB-1-528	TBD	3471715	527F	CELL CULTURE	M105	PWR-LAB5A1	3,4	49.5	35.0
IN347	SW-LAB5	L-LAB-5A1	528		LEEV-1-528	DXR2.E17C-103B	LA17_LEEV-1-528	TBD	3471716	527F	CELL CULTURE	M105	PWR-LAB5A1	4	43.0	
IN347	SW-LAB5	L-LAB-5A1	529	LTB-1-529	LGEV-1-529	DXR2.E17C-103B	LA17_LTB-1-529	TBD	3471717	527E	CONSUMABLES	M105	PWR-LAB5A1	5	35.0	
IN347	SW-LAB5	L-LAB-5A2	530	LTB-1-530	LGEV-1-530	DXR2.E17C-103B	LA17_LTB-1-530	TBD	3471718	527	WET LAB B-5	M105	PWR-LAB5A2	1,2	50.5	35.0
IN347	SW-LAB5	L-LAB-5A2	530		FHEV-1-530	DXR2.E17C-103B	LA17_FHEV-1-530	TBD	3471719	527	WET LAB B-5	M105	PWR-LAB5A2	3	44.0	
IN347	SW-LAB5	L-LAB-5A2	530		LEEV-1-530	DXR2.E17C-103B	LA17_LEEV-1-530	TBD	3471720	527	WET LAB B-5	M105	PWR-LAB5A2	4	43.0	
IN347	SW-LAB5	L-LAB-5A2	531	LTB-1-531	LGEV-1-531	DXR2.E17C-103B	LA17_LTB-1-531	TBD	3471721	527	WET LAB B-4	M105	PWR-LAB5A3	1,2	50.5	35.0
IN347	SW-LAB5	L-LAB-5A2	531		FHEV-1-531	DXR2.E17C-103B	LA17_FHEV-1-531	TBD	3471722	527	WET LAB B-4	M105	PWR-LAB5A3	3	44.0	
IN347	SW-LAB5	L-LAB-5A2	531		LEEV-1-531	DXR2.E17C-103B	LA17_LEEV-1-531	TBD	3471723	527	WET LAB B-4	M105	PWR-LAB5A3	4	43.0	
IN347	SW-LAB5	L-LAB-5A2	532	LTB-1-532	LGEV-1-532	DXR2.E17C-103B	LA17_LTB-1-532	TBD	3471724	527D	SHARED EQUIPMENT	M105	PWR-LAB5A2	5	38.5	
IN347	SW-LAB5	L-LAB-5A2	533	LTB-1-533	LGEV-1-533	DXR2.E17C-103B	LA17_LTB-1-533	TBD	3471725	527C	COMMON CHEM ROOM	M105	PWR-LAB5A2	5	35.0	
IN347	SW-LAB5	L-LAB-5B	534	LTB-1-534	LGEV-1-534	DXR2.E17C-103B	LA17_LTB-1-534	TBD	3471726	509	BIOMARKER T/H LAB	M105	PWR-LAB5A1	5	35.0	
IN347	SW-LAB5	L-LAB-5B	535	LTB-1-535	LGEV-1-535	DXR2.E17C-103B	LA17_LTB-1-535	TBD	3471727	527B	LAB CIRCULATION	M105	PWR-LAB5B3	4	35.0	
IN347	SW-LAB5	L-LAB-5B	536	LTB-1-536	LGEV-1-536	DXR2.E17C-103B	LA17_LTB-1-536	TBD	3471728	504	ANALYXIN GENOMICS CORE	M105	PWR-LAB5B4	1,2	45.0	35.0
IN347	SW-LAB5	L-LAB-5B	536		LEEV-1-536	DXR2.E17C-103B	LA17_LEEV-1-536	TBD	3471729	504	ANALYXIN GENOMICS CORE	M105	PWR-LAB5B4	3	43.0	
IN347	SW-LAB5	L-LAB-5A1	537	LTB-1-537	LGEV-1-537	DXR2.E17C-103B	LA17_LTB-1-537	TBD	3471730	527	WET LAB B-6	M105	PWR-LAB5A4	1	45.0	35.0
IN347	SW-LAB5	L-LAB-5A1	537		FHEV-1-537	DXR2.E17C-103B	LA17_FHEV-1-537	TBD	3471731	527	WET LAB B-6	M105	PWR-LAB5A4	2	44.0	
IN347	SW-LAB5	L-LAB-5A1	537		LEEV-1-537	DXR2.E17C-103B	LA17_LEEV-1-537	TBD	3471732	527	WET LAB B-6	M105	PWR-LAB5A4	3	43.0	
IN347	SW-LAB5	L-LAB-5A1	538	LTB-1-538	LGEV-1-538	DXR2.E17C-103B	LA17_LTB-1-538	TBD	3471733	527	WET LAB B-11	M105	PWR-LAB5B2	4	45.0	35.0
IN347	SW-LAB5	L-LAB-5A1	538		FHEV-1-538	DXR2.E17C-103B	LA17_FHEV-1-538	TBD	3471734	527	WET LAB B-11	M105	PWR-LAB5B2	5	44.0	
IN347	SW-LAB5	L-LAB-5B	540	LTB-1-540	LGEV-1-540	DXR2.E17C-103B	LA17_LTB-1-540	TBD	3471735	509	BIOMARKER T/H LAB	M105	PWR-LAB5A4	4	35.0	

5TH FLOOR NON-LAB ROOM ETHERNET DXR SCHEDULE

BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA
IN347	SW-LAB5	L-5B	501	TB-4-501		DXR2.E12	LA05_TB-4-501	TBD	3470533	599	ELEVATOR	M105	PWR-5B1	5	12.3
IN347	SW-LAB5	L-5B	503	TB-4-503	EV-4-503	DXR2.E17C-103B	LA05_TB-4-503	TBD	3470534	500	MEETING ROOM	M105	PWR-5B1	1	39.5
IN347	SW-LAB5	L-5B	504	TB-4-504	EV-4-504	DXR2.E17C-103B	LA05_TB-4-504	TBD	3470535	596B	WOMEN	M105	PWR-5B1	2	35.0
IN347	SW-LAB5	L-5B	505	TB-4-505	EV-4-505	DXR2.E17C-103B	LA05_TB-4-505	TBD	3470536	503	WELLNESS ROOM	M105	PWR-5B1	2	35.0
IN347	SW-LAB5	L-5B	506	TB-1-506	EV-1-506	DXR2.E17C-103B	LA17_TB-1-506	TBD	3471735	502	ANALYXIN GENOMICS LAB	M105	PWR-5B1	1	38.5
IN347	SW-LAB5	L-5B	516	TB-4-516	EV-4-516	DXR2.E17C-103B	LA05_TB-4-516	TBD	3470537	599E	CIRCULATION	M105	PWR-5B1	3	35.0
IN347	SW-LAB5	L-5B	517	TB-4-517	EV-4-517	DXR2.E17C-103B	LA05_TB-4-517	TBD	3470538	535	OFFICE	M105	PWR-5B1	3	39.5
IN347	SW-LAB5	L-5B	518	TB-4-518	EV-4-518	DXR2.E17C-103B	LA05_TB-4-518	TBD	3470539	533	OFFICE	M105	PWR-5B1	4	38.5
IN347	SW-LAB5	L-5B	519	TB-4-519	EV-4-519	DXR2.E17C-103B	LA05_TB-4-519	TBD	3470540	531	OFFICE	M105	PWR-5B1	4	38.5
IN347	SW-LAB5	L-5B	520	TB-4-520	EV-4-520	DXR2.E17C-103B	LA05_TB-4-520	TBD	3470541	529	OFFICE	M105	PWR-5B1	5	39.5
IN347	SW-LAB5	L-5B	541	TB-4-541	EV-4-541	DXR2.E17C-103B	LA05_TB-4-541	TBD	3470542	501	STORAGE	M105	PWR-5B2	1	35.0
IN347	SW-LAB5	L-5A	510	TB-4-510	EV-4-510	DXR2.E17C-103B	LA05_TB-4-510	TBD	3470543	508	OPEN OFFICE	M105	PWR-5A1	1	39.5
IN347	SW-LAB5	L-5A	512	TB-1-512	EV-1-512	DXR2.E17C-103B	LA17_TB-1-512	TBD	3471736	598D	SECURITY	M105	PWR-5A1	1	34.0
IN347	SW-LAB5	L-5A	513	TB-1-513	EV-1-513	DXR2.E17C-103B	LA17_TB-1-513	TBD	3471737	598A	IDF	M105	PWR-5A1	2	34.0
IN347	SW-LAB5	L-5A	514	TB-4-514	EV-4-514	DXR2.E17C-103B	LA05_TB-4-514	TBD	3470544	508	OPEN OFFICE	M105	PWR-5A1	3	38.5
IN347	SW-LAB5	L-5A	515	TB-4-515	EV-4-515	DXR2.E17C-103B	LA05_TB-4-515	TBD	3470545	526	OPEN CONFERENCE ROOM	M105	PWR-5A1	3	38.5
IN347	SW-LAB5	L-5A	539	TB-4-539	EV-4-539	DXR2.E17C-103B	LA05_TB-4-539	TBD	3470546	506	OFFICE	M105	PWR-5A1	2	39.5

INSTALLATION NOTES:

1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.



1 R04 5TH FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

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440P42785	
0	R08
DESIGNED BY	HB
DRAWN BY	HB
CHECKED BY	KS
APPROVED BY	
DATE ISSUED	04/06/26
DATE PLOTTED	04/02/26

5TH FLR ETHERNET DXR NETWORK

BIO LAUNCH ACCELERATOR FOR BIO
I# 202500072, IN

REVISION HISTORY

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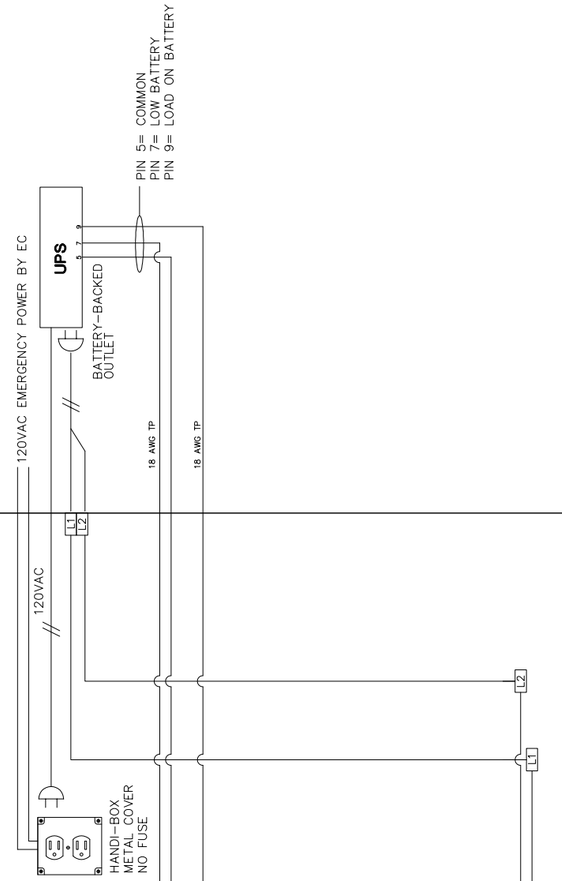
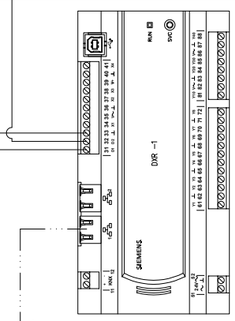
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



CAT 6 ETHERNET
TO NETWORK SWITCH

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.

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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PNL-LAB5 UPS WIRING

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station
PNL LAB5	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW LAB5	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

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IU# 20250072, IN

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5TH FLR E.DXR NETWORK BOM

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120VAC
FROM UPS

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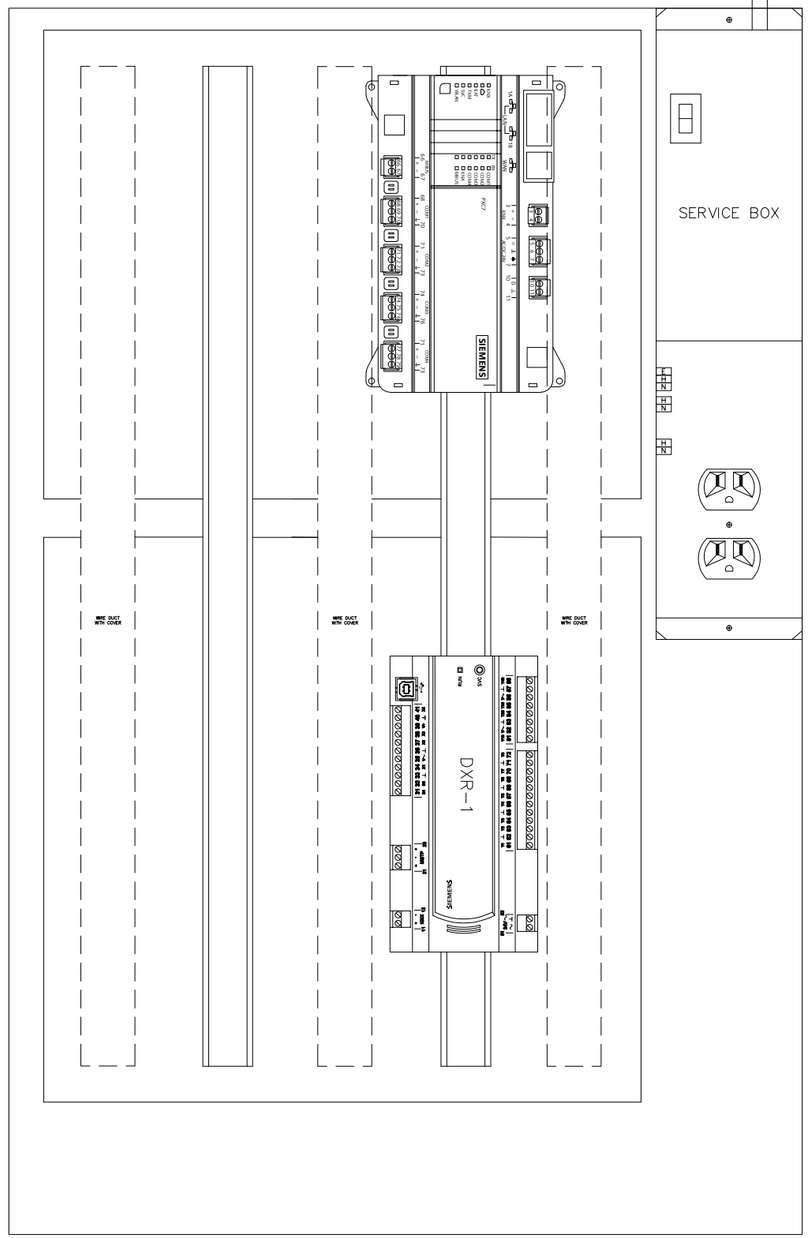

GENERAL NOTES:

1. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND DOES NOT REFLECT THE ACTUAL ARRANGEMENT OF EQUIPMENT, DUCTWORK, OR PIPING.

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PNL-PH-E PANEL LAYOUT

LCATION: PENTHOUSE

REVISION HISTORY

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IU# 20250072, IN

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PNL-PH-E LAYOUT

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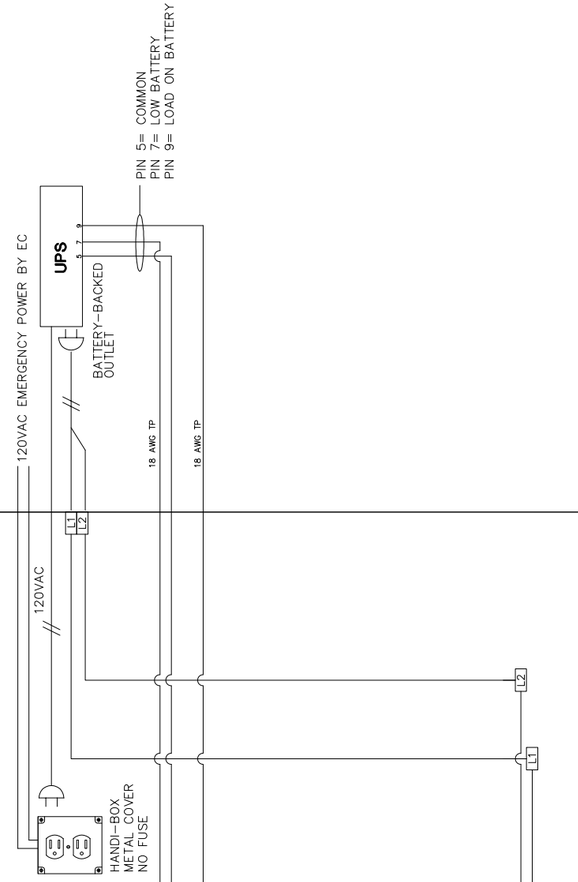
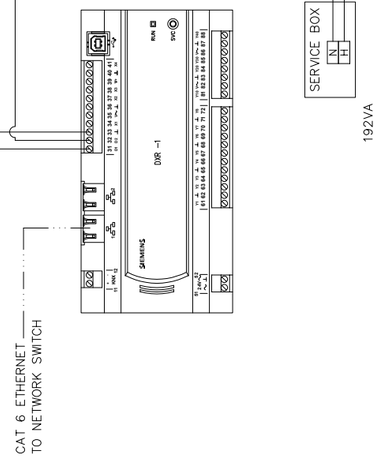
COMPONENT PANEL / POWER

FIELD WIRING



FIELD PANEL



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.

REVISION HISTORY

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IU# 20250072, IN

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PNL-PH-E UPS WIRING

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
Panel Mounted Devices					
DXR 1	1	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station

REVISION HISTORY

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PNL-PH-E PANEL BOM

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PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

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E DXR SUPERVISORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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LA17.PXCA BOM

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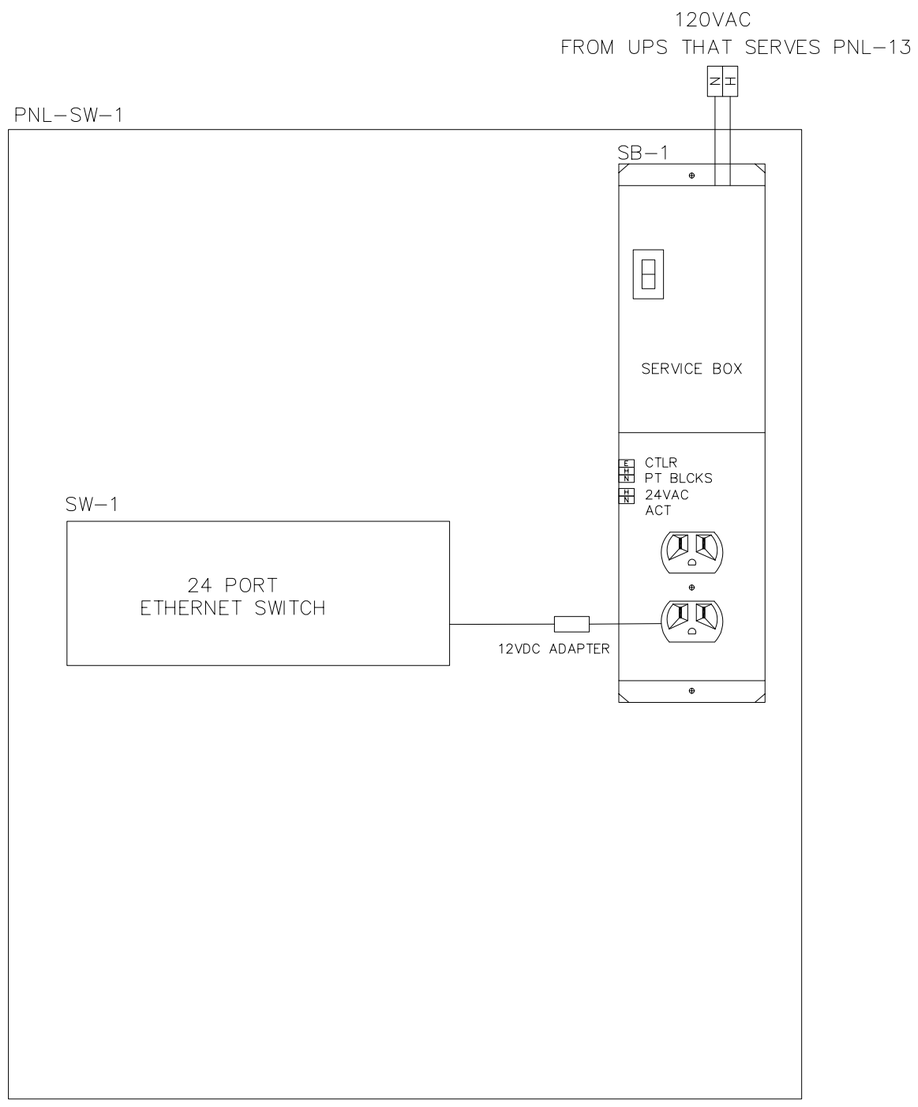

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R10

PNL-SW-1 PANEL LAYOUT

LOCATION: NEXT TO AUX-12

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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PNL-SW-1 LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
PNL SW-1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW 1	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

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PNL-SW-1 PANEL BOM

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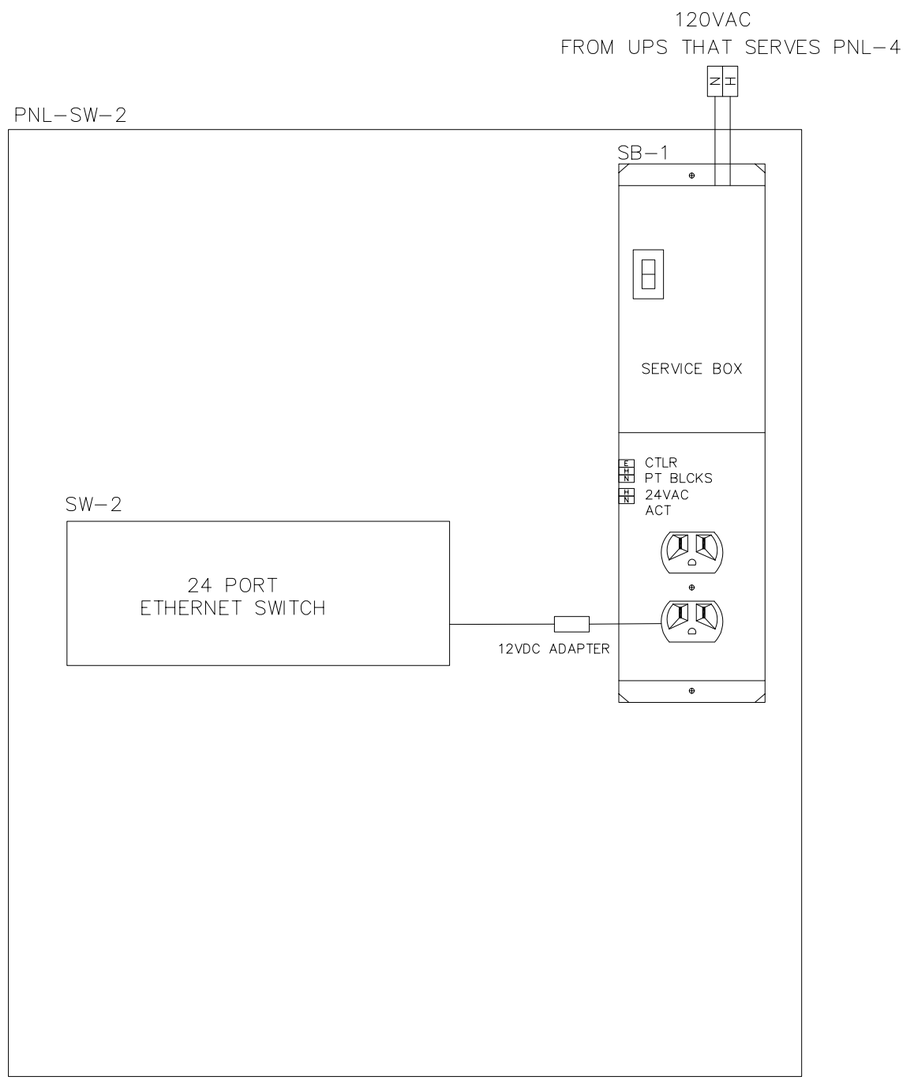

1 / R11 PNL-SW-2 PANEL LAYOUT
LOCATION: NEXT TO AUX-4

REVISION HISTORY

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IU# 20250072, IN

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PNL-SW-2 LAYOUT

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R11

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
PNL SW-2	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA
SW 2	1	FS-124F	FORTINET		24-PORT SWITCH, RSTP

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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PNL-SW-2 PANEL BOM

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R11A

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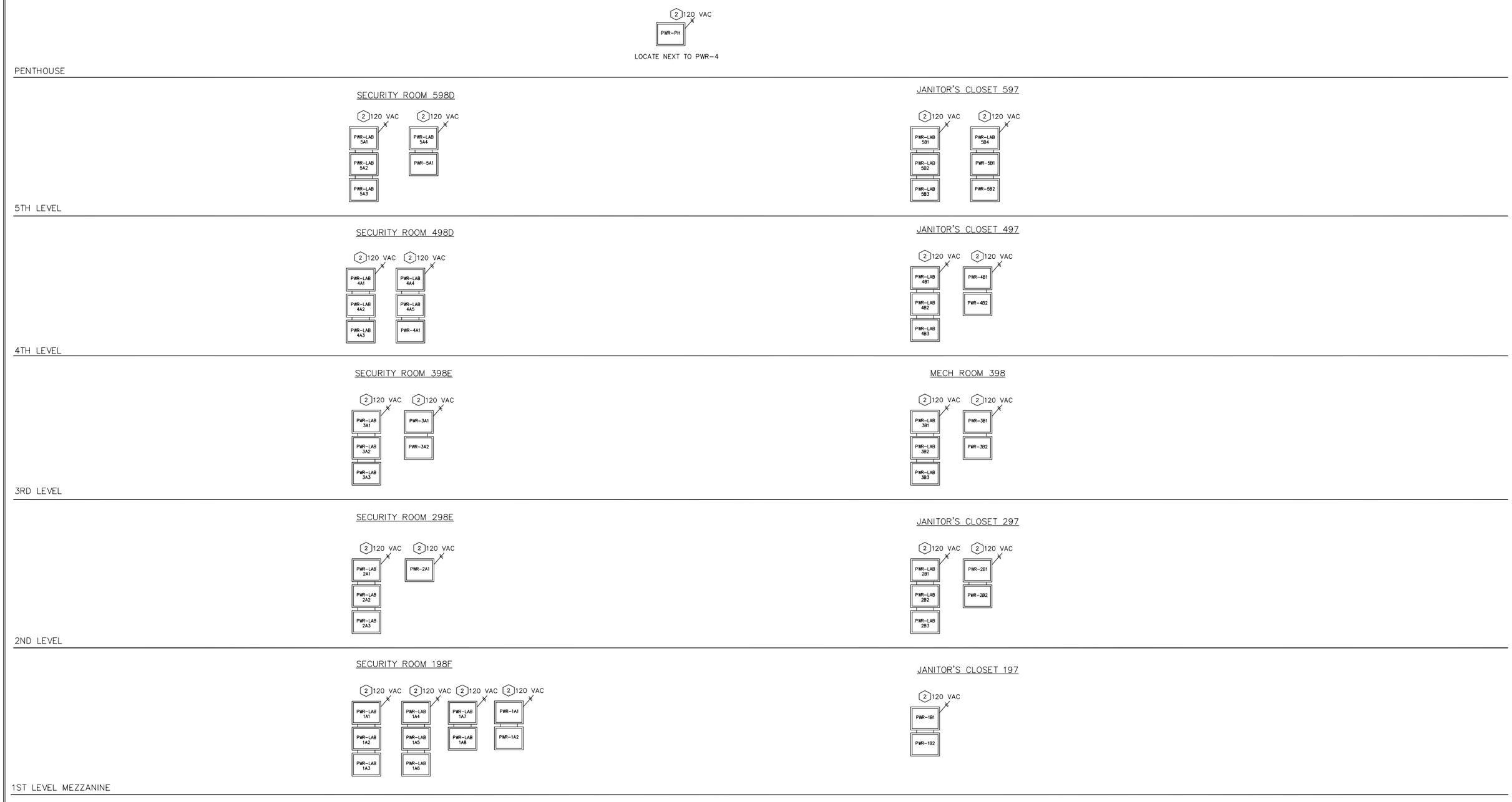
INSTALLATION NOTES:

1. SEE LAB DRAWINGS FOR IP NETWORK AND POWER TO LAB AIR VALVES.
2. POWER TO PWR PANEL BY DIVISION 26 ELECTRICAL AS STATED IN CONTRACT DOCUMENTS. POWER THAT IS NOT INDICATED IN CONTRACT DOCUMENTS BUT IS REQUIRED FOR BAS SHALL BE RESPONSIBILITY OF THE CIC.
   EMERGENCY POWER TO PWR PANELS BY DIVISION 26 ELECTRICAL (TYPICAL).
3. TRANSFORMER PANELS TO BE LOCATED IN ELECTRICAL ROOMS OR MECH ROOMS SHOWN. REFER TO DRAWINGS FOR EXACT LOCATION. MOUNTING AND FIELD WIRING BY CIC, POWER WIRING BY EC.



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BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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POWER TRUNKS

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PWR 1	54	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap

REVISION HISTORY

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POWER TRUNKS BOM

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GLOBAL POINT:
1. GENERATOR RUNNING STATUS: SEE DWG.610
2. ATS STATUS FOR A LOSS OF POWER TO THE BUILDING: SEE DWG.610

NORTH WALL
HTTE-1 0-95 % LA03-CHW-OAH 0007:D:5.7 HUMIDITY
LA12-CHW-OAT 0007:D:5.8 TEMPERATURE

2/100 OUTSIDE TEMP & HUMIDITY SENSOR
LOCATION: OUTSIDE THE BUILDING

VFD-CT-1: RB-17 LA12-CT1 START/STOP 0007:D:10.4; LA12-CT1-S SPEED 0007:D:10.5; LA12-CT1-STS STATUS 0007:D:10.11; LA12-CT1-F FAULT 0007:D:10.12
VFD-CT-2: RB-18 LA12-CT2 START/STOP 0007:D:10.6; LA12-CT2-S SPEED 0007:D:10.7; LA12-CT2-STS STATUS 0007:D:10.13; LA12-CT2-F FAULT 0007:D:10.14
VFD-CT-3: RB-19 LA12-CT3 START/STOP 0007:D:10.8; LA12-CT3-S SPEED 0007:D:10.9; LA12-CT3-STS STATUS 0007:D:10.15; LA12-CT3-F FAULT 0007:D:10.16

INTERLOCK
CT-1: RE-1 LA12-CT1-VIB-ALM 0007:D:10.1 VIBRATION ALARM; RB-23 LA12-CT1-HTR 0007:D:10.2 MOTOR HEATER ON/OFF
CT-2: RE-1 LA12-CT2-VIB-ALM 0007:D:10.3 VIBRATION ALARM; RB-24 LA12-CT2-HTR 0007:D:10.4 MOTOR HEATER ON/OFF
CT-3: RE-1 LA12-CT3-VIB-ALM 0007:D:10.5 VIBRATION ALARM; RB-25 LA12-CT3-HTR 0007:D:10.6 MOTOR HEATER ON/OFF

WIRE TO 1ST FL PANEL
FM-3 0-2000 GPM LA13-CW-MU-FLW 0007:D:0.11
MAKEUP WATER
V-25 0-10 V LA13-CW-MU-CV 0007:D:0.1
NC-SR

V-01 ON/OFF 120V LA12-CT1-CWR-ISOV 0007:D:10.7 NO-F.I.P
V-02 2POS 24V LA12-CT1-CWR-BLV 0007:D:10.8 NO-SR
V-03 ON/OFF 120V LA12-CT2-CWR-ISOV 0007:D:10.9 NO-F.I.P
V-04 2POS 24V LA12-CT2-CWR-BLV 0007:D:10.10 NO-SR
V-05 ON/OFF 120V LA12-CT3-CWR-ISOV 0007:D:10.11 NO-F.I.P
V-06 2POS 24V LA12-CT3-CWR-BLV 0007:D:10.12 NO-SR
E. POWER 120V/1/60 BY DIV 26
CWR
TO ATMOSPHERE
DPTE-17 0-50 PSI LA12-CWR-CW-DP 0007:D:11.1

ROOF
V-07 ON/OFF 120V LA12-CT1-CWS-ISOV 0007:D:10.13 NO-F.I.P
V-08 2POS 24V LA12-CT1-CWS-BLV 0007:D:10.14 NO-SR
V-09 ON/OFF 120VAC LA12-CT2-CWS-ISOV 0007:D:10.15 NO-F.I.P
V-10 2POS 24V LA12-CT2-CWS-BLV 0007:D:10.16 NO-SR
V-11 ON/OFF 120V LA12-CT3-CWS-ISOV 0007:D:10.17 NO-F.I.P
V-12 2POS 24V LA12-CT3-CWS-BLV 0007:D:10.18 NO-SR
E. POWER 120V/1/60 BY DIV 26

RB-28 LA12-ACCS-ENA 0007:D:11.6 ENABLE/DISABLE; LA12-ACCS-STPT 0007:D:10.9 TEMP. SETPOINT; LA12-ACCS-STS 0007:D:10.17 STATUS; LA12-ACCS-ALM 0007:D:10.2 ALARM
DPTE-16 0-50 PSI LA12-ACCS-DP 0007:D:10.3
DRY COOLER ACC-5

OVER FIFTH FLOOR
F.I.P
V-24 0-10 V LA12-CT-CW-BPV 0007:D:7.2
TOWER BYPASS VALVE

PENTHOUSE
VFD-CWP-1: RB-20 LA13-CWP1 START/STOP 0007:D:5.1; LA13-CWP1-S SPEED 0007:D:5.2; LA13-CWP1-STS STATUS 0007:D:5.9; LA13-CWP1-F FAULT 0007:D:5.10
VFD-CWP-2: RB-21 LA13-CWP2 START/STOP 0007:D:5.3; LA13-CWP2-S SPEED 0007:D:5.4; LA13-CWP2-STS STATUS 0007:D:5.11; LA13-CWP2-F FAULT 0007:D:5.12
VFD-CWP-3: RB-22 LA13-CWP3 START/STOP 0007:D:5.5; LA13-CWP3-S SPEED 0007:D:5.6; LA13-CWP3-STS STATUS 0007:D:5.13; LA13-CWP3-F FAULT 0007:D:5.14
4 LLS-1 LA13-CW-TANK-LVL 0007:D:5.7
CWP-1 CWP-2 CWP-3
FS-1 LA13-CWP1-FS 0007:D:5.8
FS-2 LA13-CWP2-FS 0007:D:5.9
FS-3 LA13-CWP3-FS 0007:D:5.10
TTE-19 -40/240DEG F LA13-CW-TANK-T 0007:D:5.15
INDOOR CONDENSER WTR TANK
WD-3 WATER DET LA13-CW-WD1 0007:D:5.5
WD-4 WATER DET LA13-CW-WD2 0007:D:5.6

TANK ROOM 198D
PNL-13 PNL-AUX-13
UPS-2 LA13-CW-UPS2-LBT 0007:D:0.3; POWER LOSS LA13-CW-UPS2-PWL 0007:D:0.4
RE -17 RE -18 RE -16 RE -20 RE -21 RE -22
PNL-13 AUX-13 PWR-13 120 VAC UPS

CONDENSER WATER FILTER SKID WITH PUMP CWF-1
RB-26 LA12-CWF1 START/STOP 0007:D:11.4; LA12-CWF1-STS STATUS 0007:D:0.3; LA12-CWF1-DTL 0007:D:10.10 FILTER STATUS
DPS-1 0/25 psi LA12-CWF-PS 0007:D:10.5 DPS
FILTER FEEDER HW DIFFERENTIAL PRESSURE SWITCH
WD-2 WATER DET LA12-CHW-WD2 0007:D:11.4
WD-1 WATER DET LA12-CHW-WD1 0007:D:11.3

TTE-5 -40/240DEG F LA12-CHW-CW-RT 0007:D:4.5
TTE-2 -40/240DEG F LA12-CHW-CW-RT 0007:D:4.6

CHILLER CH-1: RB-1 LA12-CH1-ENA 0007:D:11.1 ENABLE/DISABLE; LA12-CH1-STPT 0007:D:10.11 TEMP. SETPOINT; LA12-CH1-STS 0007:D:10.18 STATUS; LA12-CH1-ALM 0007:D:10.7 ALARM; BACNET IP TO BAS SWITCH
V-15 0-10 V LA12-CH1-CHW 0007:D:0.5
V-16 0-10 V LA12-CH1-CHWSV 0007:D:7.6; LA12-CH1-CHWSV-O 0007:D:10.19 OPEN STATUS
DPTE-2 RANGE PSI LA12-CH1-CHW-DP 0007:D:11.7
DPTE-1 RANGE PSI LA12-CH1-CW-DP 0007:D:11.1
CHILLER CH-2: RB-2 LA12-CH2-ENA 0007:D:11.2 ENABLE/DISABLE; LA12-CH2-STPT 0007:D:10.12 TEMP. SETPOINT; LA12-CH2-STS 0007:D:10.19 STATUS; LA12-CH2-ALM 0007:D:10.8 ALARM; BACNET IP TO BAS SWITCH
V-17 0-10 V LA12-CH2-CHW 0007:D:0.7
V-18 0-10 V LA12-CH2-CHWSV 0007:D:7.8; LA12-CH2-CHWSV-O 0007:D:10.11 OPEN STATUS
DPTE-4 RANGE PSI LA12-CH2-CHW-DP 0007:D:11.6
DPTE-3 RANGE PSI LA12-CH2-CW-DP 0007:D:11.5
CHILLER CH-3: RB-3 LA12-CH3-ENA 0007:D:11.3 ENABLE/DISABLE; LA12-CH3-STPT 0007:D:10.13 TEMP. SETPOINT; LA12-CH3-STS 0007:D:10.20 STATUS; LA12-CH3-ALM 0007:D:10.9 ALARM; BACNET IP TO BAS SWITCH
V-19 0-10 V LA12-CH3-CHW 0007:D:0.9
V-20 0-10 V LA12-CH3-CHWSV 0007:D:7.9; LA12-CH3-CHWSV-O 0007:D:10.12 OPEN STATUS
DPTE-6 RANGE PSI LA12-CH3-CHW-DP 0007:D:11.8
DPTE-5 RANGE PSI LA12-CH3-CW-DP 0007:D:11.9
E. POWER 120V/1/60 BY DIV 26

VFD-CHWP-1: RB-4 LA12-CHWP1 START/STOP 0007:D:11.7; LA12-CHWP1-S SPEED 0007:D:0.5; LA12-CHWP1-STS STATUS 0007:D:10.3; LA12-CHWP1-F FAULT 0007:D:10.4
VFD-CHWP-2: RB-5 LA12-CHWP2 START/STOP 0007:D:12.0; LA12-CHWP2-S SPEED 0007:D:0.6; LA12-CHWP2-STS STATUS 0007:D:10.5; LA12-CHWP2-F FAULT 0007:D:10.6
VFD-CHWP-3: RB-6 LA12-CHWP3 START/STOP 0007:D:12.1; LA12-CHWP3-S SPEED 0007:D:0.8; LA12-CHWP3-STS STATUS 0007:D:10.7; LA12-CHWP3-F FAULT 0007:D:10.8
CHWP-1 CHWP-2 CHWP-3

PLANT RETURN TEMPERATURE
TTE-1 -40/240DEG F LA12-CHW-RT-PLANT 0007:D:4.3

HWR
FM-6 0-2000 GPM LA12-WWHP4-HWR-FLW 0007:D:0.5
HWP-4
TTE-17 -40/240 DEG F LA12-WWHP4-HW-RT 0007:D:8.1
VFD-HWP-4: RB-11 LA12-HWP4 START/STOP 0007:D:11.5; LA12-HWP4-S SPEED 0007:D:0.2; LA12-HWP4-STS STATUS 0007:D:10.1; LA12-HWP4-F FAULT 0007:D:10.0
RB-27 LA12-WWHP4-ENA 0007:D:11.4 ENABLE/DISABLE; LA12-WWHP4-STS 0007:D:10.15 STATUS
WWHP-4
DPTE-14 RANGE PSI LA12-WWHP4-HW-DP 0007:D:9.8
FM-5 0-2000 GPM LA12-WWHP4-CBS-FLW 0007:D:0.3
TTE-18 -40/240 DEG F LA12-WWHP4-CB-ST 0007:D:4.2
DPTE-15 RANGE PSI LA12-WWHP4-CB-DP 0007:D:9.7
BY E.C.
CBP-3
E. POWER 120V/1/60 BY GV 26
V-73 ON/OFF 120V LA12-WWHP4-HWSV 0007:D:10.5
TTE-15 -40/240 DEG F LA12-WWHP4-HW-ST 0007:D:4.1
HWS

VFD-GWP-1: RB-9 LA12-GWP1 START/STOP 0007:D:11.3; LA12-GWP1-S SPEED 0007:D:0.3; LA12-GWP1-STS STATUS 0007:D:10.1; LA12-GWP1-F FAULT 0007:D:10.2
VFD-GWP-2: RB-10 LA12-GWP2 START/STOP 0007:D:11.4; LA12-GWP2-S SPEED 0007:D:0.4; LA12-GWP2-STS STATUS 0007:D:10.0; LA12-GWP2-F FAULT 0007:D:10.1
GWP-1 GWP-2
TTE-14 -40/240 DEG F LA12-ACCS-DS-ST 0007:D:0.6
TTE-13 -40/240 DEG F LA12-ACCS-CR-RT 0007:D:0.5
FM-4 0-2000 GPM LA12-WR1-HS-FLW 0007:D:0.2
HEAT EXCHANGER HE-1
TTE-12 -40/240 DEG F LA12-CWE-CB-ST 0007:D:4.4

VFD-CBP-1: RB-12 LA12-CBP1 START/STOP 0007:D:11.4; LA12-CBP1-S SPEED 0007:D:0.6; LA12-CBP1-STS STATUS 0007:D:10.9; LA12-CBP1-F FAULT 0007:D:10.10
VFD-CBP-2: RB-13 LA12-CBP2 START/STOP 0007:D:11.5; LA12-CBP2-S SPEED 0007:D:0.7; LA12-CBP2-STS STATUS 0007:D:10.11; LA12-CBP2-F FAULT 0007:D:10.12
VFD-CBP-3: RB-14 LA12-CBP3 START/STOP 0007:D:11.6; LA12-CBP3-S SPEED 0007:D:0.8; LA12-CBP3-STS STATUS 0007:D:10.13; LA12-CBP3-F FAULT 0007:D:10.14
VFD-CBP-4: RB-8 LA12-CBP4 START/STOP 0007:D:11.1; LA12-CBP4-S SPEED 0007:D:0.1; LA12-CBP4-STS STATUS 0007:D:10.15; LA12-CBP4-F FAULT 0007:D:10.16
VFD-CBP-5: RB-7 LA12-CBP5 START/STOP 0007:D:11.2; LA12-CBP5-S SPEED 0007:D:0.2; LA12-CBP5-STS STATUS 0007:D:10.17; LA12-CBP5-F FAULT 0007:D:10.18
CBP-1 CBP-2 CBP-4 CBP-5
TTE-16 -40/240 DEG F LA12-WWHP4-CB-ST 0007:D:4.8
TTE-10 -40/240DEG F LA12-CWE-CB-ST 0007:D:4.9
TTE-11 -40/240DEG F LA12-CWE-CB-ST 0007:D:4.7
E. POWER 120V/1/60 BY DIV 26
V-74 ON/OFF 120V LA12-WWHP4-CWSV 0007:D:10.7
NO-F.I.P
HEAT EXCHANGER HE-2
DPTE-12 0-50 PSI LA12-WE2-CW-DP 0007:D:10.4
DPTE-13 0-50 PSI LA12-WE2-CB-DP 0007:D:10.6

CB SYSTEM SUPPLY TEMP
CHWS
CBR
MIXED RETURN TEMPERATURE
TTE-3 -40/240DEG F LA12-CWE-CB-MT 0007:D:4.10
TTE-8 -40/240 DEG F LA12-CWE-CB-RT2 0007:D:4.6
CB SYSTEM RETURN TEMPERATURE

FM-1 0-2000 GPM LA12-CWE-RTLW 0007:D:0.1
CHW SYSTEM RETURN TEMP
TTE-4 -40/240DEG F LA12-CWE-RT 0007:D:4.4
CB SYSTEM RETURN TEMP
TTE-6 -40/240DEG F LA12-CWE-RT 0007:D:4.11
CB SYSTEM TEMP CONTROL VALVE
NO-F.I.P
V-22 0-10 V LA12-CWE-CB-CV 0007:D:7.5
TTE-2 -40/240 DEG F LA12-CWE-RT-LOAD 0007:D:4.12
CHW LOADS RETURN TEMPERATURE
V-23 0-10 V LA12-CWE-CB-BPV 0007:D:7.1
CHILLED BEAM BYPASS VALVE
NO-F.I.P
V-21 0-10 V LA12-CWE-BPV 0007:D:7.4
CHILLED WATER BYPASS VALVE
NO-F.I.P
TTE-7 -40/240 DEG F LA12-CWE-ST 0007:D:4.1
SYSTEM SUPPLY TEMPERATURE

LOWER LEVELS
DPTE-7 0-50 PSI LA12-CWE-DP1 0007:D:10.7
LOWER LEVELS AHUS
DPTE-8 0-50 PSI LA12-CWE-DP2 0007:D:10.8
PENTHOUSE AHUS
FCUS

LOWER LEVELS
DPTE-9 RANGE PSI LA12-CWE-CB-DP1 0007:D:9.1
PROCESS COOLING DROPS
DPTE-10 RANGE PSI LA12-CWE-CB-DP2 0007:D:9.2
DPTE-11 RANGE PSI LA12-CWE-CB-DP3 0007:D:9.3
CHILLED BEAMS
FCUS

PENTHOUSE MECH ROOM
PNL-12 PNL-AUX-12
UPS-1 LA12-CWE-UPS1-LBT 0007:D:18.1; POWER LOSS LA12-CWE-UPS1-PWL 0007:D:18.2
RE -1 RE -2 RE -3 RE -4 RE -5 RE -6 RE -7 RE -8 RE -9 RE -10 RE -11 RE -12 RE -13 RE -14 RE -15 RE -16
PNL-12 AUX-12 PWR-12 120 VAC UPS

INSTALLATION NOTES:
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING ON NEXT PAGE(S)
2. REFER TO PLANS FOR LOCATIONS.
3. VIBRATION SWITCH(ES) BY TOWER MANUFACTURER.
4. FLOW LEVEL FURNISHED BY OTHERS. ONE ANALOG OUTPUT UTILIZED BY BAS.
5. FLOW METER FURNISHED BY OTHERS. ONE ANALOG OUTPUT OF VOLUME RATE UTILIZED BY BAS.
6. SIEMENS DPTE PART NUMBER: 7MF0340-1FL01-5AF0-Z+B50+E01+H03+U01+Y01+Y15+Y21: 0 TO 50 PSI DP TRANSMITTERS TO BE LOCATED WHERE SHOWN ON MECHANICAL DRAWINGS. EXACT LOCATIONS OF ALL FIELD DEVICES TO BE COORDINATED WITH M/E/SIEMENS.

1/100 CHILLED WATER SYSTEM CONTROL DIAGRAM

REV #	FIELD PANEL NAME	FIELD PANEL NODE NAME
0	LA13-PNCA	
0003	LA13-PNCA	

REVISION HISTORY
00 12/7/2006 HB ISSUED FOR BID SET

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

440P412785
0
100

PROJECT: IU LAUNCH ACCELERATOR FOR BIO
LOCATION: BLOOMINGTON, IN
BID: 202500072, IN
DRAWN BY: HB
CHECKED BY: KP
APPROVED BY: MARK SWEENEY
ISSUE DATE: 04/02/26
LAST EDIT DATE: 04/03/26
DESIGNER: HB
DRAWING TITLE: CHILLED WATER SYSTEM

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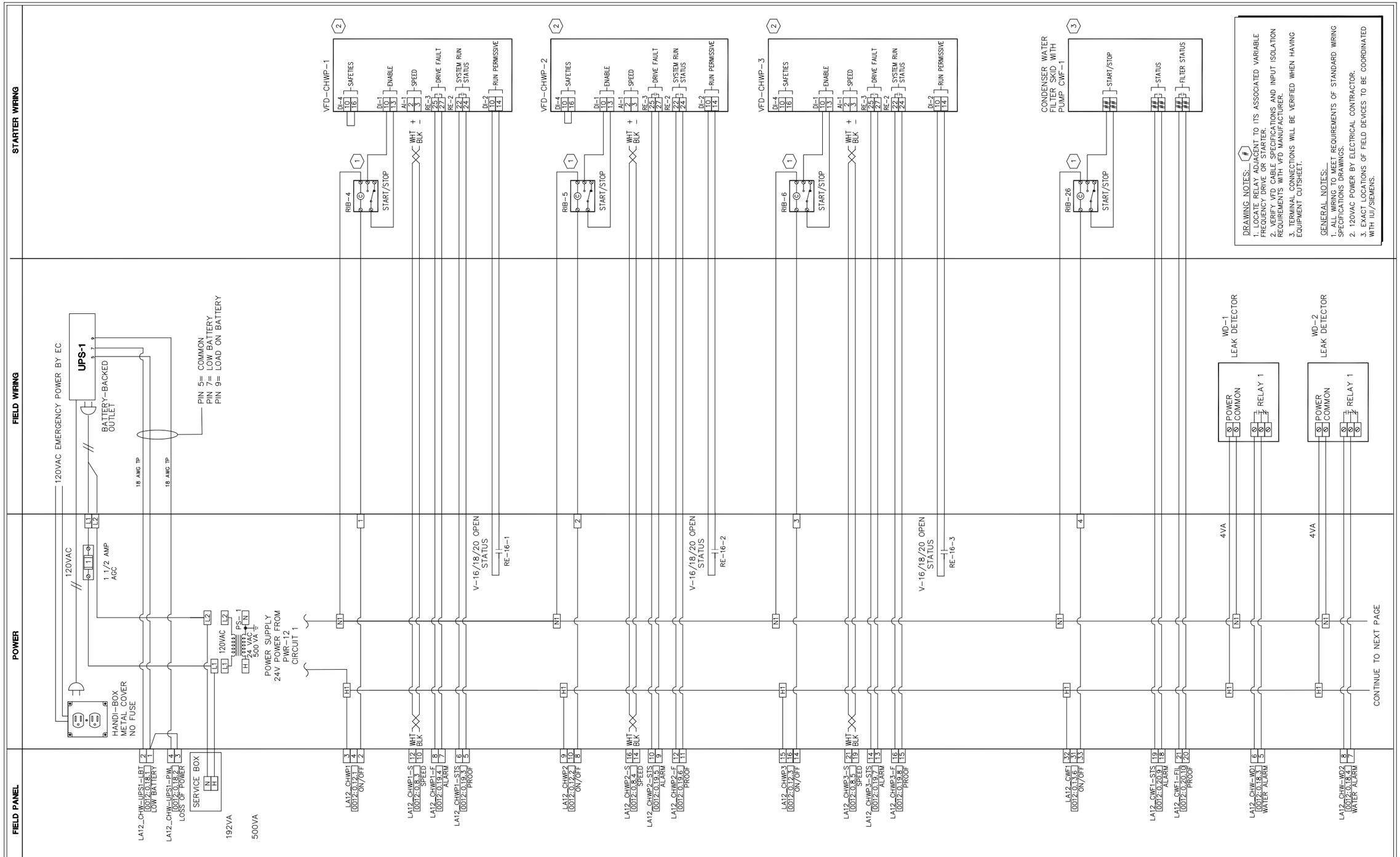

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CHW SYS ELEC. WIRING 1

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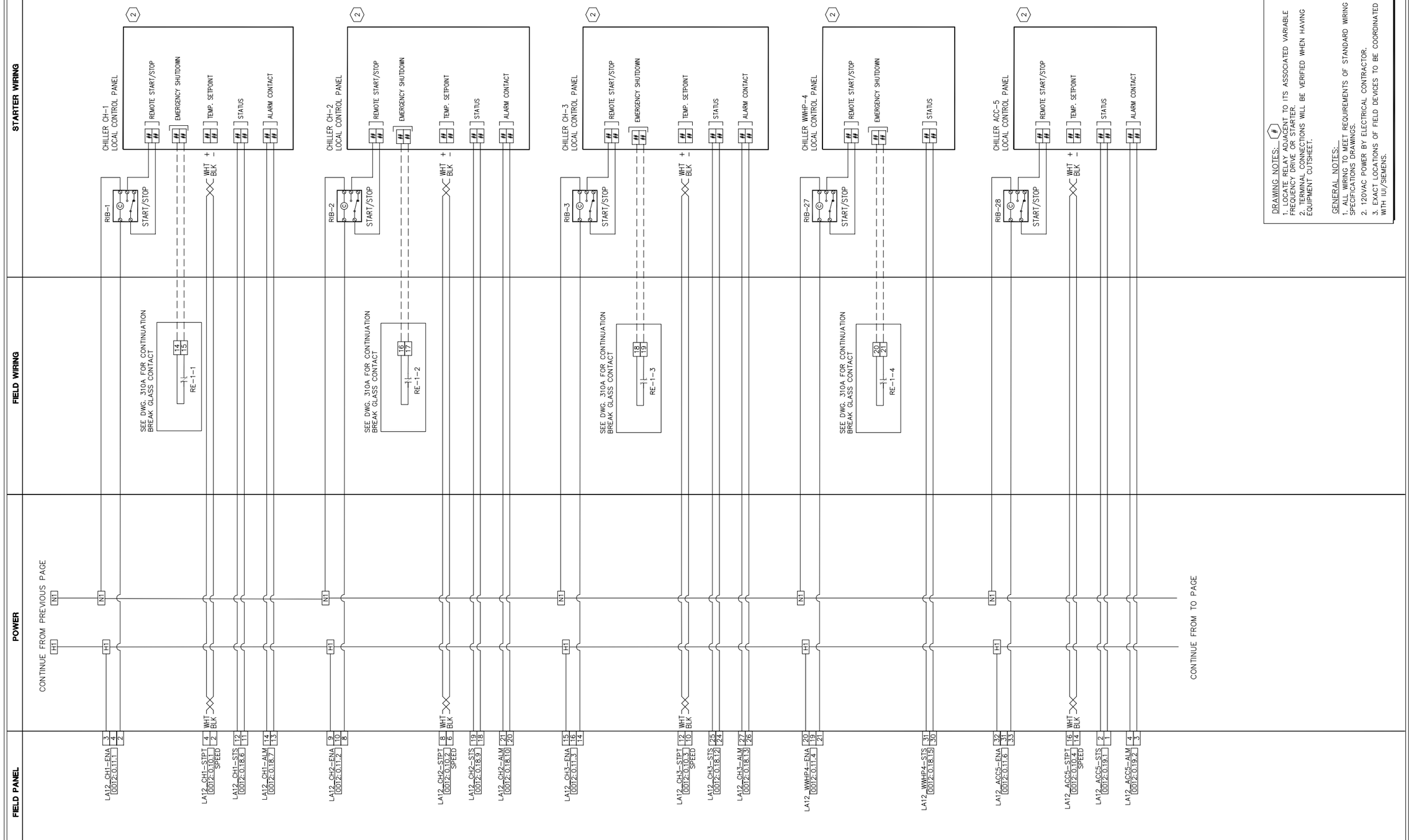

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0012	LA12.PXCA	

REVISION HISTORY

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IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CHW SYS ELEC. WIRING 2

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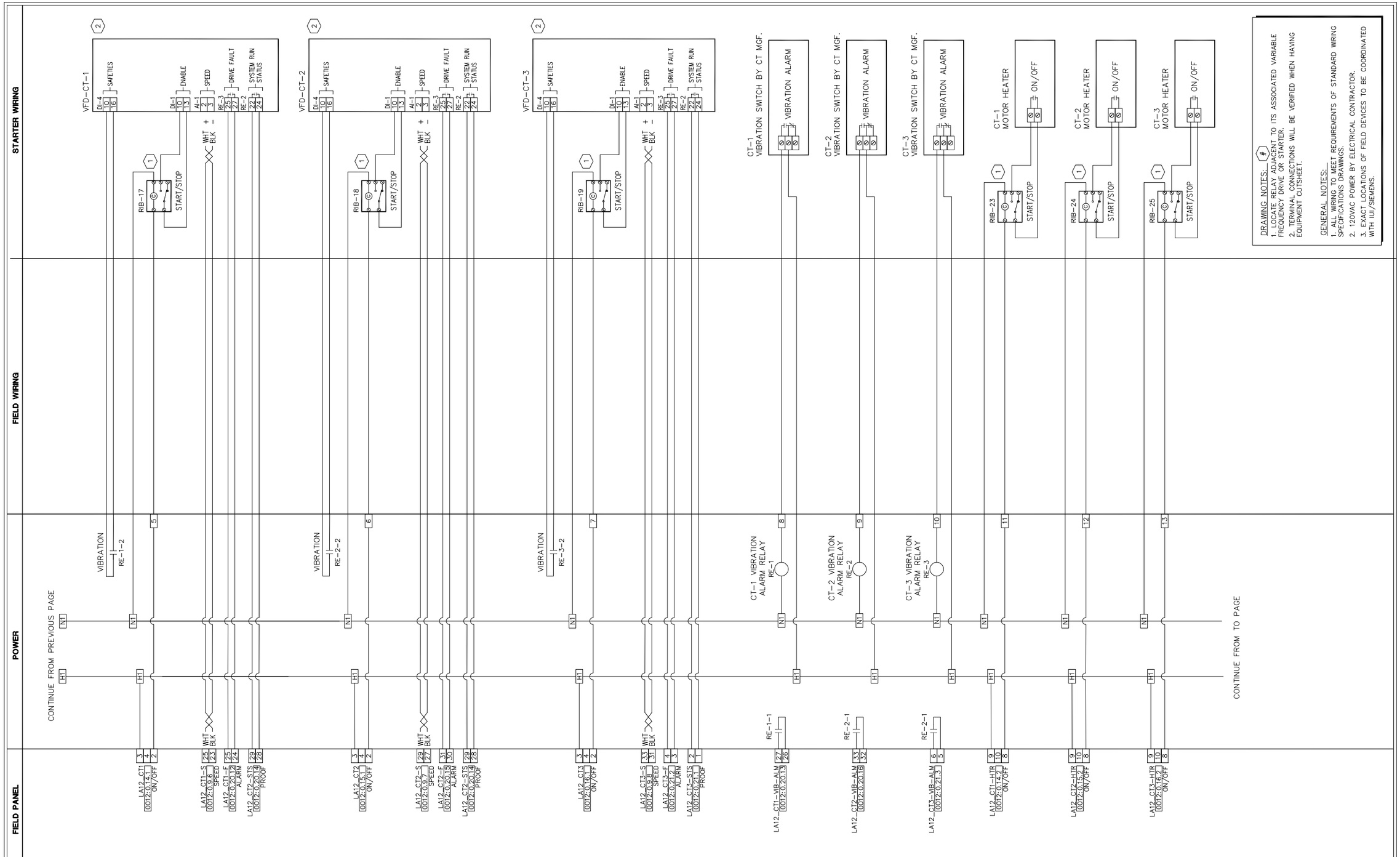

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CHW SYS ELEC. WIRING 3

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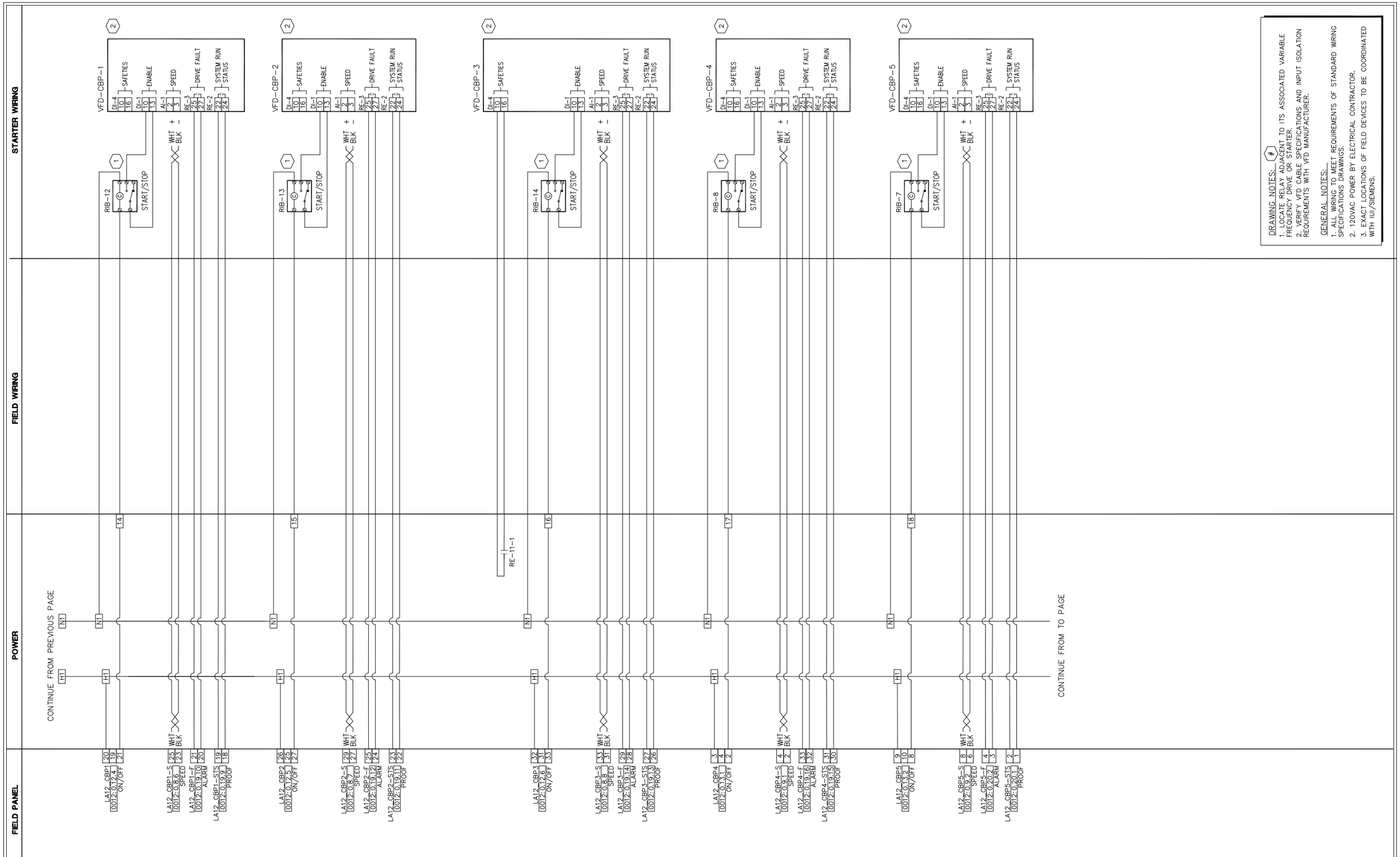

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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 IU/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CHW SYS ELEC. WIRING 4

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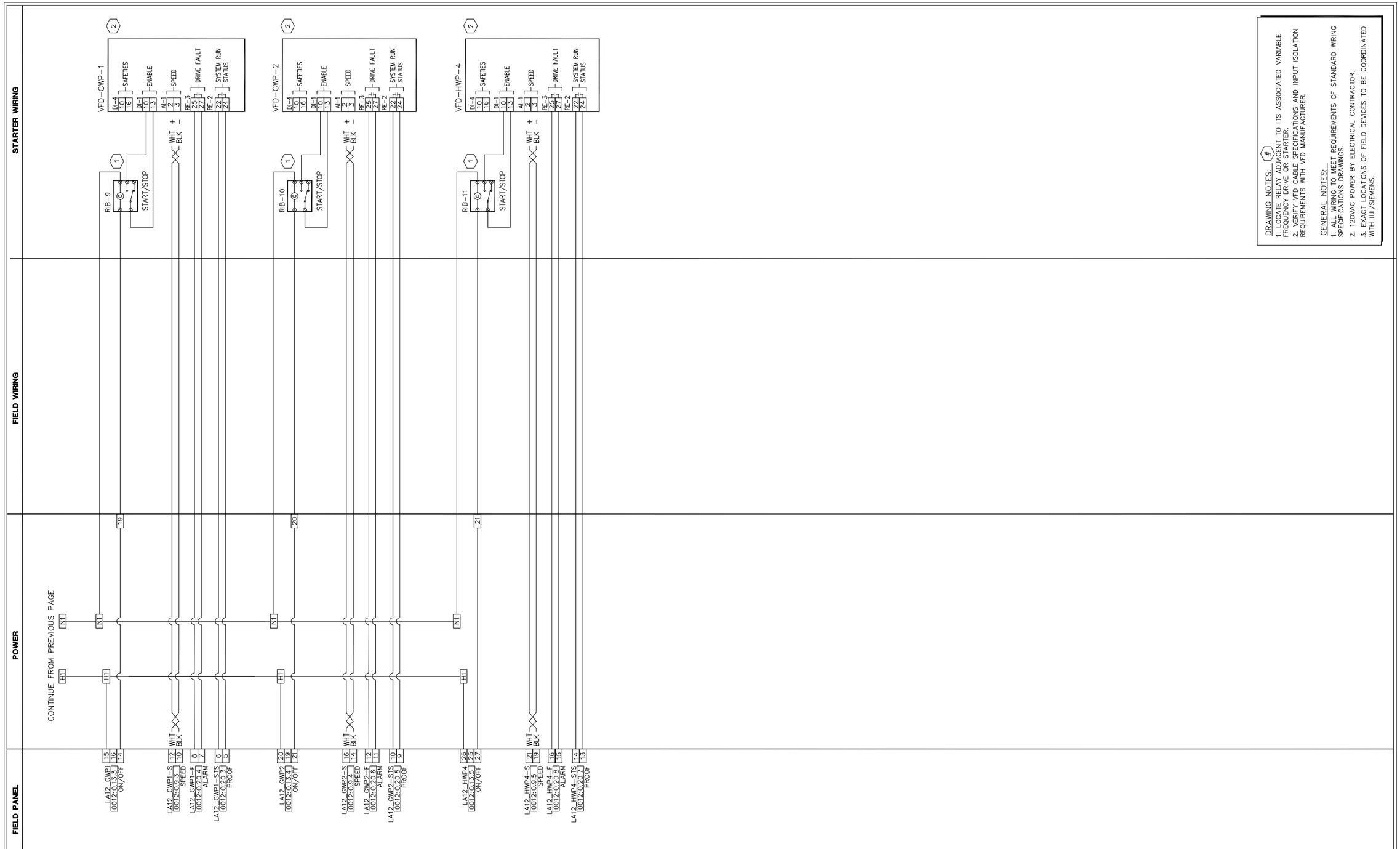

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0012	LA12.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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CHW SYS ELEC. WIRING 5

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FIELD WIRING | **STARTER WIRING**

V –1
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –3
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –5
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –7
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –9
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –11
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –13
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

V –14
2 POS 120VAC
MOTORIZED BUTTERFLY VALVE
ELECTRIC ACTUATOR
120 VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME
CURRENT DRAW : MAX 3.0A

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 IU/SIEMENS.

EMERGENCY POWER
120/1/60
BY DIV.26
L
N
COM
OPEN
CLOSED
C
D
22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

POWER

24V POWER FROM
PWR–12
CIRCUIT 2
N2
H2
RE–4
RE–5
RE–6
RE–7
RE–8
RE–9
RE–10
RE–11
V–13 OPEN RELAY
RE–12

FIELD PANEL

LA12_CT1–CWR–ISOV
0012:0.14.3
ON/OFF
LA12_CT2–CWR–ISOV
0012:0.15.3
ON/OFF
LA12_CT3–CWR–ISOV
0012:0.16.3
ON/OFF
LA12_CT1–CWS–ISOV
0012:0.14.5
ON/OFF
LA12_CT2–CWS–ISOV
0012:0.15.5
ON/OFF
LA12_CT3–CWS–ISOV
0012:0.16.5
ON/OFF
LA12_WWHP4–HWSV
0012:0.11.5
ON/OFF
LA12_HE2–CWSV
0012:0.17.1
ON/OFF

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS
SIEMENS INDUSTRY INC.
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UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CHW SYS ELEC. WIRING 6

440P412785
0
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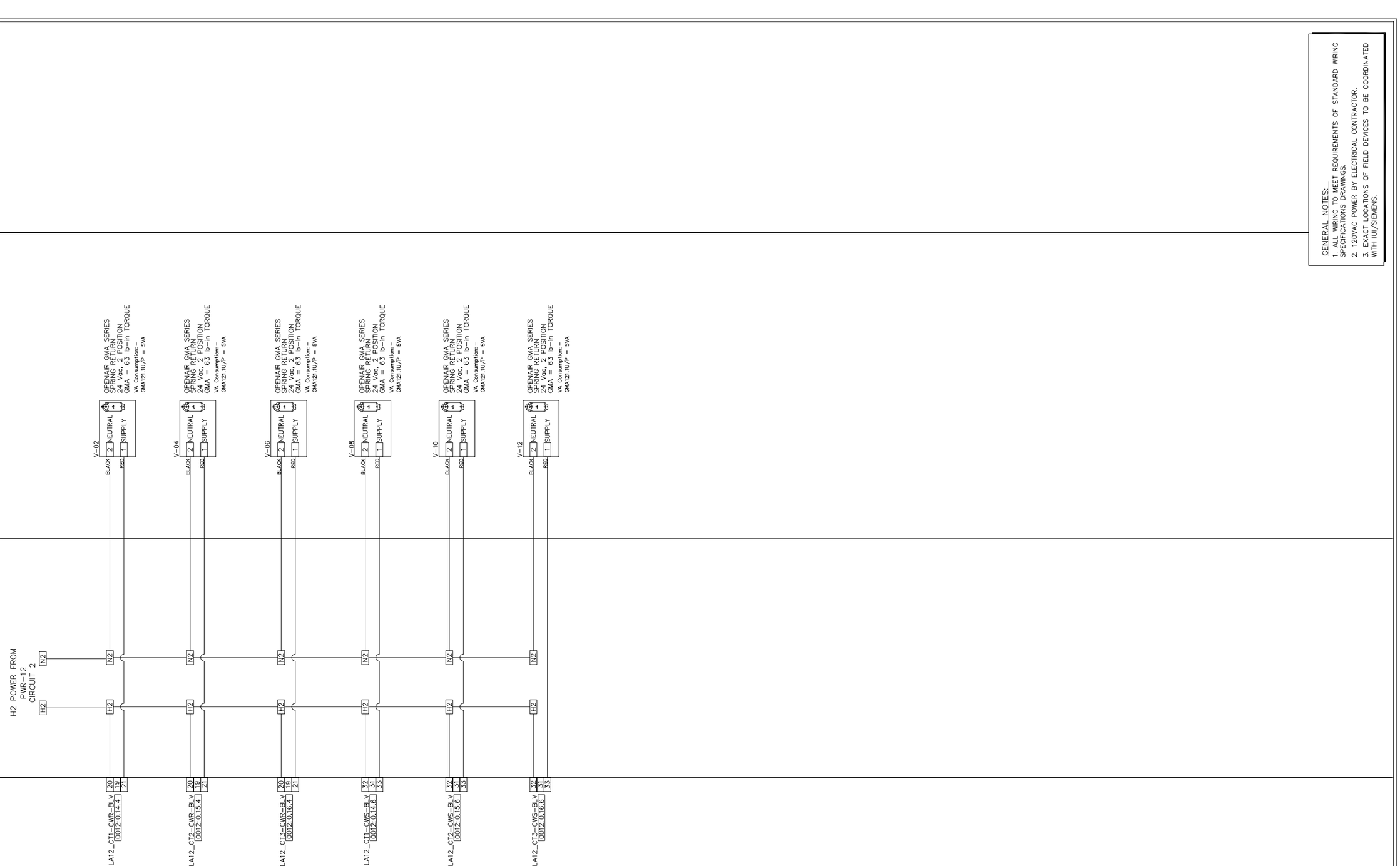
FIELD WIRING | **STARTER WIRING**



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CHW SYS ELEC. WIRING 7

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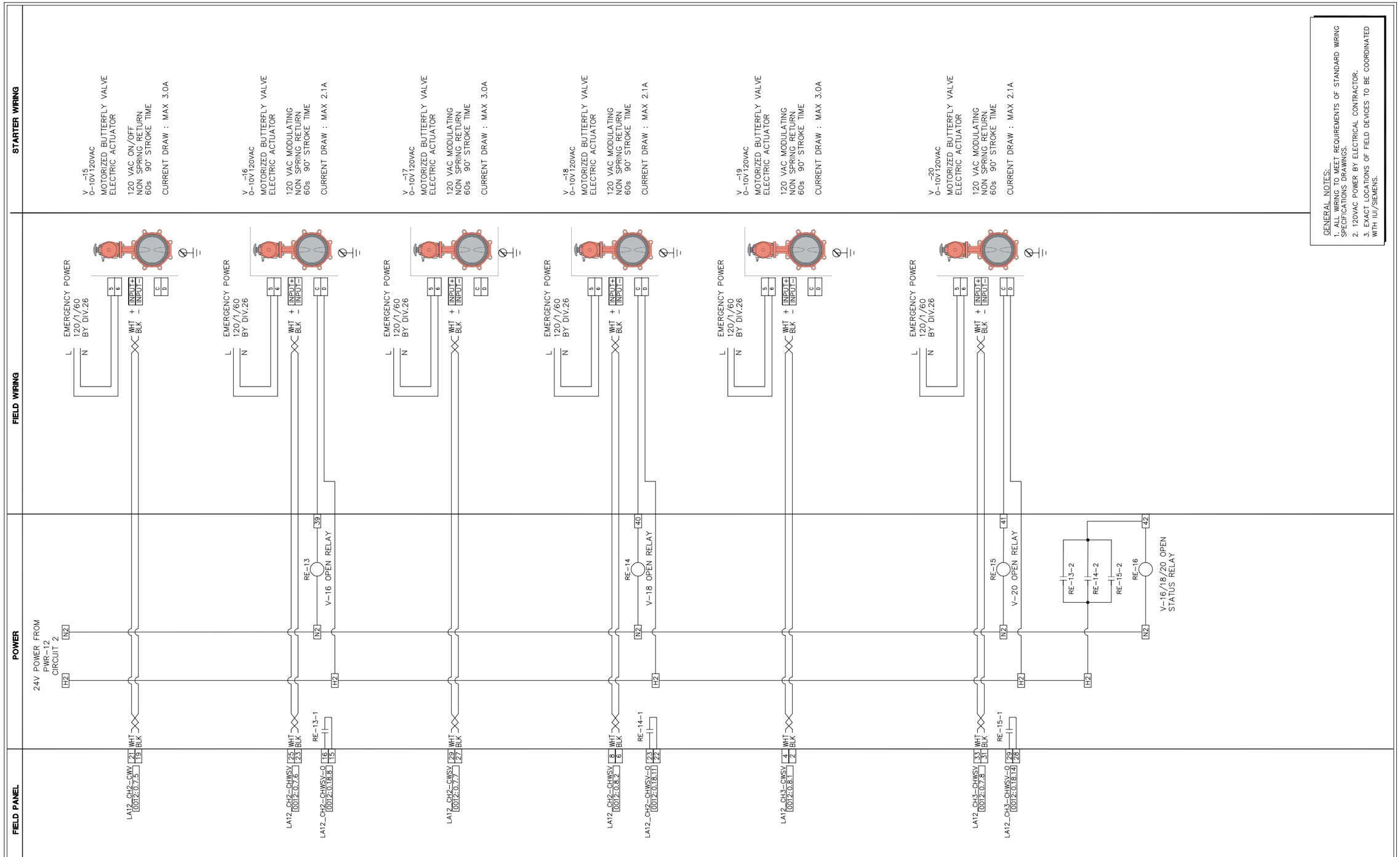

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CHW SYS ELEC. WIRING 8

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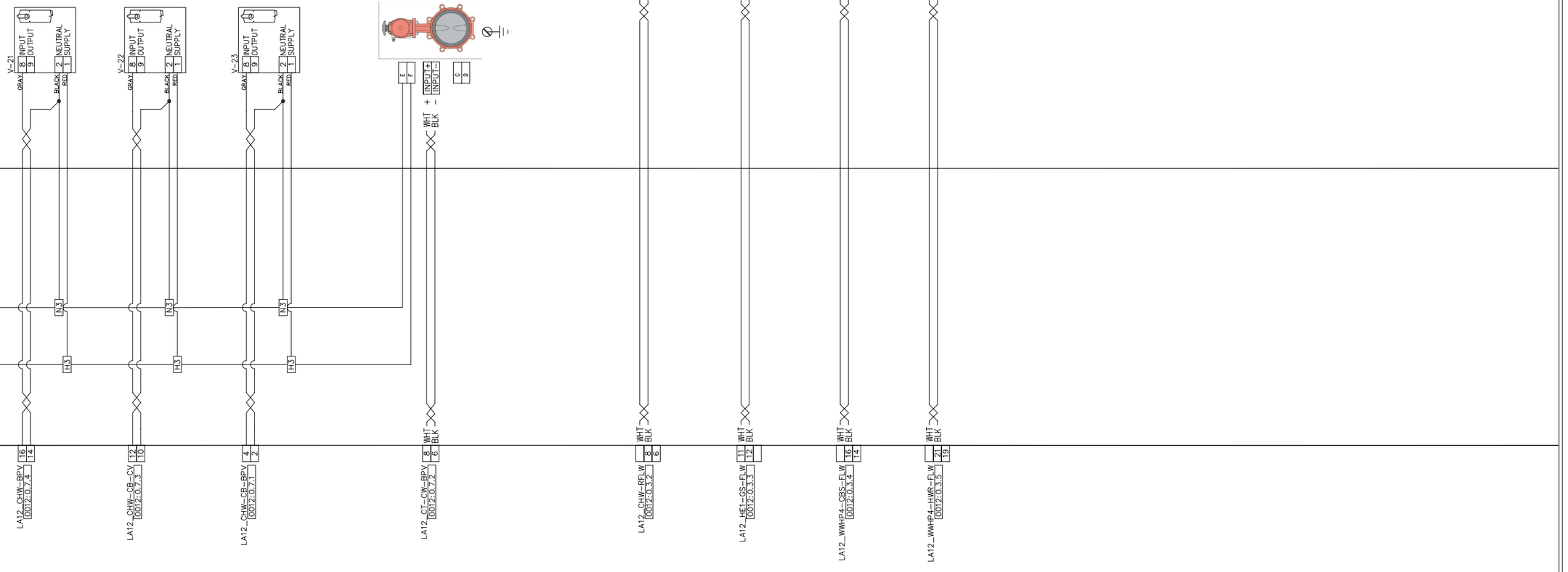
FIELD WIRING | **STARTER WIRING**



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CHW SYS ELEC. WIRING 9

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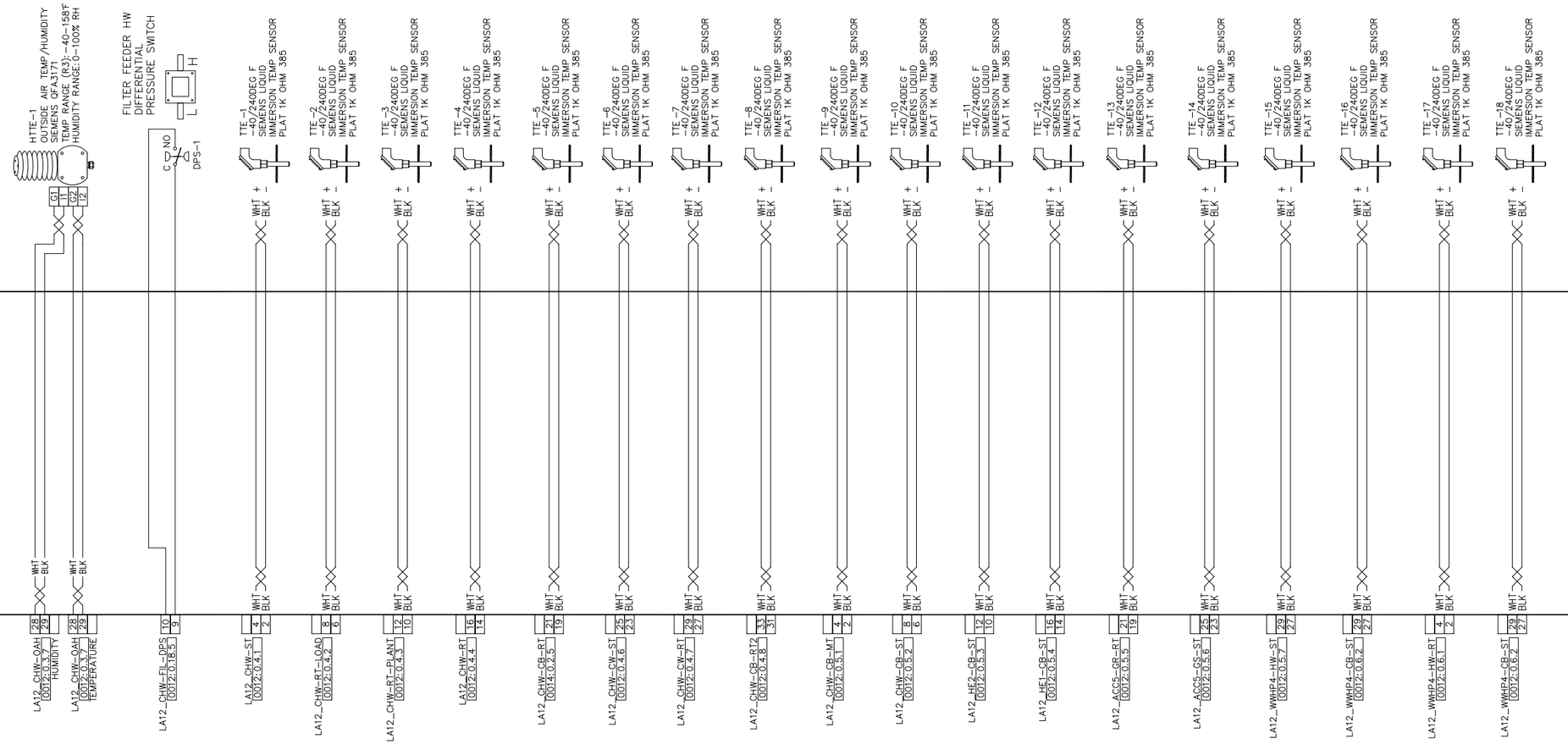
FIELD WIRING | **STARTER WIRING**



POWER

FIELD PANEL

GENERAL NOTES:
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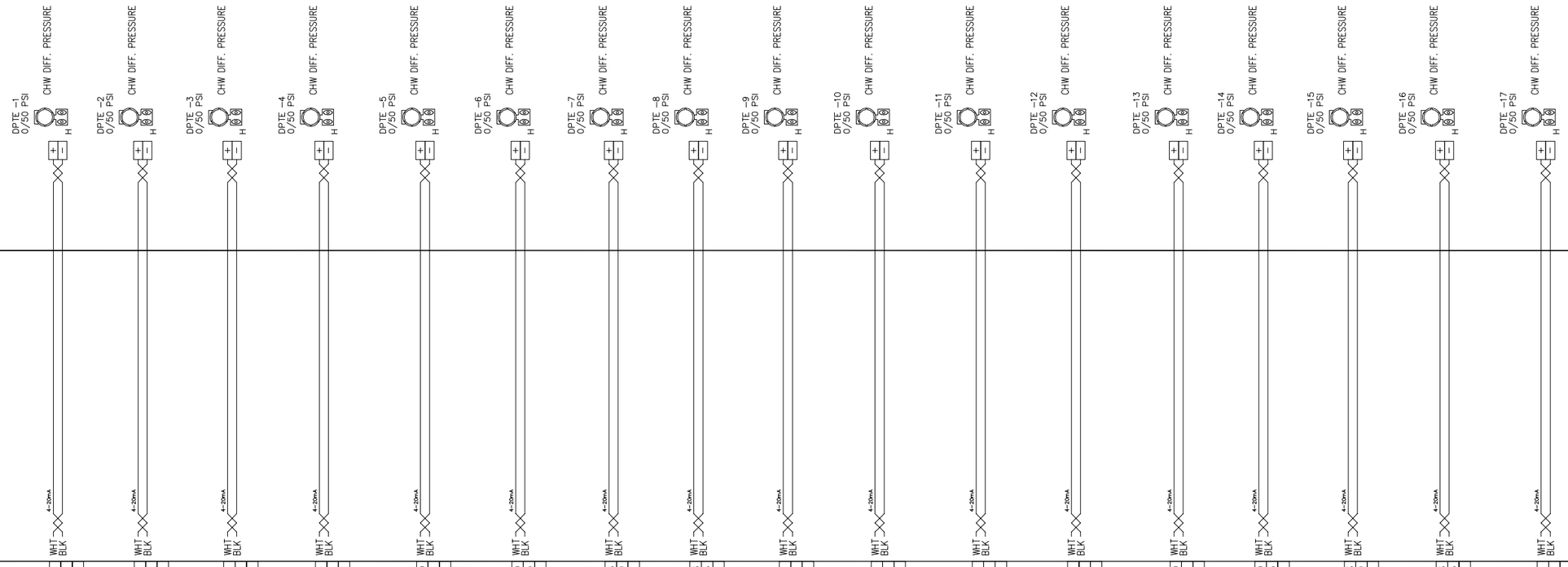

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DRAWING NOTES:
(#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.
3. TERMINAL CONNECTIONS WILL BE VERIFIED WHEN HAVING EQUIPMENT CUTSHEET.

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FIELD WIRING

STARTER WIRING

POWER

FIELD PANEL

120VAC EMERGENCY POWER BY EC

UPS-2

BATTERY-BACKED OUTLET

PIN 5= COMMON
PIN 7= LOW BATTERY
PIN 9= LOAD ON BATTERY

18 AWG TP

18 AWG TP

120VAC

1 1/2 AMP AGC

HANDI-BOX METAL COVER NO FUSE

SERVICE BOX

192VA

500VA

POWER SUPPLY 24V POWER FROM PWR-1.3 CIRCUIT 1

VFD-CWP-1

VFD-CWP-2

VFD-CWP-3

SAFETIES

ENABLE

SPEED

DRIVE FAULT

SYSTEM RUN STATUS

RUN PERMISSIVE

RIB-20

RIB-21

RIB-22

START/STOP

WHT
BLK

FS-1 SETPT GPM
LIQUID FLOW SWITCH
SPST DRY CONTACT

FS-2 SETPT GPM
LIQUID FLOW SWITCH
SPST DRY CONTACT

FS-3 SETPT GPM
LIQUID FLOW SWITCH
SPST DRY CONTACT

PCT-1
ON DELAY TIMER
T=5S
TIMING MODE: b

PCT-2
ON DELAY TIMER
T=5S
TIMING MODE: b

PCT-3
ON DELAY TIMER
T=5S
TIMING MODE: b

RE-17

RE-17-2

RE-20-2

RE-18

RE-18-2

RE-21-2

RE-19

RE-19-2

RE-22-2

6VA

FS-1 RELAY RE-20

FS-2 RELAY RE-21

FS-3 RELAY RE-22

RE-17-1

RE-18-1

RE-9-1

RE-20-1

RE-21-1

RE-22-1

LA13_CHW-UPS2-LBT 0013:0.4.1 LOW BATTERY

LA13_CHW-UPS2-PW 0013:0.4.2 LOSS OF POWER

LA13_CWP1 0013:0.3.1

LA13_CWP1-S 0013:0.2.2

LA13_CWP1-F 0013:0.4.9

LA13_CWP1-STS 0013:0.4.8

LA13_CWP2 0013:0.3.2

LA13_CWP2-F 0013:0.4.11

LA13_CWP2-F 0013:0.4.11

LA13_CWP2-STS 0013:0.4.10

LA13_CWP3 0013:0.3.3

LA13_CWP3-S 0013:0.2.4

LA13_CWP3-F 0013:0.4.13

LA13_CWP3-STS 0013:0.4.12

LA13_CWP1-FS 0013:0.4.5

LA13_CWP2-FS 0013:0.4.6

LA13_CWP3-FS 0013:0.4.7

CONTINUE TO NEXT PAGE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0013	LA13.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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CW SYS ELEC WIRING 1

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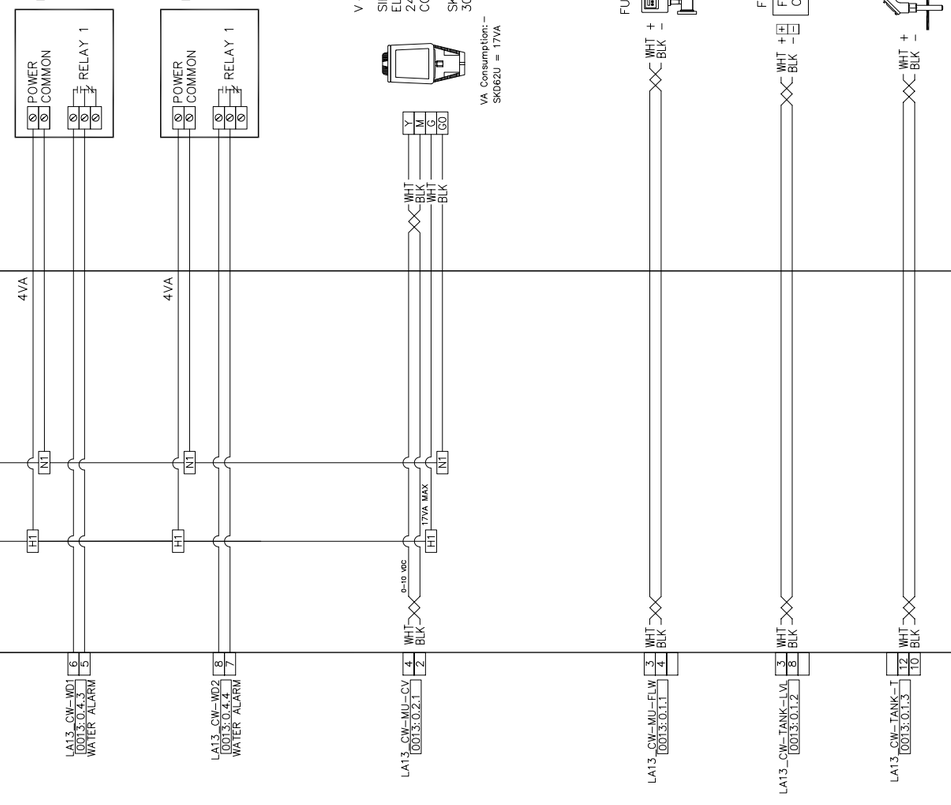
FIELD WIRING | **STARTER WIRING**



GENERAL NOTES:-
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
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0013	LA13.PXCA	

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IU# 20250072, IN

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CW SYS ELEC WIRING 2

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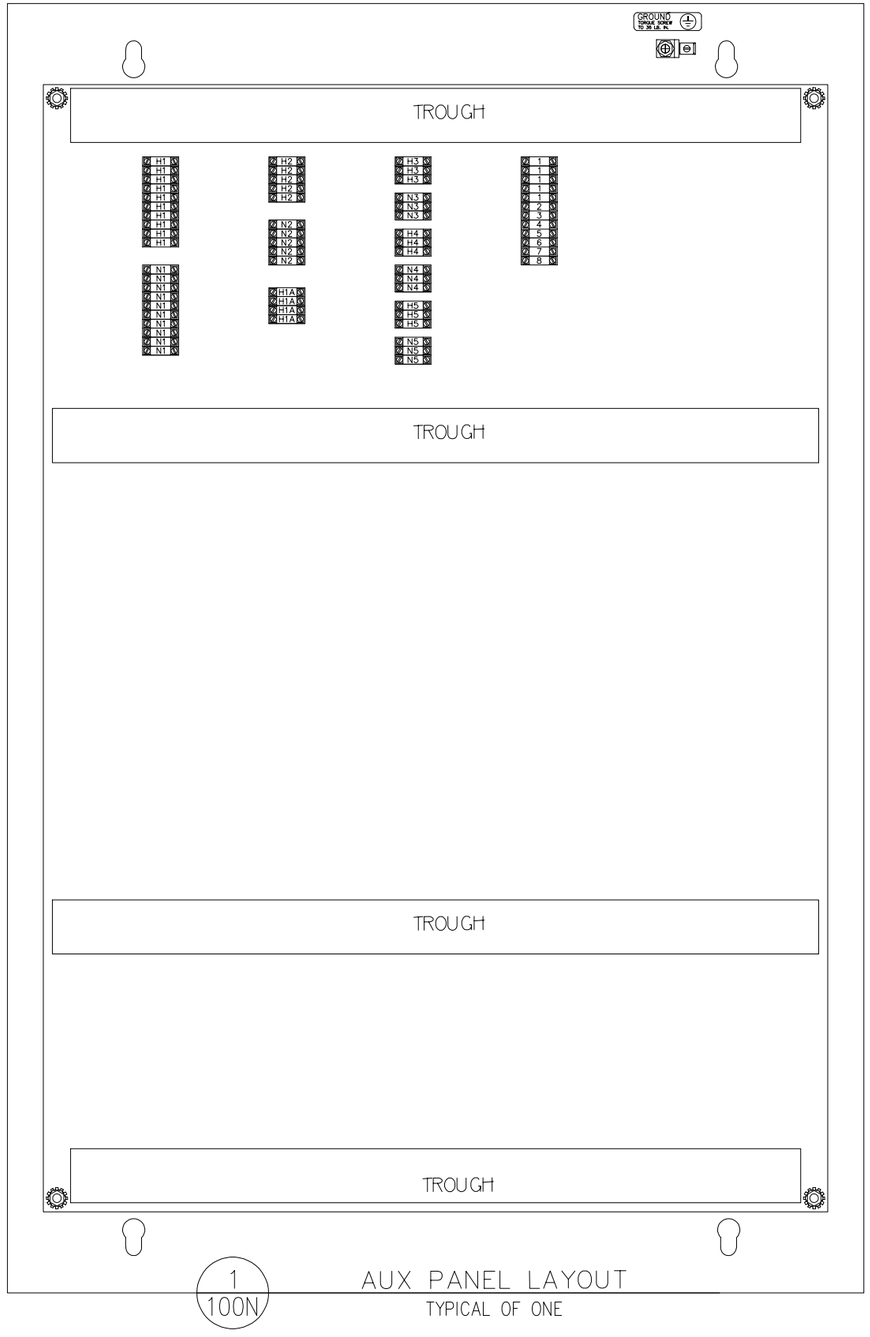
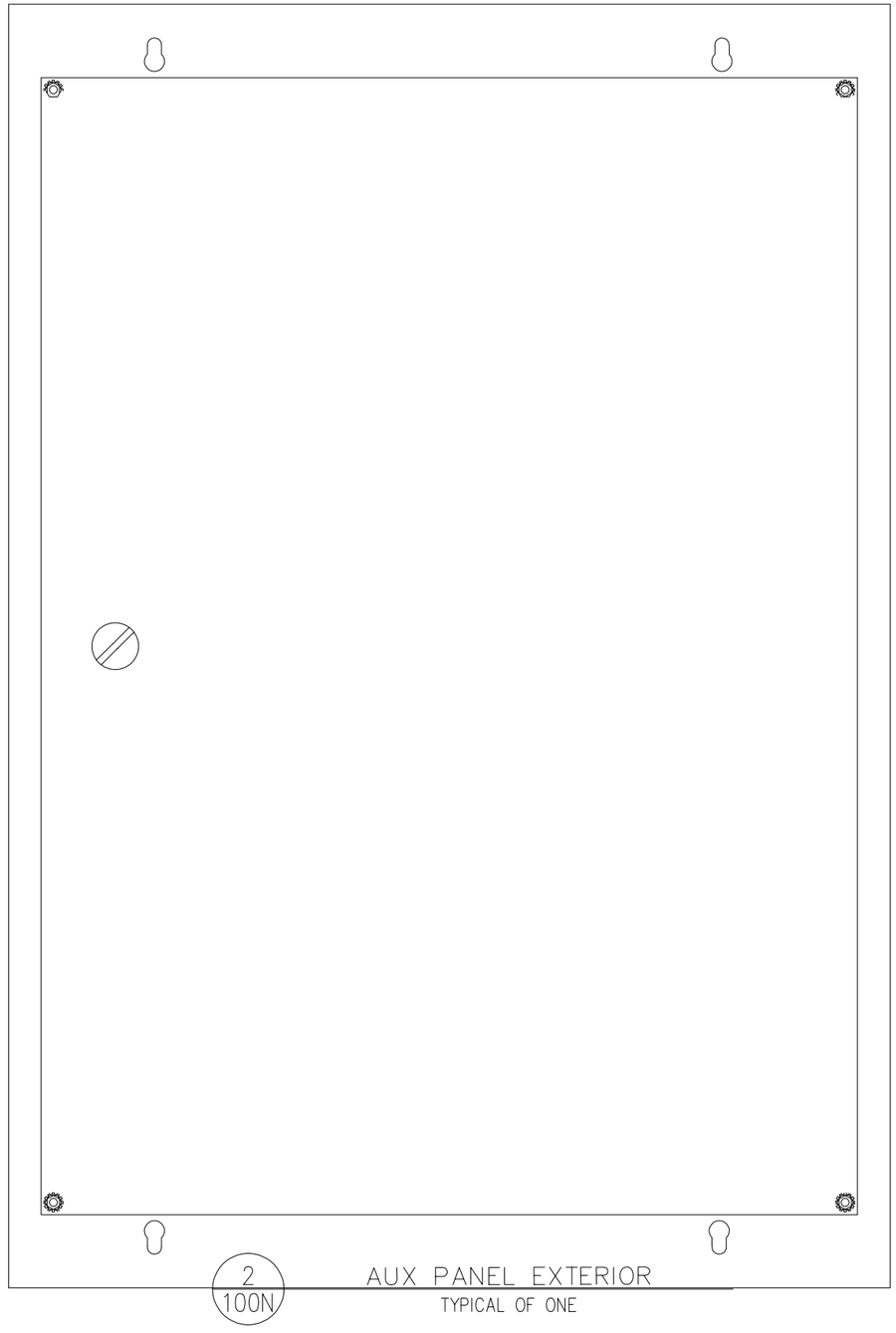


1 100N AUX PANEL LAYOUT
TYPICAL OF ONE



2 100N AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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CHW AUX PANEL LAYOUT

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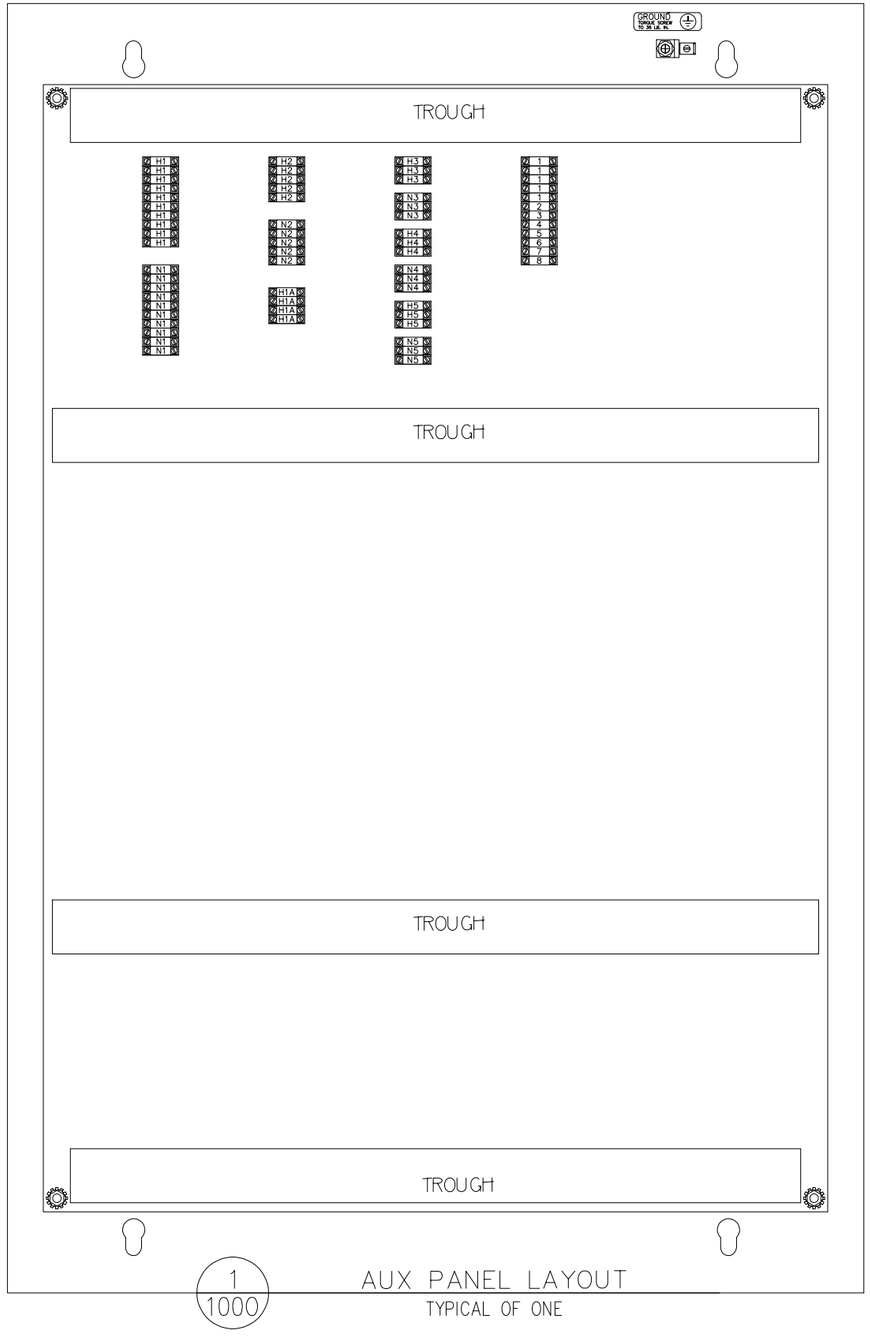

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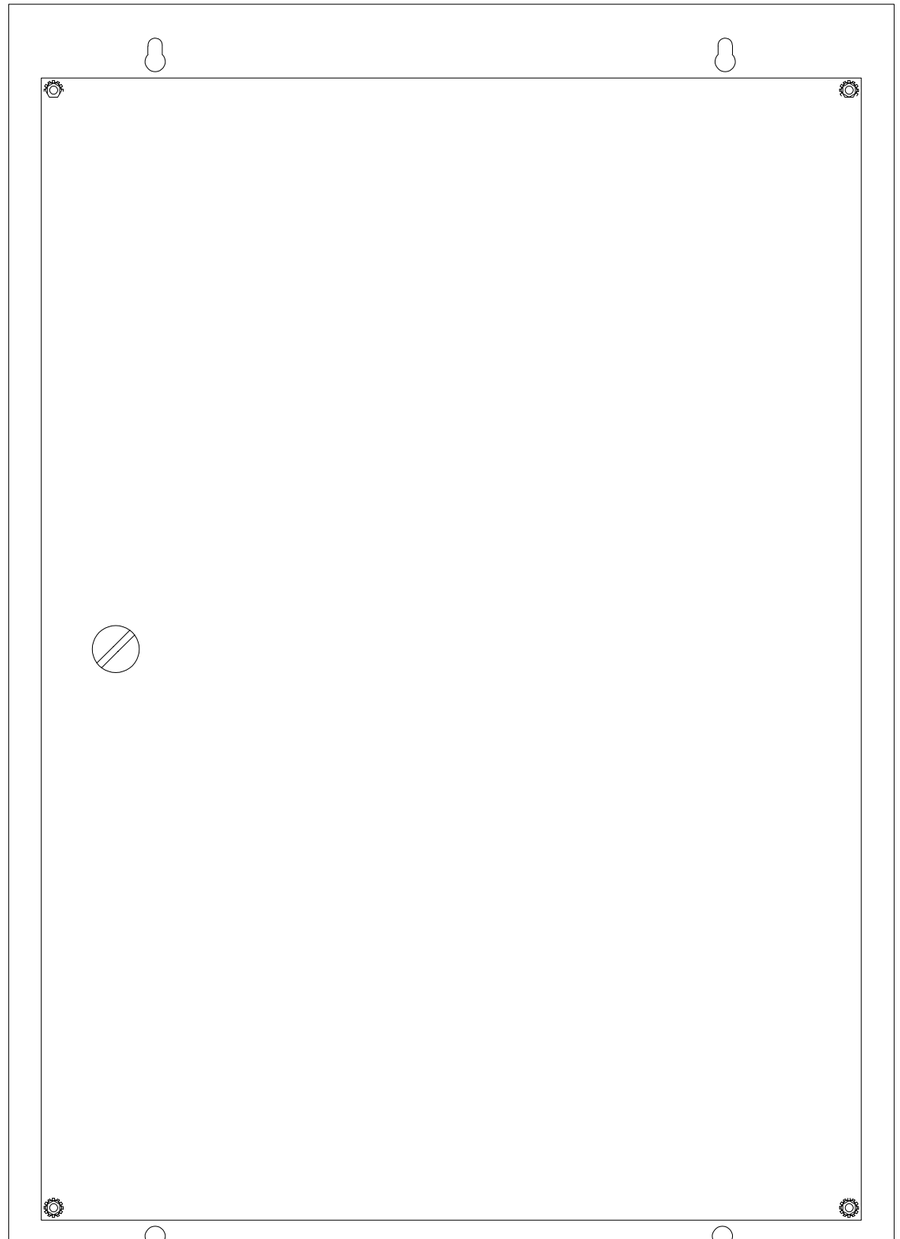
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

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CW AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
DPS 1	1	J21K-232	UNITED ELECTRIC	0706cut001	DP SW WATER 0-25 PSI FIXED DB
DPTE 1-17	17	7MF0340 SERIES	SIEMENS		DIFFERENTIAL PRESSURE 0-50PSI
FM 1	1	FBO			FURNISHED BY OTHERS
FM 3-6	4	FBO			FURNISHED BY OTHERS
FS 1-3	3	FS7-4	MCDONNELL & MILLER		LIQUID FLOW SWITCH
HTTE 1	1	QFA3171	SIEMENS	149992	ROOM RH & TEMP SENSOR, 4-20mA, 2%
	1	AQF3100	SIEMENS		WEATHER SHIELD FOR QFA31XX
PNL AUX-12-AUX-13	2	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 12-13	2	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-22	22	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
RIB 23-25	3	RIB2401B	FUNCTIONAL DEVICES	1208cut021	20A SPDT 24VAC/DC/120VAC
RIB 26-28	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1-19	19	544-577-40	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 4"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
UPS 2	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD CT-1-CT-3	3	FBO			FURNISHED BY OTHERS
VFD CBP-1-CBP-5	5	FBO			FURNISHED BY OTHERS
VFD CWP-1-CWP-3	3	FBO			FURNISHED BY OTHERS
VFD GWP-1-GWP-2	2	FBO			FURNISHED BY OTHERS
VFD HWP-4	1	FBO			FURNISHED BY OTHERS
VFD CHWP-1-CHWP-3	3	FBO			FURNISHED BY OTHERS
WD 1-4	4	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PCT 1-3	3	161	PELTEC		ON DELAY TIMER

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
RE 1-15	15	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED
RE 16	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 17-22	6	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED

SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST. THE COOLING WATER SYSTEMS (CHW, CB, CW) SHALL OPERATE 8,760 HOURS PER YEAR WITHIN THE LIMITATIONS STATED HEREIN.

1. CENTRIFUGAL CHILLERS:

ENABLE: THE CENTRIFUGAL CHILLERS SHALL BE ENABLED TO BE OPERATIONAL WHENEVER THE OUTDOOR AIR TEMPERATURE IS GREATER THAN **50F (ADJ)**.

DISABLE: THE CHILLED WATER SYSTEM SHALL SHUT DOWN WHENEVER THE OUTDOOR AIR TEMPERATURE FALLS BELOW **48F (ADJ)**. THE CHILLED WATER SYSTEM SHALL BE SHUT DOWN WHENEVER THE OAT IS BELOW **58F (ADJ)** AND THE CALCULATED PLANT TONNAGE FALLS BELOW **40 TONS (ADJ)** FOR A PERIOD OF **20 MINUTES (ADJ**).

A. CHILLERS ARE MANUALLY INDEXED FOR AUTOMATIC OPERATION THROUGH INTEGRAL ON-OFF SWITCHES.
B. CHILLERS SHALL ALTERNATE IN THE LEAD POSITION EVERY **750 HOURS (ADJ)**. FAILURE OF A CHILLER TO START WHEN COMMANDED BY THE BAS SHALL START THE NEXT CHILLER IN THE SERIES.
C. THE CHILLED WATER SYSTEM SUPPLY TEMPERATURE SETPOINT SHALL BE **42.0F (ADJ)**.
D. CALCULATE SYSTEM TONNAGE REQUIRED BY THE LOADS WITH THE CHILLED WATER SYSTEM SUPPLY TEMPERATURE SETPOINT, SYSTEM RETURN TEMPERATURE (ACTUAL), AND SYSTEM CHILLED WATER FLOW AS INPUTS. CALCULATE PLANT TONNAGE WITH THE PLANT SUPPLY TEMPERATURE (ACTUAL), PLANT RETURN TEMPERATURE (ACTUAL), AND SYSTEM CHILLED WATER FLOW AS INPUTS. TONNAGES TO BE CALCULATED IN REAL TIME AND DISPLAYED ON GRAPHICS.
E. WHEN THE CALCULATED PLANT TONNAGE EQUALS OR EXCEEDS THE CHILLER START TONNAGE **(450 TONS (ADJ))**, THE LAG CHILLER SHALL BE INITIATED.
i. THE CHILLED WATER SETPOINT OF THE LEAD CHILLER IS RAISED **2F (ADJ)** TO ALLOW THE LAG CHILLER TO COME ONLINE.
ii. THE LAG CHILLER'S CHILLED WATER AND CONDENSER WATER ISOLATION VALVES SHALL OPEN. THE CHILLED WATER ISOLATION VALVE SHALL OPEN AT A RATE SLOW ENOUGH SUCH THAT NO SHUTDOWN OF ANY OPERATING CHILLER OCCURS DUE TO LOW FLOW (ECC SHALL COORDINATE WITH CHILLER MANUFACTURER AND TEST AND BALANCE CONTRACTOR TO DETERMINE THIS VALUE).
iii. WHEN FLOW THROUGH THE LAG CHILLER IS PROVED VIA THE CHILLER'S INTERNAL SAFETIES, THE CHILLER SHALL BE ENERGIZED TO PRODUCE CHILLED WATER AT THE CHILLED WATER SYSTEM SUPPLY TEMPERATURE SETPOINT.
iv. THE LEAD CHILLER'S CHILLED WATER SETPOINT SHALL RETURN TO THE CHILLED WATER SYSTEM SUPPLY TEMPERATURE SETPOINT AFTER THE LAG CHILLER HAS BEEN OPERATIONAL FOR **5 MINUTES (ADJ)**.
v. THE ADDITION OF A THIRD CHILLER SHALL BE IN THE SAME MANNER AS DESCRIBED ABOVE.
F. WHEN TWO CHILLERS ARE OPERATING AND THE CALCULATED PLANT TONNAGE IS LESS THAN THE SINGLE CHILLER STOP TONNAGE **(425 TONS (ADJ))** FOR **15 MINUTES (ADJ),** THE LAG CHILLER SHALL SHUT DOWN ACCORDING TO THE CHILLER MANUFACTURER'S REQUIREMENTS AND BOTH OF ITS ISOLATION VALVES SHALL CLOSE.
G. WHEN THREE CHILLERS ARE OPERATING AND THE CALCULATED PLANT TONNAGE IS LESS THAN THE TWO CHILLER NOMINAL TONNAGE **(900 TONS (ADJ**) FOR **15 MINUTES (ADJ)**, THE THIRD CHILLER SHALL SHUT DOWN ACCORDING TO THE CHILLER MANUFACTURER'S REQUIREMENTS AND BOTH OF IT'S ISOLATION VALVES SHALL CLOSE.
H. WHEN THE CHILLER IS FIRST ENABLED FOLLOWING WINTER HEAT EXCHANGER HE-2 OPERATION IF THE CONDENSER TANK TEMPERATURE IS NOT AT LEAST **57F (ADJ)** AT THE TIME OF CHILLER ENABLING:
i. THE TOWER BYPASS VALVE SHALL BE FULLY OPEN AND ALL THREE COOLING TOWER CWR ISOLATION VALVES SHALL BE FULLY CLOSED (SO NO WATER GOES OVER THE TOWER) FOR AN INITIAL PERIOD OF UP TO **FIFTEEN MINUTES (ADJ)** WITH CW CIRCULATING THROUGH THE OPERATING (LOADED) LEAD CHILLER. DISABLE THE TOWER BYPASS INITIAL STARTUP SEQUENCE IF THE CONDENSER WATER SUPPLY TEMPERATURE (DISCHARGE SIDE OF THE PUMPS, PRIOR TO ENTERING THE LEAD CHILLER'S CONDENSER BARREL) REACHS **80F (ADJ)** DURING THE INITIAL STARTUP.
ii. IF AT THE END OF THIS INITIAL TIME THE CONDENSER WATER SUPPLY TEMPERATURE (DISCHARGE SIDE OF THE PUMPS, PRIOR TO ENTERING THE LEAD CHILLER'S CONDENSER BARREL) IS NOT AT LEAST **15F (ADJ)** MORE THAN THE CHILLED WATER SYSTEM SUPPLY TEMPERATURE THEN SHUT THE LEAD CHILLER DOWN. ENABLE THE LAG CHILLER AND REPEAT THE ABOVE START SEQUENCE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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WITH THE LAG CHILLER (NOW THAT THE TANK TEMPERATURE ROSE UP SOME AFTER THE FIRST ATTEMPT WITH THE LEAD CHILLER).

2. COOLING TOWERS:

ENABLE: THE COOLING TOWERS SHALL BE ENABLED TO BE OPERATIONAL WHENEVER THE OUTDOOR AIR TEMPERATURE IS GREATER THAN **35F (ADJ)** FOR HEAT EXCHANGER OPERATION.

DISABLE: THE CONDENSER WATER SYSTEM SHALL SHUT DOWN WHENEVER THE OUTDOOR AIR TEMPERATURE FALLS BELOW **34F (ADJ)**. THE CONDENSER WATER SYSTEM HEAT EXCHANGER OPERATION SHALL BE SHUT DOWN WHENEVER THE OAT IS BELOW **58F (ADJ)** AND THE WWHP EVAPORATOR DISCHARGE TEMPERATURE IS ABLE TO MEET THE WWHP EVAPORATOR WATER TEMPERATURE SETPOINT FOR A PERIOD OF **20 MINUTES (ADJ**).

A. WHENEVER A LEAD CHILLER OPERATES, THE LEAD COOLING TOWER SHALL OPERATE (WITH THE LAG SECOND TOWER CONTROLLED ON/OFF AS NOTED BELOW). WHEN TWO CHILLERS OPERATE, A MINIMUM OF TWO TOWERS SHALL OPERATE (WITH THE LAG THIRD TOWER CONTROLLED ON/OFF AS NOTED BELOW). WHEN THREE CHILLERS OPERATE, ALL THREE TOWERS SHALL OPERATE. THE TOWER FAN SHALL BE ENABLED TO OPERATE **TWO MINUTES (ADJ)** AFTER FLOW CONTROL IS FULLY ESTABLISHED TO THAT TOWER. THE BAS SHALL DISPLAY RUNHOURS OF EACH TOWER CELL FAN AND DESIGNATE THE FAN WITH THE LEAST HOURS AS THE LEAD FAN FOR STARTUP.

B. THE FAN SPEED IS VARIED TO MEET THE CONDENSER WATER TEMPERATURE SETPOINT. WITH A SINGLE LEAD TOWER FLOWING WATER AND ITS FAN REACHES **40% SPEED (ADJ)** FOR A PERIOD OF **10 MINUTES (ADJ)** THE SECOND LAG TOWER SHALL BE ENABLED TO OPERATE IN PARALLEL WITH THE FIRST WITH WATER PASSING OVER BOTH TOWERS. CONTINUE TO VARY THE SPEED OF JUST THE SINGLE LEAD TOWER FAN. WHEN THE SINGLE LEAD TOWER FAN SPEED REACHES **50% SPEED (ADJ)** FOR A PERIOD OF **15 MINUTES (ADJ)** START THE SECOND LAG TOWER FAN.

C. WITH TWO TOWERS FLOWING WATER AND TWO FANS OPERATING WITH BOTH FANS REDUCED TO THE MINIMUM **18 HZ SPEED (ADJ)** FOR A PERIOD OF **2 MINUTES (ADJ)** AND CONDENSER WATER TEMPERATURE FALLS BELOW THE CONDENSER WATER TEMPERATURE SETPOINT BY **1F (ADJ)** FOR A PERIOD OF **2 MINUTES (ADJ)**, THE TOWER FAN WITH THE MOST OPERATING HOURS SHALL BE DISABLED WHILE THE OTHER TOWER FAN CONTINUES TO OPERATE WITH WATER PASSING OVER BOTH TOWERS. THE LAG TOWER FAN SHALL BE DISABLED WHILE THE LEAD TOWER FAN CONTINUES TO OPERATE WITH WATER PASSING OVER BOTH TOWERS.

D. WITH TWO TOWERS FLOWING WATER AND ONE FAN OPERATING WITH THE FAN REDUCED TO THE MINIMUM **18 HZ SPEED (ADJ)** FOR A PERIOD OF **2 MINUTES (ADJ)** AND CONDENSER WATER TEMPERATURE FALLS BELOW THE CONDENSER WATER TEMPERATURE SETPOINT BY **1F (ADJ)** FOR A PERIOD OF **2 MINUTES (ADJ)** THE LAG TOWER SHALL BE DISABLED WHILE THE LEAD TOWER AND FAN CONTINUES TO OPERATE WITH WATER PASSING OVER ONE TOWER.

E. PROVIDE A MINIMUM FAN OFF TIME OF **5 MINUTES (ADJ)** BEFORE THAT FAN IS ENABLED TO START AGAIN. TAKE FANS OUT OF SERVICE WHICH EXCEED **SIX (ADJ) STARTES PER HOUR** AND SIGNAL AN ALARM.

E.1 WHEN TWO CHILLERS ARE OPERATING, CONTROL THE TWO TOWERS TOGETHER SIMILAR TO THE "SINGLE LEAD" TOWER TEXT ABOVE AND TURN ON/OFF THE THIRD TOWER SIMILAR TO THE "SECOND LAG" TOWER TEXT ABOVE.

F. MAINTAIN CONDENSER WATER TEMPERATURE SETPOINT BY MODULATING THE TOWER FAN SPEED FROM **18 TO 60 HZ (ADJ)**; PROGRAM OUT FREQUENCIES AS APPROPRIATE FOR VIBRATION FREE FAN OPERATION. WHEN MULTIPLE TOWER FANS ARE OPERATIONAL, TOWER FANS SPEED SHALL MODULATE TOGETHER.

G. COOLING TOWERS SHALL ALTERNATE IN THE LEAD POSITION EVERY **750 HOURS (ADJ)**. FAILURE OF A COOLING TOWER FAN SHALL AUTOMATICALLY START THE NEXT TOWER IN THE SEQUENCE AND GENERATE AN ALARM AT THE BAS.

H. WHENEVER A COOLING TOWER IS CALLED TO OPERATE, ITS SUPPLY AND RETURN ISOLATION VALVES SHALL OPEN. THE TOWER PUMP SHALL BE ENABLED AFTER A PERIOD OF **1 MINUTE (ADJ)** TO ALLOW FOR FULL OPENING OF THE TWO VALVES.

I. WHENEVER A TOWER IS REMOVED FROM THE SEQUENCE, ITS SUPPLY AND RETURN ISOLATION VALVES CLOSE. THE SUPPLY (COLD WATER LEAVING THE BOTTOM OF THE TOWER) VALVE SHALL BE DELAYED FROM BEGINNING TO CLOSE FOR A PERIOD OF **2 MINUTES (ADJ)** AFTER THE RETURN (WARM WATER TO UPPER BASIN) VALVE CLOSES TO ALLOW FOR FULL DRAINAGE OF THE TOWER BACK TO THE TANK. THE CR BLEED ISOLATION VALVE SHALL REMAIN OPEN WHILE THE TOWER IS OFF FOR A PERIOD OF**10 MINUTES (ADJ)** TO ALLOW FOR FULL DRAINAGE OF THE PIPE TO THE HOT WATER BASIN, AFTER WHICH IT SHALL CLOSE. THE CS BLEED ISOLATION VALVE SHALL REMAIN OPEN WHILE THE TOWER IS OFF FOR A PERIOD OF **8 MINUTES (ADJ)** TO ALLOW FOR FULL DRAINAGE OF THE PIPE FROM THE COLD WATER BASIN, AFTER WHICH IT SHALL CLOSE.

J. ANYTIME THE CONDENSER WATER SYSTEM IS ENABLED AND THE LEVEL CONTROLLER CALLS FOR MAKEUP WATER, THE CONDENSER WATER MAKEUP VALVE SHALL OPEN.

K. PROVIDE TANK LEVEL SETTINGS (AS MEASURED FROM THE BOTTOM OF THE TANK): TANK LOW LEVEL CRITICAL LEVEL **X" (ADJ)**; TANK LOW LEVEL **X" (ADJ)**; TANK FILL LEVEL **X" (ADJ)**; TANK HIGH LEVEL **X" (ADJ)**; TANK HIGH LEVEL CRITICAL LEVEL **X" (ADJ)**. PROVIDE ALARMS AT EACH LEVEL OTHER THAN TANK FILL LEVEL.

L. ANYTIME ALL THE CONDENSER WATER PUMPS ARE DISABLED, THE COOLING TOWERS SHALL BE DISABLED. FULLY OPEN THE BOTH CONDENSER SUPPLY (COLD WATER BASIN, BOTTOM OF TOWER) ISOLATION VALVES AND BOTH CONDENSER RETURN (WARM WATER TO UPPER BASIN) ISOLATION VALVES.

M. PROVIDE HARDWARE AND SEQUENCE SUCH THAT: THE FAN MOTOR ANTI-CONDENSATION HEATER IS POWERED OFF WHENEVER THE FAN IS OPERATING; THE MOTOR ANTI-CONDENSATION HEATER IS POWERED ON WHENEVER THE FAN IS OFF.

3. CONDENSER WATER TEMPERATURE CONTROL:

A. CONDENSER WATER TEMPERATURE SETPOINT (WHEN CENTRIFUGAL CHILLERS ARE OPERATING) SHALL VARY PER THE MEASURED OUTDOOR AIR WET BULB TEMPERATURE (UTILIZE GLOBAL OUTDOOR AIR TEMP AND GLOBAL OUTDOOR AIR HUMIDITY TO CALCULATE WET BULB. PROVIDE LOCAL BUILDING BACKUP OF EACH ALSO). LOGIC SHALL RESET THE CONDENSER WATER TEMPERATURE SETPOINT COOLER AS THE AMBIENT CONDITIONS MERIT TO ALLOW FOR COOLER CONDENSER WATER AND MORE EFFICIENT CHILLER OPERATION WITHOUT UTILIZING EXCESSIVE TOWER FAN ENERGY. CONDENSER WATER TEMPERATURE SETPOINT SHALL BE DISPLAYED AND TRENDED ON THE GRAPHICS. UTILIZE THE FIVE MINUTE RUNNING AVERAGE OAT WB CONDITION BASED ON AT LEAST 50 DATA POINTS. MAKE THE SETPOINT CHANGES OVER A **20 MINUTES (ADJ)** PERIOD WITH A VERY SLOWLY TUNED SETPOINT CHANGE LOOP. LIMIT SETPOINT CHANGES TO BE REVISED TO NO MORE THAN A **1.0F (ADJ)** PER HOUR.

- WHEN AVERAGE OAT WET BULB IS LESS THAN **63FWB (ADJ)** THE CONDENSER WATER TEMPERATURE SETPOINT SHALL BE **68F (ADJ).**
- WHEN AVERAGE OAT WET BULB IS BETWEEN **63FWB (ADJ)** AND **80FWB (ADJ)** THE CONDENSER WATER TEMPERATURE SETPOINT SHALL BE EQUAL TO THE AVERAGE OAT WET BULB **PLUS 5F (ADJ.).**
- WHEN AVERAGE OAT WET BULB IS GREATER THAN **80FWB (ADJ)** THE CONDENSER WATER TEMPERATURE SETPOINT SHALL BE **85F (ADJ).**

B. MAINTAIN CONDENSER WATER SUPPLY TEMPERATURE BY MODULATING THE TOWER FAN SPEED FROM **18 TO 60 HZ (ADJ)**; PROGRAM OUT FREQUENCIES AS APPROPRIATE FOR VIBRATION FREE FAN OPERATION. IF THE FAN IS AT MINIMUM SPEED AND CONDENSER WATER TEMPERATURE FALLS BELOW SETPOINT BY **2.0F (ADJ)** FOR A PERIOD OF **FIVE MINUTES (ADJ)**, SHUT THE TOWER FAN OFF. MAINTAIN FAN OFF FOR A MINIMUM OF **FIVE MINUTES (ADJ)** FOR EVERY FAN ON/OFF CYCLE. IF CONDENSER WATER TEMPERATURE CONTINUES TO FALL WITH THE FAN OFF MODULATE THE TOWER BYPASS VALVE TO MAINTAIN **SETPOINT MINUS 3.0F (ADJ)**. SIGNAL AN ALARM IF THE CONDENSER WATER TEMPERATURE DROPS BELOW **40F (ADJ)** FOR A PERIOD OF **1 MINUTE (ADJ)**.

4. CHILLED WATER PUMPS:

A. WHENEVER A CHILLER IS ENABLED A CHILLED WATER PUMP SHALL START IN SEQUENCE. THE BAS GRAPHICS SHALL DISPLAY RUNHOURS OF EACH PUMP AND DESIGNATE THE PUMP WITH THE LEAST HOURS AS THE LEAD PUMP AT EACH PUMP STARTUP.

B. CHILLED WATER PUMPS SHALL OPERATE IN A LEAD-LAG-LAG ARRANGEMENT.

C. CHILLED WATER PUMPS SHALL ROTATE AS THE LEAD PUMP EVERY **750 HOURS (ADJ)**. FAILURE OF THE LEAD PUMP SHALL AUTOMATICALLY START THE NEXT PUMP IN THE OPERATING SEQUENCE.

D. THE LAG PUMP SHALL START WHEN THE SYSTEM FLOW IS ABOVE **900 GPM (ADJ)** FOR **15 MINUTES**. THE PUMP SHALL STOP IF THE FLOW FALLS BELOW **800 GPM (ADJ)** FOR 1**5 MINUTES (ADJ).**

E. THE THIRD PUMP SHALL START WHEN THE SYSTEM FLOW IS ABOVE **1800 GPM (ADJ)** FOR **15 MINUTES**. THE PUMP SHALL STOP IF THE FLOW FALLS BELOW **1600 GPM (ADJ)** FOR **15 MINUTES.**

F. WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18 TO 60 HZ (ADJ)**

G. THE TWO SYSTEM DIFFERENTIAL PRESSURE SENSORS SHALL BE COMPARED AND THE SENSOR THAT IS THE MOST NEEDY (THE SENSOR WHICH IS BELOW IT'S INDIVIDUAL SENSOR SETPOINT) SHALL BE USED AS THE NORMAL PRESSURE CONTROL INPUT (THE OTHER LESS NEEDY SENSORS WILL BE AT OR ABOVE IT'S INDIVIDUAL SENSOR SETPOINT IN THIS CONDITION). THE INDIVIDUAL SENSOR SETPOINT OF THE FLOOR LEVEL SENSORS SHALL BE THE DIFFERENTIAL PRESSURE REQUIRED TO MAINTAIN THE SCHEDULED GPM AT THE FLOOR'S COILS (AS MEASURED BY THE TAB AGENT) WITH ALL THE COIL CONTROL VALVES 90% OPEN IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING. THE INDIVIDUAL SENSOR SETPOINTS SHALL EACH HAVE THEIR OWN SEPARATE PROGRAMMED ENTRIES. THE INDIVIDUAL SENSOR SETPOINTS SHALL BE NO HIGHER THAN **20 PSID (ADJ).**

H. WHEN CHILLED WATER BYPASS VALVE IS FULLY CLOSED, RESET THE NORMAL PRESSURE CONTROL INPUT DIFFERENTIAL PRESSURE SETPOINT BETWEEN **12 AND 16 PSID (ADJ**) TO MAINTAIN MOST OPEN CHILLED WATER VALVE POSITION BETWEEN **93% AND 97% OPEN (ADJ)**. USING TRIM AND RESPOND LOGIC SETPOINT RESET SHALL BE **+/- 2 PSID (ADJ) AT 10 MINUTE (ADJ)** INTERVALS TO ALLOW TIME FOR PUMP SPEED AND COOLING VALVE CONTROL LOOPS TO ADJUST.

5. CHILLED WATER BYPASS VALVE:

A. THE CHILLED WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN THE SYSTEM FLOW RATE ABOVE THE REQUIRED MINIMUM FLOW RATE **(400 GPM PER CHILLER) (ADJ)** BASED ON THE QUANTITY OF OPERATING CHILLER(S). CONFIRM MINIMUM FLOW RATES IN WRITING WITH THE CHILLER MANUFACTURER.

6. CONDENSER WATER PUMPS:

A. WHENEVER A TOWER STARTS A CONDENSER WATER PUMP SHALL START. FAILURE OF LEAD PUMP SHALL START THE NEXT PUMP IN THE SEQUENCE. THE BAS SHALL DISPLAY RUNHOURS OF EACH PUMP AND DESIGNATE THE PUMP WITH THE LEAST HOURS AS THE LEAD PUMP AT EACH PUMP STARTUP.

B. WHENEVER THE TANK LOW LEVEL CRITICAL LEVEL IS REACHED, ALL CONDENSER PUMPS SHALL BE DISABLED AND AN ALARM GIVEN.

C. CWP SHALL MODULATE IN SPEED TO MAINTAIN A MINIMUM DIFFERENTIAL PRESSURE (ATMOSPHERIC REFERENCE) IN THE CWR HEADER FEEDING THE TOWER WARM WATER BASINS AT THE DIFFERENTIAL SENSOR SETPOINT.

D. WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18 TO 60 HZ (ADJ)**

E. THE DIFFERENTIAL SENSOR SETPOINT SHALL BE THE DIFFERENTIAL PRESSURE REQUIRED TO MAINTAIN THE SCHEDULED GPM AT THE TOWER HOT WATER BASIN (AS MEASURED BY THE TAB AGENT). THERE SHALL BE THREE SEPARATE INDIVIDUAL SENSOR SETPOINTS EACH WITH THEIR OWN SEPARATE PROGRAMMED ENTRIES FOR THE CASES OF ONE, TWO, AND THREE TOWERS OPERATING. THE INDIVIDUAL SENSOR SETPOINTS SHALL BE NO HIGHER THAN **5.0 PSID (ADJ).**

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SEQUENCE OF OPERATION (CONTINUED):

7. CHILLED BEAM PUMPS:

A. A CHILLED BEAM PUMP SHALL OPERATE 8,760 HOURS PER YEAR. GENERALLY, ONLY A SINGLE CHILLED BEAM PUMP IS OPERATING. CHILLED BEAM PUMPS SHALL OPERATE IN A LEAD–LAG ARRANGEMENT. FAILURE OF LEAD PUMP SHALL START THE NEXT PUMP IN THE SEQUENCE. THE BAS SHALL DISPLAY RUNHOURS OF EACH PUMP AND DESIGNATE THE PUMP WITH THE LEAST HOURS AS THE LEAD PUMP AT EACH PUMP STARTUP. CHILLED BEAM PUMPS SHALL ROTATE AS THE LEAD PUMP EVERY **750 HOURS (ADJ)**.

B. THE DIFFERENTIAL PRESSURE SETPOINT SHALL BE DETERMINED AS FOLLOWS **(**FINAL INDIVIDUAL SENSOR SETPOINTS DETERMINED BY TAB**)** 90% THROUGH THE CB WATER PIPING SYSTEM. THE THREE SYSTEM DIFFERENTIAL PRESSURE SENSORS SHALL BE COMPARED AND THE SENSOR THAT IS THE MOST NEEDY (THE SENSOR WHICH IS BELOW IT'S INDIVIDUAL SENSOR SETPOINT) SHALL BE USED AS THE NORMAL PRESSURE CONTROL INPUT (THE OTHER LESS NEEDY SENSORS WILL BE AT OR ABOVE IT'S INDIVIDUAL SENSOR SETPOINT IN THIS CONDITION). THE INDIVIDUAL SENSOR SETPOINT OF THE FLOOR LEVEL SENSORS SHALL BE THE DIFFERENTIAL PRESSURE REQUIRED TO MAINTAIN THE SCHEDULED GPM AT THE FLOOR'S COILS (AS MEASURED BY THE TAB AGENT) WITH ALL THE COIL CONTROL VALVES 90% OPEN IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING. THE INDIVIDUAL SENSOR SETPOINTS SHALL EACH HAVE THEIR OWN SEPARATE PROGRAMMED ENTRIES. THE INDIVIDUAL SENSOR SETPOINTS SHALL BE NO HIGHER THAN **12 PSID (ADJ).**

C. WHEN ONE PUMP HAS OPERATED AT FULL SPEED (**60 HZ (ADJ)**) FOR AT LEAST **10 MINUTES (ADJ)** AND THE SYSTEM PRESSURE IS MORE THAN **2.0 PSID (ADJ) LOWER** THAN THE DIFFERENTIAL PRESSURE SETPOINT FOR AT LEAST **10 MINUTES (ADJ)** A SECOND PUMP SHALL BE ENABLED TO OPERATE IN PARALLEL WITH THE FIRST PUMP. WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18 TO 60 HZ (ADJ)** TO MAINTAIN THE REQUIRED DIFFERENTIAL PRESSURE SETPOINT.

D. WHEN TWO PUMPS ARE OPERATING BELOW MAX CUT–OUT SPEED (**40 HZ (ADJ)**) FOR AT LEAST **10 MINUTE (ADJ)** AND THE SYSTEM PRESSURE IS MORE THAN **2.0 PSID (ADJ) HIGHER** THAN THE DIFFERENTIAL PRESSURE SETPOINT FOR AT LEAST **5 MINUTES (ADJ),** A SECOND PUMP SHALL BE DISABLED. DISABLE THE PUMP WITH THE MOST OPERATING HOURS.

CHILLED BEAM SYSTEM BYPASS VALVE:

A. THE CB WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN THE SYSTEM FLOW RATE ABOVE THE REQUIRED MINIMUM FLOW RATE BASED ON THE WWHP AS MEASURED BY SYSTEM FLOW METER. UTILIZE **50 GPM (ADJ)** SET POINT MINIMUM FLOWRATE UNLESS CONFIRMED BY WWHP MANUFACTURER TO BE HIGHER.

B. SYSTEM BYPASS VALVE SHALL ALSO MODULATE OPEN TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE OF **2 PSID (ADJ)** ABOVE EFFECTIVE SYSTEM DIFFERENTIAL SET POINT WHEN A SINGLE OPERABLE PUMP IS AT MINIMUM SPEED. PUMP MINIMUM SPEED SHALL BE **18 HZ (ADJ)** UNLESS NOTED OTHERWISE.

8. CB SYSTEM TEMPERATURE CONTROL:

THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT SHALL BE **58.0F (ADJUSTABLE).** THE FOLLOWING EQUIPMENT AND OPERATING CONDITIONS ARE EACH RELATED TO THIS BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

A. WHEN THE BUILDING IS ON EMERGENCY POWER:

i. ACC IS TURNED ON, A GWP IS MODULATED IN SPEED TO PROVIDE THE ACC MAX FLOW RATE **(165 GPM)**, AND CBP–4 IS MODULATED TO MAINTAIN THE CB SYSTEM SUPPLY TEMPERATURE TO BE THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

ii. WWHP IS OFF. CENTRIFUGAL CHILLERS ARE OFF. HE–2/CBP–5 IS OFF.

B. WHEN THE BUILDING IS NOT ON EMERGENCY POWER AND THE CENTRIFUGAL CHILLERS ARE OFF:

i. WWHP CONTROLS NORMALLY (SUCH THAT IT IS PREFERENTIALLY LOADED).

ii. HE–2/CBP–5 IS TURNED ON IF THE OAT ENABLES IT (SEE BELOW) AND THE CB SYSTEM SUPPLY TEMPERATURE IS HIGHER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **PLUS 1.0F (ADJUSTABLE)** FOR AT LEAST **10 MINUTES (ADJ)** AND CBP–5 PUMP CONTROLS TO MAKE THE CB SYSTEM SUPPLY TEMPERATURE EQUAL TO THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **PLUS 0.5F (ADJUSTABLE).** HE–2/CBP–5 IS TURNED OFF WHEN THE CBP–5 PUMPS SPEED IS LESS THAN **25 HZ (ADJ)**.

iii. ACC IS TURNED ON IF THE CB SYSTEM SUPPLY TEMPERATURE IS HIGHER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **PLUS 1.5F (ADJUSTABLE)** FOR AT LEAST **10 MINUTES (ADJ)** AND CBP–4 PUMP CONTROLS TO MAKE THE CB SYSTEM SUPPLY TEMPERATURE EQUAL TO THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **PLUS 1.0F (ADJUSTABLE).** ACC IS TURNED OFF WHEN THE ACC GLYCOL MEASURED TONNAGE IS LESS THAN **20 TONS (ADJ)**.

C. WHEN THE BUILDING IS NOT ON EMERGENCY POWER AND THE CENTRIFUGAL CHILLERS ARE ON:

i. WWHP CONTROLS NORMALLY (SUCH THAT IT IS PREFERENTIALLY LOADED). ACC IS OFF. HE–2/CBP–5 IS OFF.

ii. CB SYSTEM TEMP CONTROL VALVE IS MODULATED TO MAKE THE CB SYSTEM SUPPLY TEMPERATURE EQUAL TO THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **PLUS 0.5F (ADJUSTABLE).**

9. SIDESTREAM CONDENSER WATER FILTER:

A. THE CONDENSER WATER FILTER AND ASSOCIATED PUMP SHALL RUN CONTINUOUSLY ANYTIME A TOWER IS OPERATING AND BE DISABLED ANYTIME ALL TOWERS ARE OFF (NOT FLOWING WATER). PROVIDE A **ONE MINUTE (ADJUSTABLE)** DELAY AFTER TOWER PUMP STARTS PRIOR TO ENABLING THE CWF TO ALLOW THE PENTHOUSE PIPING TO FILL WITH WATER AND FLOOD THE SUCTION OF THE CWF PUMP.

10. WATER TO WATER HEAT PUMP (WWHP):

ENABLE: THE WWHP SHALL BE ENABLED TO BE OPERATIONAL 8,760 HOURS PER YEAR.

CALCULATE WWHP TONNAGE AS THE WWHP EVAPORATOR LEAVING TEMPERATURE (ACTUAL), WWHP EVAPORATOR ENTERING TEMPERATURE (ACTUAL), AND THE WWHP EVAPORATOR WATER FLOW AS INPUTS. TONNAGES TO BE CALCULATED IN REAL TIME AND DISPLAYED ON GRAPHICS.

A. THE WWHP SHALL BE STARTED VIA SIGNAL FROM THE BAS AND CONTROLLED VIA ITS INTEGRAL PACKAGED CONTROLS TO MAINTAIN A WWHP LEAVING CHILLED WATER (EVAPORATOR) TEMPERATURE OF THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT **MINUS 1.0F (ADJUSTABLE).** WWHP PACKAGED CONTROLS SHALL LIMIT THE WWHP LEAVING HEATING WATER TEMPERATURE TO A MAXIMUM OF **135F (CONFIRM WITH MANUFACTURER'S MAXIMUM)**.

i. THE WWHP RESPECTIVE CONDENSER PUMP HWP–4 AND EVAPORATOR PUMP CBP–3 SHALL START VIA SIGNAL FROM THE WWHP CONTROL PANEL WHENEVER THE WWHP IS ACTIVE.

ii. THE WWHP HW ISOLATION VALVE SHALL BE OPENED **THIRTY SECONDS (ADJ.)** PRIOR TO STARTING THE WWHP. THE WWHP HEATING WATER ISOLATION VALVE SHALL CLOSE IMMEDIATELY UPON THE WWHP BEING DISABLED AND HWP–4 PUMP IS STOPPED.

11. WWHP HYDRONIC PUMPS (CBP-3 AND HWP-4):

A. CBP SHALL MODULATE IN SPEED TO MAINTAIN:

i. A MINIMUM DIFFERENTIAL PRESSURE ACROSS THE EVAPORATOR OF **10.0 PSID (ADJUSTABLE) PLUS OFFSET** AT ALL TIMES THE WWHP IS OPERATING.

ii. THE OFFSET SHALL BE DETERMINED BASED ON HOW FAR THE CB SYSTEM SUPPLY TEMPERATURE IS FROM THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

– OFFSET EQUALS **2.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **0.5F (ADJ)** AND **1.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT (TO FORCE MORE WATER THROUGH THE WWHP).

– OFFSET EQUALS **3.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **1.0F (ADJ)** AND **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

– OFFSET EQUALS **5.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS MORE THAN **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

iii. THE MINIMUM FLOW SETPOINT SHALL BE DETERMINED AS FOLLOWS: **150 GPM (ADJ) (**MINIMUM OPERATING EVAPORATOR FLOWRATE OF THE WWHP AS DETERMINED IN WRITING BY THE WWHP MANUFACTURER) **PLUS 50 GPM (ADJ)** = **Z GPM** THE MINIMUM FLOW SETPOINT. THE MINIMUM FLOW SETPOINT SHALL BE NO HIGHER THAN **200 GPM (ADJ).**

B. HWP SHALL MODULATE IN SPEED TO MAINTAIN:

i. A MINIMUM DIFFERENTIAL PRESSURE ACROSS THE CONDENSER OF **10.0 PSID (ADJUSTABLE) PLUS OFFSET** AT ALL TIMES THE WWHP IS OPERATING.

ii. THE OFFSET SHALL BE DETERMINED BASED ON HOW FAR THE CB SYSTEM SUPPLY TEMPERATURE IS FROM THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

– OFFSET EQUALS **2.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **0.5F (ADJ)** AND **1.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT (TO FORCE MORE WATER THROUGH THE WWHP).

– OFFSET EQUALS **3.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **1.0F (ADJ)** AND **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

– OFFSET EQUALS **5.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS MORE THAN **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

iii. THE MINIMUM FLOW SETPOINT SHALL BE DETERMINED AS FOLLOWS: **150 GPM (ADJ) (**MINIMUM OPERATING CONDENSER FLOWRATE OF THE WWHP AS DETERMINED IN WRITING BY THE WWHP MANUFACTURER) **PLUS 50 GPM (ADJ)** = **Z GPM** THE MINIMUM FLOW SETPOINT. THE MINIMUM FLOW SETPOINT SHALL BE NO HIGHER THAN **200 GPM (ADJ).**

12. AIR COOLED CHILLER:

ENABLE: THE ACC SHALL BE ENABLED TO BE OPERATIONAL WHENEVER THE GENERATOR IS OPERATING REGARDLESS OF THE OUTDOOR AIR TEMPERATURE. THE ACC SHALL ALSO BE ENABLED TO BE OPERATIONAL WHEN THE OUTDOOR AIR TEMPERATURE IS LESS THAN **50F (ADJ).**

A. THE CHILLER MANUFACTURER'S INTEGRAL CONTROL PANEL SHALL START THE CHILLER WHEN FLOW IS PROVED THROUGH THE CHILLER BY IT'S INTERNAL SAFETIES AND IT SHALL BE ENERGIZED TO PRODUCE CHILLED WATER AT THE GLYCOL SUPPLY SETPOINT.

B. THE ACC GLYCOL SUPPLY SETPOINT SHALL BE **42F (ADJ)**.

13. ACC GLYCOL PUMPS:

A. A GLYCOL PUMP SHALL OPERATE WHENEVER THE ACC IS ENABLED. GENERALLY, ONLY A SINGLE GLYCOL PUMP IS OPERATING. GLYCOL PUMPS SHALL OPERATE IN A LEAD–LAG ARRANGEMENT. FAILURE OF LEAD PUMP SHALL START THE NEXT PUMP IN THE

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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SEQUENCE. THE BAS SHALL DISPLAY RUNHOURS OF EACH PUMP AND DESIGNATE THE PUMP WITH THE LEAST HOURS AS THE LEAD PUMP AT EACH PUMP STARTUP. GLYCOL PUMPS SHALL ROTATE AS THE LEAD PUMP EVERY **750 HOURS (ADJ)**. PUMP SPEED WILL BE MODULATED TO ACHIEVE BOTH THE DIFFERENTIAL PRESSURE SETPOINT AND THE MINIMUM FLOW SETPOINT.

B. THE DIFFERENTIAL PRESSURE SETPOINT SHALL BE DETERMINED AS FOLLOWS: **9.0 PSID (ADJ) (**MINIMUM OPERATING DIFFERENTAL PRESSURE OF THE CHILLER AS DETERMINED IN WRITING BY THE CHILLER MANUFACTURER AS MEASURED AT THE ACC CONNECTIONS) **PLUS 3.0 PSID (ADJ)** = **Z PSID** THE DIFFERENTIAL PRESSURE SETPOINT. THE DIFFERENTIAL PRESSURE SETPOINT SHALL BE NO HIGHER THAN **14 PSID (ADJ).**

C. THE MINIMUM FLOW SETPOINT SHALL BE DETERMINED AS FOLLOWS: **150 GPM (ADJ) (**MINIMUM OPERATING FLOWRATE OF THE ACC AS DETERMINED IN WRITING BY THE ACC MANUFACTURER) **PLUS 50 GPM (ADJ)** = **Z GPM** THE MINIMUM FLOW SETPOINT. THE MINIMUM FLOW SETPOINT SHALL BE NO HIGHER THAN **200 GPM (ADJ).**

D. WHEN ONE PUMP HAS OPERATED AT FULL SPEED (**60 HZ (ADJ)**) FOR AT LEAST **10 MINUTES (ADJ)** AND THE SYSTEM PRESSURE IS MORE THAN **2 PSID (ADJ) LOWER** THAN THE DIFFERENTIAL PRESSURE SETPOINT FOR AT LEAST **10 MINUTES (ADJ)** A SECOND PUMP SHALL BE ENABLED TO OPERATE IN PARALLEL WITH THE FIRST PUMP. WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18 TO 60 HZ (ADJ)** TO MAINTAIN THE REQUIRED DIFFERENTIAL PRESSURE SETPOINT.

14. "FREE COOLING" WINTER HEAT EXCHANGER (HE-2):

ENABLE: THE HEAT EXCHANGER SHALL BE ENABLED TO BE OPERATIONAL WHENEVER THE OUTDOOR AIR TEMPERATURE IS LESS THAN **50F (ADJ)** AND THE OUTDOOR AIR TEMPERATURE IS GREATER THAN **35F (ADJ).**

DISABLE: THE HEAT EXCHANGER SHALL SHUT DOWN WHENEVER THE OUTDOOR AIR TEMPERATURE FALLS BELOW **34F (ADJ)**. THE HEAT EXCHANGER SHALL BE SHUT DOWN WHENEVER THE OAT IS BELOW **50F (ADJ)** AND THE WWHP CONDENSER DISCHARGE TEMPERATURE IS ABLE TO MEET THE CONDENSER WATER TEMPERATURE SETPOINT FOR A PERIOD OF **20 MINUTES (ADJ**).

A. ONLY ONE COOLING TOWER SHALL BE AVAILABLE TO OPERATE WITH THE HE. THE COOLING TOWER FAN CONTROL CONDENSER WATER TEMPERATURE SETPOINT WITH THE HE OPERATING SHALL BE **43F (ADJ).** THE COOLING TOWER FAN CONTROL CONDENSER WATER TANK TEMPERATURE SETPOINT WITH THE HE OPERATING SHALL BE **43F (ADJ).** THE COOLING TOWER FAN SPEED CONTROL SHALL BE LIMITED BY THE LOWEST OF THESE THESE TWO CONTROL RESTRICTIONS SO AS TO NOT ICE THE TOWER.

B. THE COOLING TOWER WATER BYPASS VALVE SHALL MODULATE OPEN (ALLOW WARM CW WATER BACK TO THE TANK RATHER THAN OVER THE COLD COOLING TOWER) TO MAINTAIN THE CW TANK WATER TEMPERATURE AT **42F (ADJ)**.

C. OPEN AN INOPERATIVE CHILLER CONDENSER WATER ISOLATION VALVE **10% (ADJ)** IN ORDER TO PROVIDE A PARTIAL FLOWPATH FOR CW WATER TO CIRCULATE SUCH THAT THE COOLING TOWER MINIMUM WINTER FLOWRATE CAN BE ACHIEVED. ONE CWP SHALL MODULATE IN SPEED TO MAINTAIN:

i. A MINIMUM DIFFERENTIAL PRESSURE ACROSS THE CW SIDE OF THE HE-2 OF **10.0 PSID (ADJUSTABLE)**

15. WINTER HEAT EXCHANGER PUMP:

A. CBP SHALL MODULATE IN SPEED TO MAINTAIN:

i. A MINIMUM DIFFERENTIAL PRESSURE ACROSS THE CB SIDE OF THE HE-2 OF **10.0 PSID (ADJUSTABLE) PLUS OFFSET** AT ALL TIMES THE HE IS OPERATING.

ii. THE OFFSET SHALL BE DETERMINED BASED ON HOW FAR THE CB SYSTEM SUPPLY TEMPERATURE IS FROM THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

- OFFSET EQUALS **2.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **0.5F (ADJ)** AND **1.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT (TO FORCE MORE WATER THROUGH THE HE).
- OFFSET EQUALS **3.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS BETWEEN **1.0F (ADJ)** AND **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.
- OFFSET EQUALS **5.0 PSID (ADJUSTABLE)** WHEN THE CB SYSTEM SUPPLY TEMPERATURE IS MORE THAN **2.0F (ADJ)** GREATER THAN THE BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT.

SEQUENCE OF OPERATION (CONTINUED):

16. SAFETIES AND ALARMS:

A. GENERATE AN ALARM WITH ANY PUMP FAILURE (PUMP IS ENABLED AND STATUS IS NOT SEEN), TOWER FAN FAILURE (FAN IS ENABLED AND STATUS IS NOT SEEN), FAN VIBRATION SWITCH ACTIVATION, OR OIL LEVEL SENSOR ACTIVATION.

B. REFRIGERANT MONITOR ACTIVATION SHALL SOUND LOCAL ALARM HORN (INTEGRAL TO THE REFRIGERANT MONITOR) AT **500 PPM (ADJ)** FIRST STAGE ALARM DETECTED AND ACTIVATE CEF TO FULL SPEED. SIGNAL A PRIORITY ALARM AT THE OWS.

C. CHILLERS SHALL BE ORDERLY DISABLED AT **320 PPM (EIGHT HOUR EXPOSURE LIMIT R-514A) (ADJ)** HIGH ALARM DETECTED AT THE REFRIGERANT MONITOR WHILE CEF CONTINUES TO OPERATE AT FULL SPEED. SIGNAL A PRIORITY ALARM AT THE OWS.

D. SIGNAL AN ALARM AT THE OWS IF THE BUILDING OUTDOOR AIR TEMPERATURE READING IS MORE THAT **5F (ADJ)** DIFFERENT THAN THE GLOBAL OUTDOOR AIR TEMPERATURE. IF EITHER SIGNAL IS LOST OR BECOMES UNRELIABLE UTILIZE THE SENSOR READING CLOSEST TO THE FIVE MINUTE OLD AVERAGE OF THE TWO SENSORS UNTIL THE SENSORS ARE WITHIN 5°F OF EACH OTHER AGAIN.

E. SIGNAL AN ALARM AT THE OWS IF THE TANK MAKEUP WATER FLOWMETER READING IS MORE THAN **200 GALLONS (ADJ) IN A ONE HOUR (ADJ)** PERIOD.

F. SIGNAL AN ALARM AT THE OWS IF THE CB SYSTEM SUPPLY WATER TEMPERATURE READING IS MORE THAN **5.0F (ADJ)** HIGHER THAN THE CB SUPPLY WATER TEMPERATURE SETPOINT FOR A PERIOD OF **20 MINUTES (ADJ)**.

G. IF THE SUMP HIGH LEVEL LIMIT IS MET FOR **THREE CONTINUOUS SECONDS (ADJ.)** THEN OPEN THE BLOWDOWN VALVE UNTIL THE HIGH LEVEL LIMIT READS "NOT MET" FOR **TEN CONTINUOUS SECONDS (ADJ.)** AND SIGNAL AN ALARM.

H. GENERATE AN ALARM WHEN ANY WATER SENSOR INDICATES THAT A LEAK HAS OCCURRED ON THE FLOOR; ADJUST THE SENSORS TO ACTUATE AT A 0.25" DEPTH OF WATER AND LOCATE THEM WHERE THEY WILL NOT BE A TRIPPING HAZARD.

I. SEE REFRIGERANT MONITOR AND EXHAUST FAN SCHEMATIC FOR RELATED SAFETIES AND ALARMS.

17. OVERALL SYSTEM REQUIREMENTS:

A. CONFIRM CHILLER REQUIRED MINIMUM FLOWRATE AND MINIMUM DIFFERENTIAL PRESSURE REQUIRED ACROSS THE CONDENSER BARREL AND THE EVAPORATOR BARREL WITH A WRITTEN CONFIRMATION FROM OF THE EQUIPMENT MANUFACTURER'S FINAL SUBMITTAL AND ALSO WITH A WRITTEN CONFIRMATION FROM THE EQUIPMENT MANUFACTURER'S ONSITE STARTUP PERSONNEL AND VERIFY SETPOINTS AND OPERATION DURING CHILLER STARTUP AND TOWER STARTUP AT LOW LOAD CONDITIONS AND HIGH LOAD CONDITIONS.

B. ADJUST AND TUNE THE OPERATING SEQUENCE RESPONSE, VFC RAMP SETTINGS TIMES, TIMERS IN STAGING SEQUENCES, TIMERS IN DE-STAGING SEQUENCES, BYPASS VALVE SPEED, AND VALVE FULL OPEN POSITION SETTINGS SUCH THAT THE MINIMUM DIFFERENTIAL PRESSURE REQUIRED TO OPERATE THE CHILLER(S) IS ALWAYS MET DURING STAGING, DE-STAGING, STARTUPS, AND SHUTDOWNS OF CHILLERS.

C. TUNE THE VARIABLES, THE LOOP RESPONSE, AND THE TIMER SETTINGS FOR AN ORDERLY STAGING AND DE-STAGING FOR SMOOTH TRANSITIONS BETWEEN OPERATING MODES.

D. PROGRAM INITIAL CHILLER ENABLE MINIMUM DIFFERENTIAL PRESSURES AND SEPARATE STEADY-STATE CHILLER RUNNING MINIMUM DIFFERENTIAL PRESSURE OPERATING SETTINGS.

E. PROGRAM MINIMUM PUMP SPEED STARTING SIGNALS AND COORDINATE WITH VFC MINIMUM SPEED SETTINGS.

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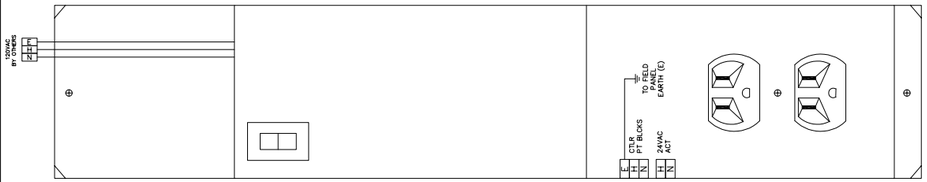
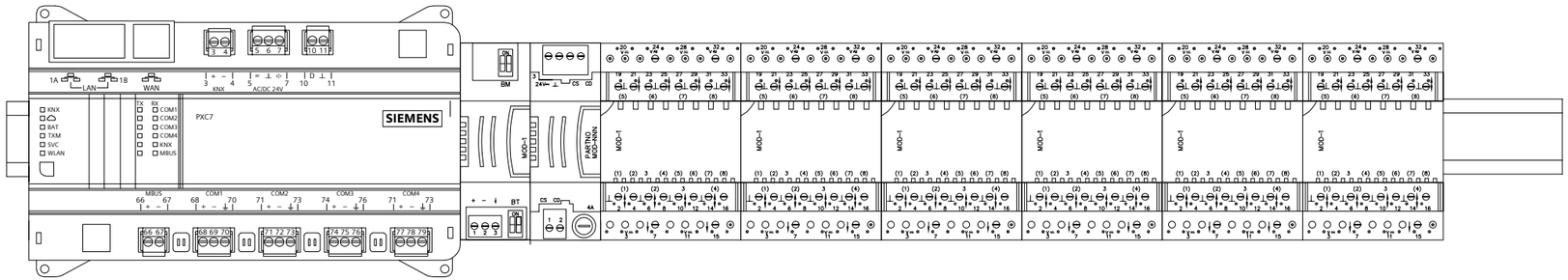
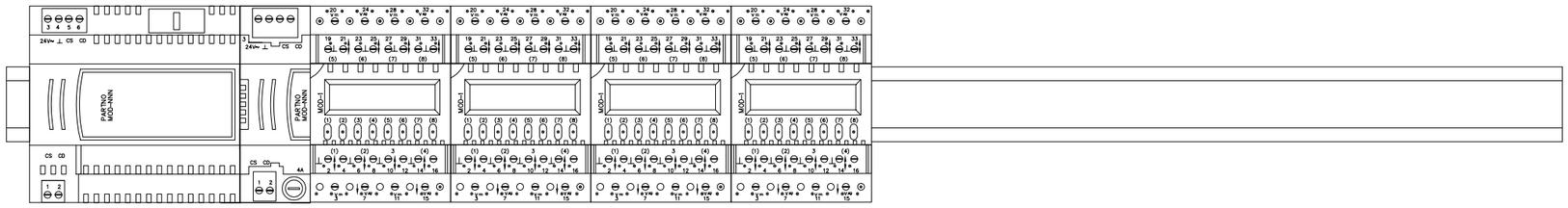
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.







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LA12.PXCA INSTALLATION

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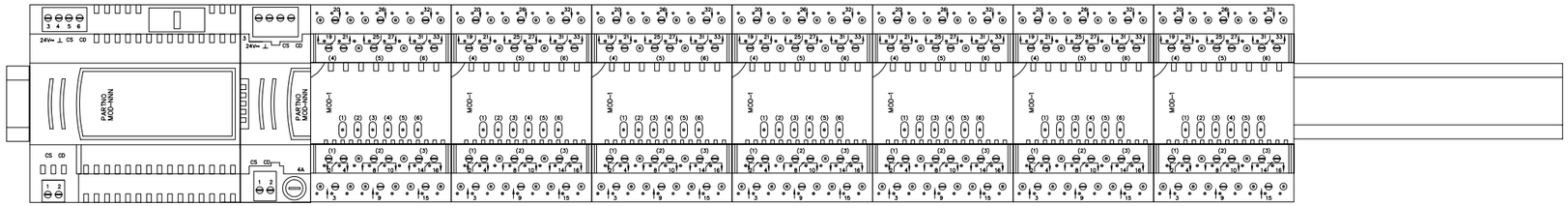

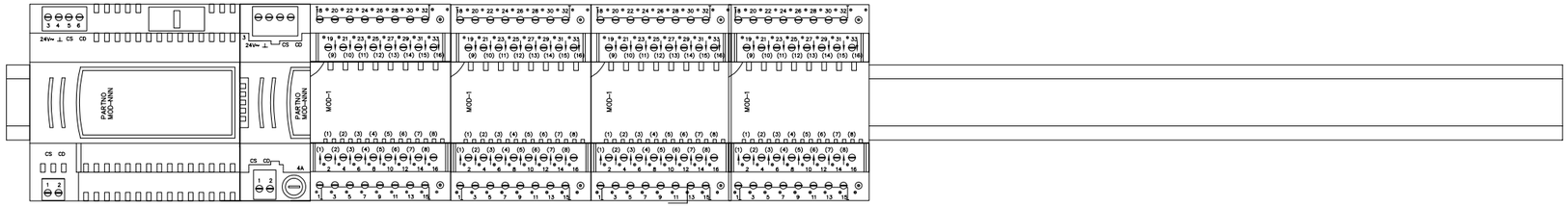

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PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

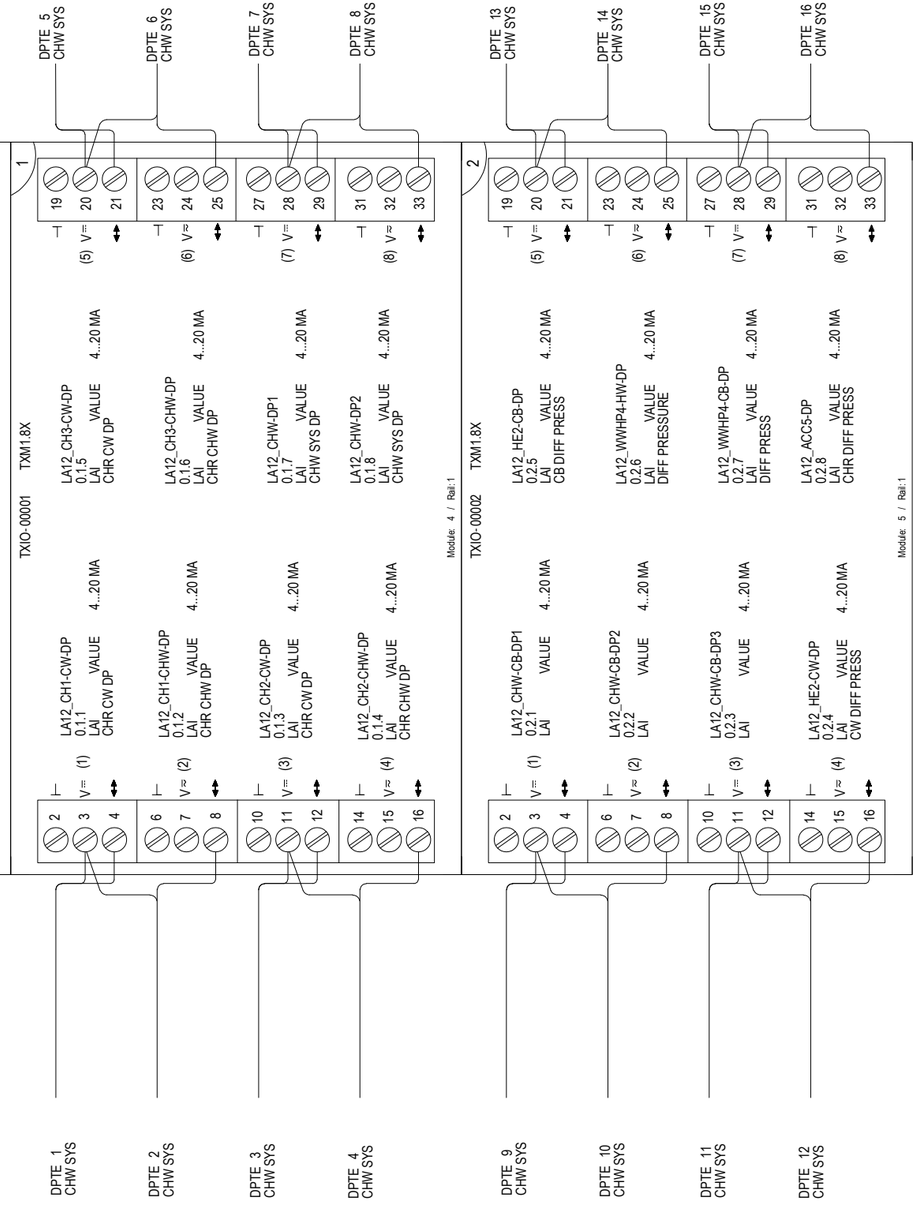
Module: 2 / Rail: 1

TXIO - 0000X TXA1.IBE

BUS EXPANSION

Module: 3 / Rail: 1

TXIO-00001 TXM1.8X



Module: 4 / Rail: 1

TXIO-00002 TXM1.8X

Module: 5 / Rail: 1

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CHW SYSTEM

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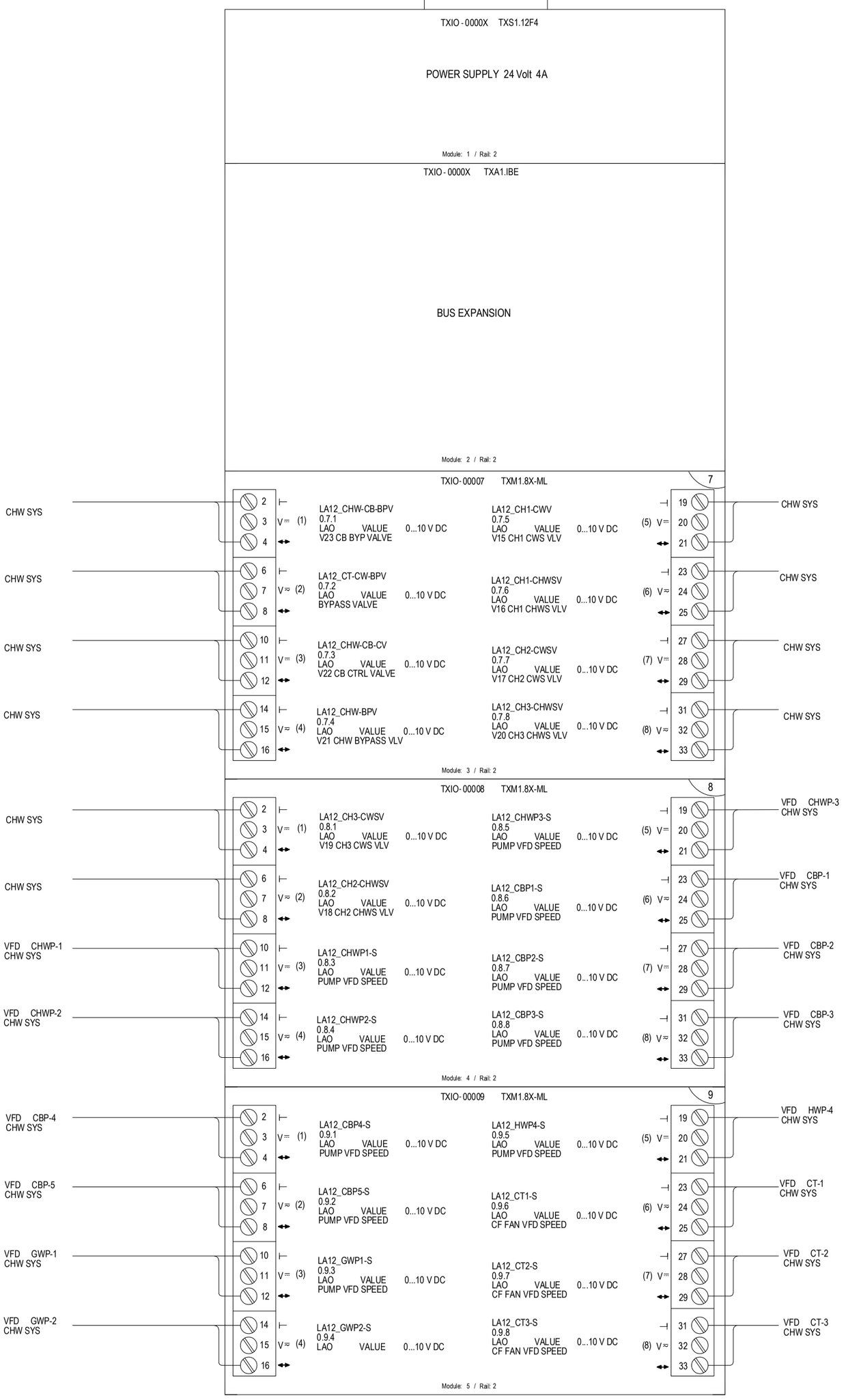

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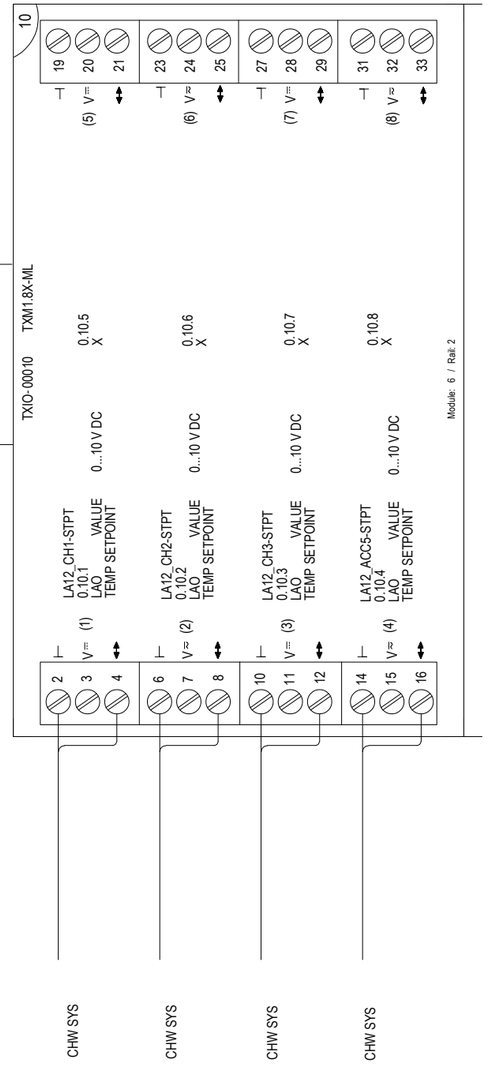

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TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A

Module: 1 / Rail: 3

TXIO - 0000X TXA1.IBE

BUS EXPANSION

Module: 2 / Rail: 3

TXIO-00011 TXM1.6R-M

11

19 20 21 — (4) — LA12_WWHP4-ENA 0,11.4 LDO CHR ENA/DISABLE ON/OFF

25 26 27 — (5) — LA12_WWHP4-HWSV 0,11.5 LDO VALVE OPEN CLOSE ON/OFF

31 32 33 — (6) — LA12_ACC5-ENA 0,11.6 LDO CHR ENA/DISABLE ON/OFF

2 3 4 — (1) — LA12_CH1-ENA 0,11.1 LDO CHILLER ENA/DISABLE ON/OFF

8 9 10 — (2) — LA12_CH2-ENA 0,11.2 LDO CHILLER ENA/DISABLE ON/OFF

14 15 16 — (3) — LA12_CH3-ENA 0,11.3 LDO CHILLER ENA/DISABLE ON/OFF

RIB 27 CHW SYS

CHW SYS

RIB 28 CHW SYS

RIB 1 CHW SYS

RIB 2 CHW SYS

RIB 3 CHW SYS

Module: 3 / Rail: 3

TXIO-00012 TXM1.6R-M

12

19 20 21 — (4) — LA12_CBP1 0,12.4 LDO PUMP START STOP ON/OFF

25 26 27 — (5) — LA12_CBP2 0,12.5 LDO PUMP START STOP ON/OFF

31 32 33 — (6) — LA12_CBP3 0,12.6 LDO PUMP START STOP ON/OFF

2 3 4 — (1) — LA12_CHWP1 0,12.1 LDO PUMP START STOP ON/OFF

8 9 10 — (2) — LA12_CHWP2 0,12.2 LDO PUMP START STOP ON/OFF

14 15 16 — (3) — LA12_CHWP3 0,12.3 LDO PUMP START STOP ON/OFF

VFD CBP-1 CHW SYS

VFD CBP-2 CHW SYS

VFD CBP-3 CHW SYS

VFD CHWP-1 CHW SYS

VFD CHWP-2 CHW SYS

VFD CHWP-3 CHW SYS

Module: 4 / Rail: 3

TXIO-00013 TXM1.6R-M

13

19 20 21 — (4) — LA12_GWP2 0,13.4 LDO PUMP START STOP ON/OFF

25 26 27 — (5) — LA12_HWP4 0,13.5 LDO PUMP START STOP ON/OFF

31 32 33 — (6) — LA12_CWF1 0,13.6 LDO PUMP START STOP ON/OFF

2 3 4 — (1) — LA12_CBP4 0,13.1 LDO PUMP START STOP ON/OFF

8 9 10 — (2) — LA12_CBP5 0,13.2 LDO PUMP START STOP ON/OFF

14 15 16 — (3) — LA12_GWP1 0,13.3 LDO PUMP START STOP ON/OFF

VFD GWP-2 CHW SYS

VFD HWP-4 CHW SYS

RIB 26 CHW SYS

VFD CBP-4 CHW SYS

VFD CBP-5 CHW SYS

VFD GWP-1 CHW SYS

Module: 5 / Rail: 3

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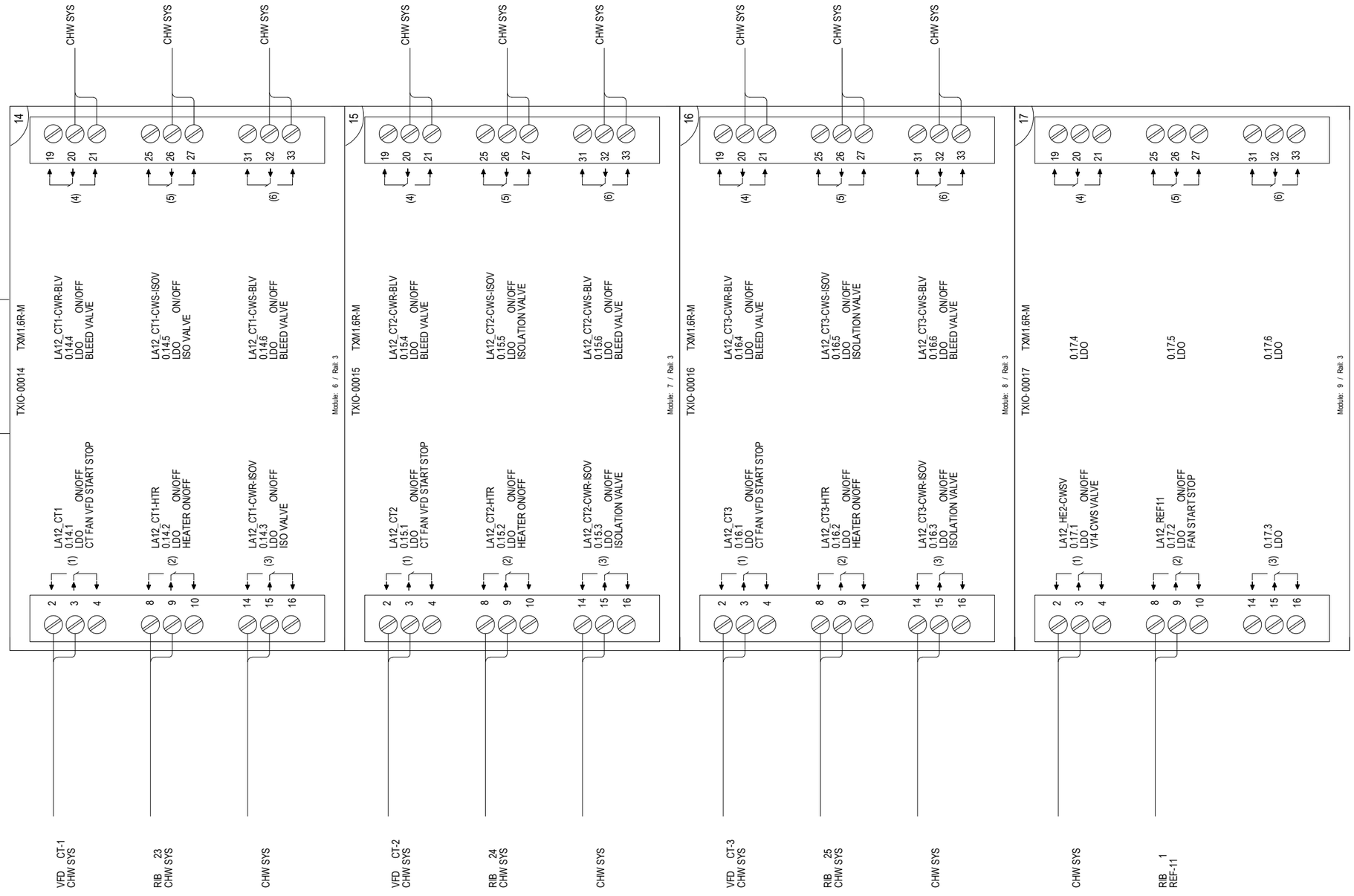

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TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A

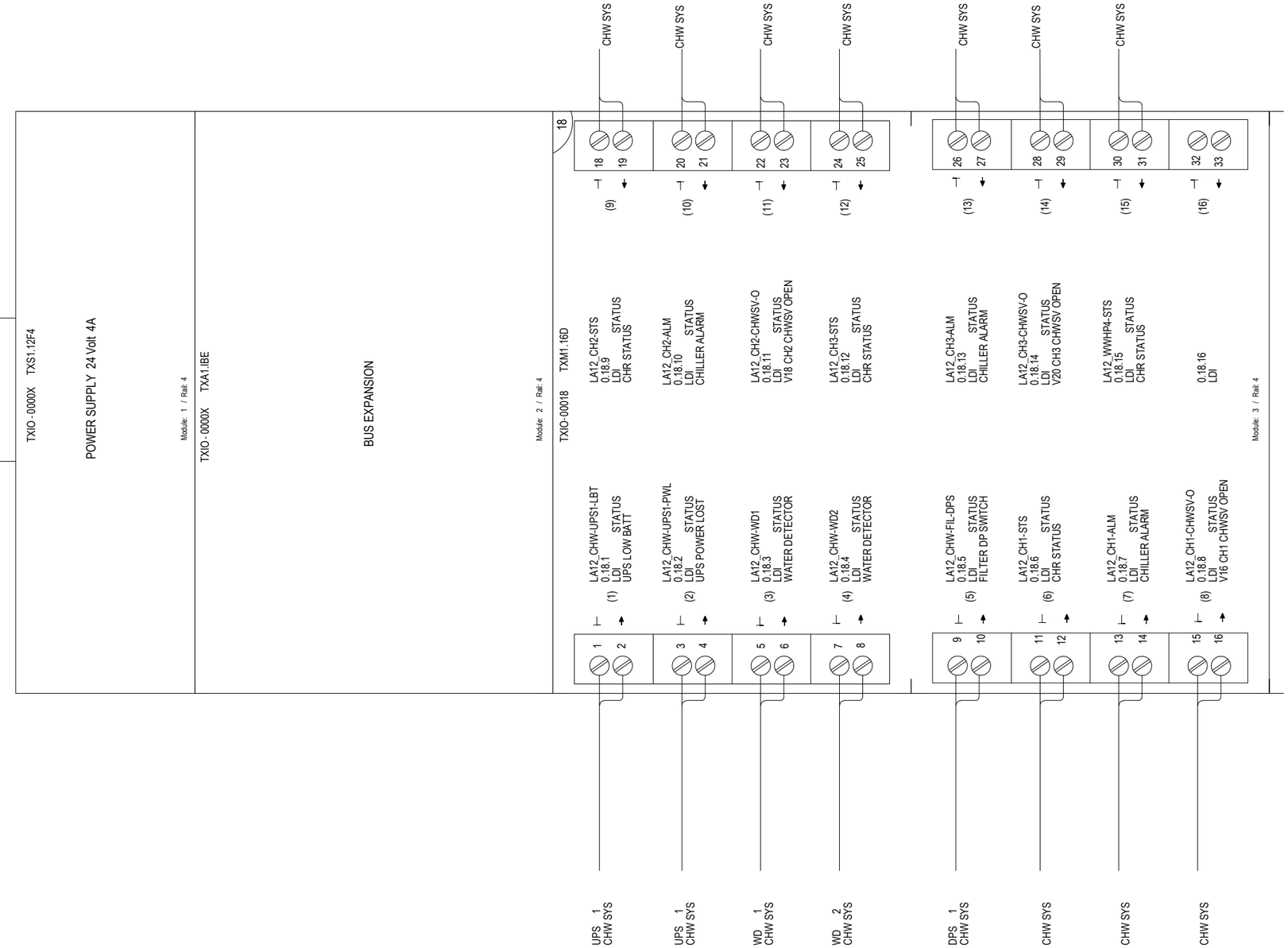
Module: 1 / Rail: 4

TXIO - 0000X TXA1.IBE

BUS EXPANSION

Module: 2 / Rail: 4

TXIO-00018 TXM1.16D



Module: 3 / Rail: 4

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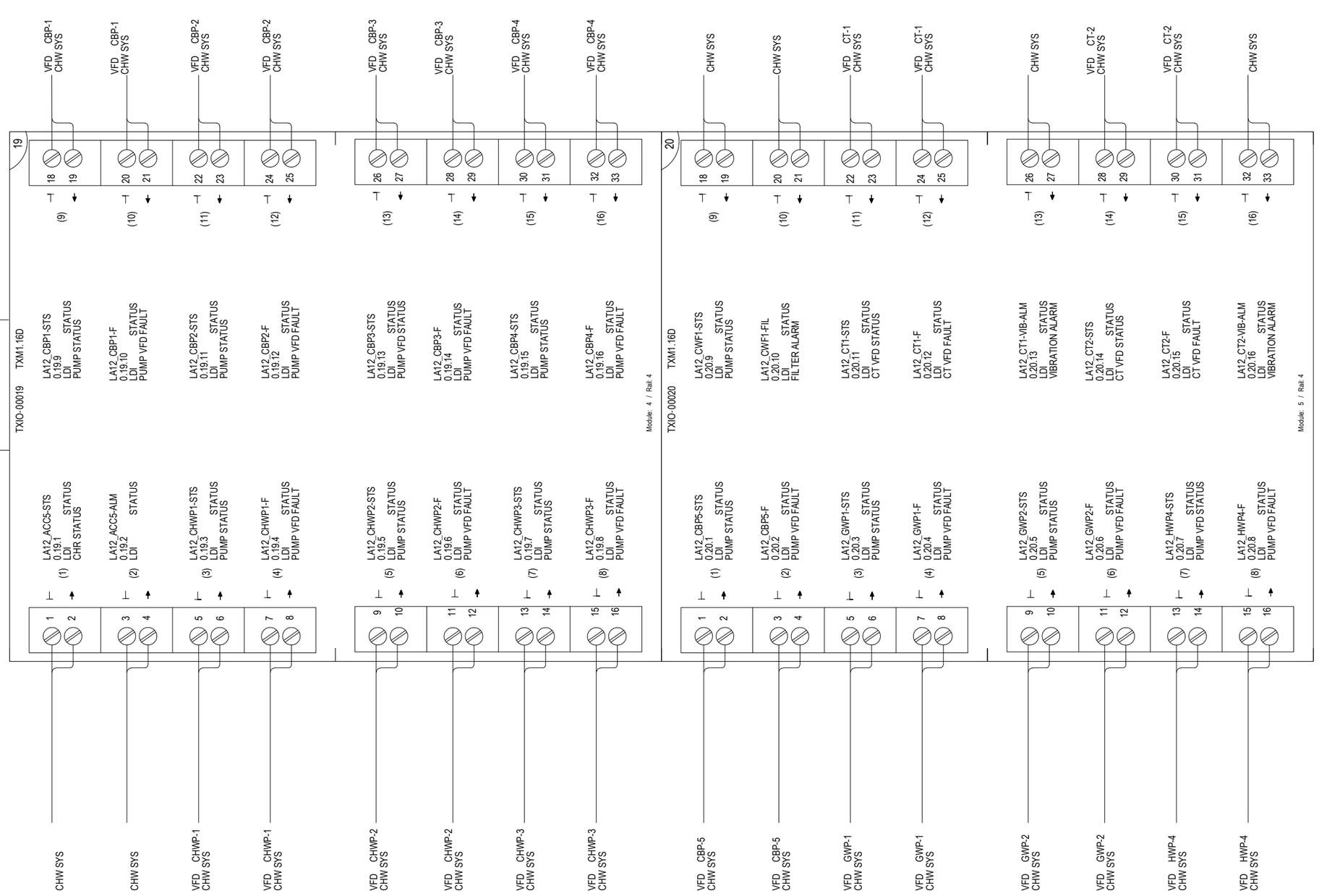

REVISION HISTORY

00	4/2/2026	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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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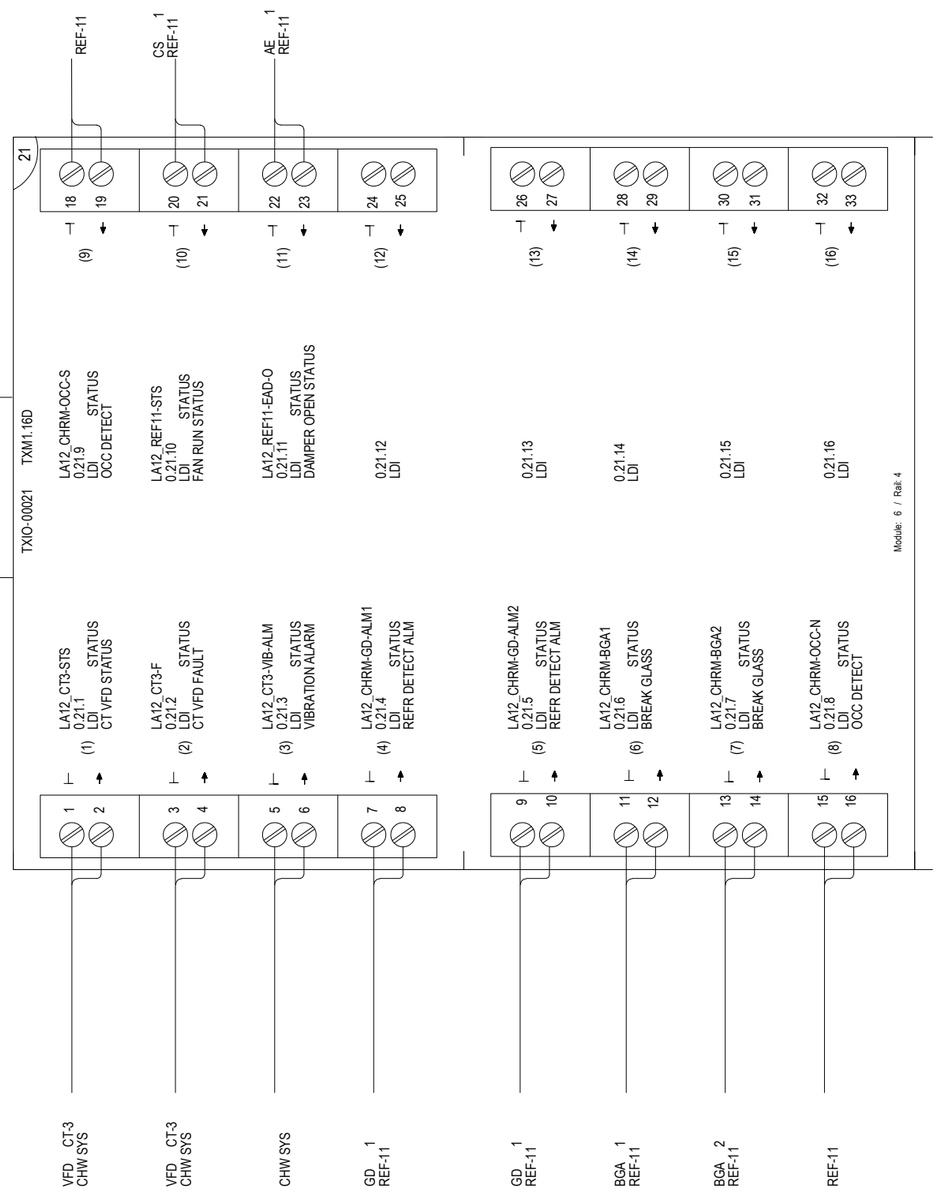

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IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1-2	2	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXA1.IBE	SIEMENS	149476	ISLAND BUS EXPANSION MODULE
	6	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	3	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	4	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	7	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	4	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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IU# 20250072, IN

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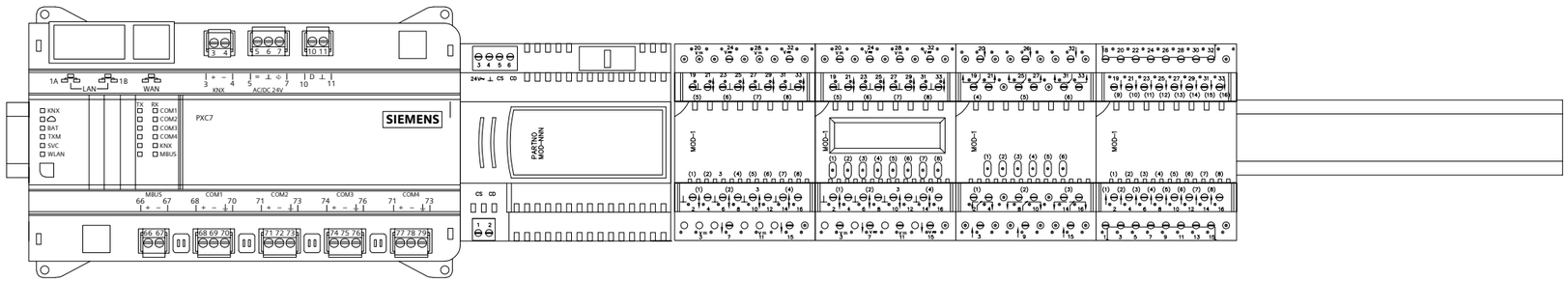
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.



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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA13.PXCA INSTALLTION

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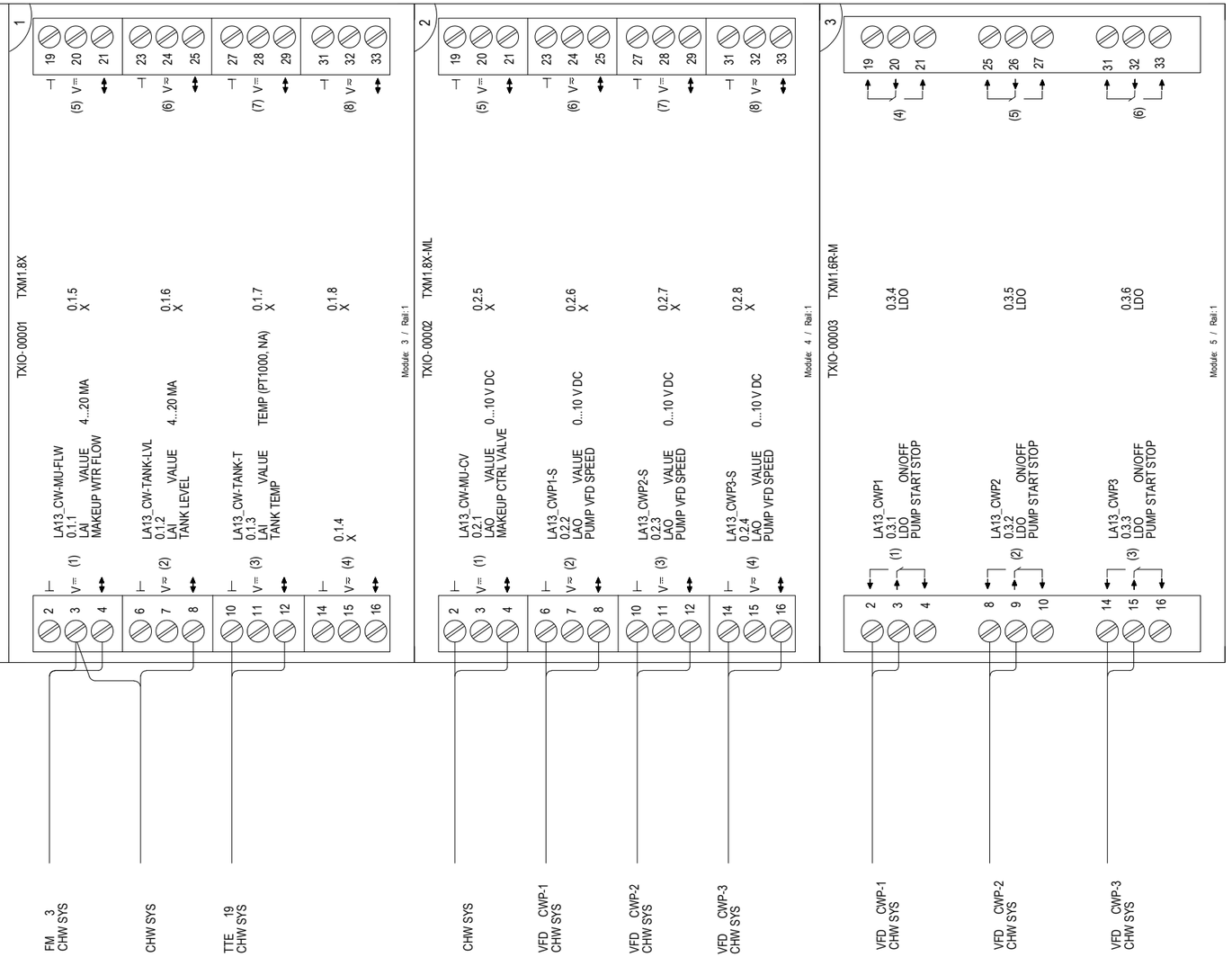
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU LAUNCH ACCELERATOR FOR BIO

IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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CONDENSER WTR SYSTEM

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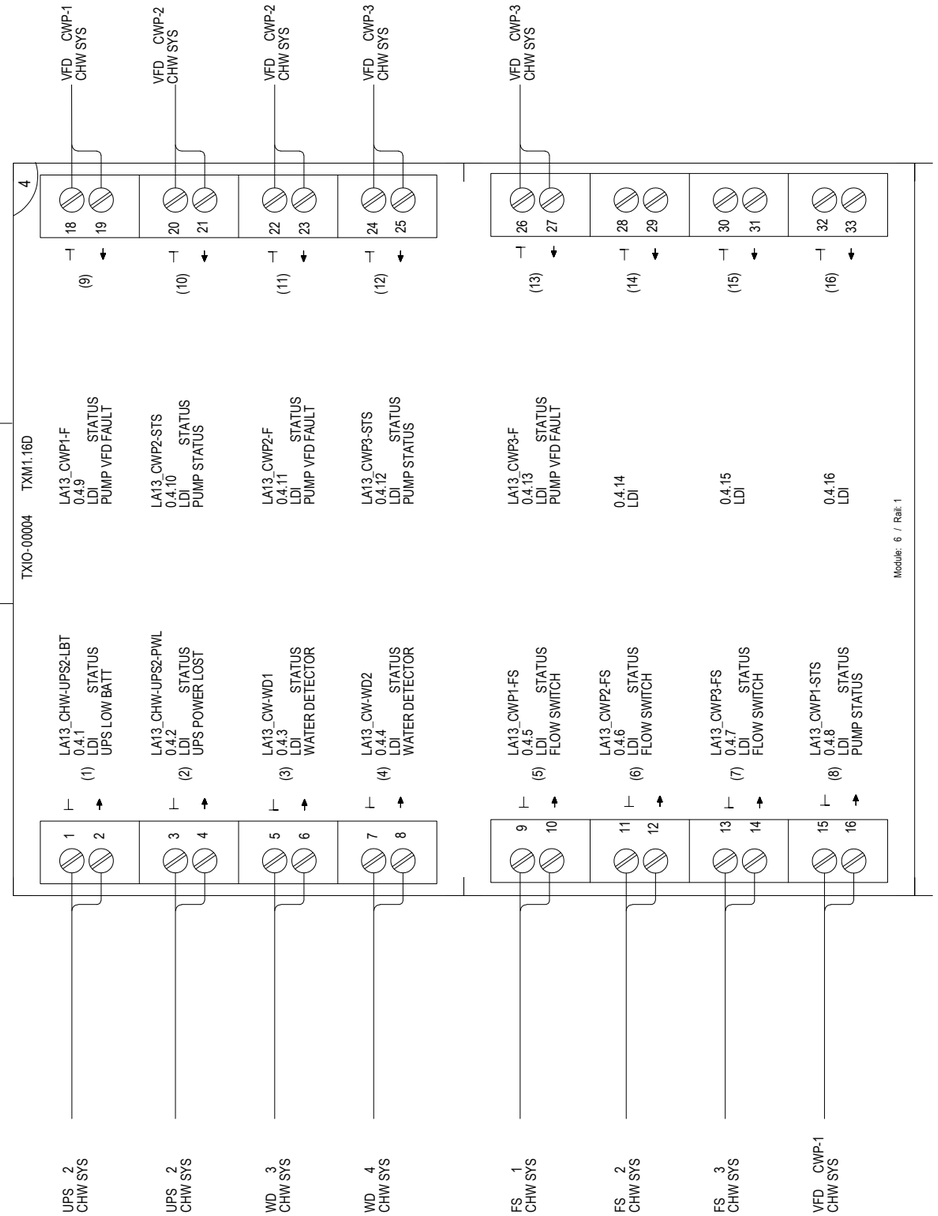

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	1	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA13.PXCA BOM

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INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING ON NEXT PAGE(S)
2. REFER TO PLANS FOR LOCATIONS.
3. WIRED BY C.I.C.
4. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
5. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
6. SIEMENS DPTE PART NUMBER: 7MF0340-1PL01-5AM2-Z+B20+E01+H103+U01+Y01+Y15+Y21: 0 TO 50 PSI DP TRANSMITTERS TO BE LOCATED WHERE SHOWN ON MECHANICAL DRAWINGS. EXACT LOCATIONS OF ALL FIELD DEVICES TO BE COORDINATED WITH IU/SIEMENS.
7. LOCATED AT 90% THROUGH HEATING WATER SYSTEM WHERE SHOWN ON PLAN.
8. HEADER COMMON HEATING WATER SUPPLY SENSOR AND COMMON HEADER HEATING WATER RETURN SENSOR FURNISHED BY BOILER MANUFACTURER AND INSTALLED BY M.C. IN THERMOWELL PROVIDED BY M.C.

NORTH WALL
HTTE-1
0/100 rh
LA14_OAH
0014:0.1.2
HUMIDITY
LA14_OAT
0014:0.1.1
TEMPERATURE

2 / 110 OUTSIDE TEMP & HUMIDITY SENSOR
LOCATION: OUTSIDE THE BUILDING

FURNISHED BY OTHERS
FM-1
RANGEGPM
LA14_HHW-HWSF
0014:0.1.3

WIRE TO BOILER MANAGERMENT PANEL (3) (8) TTE
TTE -4
-40/240 DEG F
LA14_HHW-ST
0014:0.2.4

HWS — HWS — HWS — HWS

V-4
2POS 24V
LA14_HHW-BLR-BPV
0014:0.6.1
LA14_HHW-BLR-BPV-O
0014:0.6.7
OPEN STATUS
SEE VALVE SCHEDULE FOR SIZE AND TYPE
NO-F.I.P

VFD-HWP-1
RIB-1
LA14_HHW-HWP1
0014:0.4.2
START/STOP
LA14_HHW-HWP1-S
0014:0.3.2
SPEED
LA14_HHW-HWP1-STS
0014:0.5.13
STATUS
LA14_HHW-HWP1-F
0014:0.5.14
FAULT

VFD-HWP-2
RIB-2
LA14_HHW-HWP2
0014:0.4.3
START/STOP
LA14_HHW-HWP2-S
0014:0.3.3
SPEED
LA14_HHW-HWP2-STS
0014:0.5.15
STATUS
LA14_HHW-HWP2-F
0014:0.5.16
FAULT

VFD-HWP-3
RIB-3
LA14_HHW-HWP3
0014:0.4.4
START/STOP
LA14_HHW-HWP3-S
0014:0.3.4
SPEED
LA14_HHW-HWP3-STS
0014:0.6.1
STATUS
LA14_HHW-HWP3-F
0014:0.6.2
FAULT

HWP -1
HWP -2
HWP -3

SEE VALVE SCHEDULE FOR SIZE AND TYPE
V-5
0-10 V
LA14_HHW-BPV
0014:0.3.1
NO-F.I.P

DPTE -1
0-50 PSI
LA14_HHW-DP-PH
0014:0.1.4
LOC: PENTHOUSE

DPTE -2
0-50 PSI
LA14_HHW-DP-3FL
0014:0.1.5
LOC: 3RD FL RM.397

DPTE -3
0-50 PSI
LA14_HHW-DP-1FL
0014:0.1.6
LOC: 1ST FL AT AHU-7

V-1
2POS 24VAC
LA14_HB1-ISV-O
0014:0.5.10
VLV OPEN STATUS
SEE VALVE SCHEDULE FOR SIZE AND TYPE
RIB-5
NO-F.I.P
TTE -1
-40/240DEG F
LA14_HB1-HWST
0014:0.2.1
HB-1
LA14_HB1-ALM
0014:0.6.3
BOILER ALARM

V-2
2POS 24VAC
LA14_HB2-ISV-O
0014:0.5.11
VLV OPEN STATUS
SEE VALVE SCHEDULE FOR SIZE AND TYPE
RIB-6
NO-F.I.P
TTE -2
-40/240DEG F
LA14_HB2-HWST
0014:0.2.2
HB-2
LA14_HB2-ALM
0014:0.6.4
BOILER ALARM

V-3
2POS 24VAC
LA14_HB3-ISV-O
0014:0.5.12
VLV OPEN STATUS
SEE VALVE SCHEDULE FOR SIZE AND TYPE
RIB-7
NO-F.I.P
TTE -3
-40/240DEG F
LA14_HB3-HWST
0014:0.2.3
HB-3
LA14_HB3-ALM
0014:0.6.5
BOILER ALARM

TTE (8) TTE -5
-40/240 DEG F
LA14_HHW-BLR-RT
0014:0.2.5
(3) WIRE TO BOILER MANAGERMENT PANEL

TTE -7
-40/240 DEG F
LA14_HHW-RT
0014:0.2.7
HWR — HWR — HWR — HWR

TTE -6
-40/240DEG F
LA14_HHW-WWHP-LVT
0014:0.2.6

WD -1
WATER DET
LA14_HHW-WD1
0014:0.5.7

WD -2
WATER DET
LA14_HHW-WD2
0014:0.5.8

WWHP-4
EVAPORATOR
CONDENSER
NO-SR
V-3
0-10 V
HWP -4

SEE CHILLED WATER SYSTEM CONTROL DRAWINGS FOR CONTINUATION AND DETAILS

(2) DPS-1
0/25 psi
LA14_HHW-FIL-DPS
0014:0.5.9
FILTER FEEDER HW DIFFERENTIAL PRESSURE SWITCH

HORN STROBE
(2) PB -1
LA14_HHW-EPB
0014:0.5.1
STATUS
BOILER EMERGENCY SHUTDOWN PUSH BUTTON

(5) OCC -1
CEILING MOUNTED OCCUPANCY SENSOR(S) (BY OTHERS)
LA14_HHW-OCC
0014:0.5.6
STATUS

FURNISHED BY OTHERS
GD -1
CO PPM
LA14_HHW-CO-PPM
0014:0.1.7
CO SESNOR

BOILER MANAGEMENT PANEL BY BOILER MANUFACTURER
120 VAC
UPS-2
OUTDOOR TEMP. SENSOR PROVIDED BY BOILER MANUFACTURER
T (3)

RIB-4
1xDO SYSTEM ENABLE/DISABLE
1xAO SUPPLY WATER SETPOINT
1xBI BOILER MANAGEMENT PANEL ALARM
(3) FROM/TO FIELD PANEL

SYSTEM ENABLE/DISABLE
LA14_HHW-ENA
0014:0.4.5

SUP WATER SETPOINT
LA14_HHW-HWST-STPT
0014:0.3.5

SYSTEM ALARM
LA14_HHW-ALM
0014:0.6.6

ELECTRICAL TROUGH
PNL-14
PXCA-14
HHW SYSTEM CONTROL PANEL
AUX-14
HHW SYSTEM
PWR-14
120 VAC
UPS

PNL-14 PNL-AUX-14

UPS-1
UPS LO BATT
LA14_HHW-UPS1-LBT
0014:0.5.2
POWER LOSS
LA14_HHW-UPS1-PWL
0014:0.5.3

UPS-2
UPS LO BATT
LA14_HHW-UPS2-LBT
0014:0.5.4
POWER LOSS
LA14_HHW-UPS2-PWL
0014:0.5.5

RE -1 RE -2 RE -3
RE -4 RE -5 RE -6
RE -4A

1 / 110 HEATING HOT WATER SYSTEM CONTROL DIAGRAM

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SMART INFRASTRUCTURE DIVISION

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

DRAWN BY	CHECKED BY	APPROVED BY	ISSUE DATE	LAST REVISION
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HEATING HOT WATER SYSTEM

440P412785
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REF #	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

REVISION HISTORY

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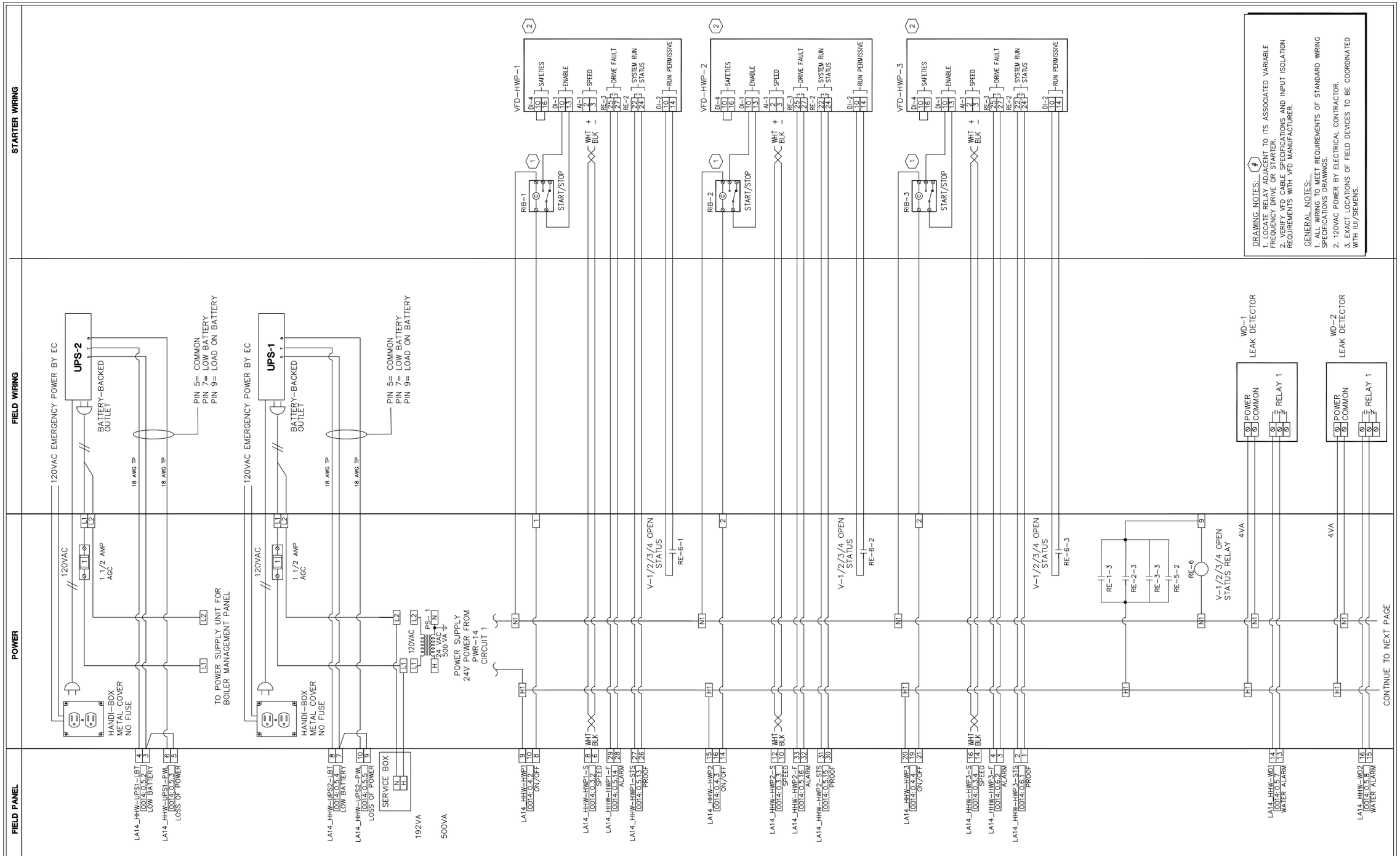

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 1

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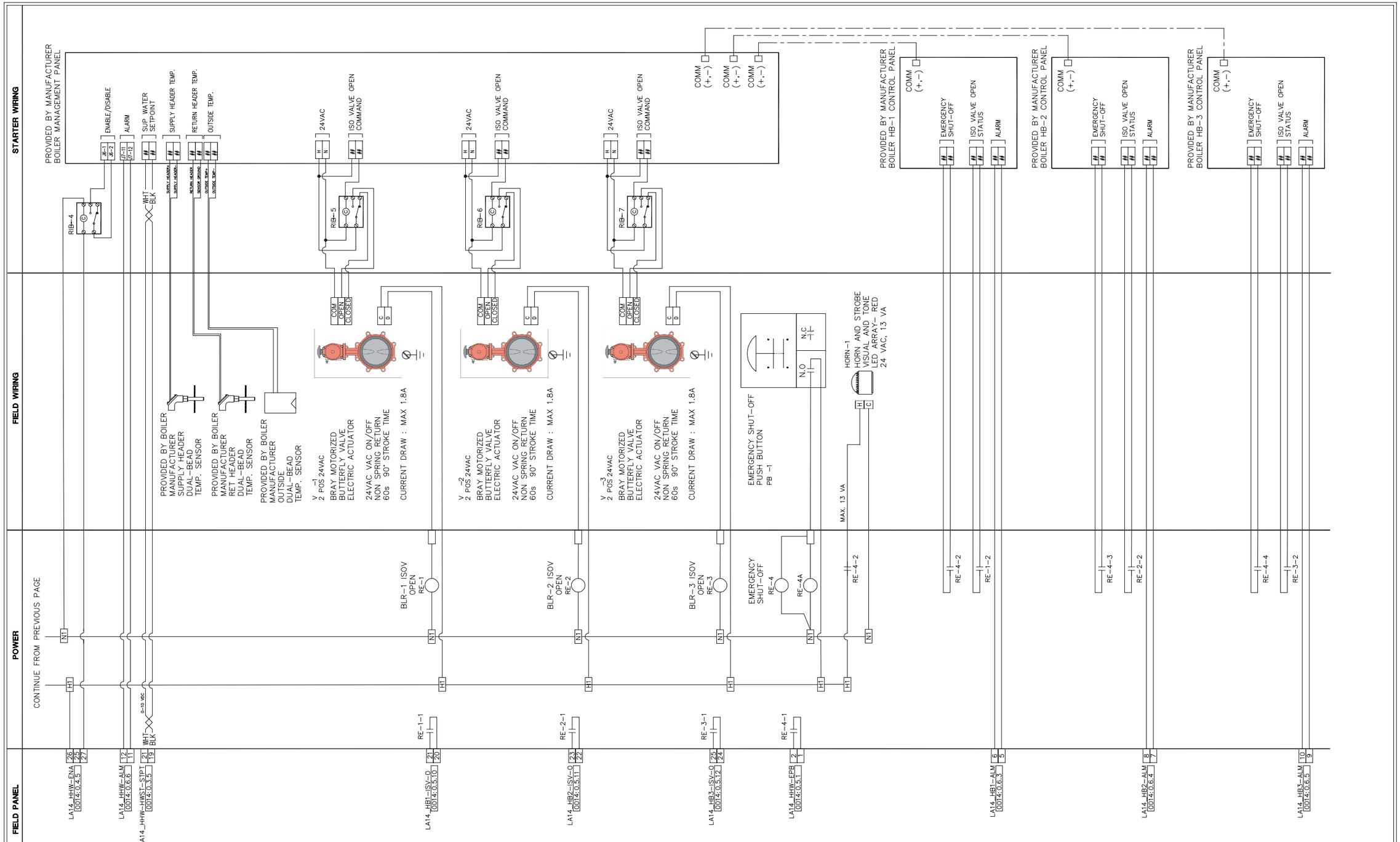

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 2

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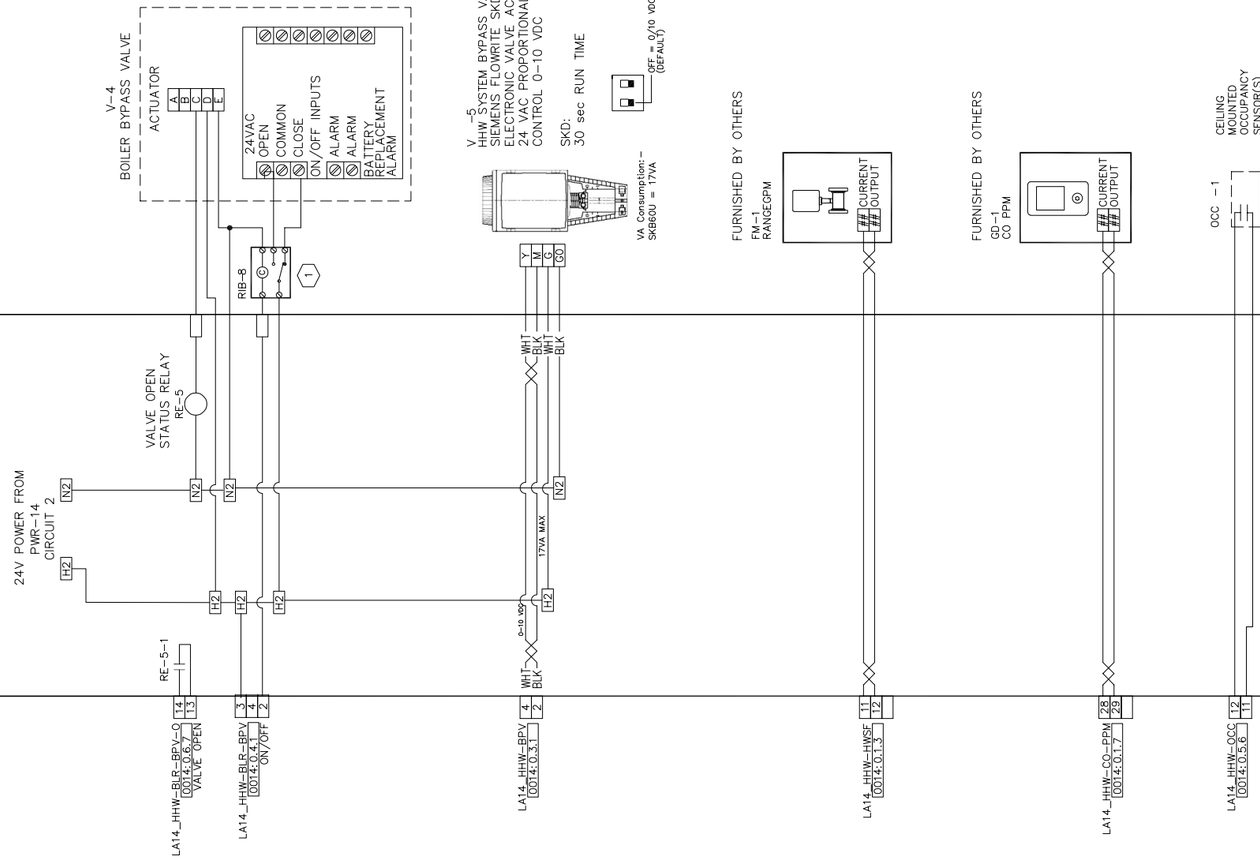
FIELD WIRING

STARTER WIRING

POWER

FIELD PANEL



V -4
2 POS 24VAC
BRAY MOTORIZED
BUTTERFLY VALVE
ELECTRIC ACTUATOR

24VAC VAC ON/OFF
NON SPRING RETURN
60s 90° STROKE TIME

CURRENT DRAW : MAX 1.8A

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

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 IU/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 3

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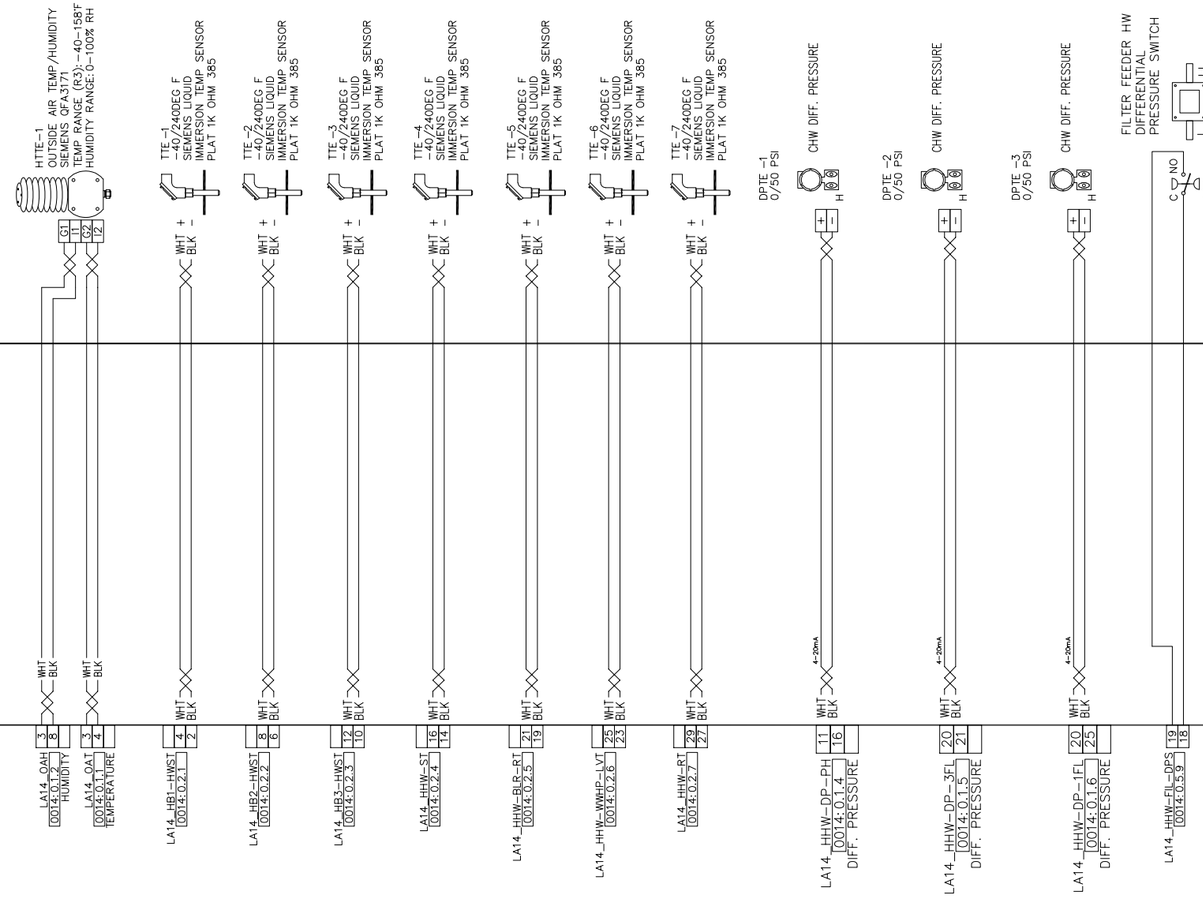
FIELD WIRING | **STARTER WIRING**



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 4

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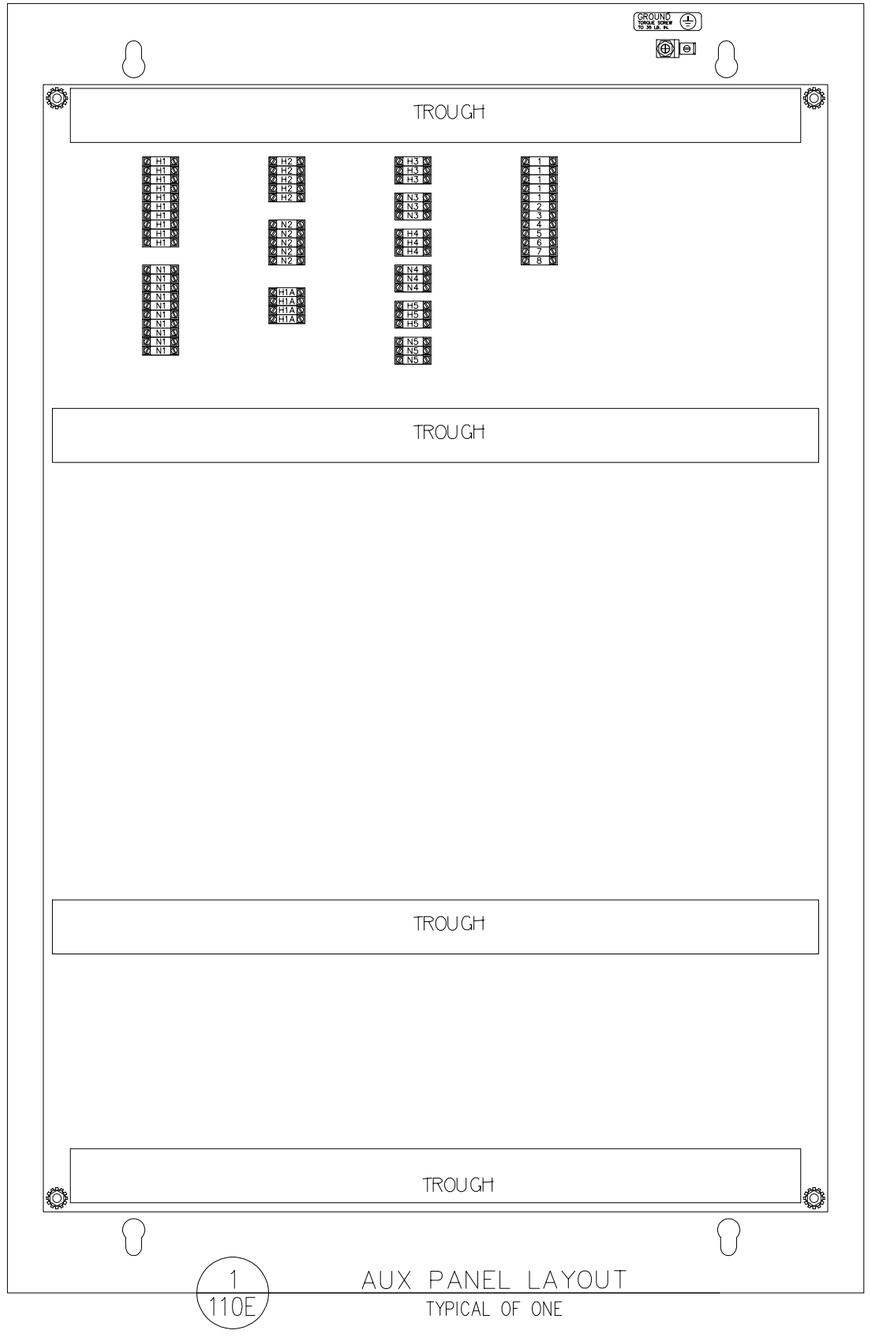

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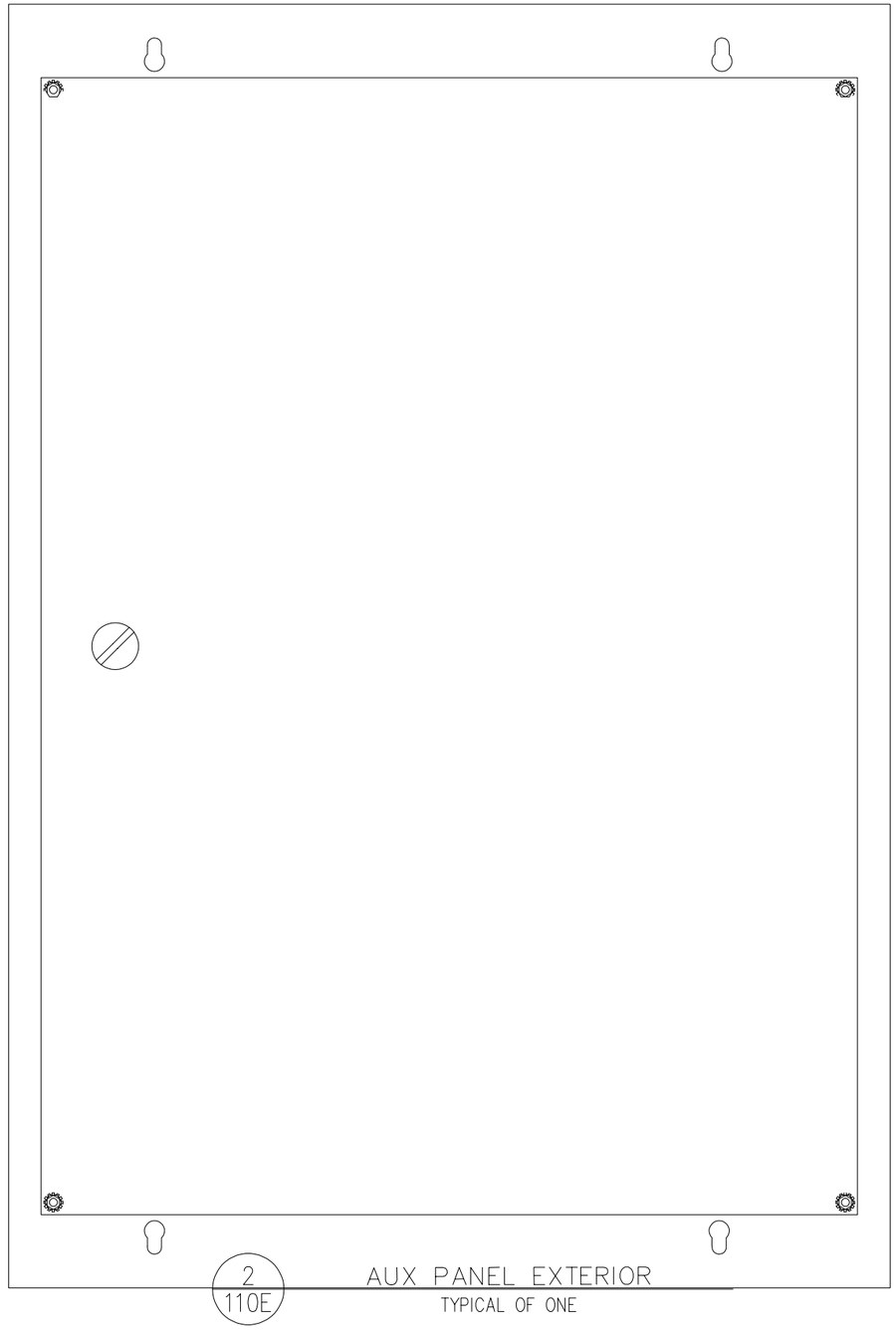
AUX PANEL LAYOUT

TYPICAL OF ONE



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110E

AUX PANEL EXTERIOR

TYPICAL OF ONE

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01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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INDIANAPOLIS, IN 46268
UNITED STATES
PHONE: 317-293-8880
FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

HHW AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
DPS 1	1	J21K-232	UNITED ELECTRIC	0706cut001	DP SW WATER 0-25 PSI FIXED DB
DPTE 1-3	3	7MF0340 SERIES	SIEMENS		DIFFERENTIAL PRESSURE 0-50PSI
GD 1	1	FBO			FURNISHED BY OTHERS
HORN 1	1	TWS-A-GN	KELE INC	1011cut075	24V AC/DC VARIABLE SOUND HORN
HTTE 1	1	QFA3171	SIEMENS	149992	ROOM RH & TEMP SENSOR, 4-20mA, 2%
	1	AQF3100	SIEMENS		WEATHER SHIELD FOR QFA31XX
PB 1	1	ST120SL-N1-BS	KELE		SHUT-DOWN PUSH BUTTON PULL RESET
	1	PILNCCB	KELE		N.C CONTACT BLK
	1	PILNOCB	KELE		N.O CONTACT BLK FOR PB-1
	1	PILCLHCOV1	KELE		CLEAR HINGED COVER
PNL AUX-14	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 14	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-8	8	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1-7	7	544-577-40	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 4"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
UPS 2	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-3	3	FBO			FURNISHED BY OTHERS
WD 1-2	2	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 5	1	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED
RE 6	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 4A	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

BAS DDC CONTROLLER SEQUENCE OF OPERATION:

ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST. THE HEATING WATER SYSTEM SHALL OPERATE 8,760 HOURS PER YEAR.

1. ENABLE: THE HEATING HOT WATER SYSTEM IS STARTED FROM DDC PANEL OR FROM COMMAND OF BUILDING AUTOMATION SYSTEM. SYSTEM TO RUN CONTINOUSLY.

2. DISABLE: WHEN SYSTEM IS DISABLED MANUALLY THROUGH THE BUILDING AUTOMATION SYSTEM, BOILERS ARE DISABLED AND PUMPS STOP.

3. BOILERS:

- A MINIMUM OF ONE BOILER SHALL ALWAYS BE ENABLED. ALL BOILERS ARE AVAILABLE FOR OPERATION IN NORMAL CONDITIONS.
- THE SYSTEM SUPPLY HEATING WATER SET POINT SHALL BE SELECTED BY THE BAS AND FURNISHED AS AN INPUT TO THE BOILER MANAGEMENT PANEL. SET POINT SHALL BE **130F (ADJ)**. RESET HEATING WATER FROM **130F TO 110F (ADJ)** AS THE OUTDOOR AIR TEMPERATURE VARIES FROM **40F** TO **70F (ADJ).** DURING WARM-UP MODE, WHEN THE OUTDOOR AIR TEMPERATURE IS LESS THAN **30F (ADJ)**, FROM 6:00 A.M. TO 8:00 A.M. MONDAY THROUGH FRIDAY, THE SUPPLY TEMPERATURE SETPOINT SHALL BE **140F (ADJ)** IF QUANTITY **THREE (ADJ.)** CRITICAL SPACES (MULTIPURPOSE ROOM 100, ADVANCED WET LAB 108A, AND OPEN WORKSPACE ROOM 412) ARE BELOW THE SPACE TEMPERATURE HEATING SETPOINT AND THEIR ZONE HEATING VALVES ARE MORE THAN **85% (ADJ)** OPEN.?

4. HEATING WATER PUMPS:

- HEATING WATER PUMPS SHALL OPERATE IN LEAD, LAG, STANDBY ARRANGEMENT. A MINIMUM OF ONE PUMP SHALL ALWAYS BE ENABLED.
- HEATING WATER PUMPS SHALL ROTATE AS THE LEAD PUMP EVERY **750 HOURS (ADJ)**. FAILURE OF ANY PUMP SHALL AUTOMATICALLY START THE NEXT PUMP IN THE OPERATING SEQUENCE.
- LAG PUMP STARTS WHEN SYSTEM FLOW EXCEEDS **650** GPM (ADJ) FOR TEN MINUTES (ADJ). LAG PUMP STOPS WHEN SYSTEM FLOW IS LESS THAN **550** GPM (ADJ) FOR 10 MINUTES (ADJ).?WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18 TO 60 HZ (ADJ)** TO MAINTAIN THE NORMAL PRESSURE CONTROL INPUT.
- THE THREE SYSTEM DIFFERENTIAL PRESSURE SENSORS SHALL BE COMPARED AND THE SENSOR THAT IS THE MOST NEEDY (THE SENSOR WHICH IS BELOW IT'S INDIVIDUAL SENSOR SETPOINT) SHALL BE USED AS THE NORMAL PRESSURE CONTROL INPUT (THE OTHER LESS NEEDY SENSORS WILL BE AT OR ABOVE IT'S INDIVIDUAL SENSOR SETPOINT IN THIS CONDITION). THE INDIVIDUAL SENSOR SETPOINT OF THE FLOOR LEVEL SENSORS SHALL BE THE DIFFERENTIAL PRESSURE REQUIRED TO MAINTAIN THE SCHEDULED GPM AT THE FLOOR'S COILS AND FINNED TUBE RADIATION (AS MEASURED BY THE TAB AGENT) WITH ALL THE COIL CONTROL VALVES AND FINNED TUBE RADIATION CONTROL VALVES 90% OPEN IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING. THE INDIVIDUAL SENSOR SETPOINTS SHALL EACH HAVE THEIR OWN SEPARATE PROGRAMMED ENTRIES. THE INDIVIDUAL SENSOR SETPOINTS SHALL BE NO HIGHER THAN **10 PSID (ADJ).**
- THE NORMAL PRESSURE CONTROL INPUT SHALL BE RESET DOWNWARD BASED ON VALVE POSITION SUCH THAT THE WORST CASE CONTROL VALVE IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING IS **95% (ADJ)** OPEN BASED ON A TRIM OR RESPOND LOOP OR SIMILAR LOGIC. THE NORMAL PRESSURE CONTROL INPUT SHALL BE REDUCED TO NO LOWER THAN **5 PSID (ADJ)**. THE MAXIMUM NORMAL PRESSURE CONTROL INPUT SHALL BE NO MORE THAN **10 PSID (ADJ).**
- PUMP DIFFERENTIAL PRESSURE WILL BE ABLE TO BE MANUALLY SELECTED (VIA A PREPROGRAMMED GRAPHICAL SCREEN BUTTON) AS THE BACKUP PRESSURE CONTROL INPUT. WHEN THE BACKUP PRESSURE CONTROL BUTTON IS SELECTED, THE INDIVIDUAL SENSOR SETPOINTS AND NORMAL PRESSURE CONTROL INPUT ARE DISREGARDED AND THE PUMP DIFFERENTIAL PRESSURE SIGNAL UTILIZED IN THEIR PLACE. THE BACKUP PRESSURE CONTROL INPUT SHALL BE DETERMINED BY THE TAB AGENT AND WILL BE APPROXIMATELY **30 PSID (ADJ).**

5. HEATING WATER BYPASS VALVE:

- THE HEATING WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN THE SYSTEM FLOW RATE ABOVE THE REQUIRED MINIMUM FLOW RATE BASED ON THE OPERATING BOILER(S) AS MEASURED BY SYSTEM FLOW METER. UTILIZE **30 GPM (ADJ)** SET POINT MINIMUM FLOWRATE PER OPERATING BOILER UNLESS CONFIRMED BY BOILER MANUFACTURER TO BE HIGHER.
- SYSTEM BYPASS VALVE SHALL ALSO MODULATE OPEN TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE OF **2 PSID (ADJ)** ABOVE EFFECTIVE SYSTEM DIFFERENTIAL SET POINT WHEN A SINGLE OPERABLE PUMP IS AT MINIMUM SPEED. PUMP MINIMUM SPEED SHALL BE 18 HZ UNLESS NOTED OTHERWISE.

6. WWHP:

- THE HEATING WATER CONDENSER LEAVING WATER TEMPERATURE SETPOINT FOR THE WWHP SHALL BE **130F (ADJ)** AS CONTROLLED BY THE WWHP INTEGRAL CONTROLLER.
- WHEN THE WWHP HWP-4 IS OPERATING, IF ALL THREE BOILERS ARE INOPERATIVE (BASED ON WHATEVER BAS INPUT POINTS FROM THE THREE BOILERS THEMSELVES OR THE BOILER MANAGEMENT PANEL OR THE THREE BOILER ISOLATION VALVES ARE AVAILABLE), THEN FULLY OPEN THE BOILER BYPASS VALVE. OTHERWISE FULLY CLOSE THE BOILER BYPASS VALVE.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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7. ALARMS:

- o GENERATE ALARM ANYTIME THE SYSTEM SUPPLY TEMPERATURE DIFFERS FROM SET POINT BY GREATER THAN **10F (ADJ)** FOR **10 MINUTES (ADJ)**.
- o GENERATE ALARM ANYTIME CARBON MONOXIDE LEVEL IS ABOVE **25 PPM (ADJ)** AND SHUT DOWN BOILERS WHEN LEVEL IS ABOVE **50 PPM (ADJ)**.
- o MANUAL DEPRESSION OF EMERGENCY BOILER SHUTDOWN SWITCH SHALL SOUND HORN AND DISABLE ALL BOILERS.
- o GENERATE ALARM ANYTIME WATER IS DETECTED BY THE WATER DETECTOR.
- o SIGNAL AN ALARM AT THE OWS IF THE BUILDING OUTDOOR TEMPERATURE SENSOR READING IS MORE THAN **5F (ADJ)** DIFFERENT THAN THE CAMPUS GLOBAL OUTDOOR AIR TEMPERATURE FOR A PERIOD OF **TEN MINUTES (ADJ).** IF EITHER SIGNAL IS LOST OR BECOMES UNRELIABLE THEN UTILIZE THE SENSOR CLOSEST TO THE OLD FIVE MINUTE ROLLING AVERAGE OF THE TWO SENSORS UNTIL THE BUILDING SENSOR AND GLOBAL SENSOR ARE WITHIN **5F (ADJ)** OF EACH OTHER AGAIN.
- o GENERATE AN ALARM IF ANY PUMP IS COMMANDED TO START AND STATUS IS NOT SEEN WITHIN **30 SECONDS (ADJ)**.

BOILER MANAGEMENT PANEL SEQUENCE
(CONTROL VIA THE BOILER MANAGEMENT PANEL FURNISHED WITH THE BOILER EQUIPMENT):

- o BOILERS ARE MANUALLY INDEXED FOR AUTOMATIC OPERATION THROUGH INTEGRAL ON–OFF SWITCHES AT THEIR INDIVIDUAL CONTROL PANELS. ALL BOILERS ARE AVAILABLE FOR SERVICE AT ALL TIMES FOR NORMAL OPERATION. ANY BOILER TAKEN OUT OF SERVICE (MANUALLY DEENERGIZED) SHALL BE REMOVED FROM THE CONTROL SEQUENCE AND NOTED ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- o A MINIMUM OF ONE BOILER SHALL ALWAYS BE ENABLED. BOILER ISOLATION VALVE CONTROL SHALL BE VIA THE BOILER MANAGEMENT PANEL. LEAD BOILER ISOLATION VALVE SHALL BE FULLY OPEN AT ALL TIMES. LAG BOILER(S) ISOLATION VALVE SHALL OPEN WHENEVER A LAG BOILER IS CALLED TO OPERATE. COMMAND CLOSED THE ISOLATION VALVE OF A BOILER TAKEN OUT OF SEQUENCE AFTER A **5 MIN. (ADJ)** TIME DELAY.
- o QUANTITY OF BOILERS OPERATING AND THE FIRING RATE SHALL BE DETERMINED BY THE BOILER MANAGEMENT PANEL. MULTIPLE BOILERS SHALL RUN IN LOW FIRE MODE BEFORE MODULATING FIRING RATE TOWARD HIGHER FIRE TO MAINTAIN THE HIGHEST EFFICIENCY POSSIBLE. DISPLAY THE FIRING RATE COMMAND FOR EACH BOILER ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- o BOILER ROTATION SHALL BE COMMANDED BY THE BOILER MANAGEMENT PANEL. ROTATE BOILER OPERATION WHEN DETERMINING WHICH BOILER TO ENABLE BY ENABLING THE UNIT WITH LEAST AMOUNT OF RUNTIME. WHEN ROTATING BOILERS OUT OF SEQUENCE DISABLE THE BOILER WITH THE MOST RUN–HOURS. DISPLAY BOILER RUN–HOURS AND ON/OFF RUN CYCLES ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- o THE SYSTEM SUPPLY HEATING WATER SET POINT SHALL BE SELECTED BY THE BAS AND FURNISHED AS AN INPUT TO THE BOILER MANAGEMENT PANEL.
- o THE BOILER MANAGEMENT PANEL SHALL BE CONFIGURED FOR PARALLEL BOILER OPERATION.

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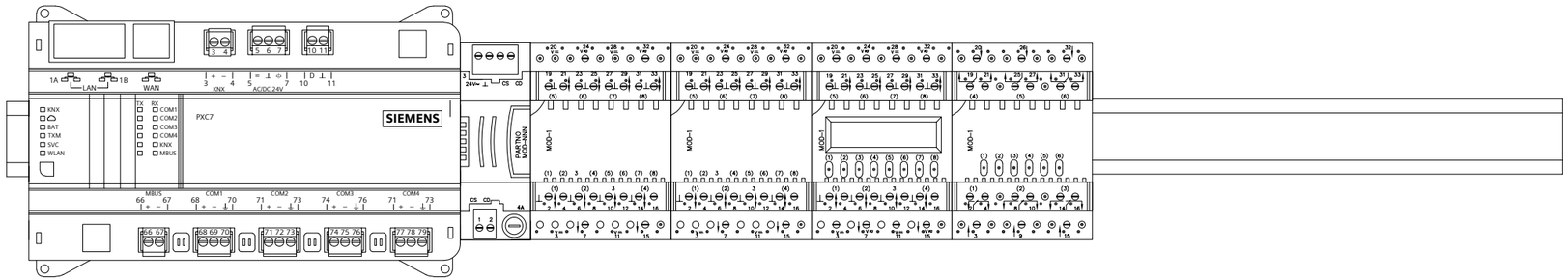
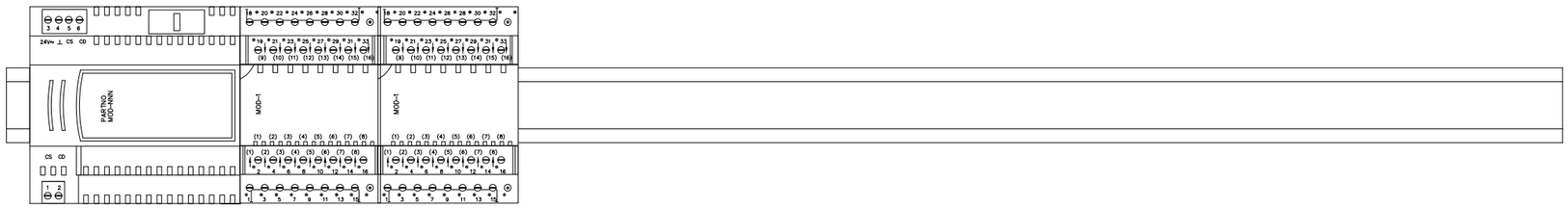
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





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LA14.PXCA INSTALLATION

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PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

Module: 2 / Rail: 1

TXIO- 00001 TXM1.8X

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓	↕	⊣	V≂	↕	⊣	V⎓	↕	⊣	V≂	↕
	(5)			(6)			(7)			(8)	
	LA14_HHW-DP-3FL 0.1.5 LAI DIFF PRESSURE			LA14_HHW-DP-1FL 0.1.6 LAI DIFF PRESSURE			LA14_HHW-CO-PPM 0.1.7 LAI CO SENSOR PPM			0.1.8 X	
	4...20 MA			4...20 MA			4...20 MA			4...20 MA	

DPTE 2 HHW SYS — DPTE 3 HHW SYS — GD 1 HHW SYS

2	3	4	6	7	8	10	11	12	14	15	16
⊣	V⎓	⊣	⊣	V≂	⊣	⊣	V⎓	⊣	⊣	V≂	⊣
	(1)			(2)			(3)			(4)	
LA14_OAT 0.1.1 LAI OA TEMP	VALUE		LA14_OAH 0.1.2 LAI OA HUM	VALUE		LA14_HHW-HWSF 0.1.3 LAI HW SUP FLOW	VALUE		LA14_HHW-DP-PH 0.1.4 LAI DIFF PRESSURE	VALUE	
4...20 MA			4...20 MA			4...20 MA			4...20 MA		

HTTE 1 HHW SYS — HTTE 1 HHW SYS — HHW SYS — DPTE 1 HHW SYS

Module: 3 / Rail: 1

TXIO- 00002 TXM1.8X

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓	↕	⊣	V≂	↕	⊣	V⎓	↕	⊣	V≂	↕
	(5)			(6)			(7)			(8)	
	LA14_HHW-BLR-RT 0.2.5 LAI HW RET TEMP			LA14_HHW-WWHP-LVT 0.2.6 LAI HW RET TEMP			LA14_HHW-RT 0.2.7 LAI HW RET TEMP			0.2.8 X	
	TEMP (PT1000, NA)			TEMP (PT1000, NA)			TEMP (PT1000, NA)			TEMP (PT1000, NA)	

TTE 5 HHW SYS — TTE 6 HHW SYS — TTE 7 HHW SYS

2	3	4	6	7	8	10	11	12	14	15	16
⊣	V⎓	⊣	⊣	V≂	⊣	⊣	V⎓	⊣	⊣	V≂	⊣
	(1)			(2)			(3)			(4)	
LA14_HB1-HWST 0.2.1 LAI HW SUP TEMP	VALUE		LA14_HB2-HWST 0.2.2 LAI HW SUP TEMP	VALUE		LA14_HB3-HWST 0.2.3 LAI HW SUP TEMP	VALUE		LA14_HHW-ST 0.2.4 LAI HW SUP TEMP	VALUE	
TEMP (PT1000, NA)			TEMP (PT1000, NA)			TEMP (PT1000, NA)			TEMP (PT1000, NA)		

TTE 1 HHW SYS — TTE 2 HHW SYS — TTE 3 HHW SYS — TTE 4 HHW SYS

Module: 4 / Rail: 1

TXIO- 00003 TXM1.8X-ML

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓	↕	⊣	V≂	↕	⊣	V⎓	↕	⊣	V≂	↕
	(5)			(6)			(7)			(8)	
	LA14_HHW-HWST-STPT 0.3.5 LAO TEMP SETPOINT			0.3.6 X			0.3.7 X			0.3.8 X	
	0...10 V DC			0...10 V DC			0...10 V DC			0...10 V DC	

HHW SYS

2	3	4	6	7	8	10	11	12	14	15	16
⊣	V⎓	⊣	⊣	V≂	⊣	⊣	V⎓	⊣	⊣	V≂	⊣
	(1)			(2)			(3)			(4)	
LA14_HHW-BPV 0.3.1 LAO BYPASS VALVE	VALUE		LA14_HHW-HWP1-S 0.3.2 LAO PUMP VFD SPEED	VALUE		LA14_HHW-HWP2-S 0.3.3 LAO PUMP VFD SPEED	VALUE		LA14_HHW-HWP3-S 0.3.4 LAO PUMP VFD SPEED	VALUE	
0...10 V DC			0...10 V DC			0...10 V DC			0...10 V DC		

HHW SYS — VFD 1 HHW SYS — VFD 2 HHW SYS — VFD 3 HHW SYS

Module: 5 / Rail: 1

REVISION HISTORY

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HHW SYSTEM

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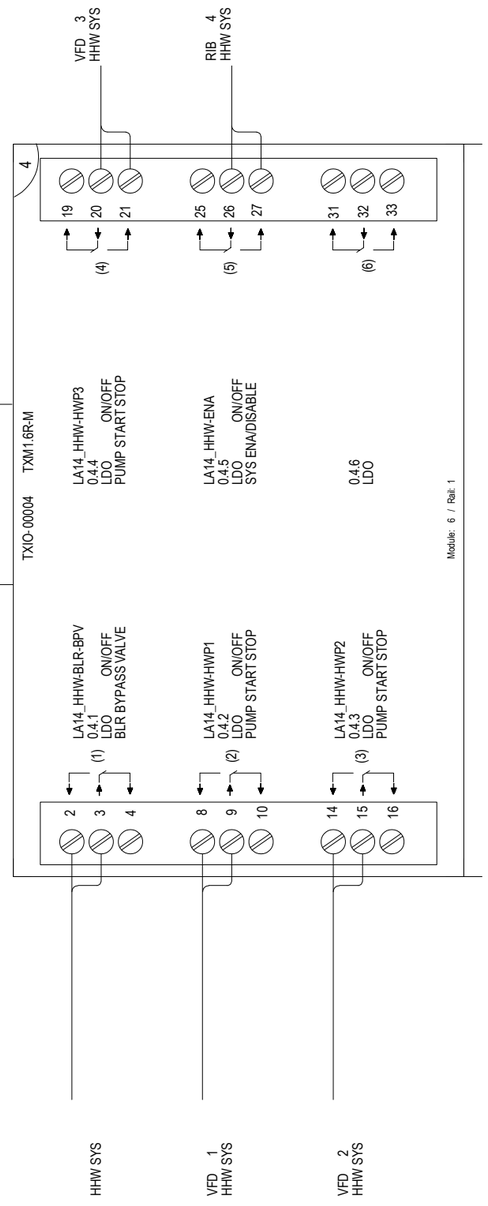

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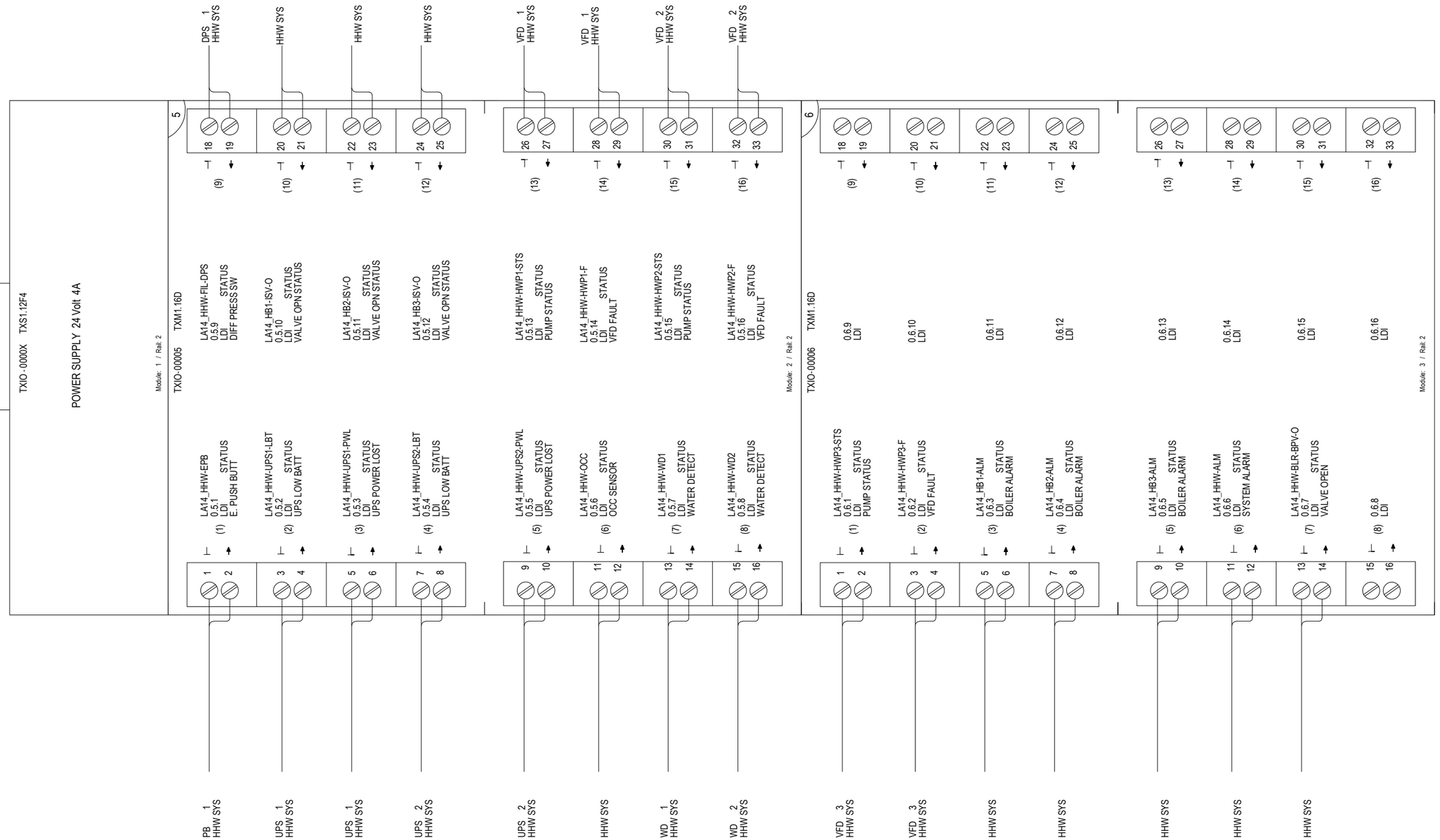
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	2	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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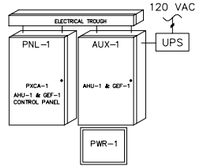
GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

ESLAM "HANDSHAKE" INTERLOCK WIRING
PULL WIRE TO LAB FHEF-10A/B/C CONTROLLER

LA01_ELSAM-FHEF10OUT
0001:0.7.4
SUPERVISORY OUTPUT
LA01_ELSAM-FHEF10IN
0001:0.9.8
SUPERVISORY INPUT

PNL-1 / AUX-1
RB-1
LA01_AHU1-FA
0001:0.8.1
FIRE ALARM
4
UPS-1
UPS LO BATT
LA01_AHU1-UPS-LBT
0001:0.8.2
POWER LOSS
LA01_AHU1-UPS-PWL
0001:0.8.3
PB -1
RE -1
RE -2
RE -3
RE -4
RE -5
LA01_AHU1-RUN
0001:0.7.5
AHU RUN STATUS



INSTALLATION NOTES:

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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. DAMPER PROVIDED AND PRE-INSTALLED BY AHU MANUFACTURER.
6. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
7. VFD PROVIDED BY OTHERS.
8. REFER TO PLANS FOR LOCATIONS.
9. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
10. LOCATE WITHIN 12" FROM COOLING COIL DISCHARGE.
11. LOCATE WITHIN 12" FROM HEATING COIL INLET. DEW POINT SENSOR (MEASURING A SINGLE POINT) IS MOUNTED AS FAR AWAY FROM THE WHEEL AS POSSIBLE AT AT THE POINT BETWEEN THE TWO HALVES. IT IS LOCATED IN THE CENTER OF THE UNIT TO READ A WELL MIXED AIRSTREAM.
12. LOCATE AVERAGING SENSOR WITHIN 12" FROM THE HEATING COIL INLET ACROSS THE "COLD HALF" ("COLD HALF" SENSOR LOCATION IS DETERMINED FROM WHEEL ROTATION WHERE THE COLD WHEEL FIRST ROTATES OUT OF THE COLD OUTDOOR AIRSTREAM DURING THE WINTER AND INTO THE WARMER EXHAUST PORTION OF THE UNIT). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
13. LOCATE AVERAGING SENSOR WITHIN 12" FROM HEATING COIL INLET ACROSS THE "WARM HALF" (WARM IN THE WINTER WHERE THE WARM WHEEL FIRST ROTATES INTO THE COLD OUTDOOR AIRSTREAM). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
14. DAMPER AND ACTUATOR (WITH INTEGRAL ENDSWITCH) FURNISHED BY GEF MANUFACTURER.
15. ROTATION SENSOR FURNISHED BY UNIT MANUFACTURER.

VFD-GEF-1
RIB-10
SAFETY RELAY
RIB-9
LA01_AHU1-GEF1
0001:0.7.1
START/STOP
LA01_AHU1-GEF1-S
0001:0.5.7
SPEED
LA01_AHU1-GEF1-STS
0001:0.9.3
STATUS
LA01_AHU1-GEF1-F
0001:0.9.4
FAULT
VFD-5

DPTE-6
+/-5 IN WG
LA01_AHU1-ESP2
0001:0.1.6
SPP-8
DPTE-5
+/-5 IN WG
LA01_AHU1-ESP1
0001:0.1.5
SPP-7

AE -2
2POS 2 Pos
LA01_AHU1-EAD
0001:0.6.2
DPS-2
-3.5 IN WG
LA01_AHU1-GEF1-LSP
0001:0.8.7
LA01_AHU1-EAD-O
0001:0.8.9
OPEN STATUS
INTERLOCK
TO GEF VFD'S
D-5
NC
SPP-6
GEF-1
25000 CFM
40 HP
FIELD DUCTWORK

TTE-7
20/120 DEG F
LA01_AHU1-ERW-EAT
0001:0.3.7
HTE-5
0/100 rh
LA01_AHU1-ERW-EAH
0001:0.2.5
AHU
SPP-5
DPTE-4
+/-10IN WG
LA01_AHU1-GEF1-ESP
0001:0.1.4
TTE-6
20/120 DEG F
LA01_AHU1-EAT
0001:0.3.6
HTE-4
0/100 rh
LA01_AHU1-EAH
0001:0.2.4
SD-1
EA
AHU
FIELD DUCT WORK

ENTHALPY WHEEL

LA01_AHU1-ROT-A
0001:0.8.4
ROTATION ALARM

VFD-HEAT WHEEL
RIB-11
LA01_AHU1-WL
0001:0.7.2
START/STOP
LA01_AHU1-WL-STS
0001:0.9.5
VFD STATUS
LA01_AHU1-WL-S
0001:0.5.8
VFD SPEED
LA01_AHU1-WL-F
0001:0.9.6
FAULT
VFD-WL
VFD-6

VFD-SF-1A
RIB-2
SAFETY RELAY
RIB-1
LA01_AHU1-SFA
0001:0.6.3
START/STOP
LA01_AHU1-SFA-S
0001:0.5.3
SPEED
LA01_AHU1-SFA-STS
0001:0.8.10
STATUS
LA01_AHU1-SFA-F
0001:0.8.11
FAULT
VFD-1

VFD-SF-1B
RIB-4
SAFETY RELAY
RIB-3
LA01_AHU1-SFB
0001:0.6.4
START/STOP
LA01_AHU1-SFB-S
0001:0.5.4
SPEED
LA01_AHU1-SFB-STS
0001:0.8.12
STATUS
LA01_AHU1-SFB-F
0001:0.8.13
FAULT
VFD-2

VFD-SF-1C
RIB-6
SAFETY RELAY
RIB-5
LA01_AHU1-SFC
0001:0.6.5
START/STOP
LA01_AHU1-SFC-S
0001:0.5.5
SPEED
LA01_AHU1-SFC-STS
0001:0.8.14
STATUS
LA01_AHU1-SFC-F
0001:0.8.15
FAULT
VFD-3

VFD-SF-1D
RIB-8
SAFETY RELAY
RIB-7
LA01_AHU1-SFD
0001:0.6.6
START/STOP
LA01_AHU1-SFD-S
0001:0.5.6
SPEED
LA01_AHU1-SFD-STS
0001:0.9.1
STATUS
LA01_AHU1-SFD-F
0001:0.9.2
FAULT
VFD-4

DPTE-3
+/-5 IN WG
LA01_AHU1-SSP2
0001:0.1.3
SPP-4
SA

AE -1 (4)
2POS 2 Pos
LA01_AHU1-OAD
0001:0.6.1
LA01_AHU1-OAD-O
0001:0.8.8
OPEN STATUS
INTERLOCK
TO SF VFD'S
D-1
NO
138"x68"
OA
FIELD DUCTWORK
AHU

TTE-1
20/120 DEG F
LA01_AHU1-OAT
0001:0.3.1
HTE-1
0/100 rh
LA01_AHU1-OAH
0001:0.2.1
TTE-3
20/120 DEG F
LA01_AHU1-ERW-SAT2
0001:0.3.3
HTE-2
0/100 rh
LA01_AHU1-ERW-SAH
0001:0.2.2
LTDE-1
38 DEG F
LA01_AHU1-LTD
0001:0.8.5
-22/158deg F
LA01_AHU1-HCT1
0001:0.2.7
LTDE-2
38 DEG F
-22/158deg F
LA01_AHU1-HCT2
0001:0.2.8
TTE-4
20/120 DEG F
LA01_AHU1-CCT
0001:0.3.4
TTE-2
20/120 DEG F
LA01_AHU1-ERW-SAT1
0001:0.3.2
xx SQFT
H
C
SF-1A
7500 CFM
15.0HP
SF-1B
7500 CFM
15.0HP
SF-1C
7500 CFM
15.0HP
SF-1D
7500 CFM
15.0HP
6

DPS-1
4 IN WG
LA01_AHU1-HSP
0001:0.8.6
SPP-2
TTE-5
20/120 DEG F
LA01_AHU1-SAT
0001:0.3.5
HTE-3
0/100 rh
LA01_AHU1-SAH
0001:0.2.3
SPP-1
DPTE-1
+/-10IN WG
LA01_AHU1-DASP
0001:0.1.1
AHU
FIELD DUCT WORK

DPTE-2
+/-5 IN WG
LA01_AHU1-SSP1
0001:0.1.2
SPP-3
SA

TTE-9
-40/240DEG F
LA01_AHU1-HRT
0001:0.4.1
V-2
0/10 V
LA01_AHU1-HCV
0001:0.5.2
TTE-8
-40/240DEG F
LA01_AHU1-HST
0001:0.3.8
HWR
HWS
NO-SR
HCP-1
CS-1
LA01_AHU1-HCP-STS
0001:0.9.7
RIB-12
LA01_AHU1-HCP
0001:0.7.3
TTE-10
-40/240DEG F
LA01_AHU1-CRT
0001:0.4.2
V-1
0/10 VOLTS
LA01_AHU1-CCV
0001:0.5.1
CHWR
CHWS
NO-SR
WD-1
WATER DET
LA01_AHU1-WD
0001:0.9.9

DPTE-7
+/-0.25 IN H2O
LA01_AHU1-BDP
0001:0.1.7
SSP-9
SSP-8
9
BUILDING DIFFERENTIAL PRESSURE SENSOR

8
HTE-6
10/90 %RH
LA01_AHU1-RMH
0001:0.2.6
HUMIDITY

1/200 AHU-1 CONTROL DIAGRAM
LOCATION: MECHNICAL ROOM - WEST PENTHOUSE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01 PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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FAX: 317-240-0374

GJ LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DATE SUBMITTED
HB	HB	KH	HB	04/02/26

AHU-1 CONTROL

440P412785
0
200

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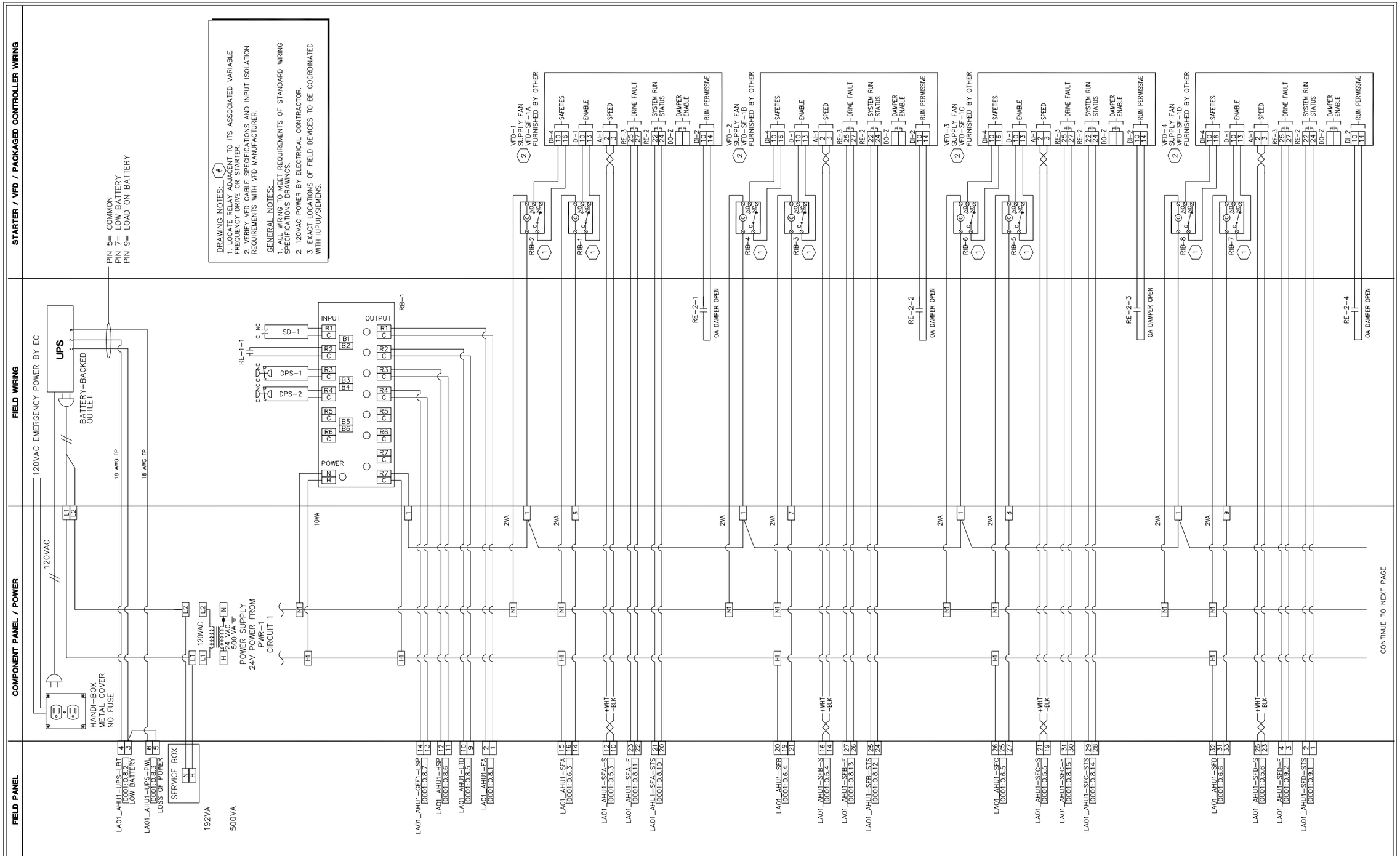

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 ELEC WIRING 1

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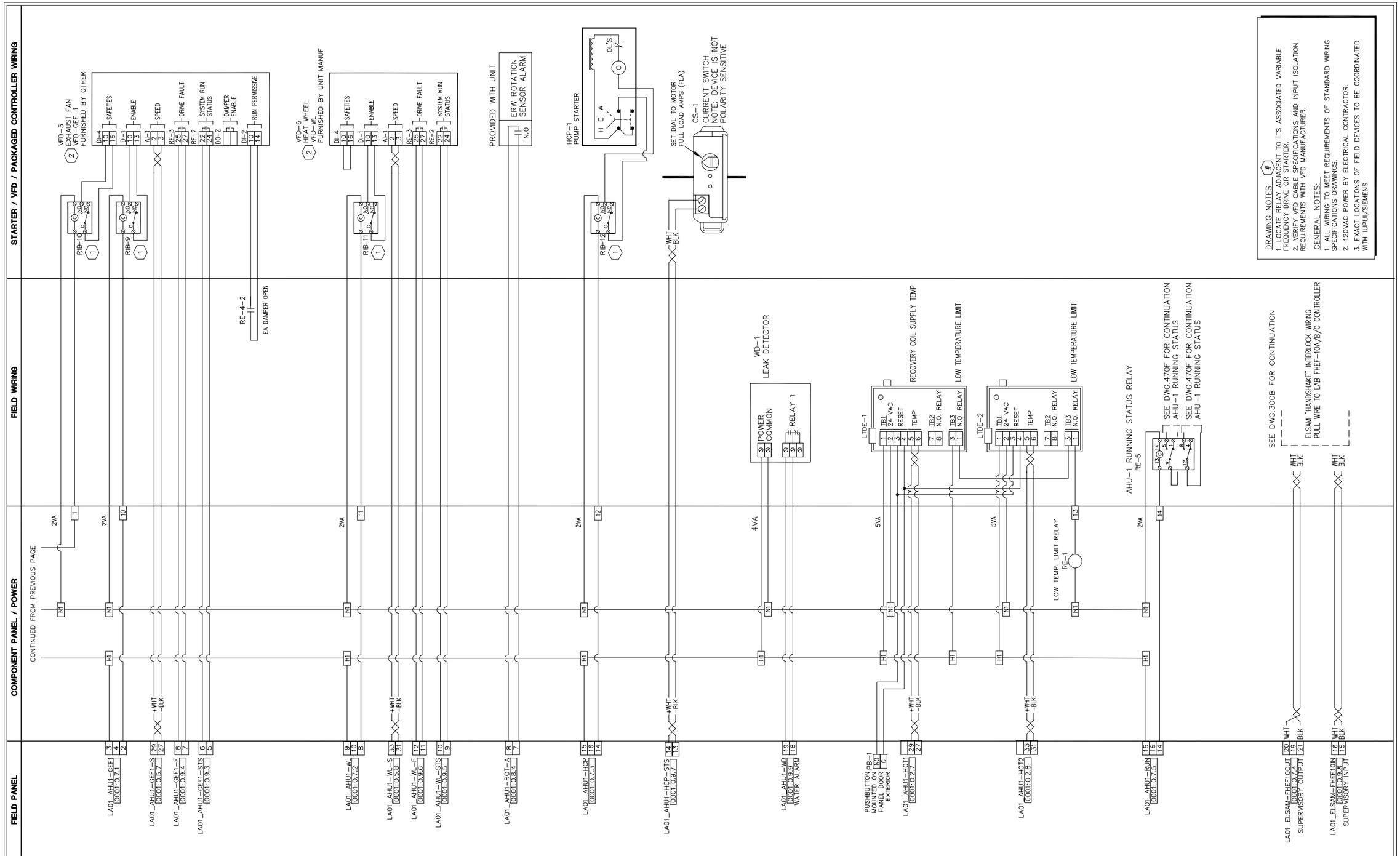

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 ELEC WIRING 2

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

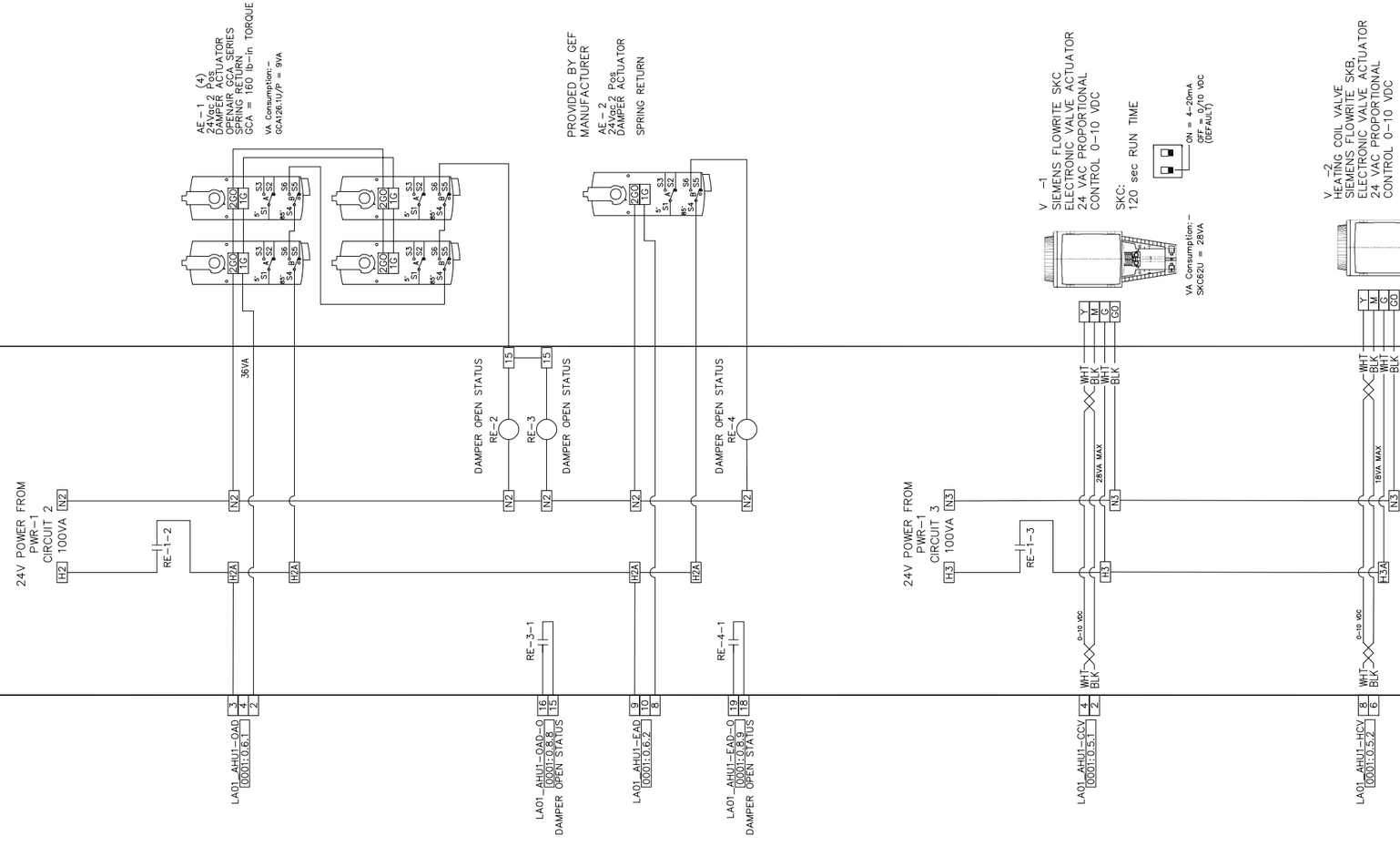
EXHAUST AIR DAMPER

COOLING COIL VAVLE

HEATING COIL VAVLE

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.

COMPONENT PANEL / POWER



FIELD PANEL

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

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00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 ELEC WIRING 3

440P412785
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200C

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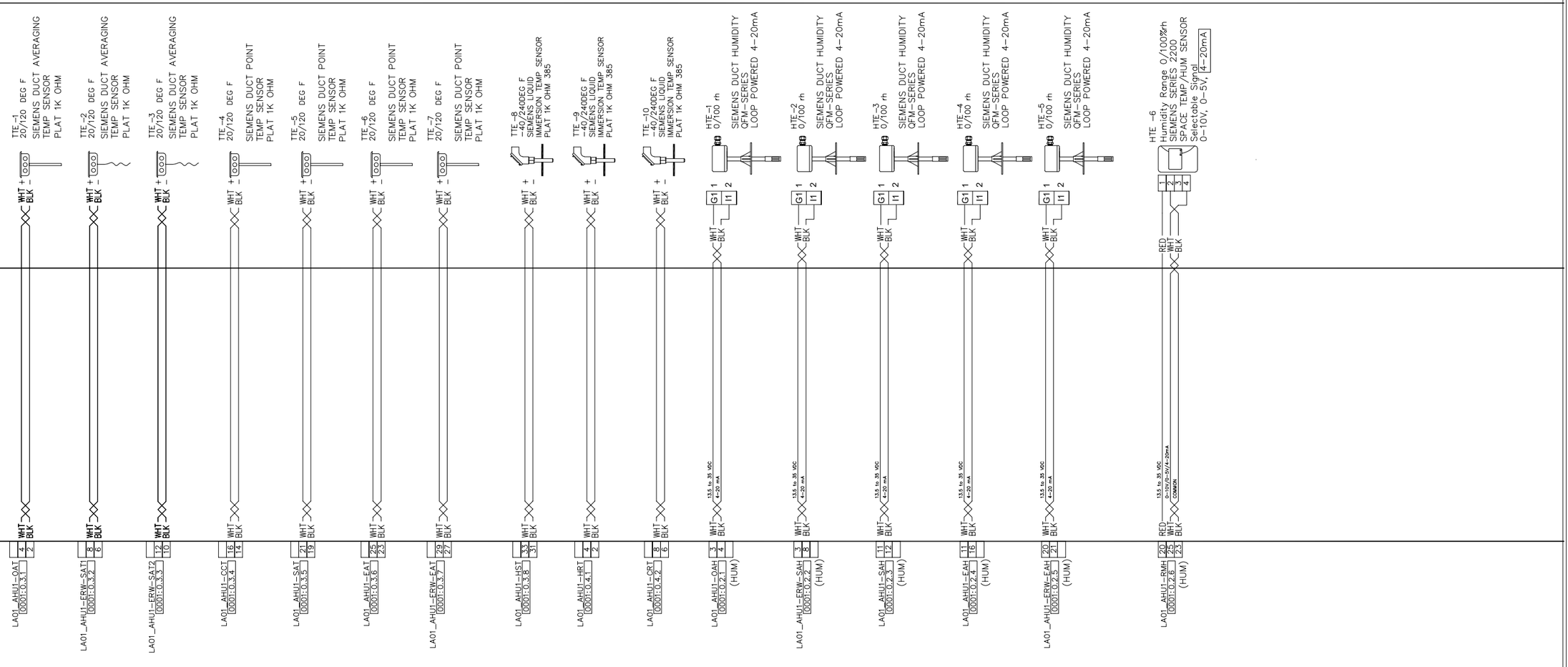
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 ELEC WIRING 4

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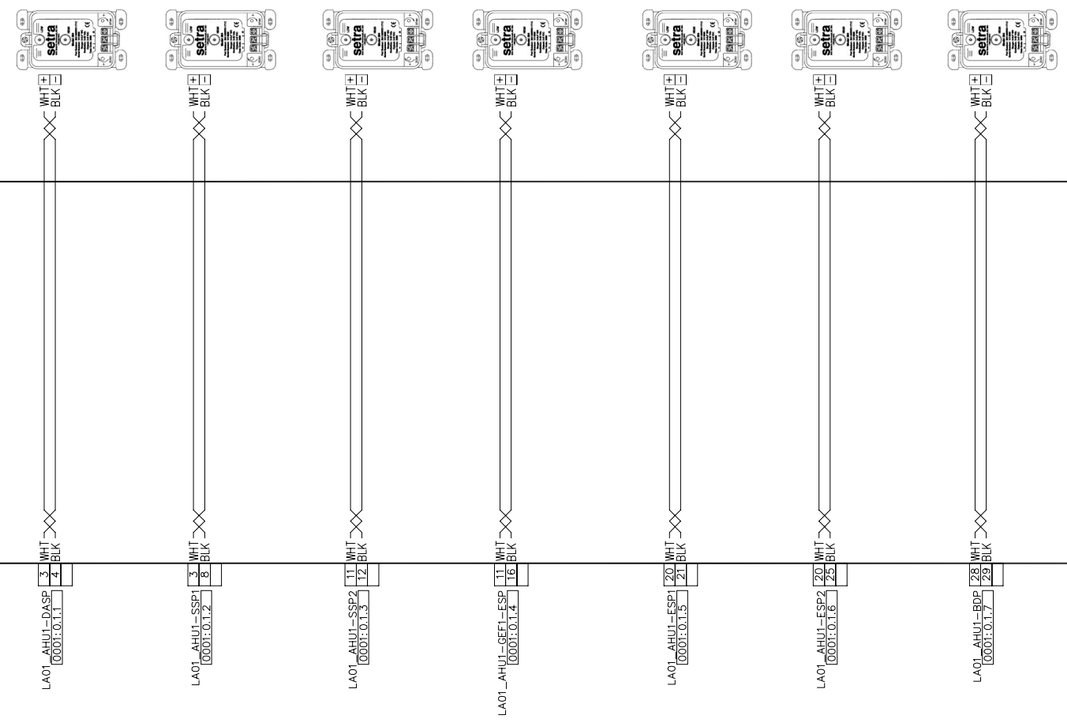
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



COMPONENT PANEL / POWER

FIELD PANEL

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 ELEC WIRING 5

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0
200E

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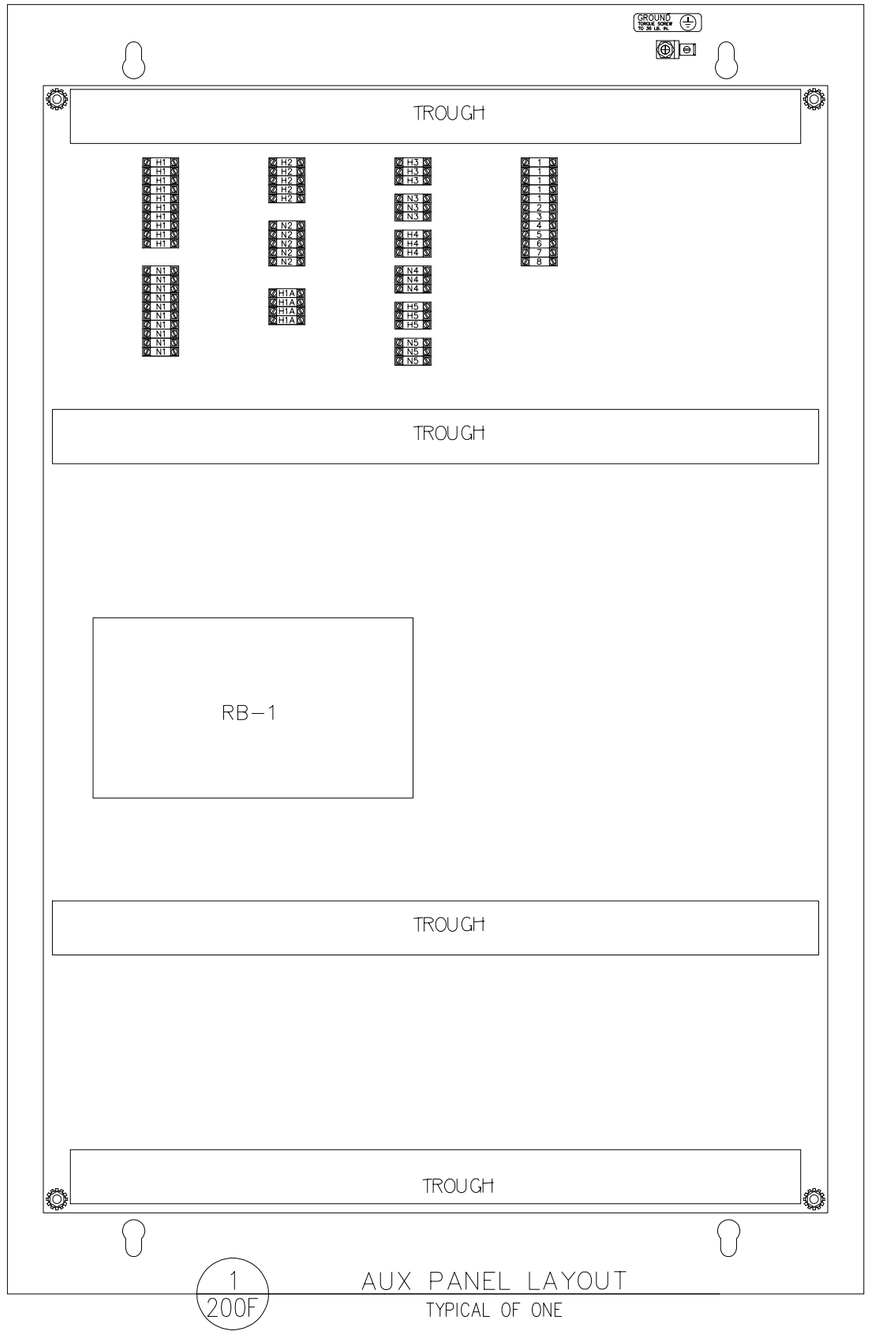
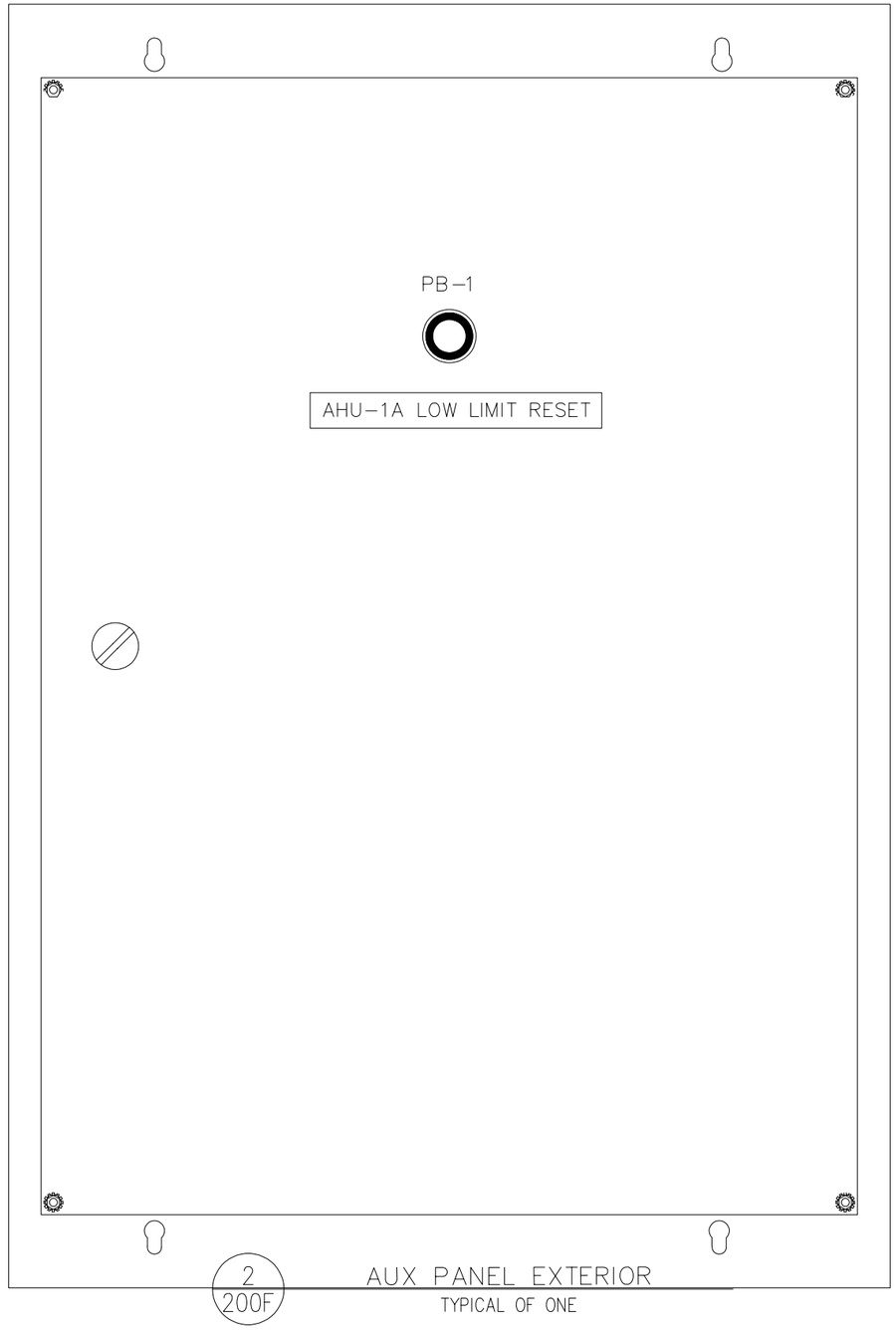


1 200F AUX PANEL LAYOUT
TYPICAL OF ONE



2 200F AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	4	GCA126.1P	SIEMENS	154001	2 PT SR,24V,MED/S/PLNM.
	2	ASK73.1	SIEMENS		TANDEM MOUNT KIT
AE 2	1	FBO			FURNISHED BY OTHERS
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2-3	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5-6	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 7	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTE 1-5	5	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 6	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-1	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 1	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-12	12	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 9	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 2-4	3	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 5-7	3	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8-10	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-6	6	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 5	1	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED

REFER TO PAGE 241 FOR AHU SEQUENCE OF OPERATION.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 CONTROL BOM

440P412785
0
200G

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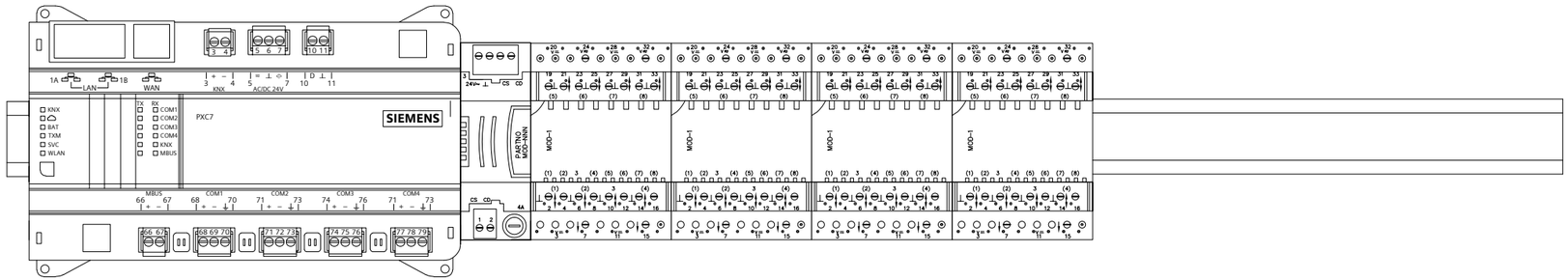
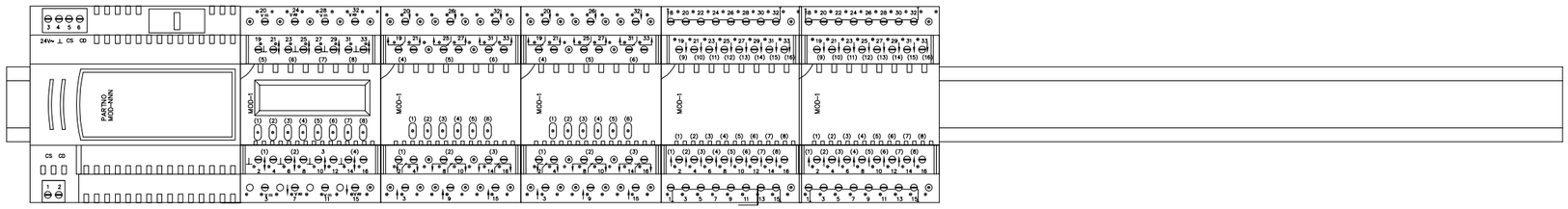
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LA01.PXCA INSTALLATION

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E200

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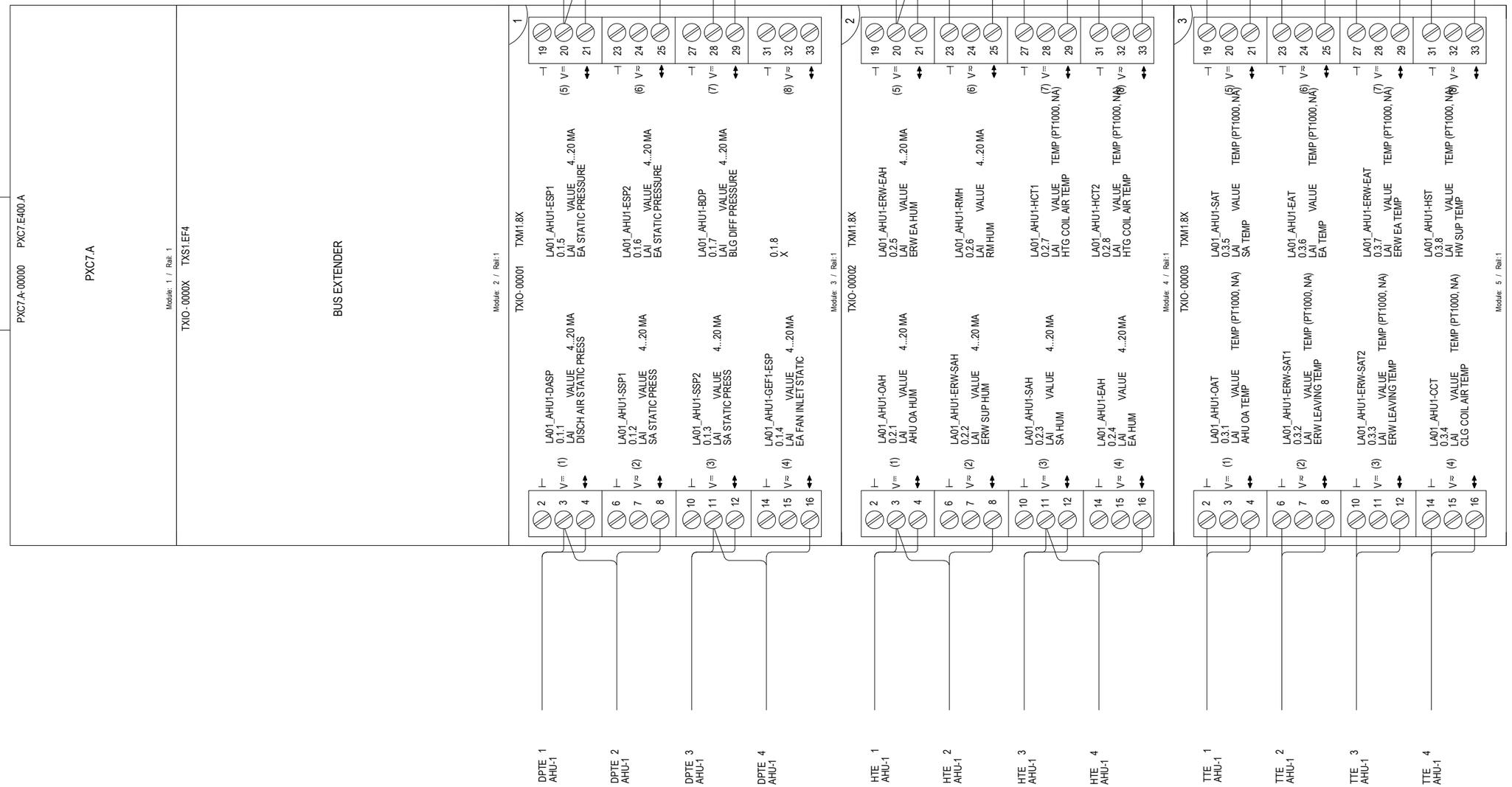
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER



REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-1 & GEF-1

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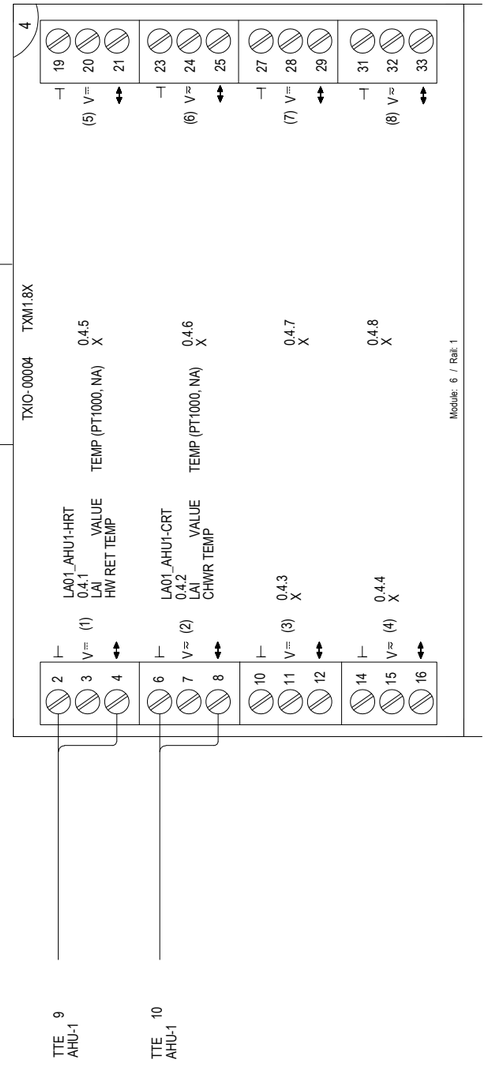

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IU# 20250072, IN

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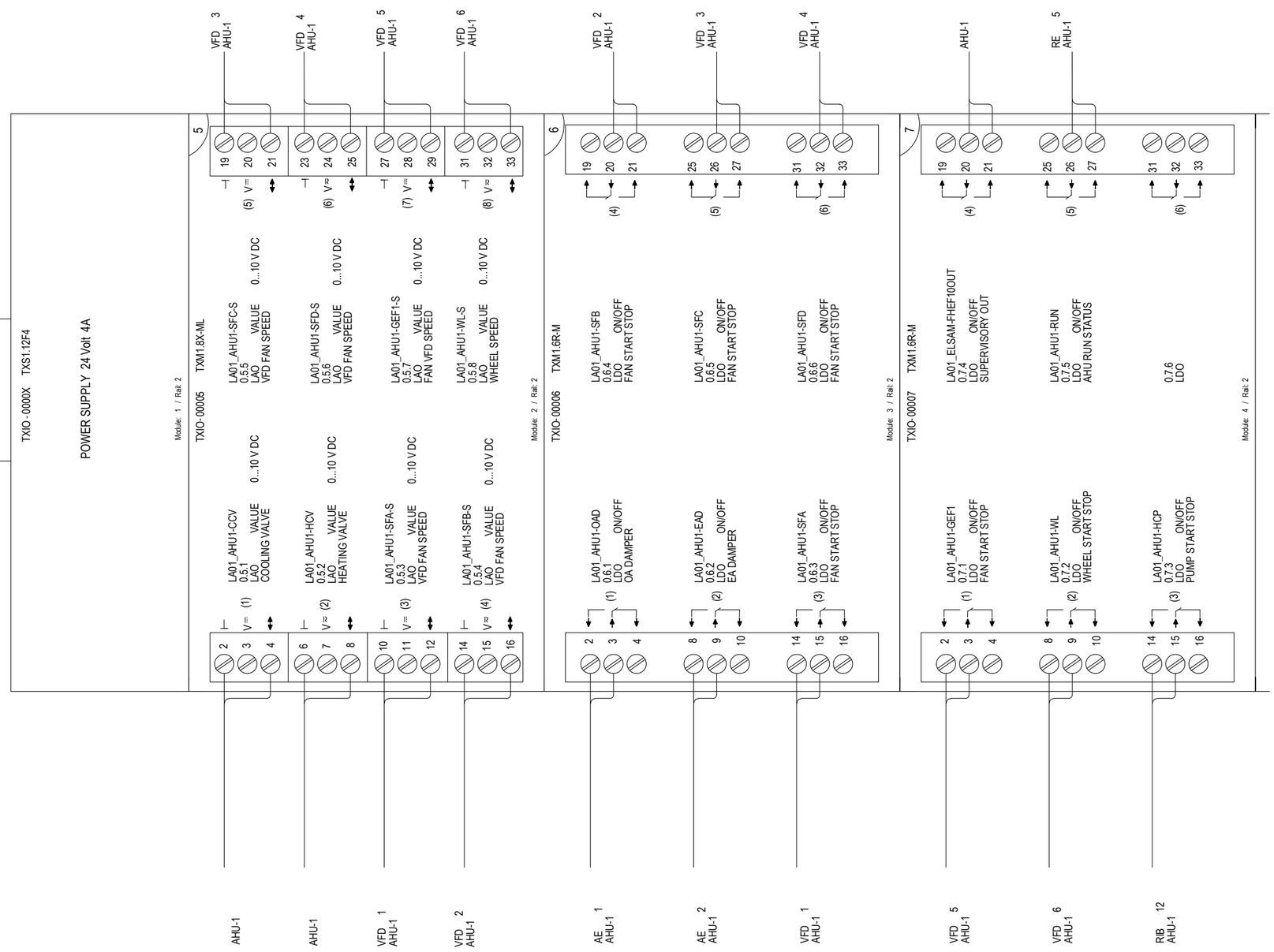
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU# 20250072, IN

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LA01.PXCAp003

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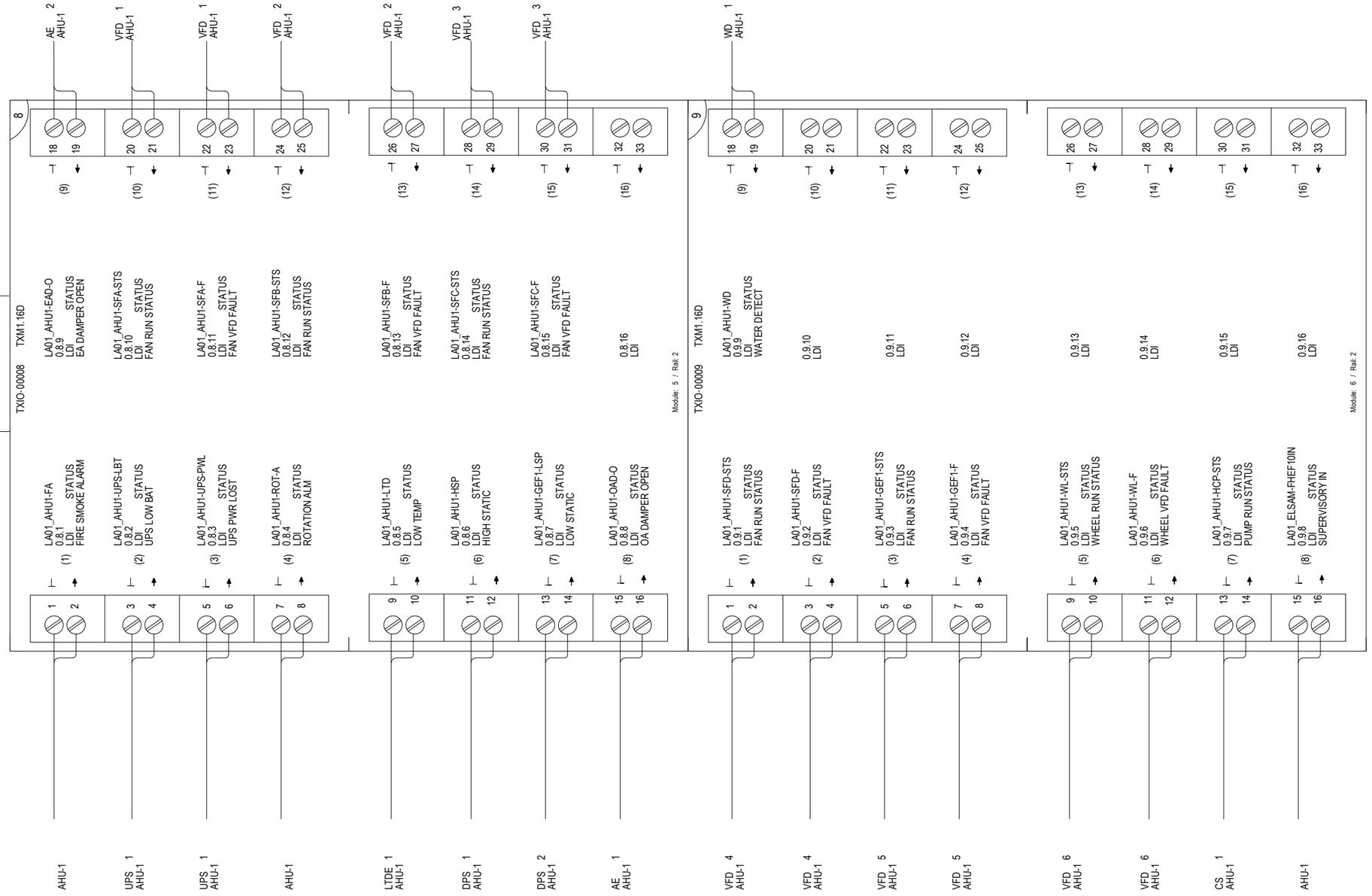

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	2	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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LA01.PXCA BOM

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GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

ESLAM "HANDSHAKE" INTERLOCK WIRING
PULL WIRE TO LAB FHEF-10A/B/C CONTROLLER

LA02_ELSAM-FHEF100UT
0002:0.7.4
SUPERVISORY OUTPUT

LA02_ELSAM-FHEF10IN
0002:0.9.8
SUPERVISORY INPUT

PNL-2 / AUX-2

RB-1
LA02_AHU2-FA
0002:0.8.1
FIRE ALARM
4

UPS-1
UPS LO BATT
LA02_AHU2-UPS-LBT
0002:0.8.2

POWER LOSS
LA02_AHU2-UPS-PWL
0002:0.8.3

PB -1
RE-1 RE-2 RE-3
RE-4 RE-5
LA02_AHU2-RUN
0002:0.7.5
AHU RUN STATUS

ELECTRICAL TROUGH
120 VAC
PNL-2
AUX-2
UPS
PXCA-2
AHU-2 & GEF-2
CONTROL PANEL
AHU-2 & GEF-2
PWR-2

INSTALLATION NOTES:

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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. DAMPER PROVIDED AND PRE-INSTALLED BY AHU MANUFACTURER.
6. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
7. VFD PROVIDED BY OTHERS.
8. REFER TO PLANS FOR LOCATIONS.
9. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
10. LOCATE WITHIN 12" FROM COOLING COIL DISCHARGE.
11. LOCATE WITHIN 12" FROM HEATING COIL INLET. DEW POINT SENSOR (MEASURING A SINGLE POINT) IS MOUNTED AS FAR AWAY FROM THE WHEEL AS POSSIBLE AT AT THE POINT BETWEEN THE TWO HALVES. IT IS LOCATED IN THE CENTER OF THE UNIT TO READ A WELL MIXED AIRSTREAM.
12. LOCATE AVERAGING SENSOR WITHIN 12" FROM THE HEATING COIL INLET ACROSS THE "COLD HALF" ("COLD HALF" SENSOR LOCATION IS DETERMINED FROM WHEEL ROTATION WHERE THE COLD WHEEL FIRST ROTATES OUT OF THE COLD OUTDOOR AIRSTREAM DURING THE WINTER AND INTO THE WARMER EXHAUST PORTION OF THE UNIT). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
13. LOCATE AVERAGING SENSOR WITHIN 12" FROM HEATING COIL INLET ACROSS THE "WARM HALF" (WARM IN THE WINTER WHERE THE WARM WHEEL FIRST ROTATES INTO THE COLD OUTDOOR AIRSTREAM). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
14. DAMPER AND ACTUATOR (WITH INTEGRAL ENDSWITCH) FURNISHED BY GEF MANUFACTURER.
15. ROTATION SENSOR FURNISHED BY UNIT MANUFACTURER.

VFD-GEF-2
RIB-10
SAFETY RELAY
RIB-9
LA02_AHU2-GEF1
0002:0.7.1
START/STOP
LA02_AHU2-GEF1-S
0002:0.5.7
SPEED
LA02_AHU2-GEF1-STS
0002:0.9.3
STATUS
LA02_AHU2-GEF1-F
0002:0.9.4
FAULT
VFD-5

AE -2
2POS 2 Pos
LA02_AHU2-EAD
0002:0.6.2
DPS-2
-.35 IN WG
LA02_AHU2-GEF1-LSP
0002:0.8.7
LA02_AHU2-EAD-O
0002:0.8.9
OPEN STATUS
INTERLOCK
TO GEF VFD'S
D-5
NC
SPP-6
GEF-2
25000 CFM
40 HP
FIELD DUCTWORK
TTE-7
20/120 DEG F
LA02_AHU2-ERW-EAT
0002:0.3.7
HTE-5
0/100 rh
LA02_AHU2-ERW-EAH
0002:0.2.5
AHU
SPP-5
DPTE-4
+/-10IN WG
LA02_AHU2-GEF1-ESP
0002:0.1.4
TTE-6
20/120 DEG F
LA02_AHU2-EAT
0002:0.3.6
HTE-4
0/100 rh
LA02_AHU2-EAH
0002:0.2.4
SD-1
EA
DPTE-6
+/-5 IN WG
LA02_AHU2-ESP2
0002:0.1.6
SPP-8
DPTE-5
+/-5 IN WG
LA02_AHU2-ESP1
0002:0.1.5
SPP-7
AHU FIELD DUCT WORK
SA

ENTHALPY WHEEL

VFD-HEAT WHEEL
RIB-11
LA02_AHU2-WL
0002:0.7.2
START/STOP
LA02_AHU2-WL-STS
0002:0.9.5
VFD STATUS
LA02_AHU2-WL-S
0002:0.5.8
VFD SPEED
LA02_AHU2-WL-F
0002:0.9.6
FAULT
VFD-6
VFD-WL
LA02_AHU2-ROT-A
0002:0.8.4
ROTATION ALARM

VFD-SF-2A
RIB-2
SAFETY RELAY
RIB-1
LA02_AHU2-SFA
0002:0.6.3
START/STOP
LA02_AHU2-SFA-S
0002:0.5.3
SPEED
LA02_AHU2-SFA-STS
0002:0.8.10
STATUS
LA02_AHU2-SFA-F
0002:0.8.11
FAULT
VFD-1

VFD-SF-2B
RIB-4
SAFETY RELAY
RIB-3
LA02_AHU2-SFB
0002:0.6.4
START/STOP
LA02_AHU2-SFB-S
0002:0.5.4
SPEED
LA02_AHU2-SFB-STS
0002:0.8.12
STATUS
LA02_AHU2-SFB-F
0002:0.8.13
FAULT
VFD-2

VFD-SF-2C
RIB-6
SAFETY RELAY
RIB-5
LA02_AHU2-SFC
0002:0.6.5
START/STOP
LA02_AHU2-SFC-S
0002:0.5.5
SPEED
LA02_AHU2-SFC-STS
0002:0.8.14
STATUS
LA02_AHU2-SFC-F
0002:0.8.15
FAULT
VFD-3

VFD-SF-2D
RIB-8
SAFETY RELAY
RIB-7
LA02_AHU2-SFD
0002:0.6.6
START/STOP
LA02_AHU2-SFD-S
0002:0.5.6
SPEED
LA02_AHU2-SFD-STS
0002:0.9.1
STATUS
LA02_AHU2-SFD-F
0002:0.9.2
FAULT
VFD-4

AE -1 (4)
2POS 2 Pos
LA02_AHU2-OAD
0002:0.6.1
LA02_AHU2-OAD-O
0002:0.8.8
OPEN STATUS
INTERLOCK
TO SF VFD'S
D-1
NO
138"x68"
OA
FIELD DUCTWORK
AHU
TTE-1
20/120 DEG F
LA02_AHU2-OAT
0002:0.3.1
HTE-1
0/100 rh
LA02_AHU2-OAH
0002:0.2.1
TTE-3
20/120 DEG F
LA02_AHU2-ERW-SAT2
0002:0.3.3
TTE-2
20/120 DEG F
LA02_AHU2-ERW-SAT1
0002:0.3.2
HTE-2
0/100 rh
LA02_AHU2-ERW-SAH
0002:0.2.2
LTDE-1
38 DEG F
LA02_AHU2-LTD
0002:0.8.5
-22/158deg F
LA02_AHU2-HCT1
0002:0.2.7
LTDE-2
38 DEG F
-22/158deg F
LA02_AHU2-HCT2
0002:0.2.8
TTE-4
20/120 DEG F
LA02_AHU2-CCT
0002:0.3.4
xx SQFT
TTE-9
-40/240DEG F
LA02_AHU2-HRT
0002:0.4.1
TTE-8
-40/240DEG F
LA02_AHU2-HST
0002:0.3.8
TTE-10
-40/240DEG F
LA02_AHU2-CRT
0002:0.4.2
V-2
0/10 V
LA02_AHU2-HCV
0002:0.8.2
HWR
HWS
NO-SR
HCP-2
CS-1
LA02_AHU2-HCP-STS
0002:0.9.7
RIB-12
LA02_AHU2-HCP
0002:0.7.3
V-1
0/10 VOLTS
LA02_AHU2-CCV
0002:0.5.1
CHWR
CHWS
NO-SR
WD-1
WATER DET
LA02_AHU2-WD
0002:0.9.9
SF-2A
7500 CFM
15.0HP
SF-2B
7500 CFM
15.0HP
SF-2C
7500 CFM
15.0HP
SF-2D
7500 CFM
15.0HP
6
DPS-1
4 IN WG
LA02_AHU2-HSP
0002:0.8.6
SPP-1
SPP-2
DPTE-1
+/-10IN WG
LA02_AHU2-DASP
0002:0.1.1
TTE-5
20/120 DEG F
LA02_AHU2-SAT
0002:0.3.5
HTE-3
0/100 rh
LA02_AHU2-SAH
0002:0.2.3
AHU FIELD DUCT WORK
DPTE-3
+/-5 IN WG
LA02_AHU2-SSP2
0002:0.1.3
SPP-4
DPTE-2
+/-5 IN WG
LA02_AHU2-SSP1
0002:0.1.2
SPP-3

BUILDING DIFFERENTIAL PRESSURE SENSOR
DPTE-7
+/-0.25 IN H2O
LA02_AHU2-BDP
0002:0.1.7
SSP-9
SSP-8
9
HTE-6
10/90 %RH
LA02_AHU2-RMH
0002:0.2.6
HUMIDITY

1 / 210 AHU-2 CONTROL DIAGRAM
LOCATION: MECHNICAL ROOM - WEST PENTHOUSE

440P412785
0
210

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

GBU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DESIGN BY	DRAWN BY	CHECKED BY	APPD BY	ISSUE DATE
HB		KR	04/02/26	04/02/26

AHU-2 CONTROL

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

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FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

120VAC EMERGENCY POWER BY EC

UPS

BATTERY-BACKED OUTLET

PIN 5= COMMON
PIN 7= LOW BATTERY
PIN 9= LOAD ON BATTERY

18 AWG TP

18 AWG TP

120VAC

HANDI-BOX
METAL COVER
NO FUSE

SERVICE BOX

192VA

500VA

POWER SUPPLY
24V POWER FROM PWR-2
CIRCUIT 1

500 VA
24 VAC

RB-1

INPUT / OUTPUT

SD-1

DPS-1

DPS-2

RE-1-1

POWER

VFD-1
SUPPLY FAN
VFD-SF-2A
FURNISHED BY OTHER

VFD-2
SUPPLY FAN
VFD-SF-2B
FURNISHED BY OTHER

VFD-3
EXHAUST FAN
VFD-SF-2C
FURNISHED BY OTHER

VFD-4
SUPPLY FAN
VFD-SF-2D
FURNISHED BY OTHER

SAFETIES
ENABLE
SPEED
DRIVE FAULT
SYSTEM RUN STATUS
DAMPER ENABLE
RUN PERMISSIVE

RIB-1
RIB-2
RIB-3
RIB-4
RIB-5
RIB-6
RIB-7
RIB-8

RE-2-1
RE-2-2
RE-2-3
RE-2-4
0A DAMPER OPEN

10VA
2VA

+WHT
-BLK

LA02_AHU2-UPS-LBT 0002.0.8.2 LOW BATTERY
LA02_AHU2-UPS-PWL 0002.0.8.1 LOSS OF POWER
LA02_AHU2-GEFL-LSP 0002.0.8.7
LA02_AHU2-HSP 0002.0.8.6
LA02_AHU2-LTD 0002.0.8.5
LA02_AHU2-FA 0002.0.8.1
LA02_AHU2-SFA 0002.0.6.3
LA02_AHU2-SFA-S 0002.0.5.3
LA02_AHU2-SFA-F 0002.0.8.11
LA02_AHU2-SFA-STS 0002.0.8.10
LA02_AHU2-SFB 0002.0.6.4
LA02_AHU2-SFB-S 0002.0.5.4
LA02_AHU2-SFB-F 0002.0.8.13
LA02_AHU2-SFB-STS 0002.0.8.12
LA02_AHU2-SFC 0002.0.6.5
LA02_AHU2-SFC-S 0002.0.5.5
LA02_AHU2-SFC-F 0002.0.8.15
LA02_AHU2-SFC-STS 0002.0.8.14
LA02_AHU2-SFD 0002.0.6.6
LA02_AHU2-SFD-S 0002.0.5.6
LA02_AHU2-SFD-F 0002.0.9.2
LA02_AHU2-SFD-STS 0002.0.9.1

CONTINUE TO NEXT PAGE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

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AHU-2 ELEC WIRING 1

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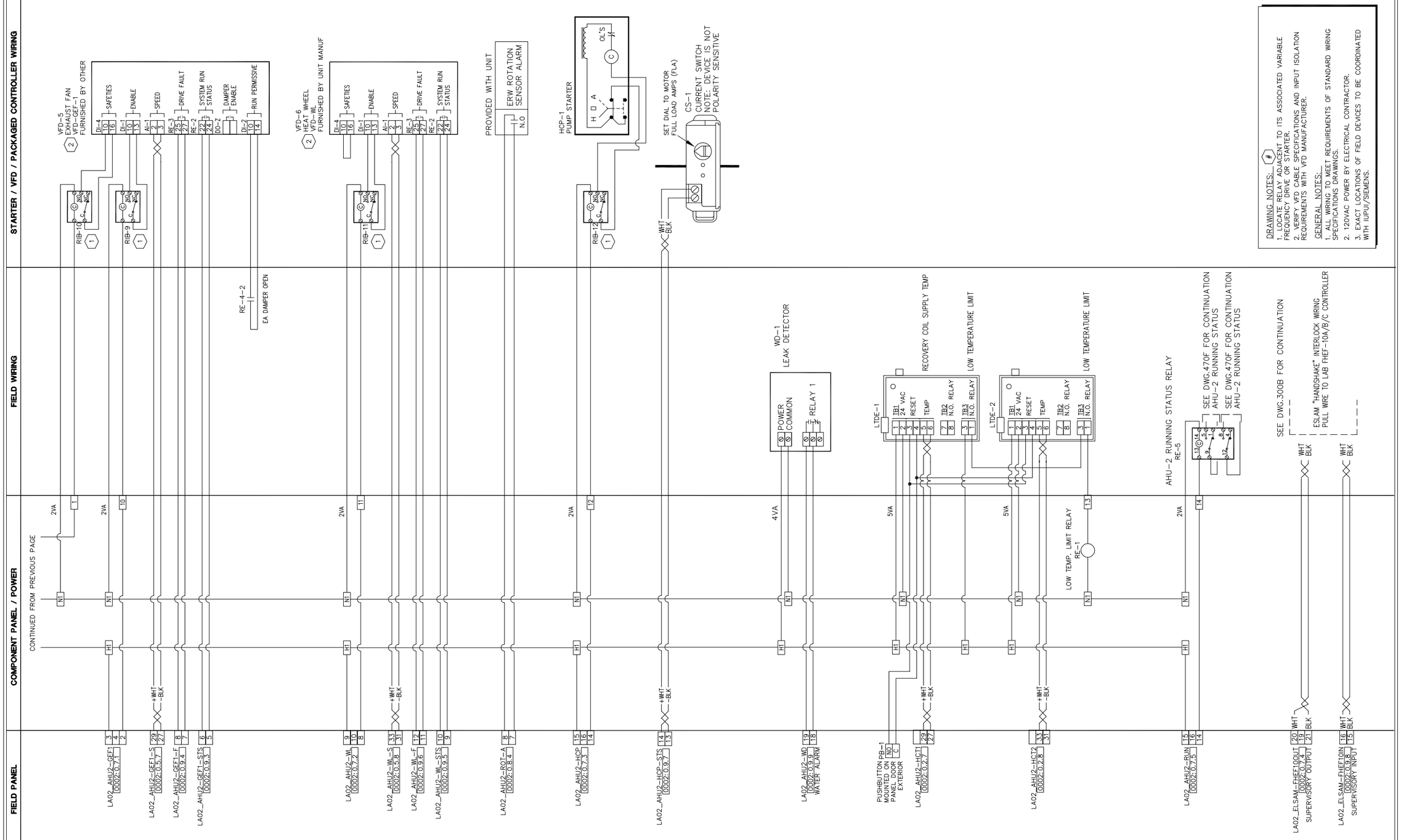

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AHU-2 ELEC WIRING 2

440P412785
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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

AE – 1 (4)
24Vac 2 Pos
DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA126.1U/P = 9VA

EXHAUST AIR DAMPER

PROVIDED BY GEF
MANUFACTURER
AE – 2
24Vac 2 Pos
DAMPER ACTUATOR
SPRING RETURN

COOLING COIL VAVLE

V – 1
SIEMENS FLOWRITE SKC
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKC:
120 sec RUN TIME

ON = 4–20mA
OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKC62U = 28VA

HEATING COIL VAVLE

V – 2
HEATING COIL VALVE
SIEMENS FLOWRITE SKB,
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKB:
120 sec RUN TIME

OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKB62U = 18VA

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.

COMPONENT PANEL / POWER

24V POWER FROM PWR–1 CIRCUIT 2 100VA
24V POWER FROM PWR–1 CIRCUIT 3 100VA
36VA
28VA MAX
18VA MAX
DAMPER OPEN STATUS RE–2
DAMPER OPEN STATUS RE–3
DAMPER OPEN STATUS RE–4
RE–1–2
RE–1–3
RE–3–1
RE–4–1
0–10 VDC
WHT
BLK

FIELD PANEL

LA02_AHU2–OAD 0002:0.6.1
LA02_AHU2–OAD–0 0002:0.8.8 DAMPER OPEN STATUS
LA02_AHU2–EAD 0002:0.6.2
LA02_AHU2–EAD–0 0002:0.8.9 DAMPER OPEN STATUS
LA02_AHU2–CCV 0002:0.5.1
LA02_AHU2–HCV 0002:0.5.2

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-2 ELEC WIRING 3

440P412785
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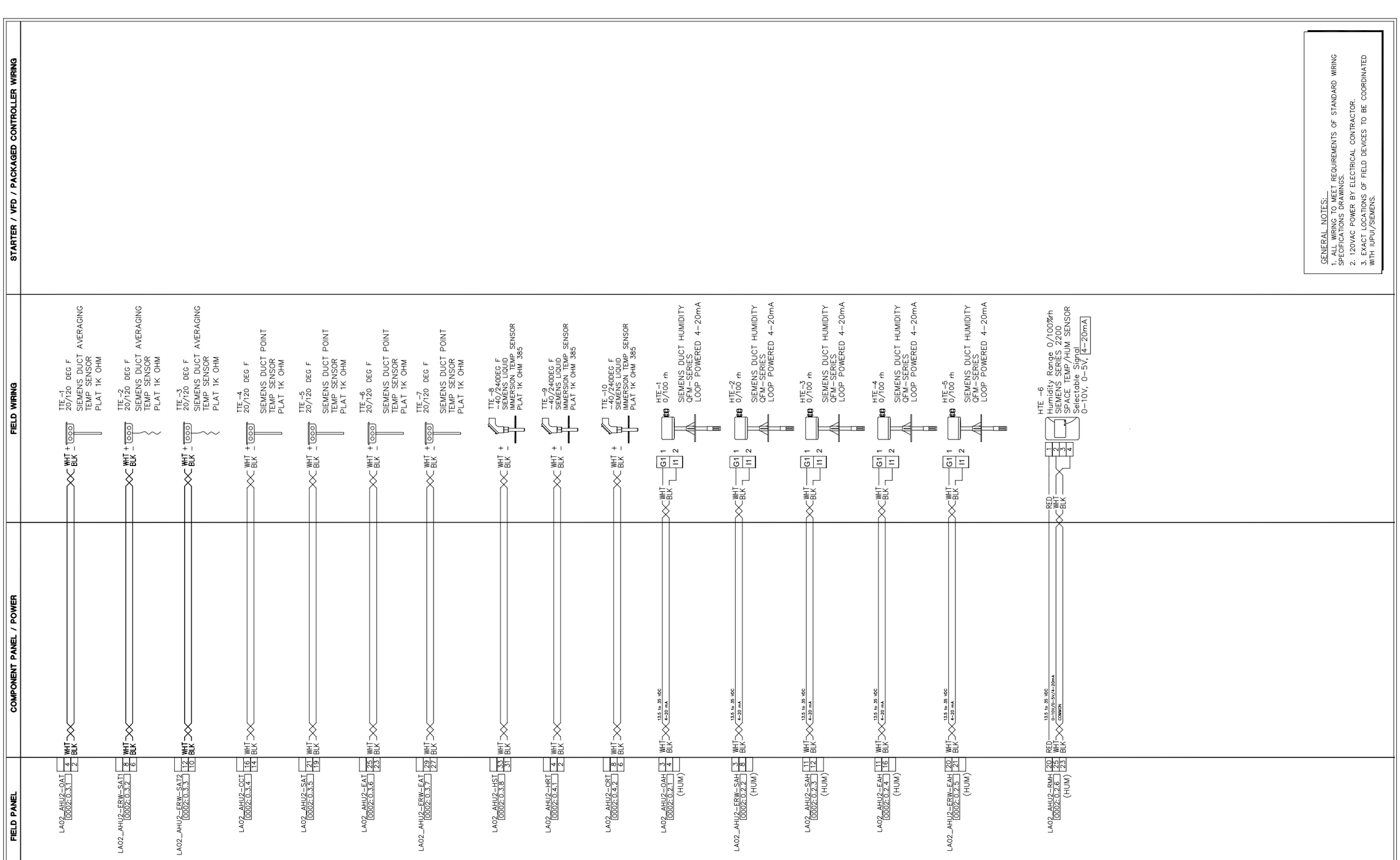

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2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

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HB	HB	KR	04/02/26	04/02/26

AHU-2 ELEC WIRING 4

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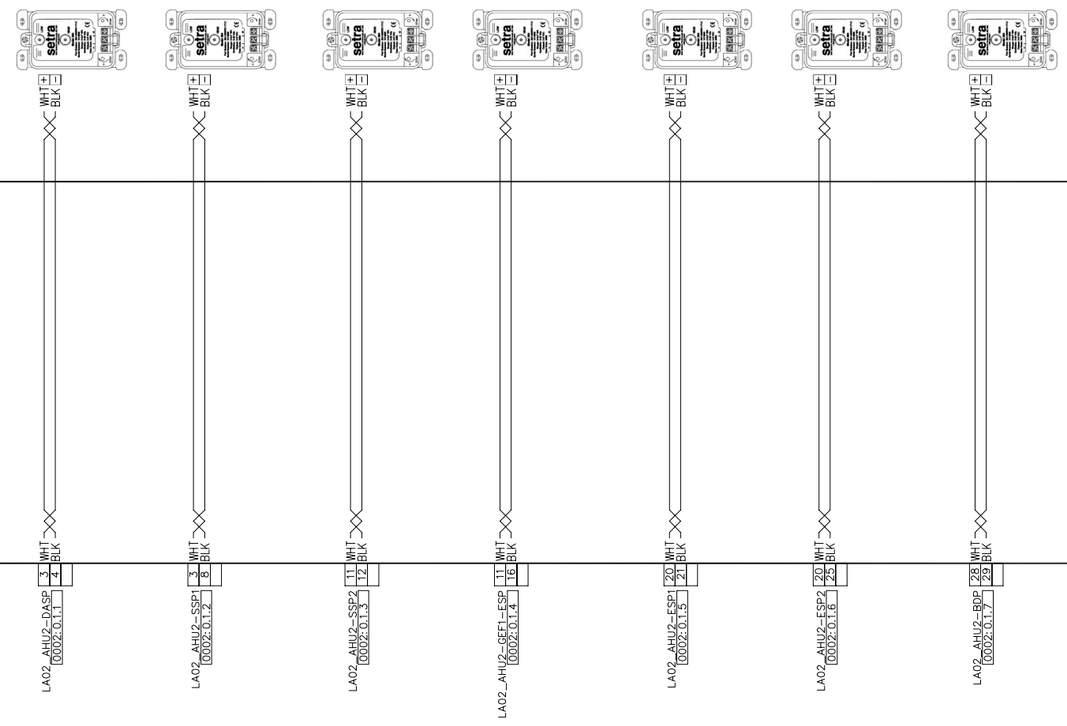
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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AHU-2 ELEC WIRING 5

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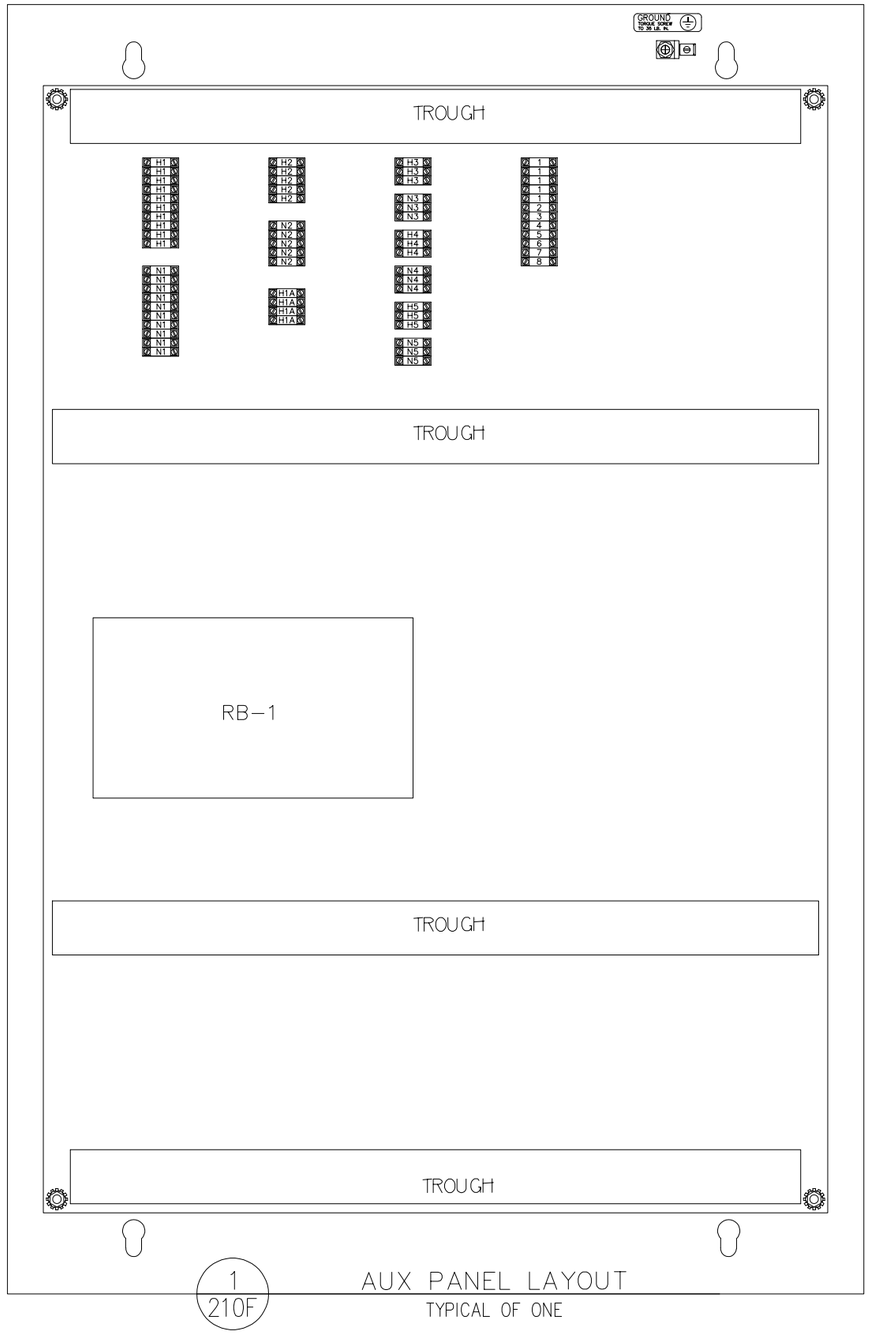

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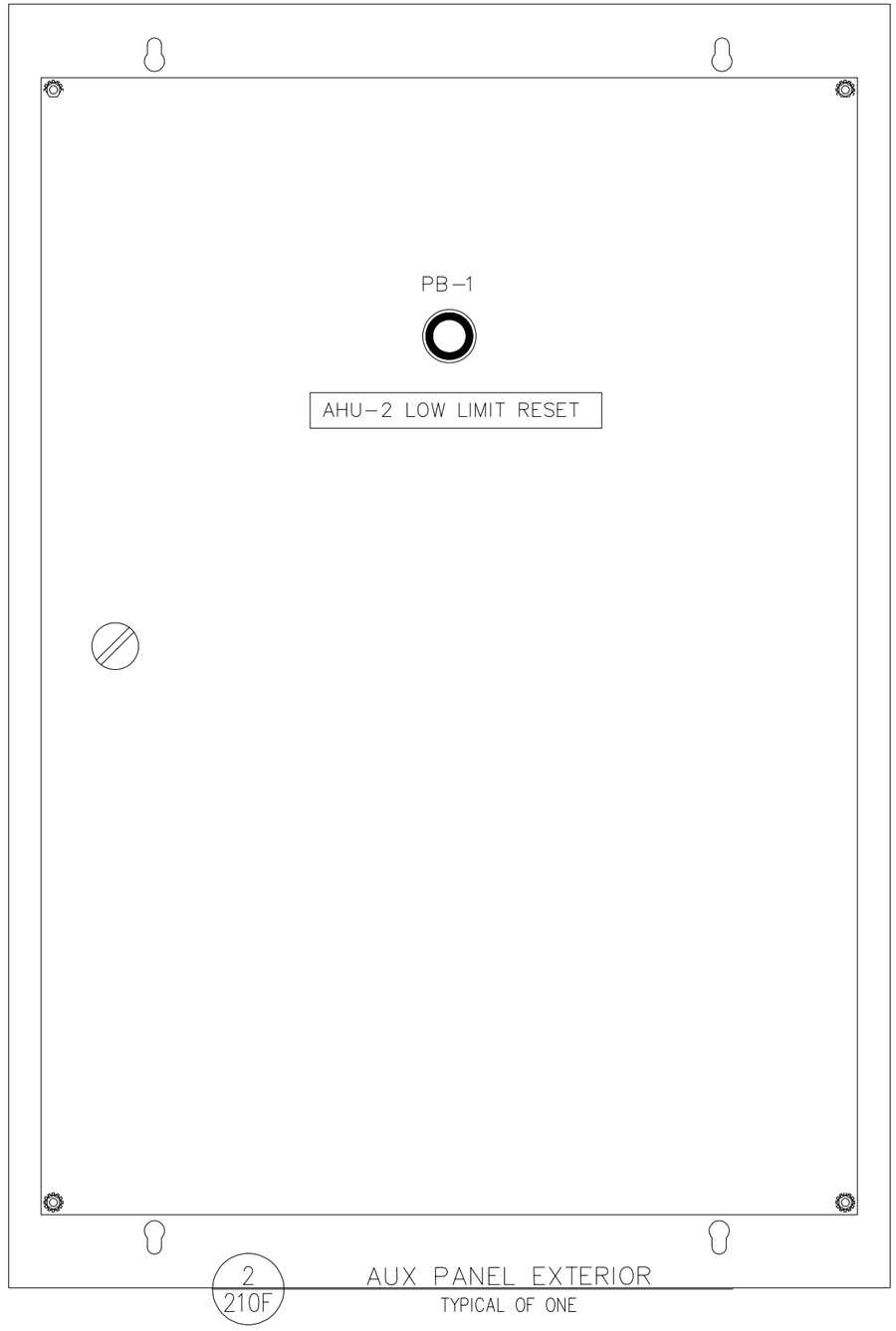
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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IU# 20250072, IN

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AHU-2 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	4	GCA126.1P	SIEMENS	154001	2 PT SR,24V,MED/S/PLNM.
	2	ASK73.1	SIEMENS		TANDEM MOUNT KIT
AE 2	1	FBO			FURNISHED BY OTHERS
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2-3	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5-6	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 7	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTE 1-5	5	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 6	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-2	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 2	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-12	12	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 9	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 2-4	3	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 5-7	3	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8-10	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-6	6	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 5	1	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED

REFER TO PAGE 241 FOR AHU SEQUENCE OF OPERATION.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-2 CONTROL BOM

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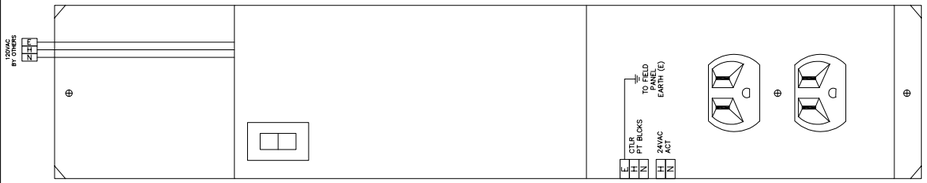
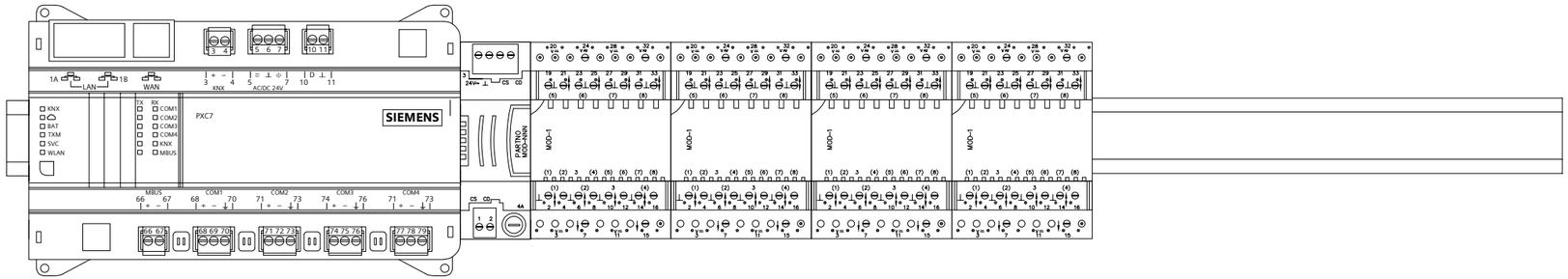
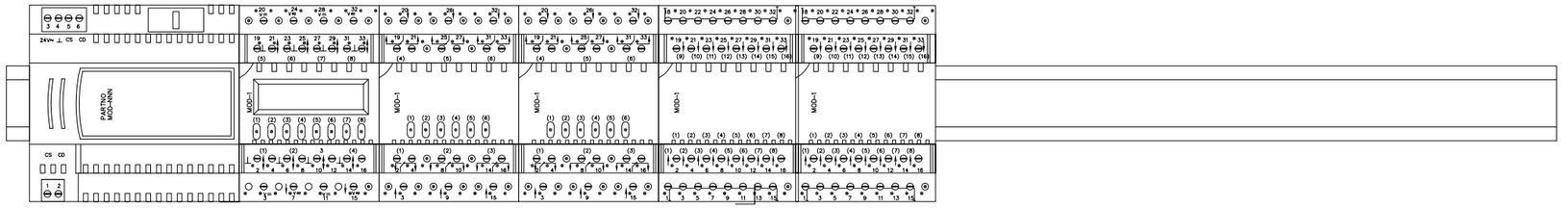
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.







REVISION HISTORY			
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LA02.PXCA INSTALLATION

440P412785
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PXC7.A-00000 PXC7.E400.A

PXC7.A

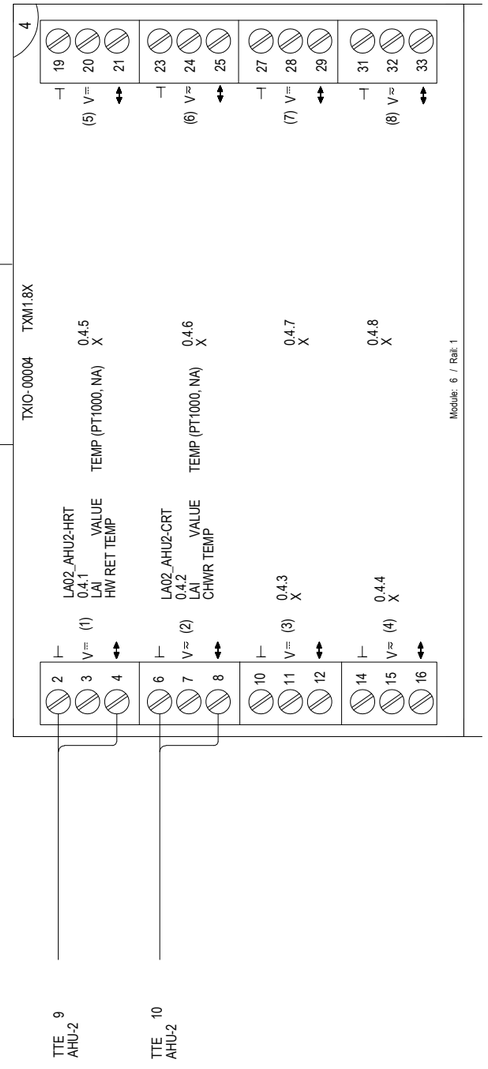
Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

Module: 2 / Rail: 1

TXIO- 00001 TXM1.8X



REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA02.PXCAp002

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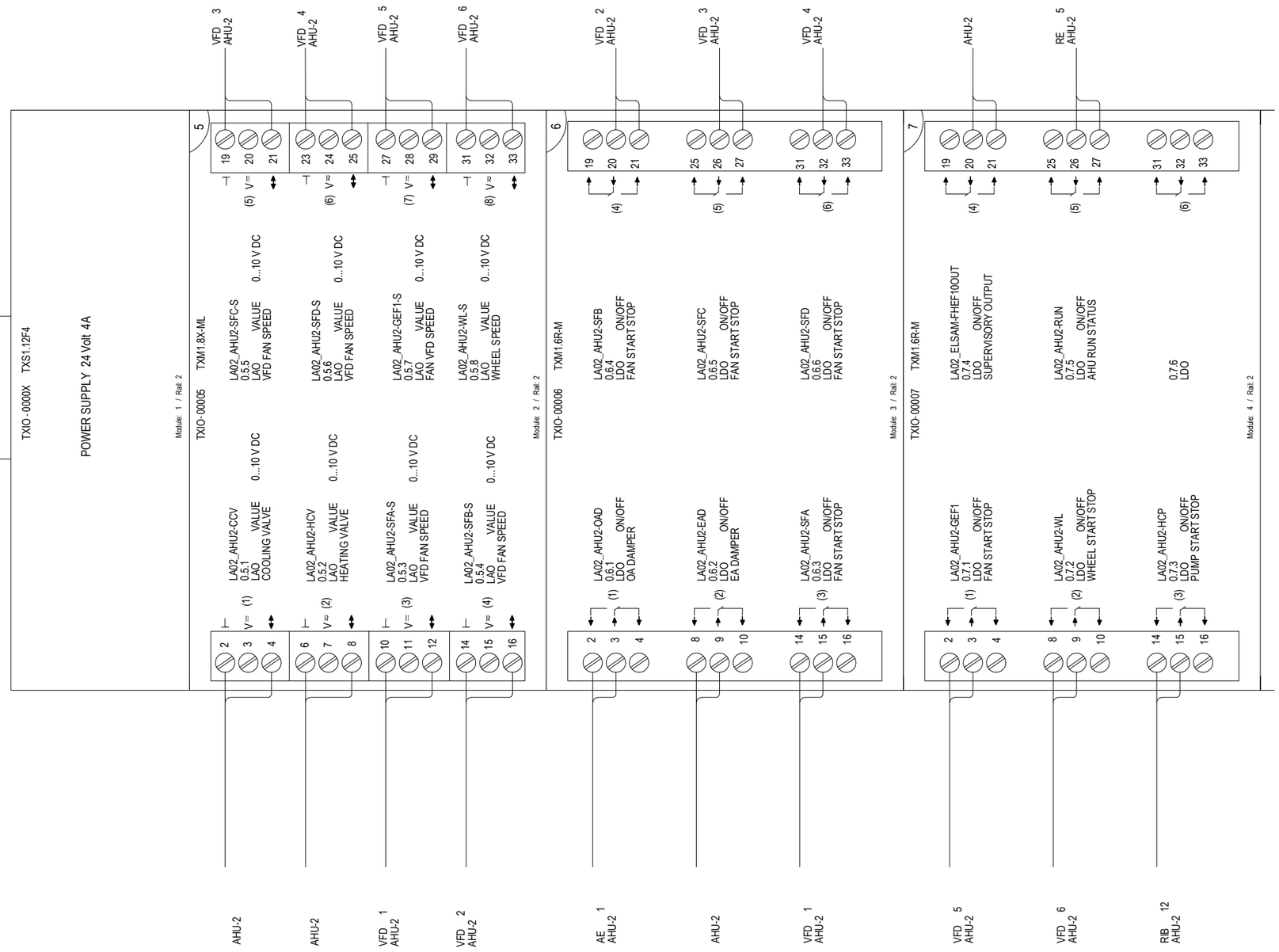
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



REVISION HISTORY

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LA02.PXCAp003

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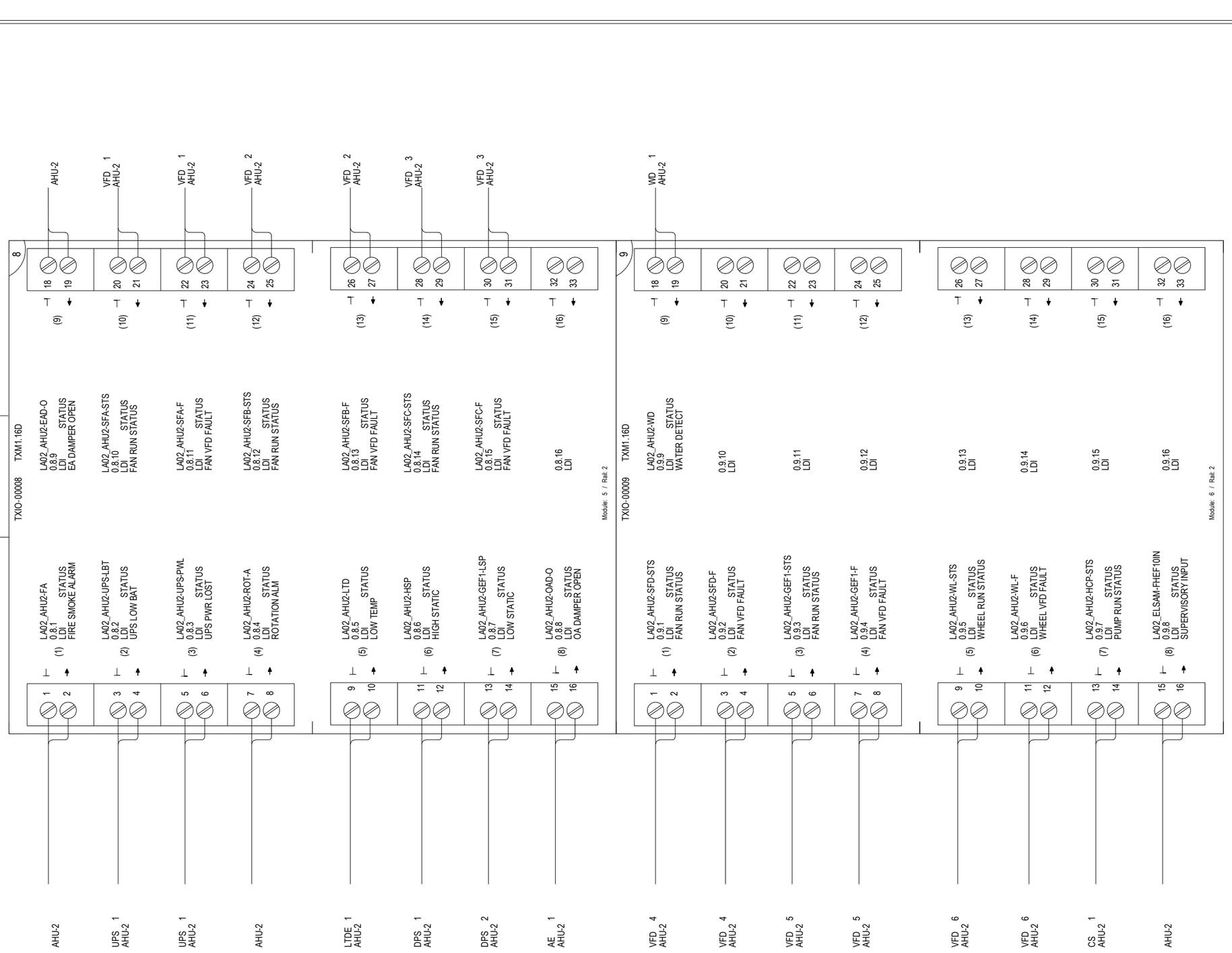

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LA02.PXCAp004

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	2	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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LA02.PXCA BOM

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GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

ESLAM "HANDSHAKE" INTERLOCK WIRING
PULL WIRE TO LAB FHEF-10A/B/C CONTROLLER

LA03_ELSAM-FHEF10OUT
0003:0.7.4
SUPERVISORY OUTPUT

LA03_ELSAM-FHEF10IN
0003:0.9.8
SUPERVISORY INPUT

PNL-3 / AUX-3

RB-1
LA03_AHU3-FA
0003:0.8.1
FIRE ALARM
(4)

UPS-1
UPS LO BATT
LA03_AHU3-UPS-LBT
0003:0.8.2

POWER LOSS
LA03_AHU3-UPS-PWL
0003:0.8.3

PB -1
RE -1 RE -2 RE -3
RE -4 RE -5
LA03_AHU3-RUN
0003:0.7.5
AHU RUN STATUS

120 VAC
ELECTRICAL TROUGH
PNL-3 — PXCA-3 AHU-3 & GEF-3 CONTROL PANEL
AUX-3 — AHU-3 & EF-3
PWR-3
UPS

INSTALLATION NOTES:

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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. DAMPER PROVIDED AND PRE-INSTALLED BY AHU MANUFACTURER.
6. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
7. VFD PROVIDED BY OTHERS.
8. REFER TO PLANS FOR LOCATIONS.
9. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
10. LOCATE WITHIN 12" FROM COOLING COIL DISCHARGE.
11. LOCATE WITHIN 12" FROM HEATING COIL INLET. DEW POINT SENSOR (MEASURING A SINGLE POINT) IS MOUNTED AS FAR AWAY FROM THE WHEEL AS POSSIBLE AT AT THE POINT BETWEEN THE TWO HALVES. IT IS LOCATED IN THE CENTER OF THE UNIT TO READ A WELL MIXED AIRSTREAM.
12. LOCATE AVERAGING SENSOR WITHIN 12" FROM THE HEATING COIL INLET ACROSS THE "COLD HALF" ("COLD HALF" SENSOR LOCATION IS DETERMINED FROM WHEEL ROTATION WHERE THE COLD WHEEL FIRST ROTATES OUT OF THE COLD OUTDOOR AIRSTREAM DURING THE WINTER AND INTO THE WARMER EXHAUST PORTION OF THE UNIT). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
13. LOCATE AVERAGING SENSOR WITHIN 12" FROM HEATING COIL INLET ACROSS THE "WARM HALF" (WARM IN THE WINTER WHERE THE WARM WHEEL FIRST ROTATES INTO THE COLD OUTDOOR AIRSTREAM). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
14. DAMPER AND ACTUATOR (WITH INTEGRAL ENDSWITCH) FURNISHED BY GEF MANUFACTURER.

VFD-GEF-3
RIB-10
SAFETY RELAY
RIB-9
LA03_AHU3-GEF1
0003:0.7.1
START/STOP
LA03_AHU3-GEF1-S
0003:0.5.7
SPEED
LA03_AHU3-GEF1-STS
0003:0.9.3
STATUS
LA03_AHU3-GEF1-F
0003:0.9.4
FAULT
VFD-5

AE -2
2POS 2 Pos
LA03_AHU3-EAD
0003:0.6.2
(2) DPS-2
-.35 IN WG
LA03_AHU3-GEF1-LSP
0003:0.8.7
HI LO
SPP-6
LA03_AHU3-EAD-O
0003:0.8.9
OPEN STATUS
(14) INTERLOCK TO GEF VFD'S
D-5
NC
TTE-7
20/120 DEG F
LA03_AHU3-ERW-EAT
0003:0.3.7
HTE-5
0/100 rh
LA03_AHU3-ERW-EAH
0003:0.2.5
AHU
SPP-5
GEF-3
25000 CFM
40 HP
FIELD DUCTWORK
DPTE-4
+/-10IN WG
LA03_AHU3-GEF1-ESP
0003:0.1.4
TTE-6
20/120 DEG F
LA03_AHU3-EAT
0003:0.3.6
HTE-4
0/100 rh
LA03_AHU3-EAH
0003:0.2.4
SD-1 (3) (4)
EA
DPTE-6
+/-5 IN WG
LA03_AHU3-ESP2
0003:0.1.6
SPP-8
DPTE-5
+/-5 IN WG
LA03_AHU3-ESP1
0003:0.1.5
SPP-7
AHU FIELD DUCT WORK

VFD-HEAT WHEEL
RIB-11
LA03_AHU3-WL
0003:0.7.2
START/STOP
LA03_AHU3-WL-STS
0003:0.9.5
VFD STATUS
LA03_AHU3-WL-S
0003:0.5.8
VFD SPEED
LA03_AHU3-WL-F
0003:0.9.6
FAULT
VFD-6
(5) VFD-WL
ENTHALPY WHEEL
LA03_AHU3-ROT-A
0003:0.8.4
ROTATION ALARM

VFD-SF-3A
RIB-2
SAFETY RELAY
RIB-1
LA03_AHU3-SFA
0003:0.6.3
START/STOP
LA03_AHU3-SFA-S
0003:0.5.3
SPEED
LA03_AHU3-SFA-STS
0003:0.8.10
STATUS
LA03_AHU3-SFA-F
0003:0.8.11
FAULT
(7) VFD-1

VFD-SF-3B
RIB-4
SAFETY RELAY
RIB-3
LA03_AHU3-SFB
0003:0.6.4
START/STOP
LA03_AHU3-SFB-S
0003:0.5.4
SPEED
LA03_AHU3-SFB-STS
0003:0.8.12
STATUS
LA03_AHU3-SFB-F
0003:0.8.13
FAULT
(7) VFD-2

VFD-SF-3C
RIB-6
SAFETY RELAY
RIB-5
LA03_AHU3-SFC
0003:0.6.5
START/STOP
LA03_AHU3-SFC-S
0003:0.5.5
SPEED
LA03_AHU3-SFC-STS
0003:0.8.14
STATUS
LA03_AHU3-SFC-F
0003:0.8.15
FAULT
(7) VFD-3

VFD-SF-3D
RIB-8
SAFETY RELAY
RIB-7
LA03_AHU3-SFD
0003:0.6.6
START/STOP
LA03_AHU3-SFD-S
0003:0.5.6
SPEED
LA03_AHU3-SFD-STS
0003:0.9.1
STATUS
LA03_AHU3-SFD-F
0003:0.9.2
FAULT
(7) VFD-4

AE -1 (4)
2POS 2 Pos
LA03_AHU3-OAD
0003:0.6.1
LA03_AHU3-OAD-O
0003:0.8.8
OPEN STATUS
(5) D-1
NO
138"x68"
INTERLOCK TO SF VFD'S
TTE-1
20/120 DEG F
LA03_AHU3-OAT
0003:0.3.1
HTE-1
0/100 rh
LA03_AHU3-OAH
0003:0.2.1
OA
FIELD DUCTWORK
AHU
(12) TTE-3
20/120 DEG F
LA03_AHU3-ERW-SAT2
0003:0.3.3
(11) HTE-2
0/100 rh
LA03_AHU3-ERW-SAH
0003:0.2.2
(13) TTE-2
20/120 DEG F
LA03_AHU3-ERW-SAT1
0003:0.3.2
(2) LTDE-1
38 DEG F
LA03_AHU3-LTD
0003:0.8.5
-22/158deg F
LA03_AHU3-HCT1
0003:0.2.7
(2) LTDE-2
38 DEG F
-22/158deg F
LA03_AHU3-HCT2
0003:0.2.8
(10) TTE-4
20/120 DEG F
LA03_AHU3-CCT
0003:0.3.4
xx SQFT
H
C
TTE-9
-40/240DEG F
LA03_AHU3-HRT
0003:0.4.1
TTE-8
-40/240DEG F
LA03_AHU3-HST
0003:0.3.8
V-2
0/10 V
LA03_AHU3-HCV
0003:0.8.2
NO-SR
HWR
HWS
HCP-3
CS-1
LA03_AHU3-HCP-STS
0003:0.9.7
RIB-12
LA03_AHU3-HCP
0003:0.7.3
TTE-10
-40/240DEG F
LA03_AHU3-CRT
0003:0.4.2
V-1
0/10 VOLTS
LA03_AHU3-CCV
0003:0.5.1
NO-SR
CHWR
CHWS
WD -1
WATER DET
LA03_AHU3-WD
0003:0.9.9
(6)
SF-3A 7500 CFM 15.0HP
SF-3B 7500 CFM 15.0HP
SF-3C 7500 CFM 15.0HP
SF-3D 7500 CFM 15.0HP
DPS-1 (2)
4 IN WG
LA03_AHU3-HSP
0003:0.8.6
SPP-1
SPP-2
TTE-5
20/120 DEG F
LA03_AHU3-SAT
0003:0.3.5
HTE-3
0/100 rh
LA03_AHU3-SAH
0003:0.2.3
DPTE-1
+/-10IN WG
LA03_AHU3-DASP
0003:0.1.1
DPTE-3
+/-5 IN WG
LA03_AHU3-SSP2
0003:0.1.3
SPP-4
DPTE-2
+/-5 IN WG
LA03_AHU3-SSP1
0003:0.1.2
SPP-3
SA
AHU FIELD DUCT WORK

DPTE-7
+/-0.25 IN H2O
LA03_AHU3-BDP
0003:0.1.7
SSP-9
SSP-8 (9)
BUILDING DIFFERENTIAL PRESSURE SENSOR

(8) HTE-6
10/90 %RH
LA03_AHU3-RMH
0003:0.2.6
HUMIDITY

1/220 AHU-3 CONTROL DIAGRAM
LOCATION: MECHNICAL ROOM - WEST PENTHOUSE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
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FAX: 317-240-8374

BGU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

DRAWN BY	CHECKED BY	APPROVED BY	DATE OF ISSUE
HB	KR	HB	04/02/26

AHU-3 CONTROL

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FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

120VAC EMERGENCY POWER BY EC

UPS

BATTERY-BACKED OUTLET

PIN 5= COMMON
PIN 7= LOW BATTERY
PIN 9= LOAD ON BATTERY

18 AWG TP

18 AWG TP

120VAC

HANDI-BOX
METAL COVER
NO FUSE

RB-1

INPUT / OUTPUT

SD-1

DPS-1

DPS-2

POWER

RE-1-1

VFD-1 SUPPLY FAN VFD-SF-3A FURNISHED BY OTHER

VFD-2 SUPPLY FAN VFD-SF-3B FURNISHED BY OTHER

VFD-3 SUPPLY FAN VFD-SF-3C FURNISHED BY OTHER

VFD-4 SUPPLY FAN VFD-SF-3D FURNISHED BY OTHER

SAFETIES
ENABLE
SPEED
DRIVE FAULT
SYSTEM RUN STATUS
DAMPER ENABLE
RUN PERMISSIVE

RIB-1
RIB-2
RIB-3
RIB-4
RIB-5
RIB-6
RIB-7
RIB-8

RE-2-1 0A DAMPER OPEN

RE-2-2 0A DAMPER OPEN

RE-2-3 0A DAMPER OPEN

RE-2-4 0A DAMPER OPEN

10VA

2VA

SERVICE BOX

192VA

500VA

500 VA 24 VAC POWER SUPPLY 24V POWER FROM PWR-3 CIRCUIT 1

+WHT
-BLK

LA03_AHU3-UPS-LBT 0003.0.8.2 LOW BATTERY

LA03_AHU3-UPS-PWL 0003.0.8.1 LOSS OF POWER

LA03_AHU3-GEFI-LSP 0003.0.8.7

LA03_AHU3-HSP 0003.0.8.6

LA03_AHU3-LTD 0003.0.8.5

LA03_AHU3-FA 0003.0.8.1

LA03_AHU3-SFA 0003.0.6.3

LA03_AHU3-SFA-S 0003.0.5.3

LA03_AHU3-SFA-F 0003.0.8.11

LA03_AHU3-SFA-STS 0003.0.8.10

LA03_AHU3-SFB 0003.0.6.4

LA03_AHU3-SFB-S 0003.0.5.4

LA03_AHU3-SFB-F 0003.0.8.13

LA03_AHU3-SFB-STS 0003.0.8.12

LA03_AHU3-SFC 0003.0.6.5

LA03_AHU3-SFC-S 0003.0.5.5

LA03_AHU3-SFC-F 0003.0.8.15

LA03_AHU3-SFC-STS 0003.0.8.14

LA03_AHU3-SFD 0003.0.6.6

LA03_AHU3-SFD-S 0003.0.5.6

LA03_AHU3-SFD-F 0003.0.9.2

LA03_AHU3-SFD-STS 0003.0.9.1

CONTINUE TO NEXT PAGE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-3 ELEC WIRING 1

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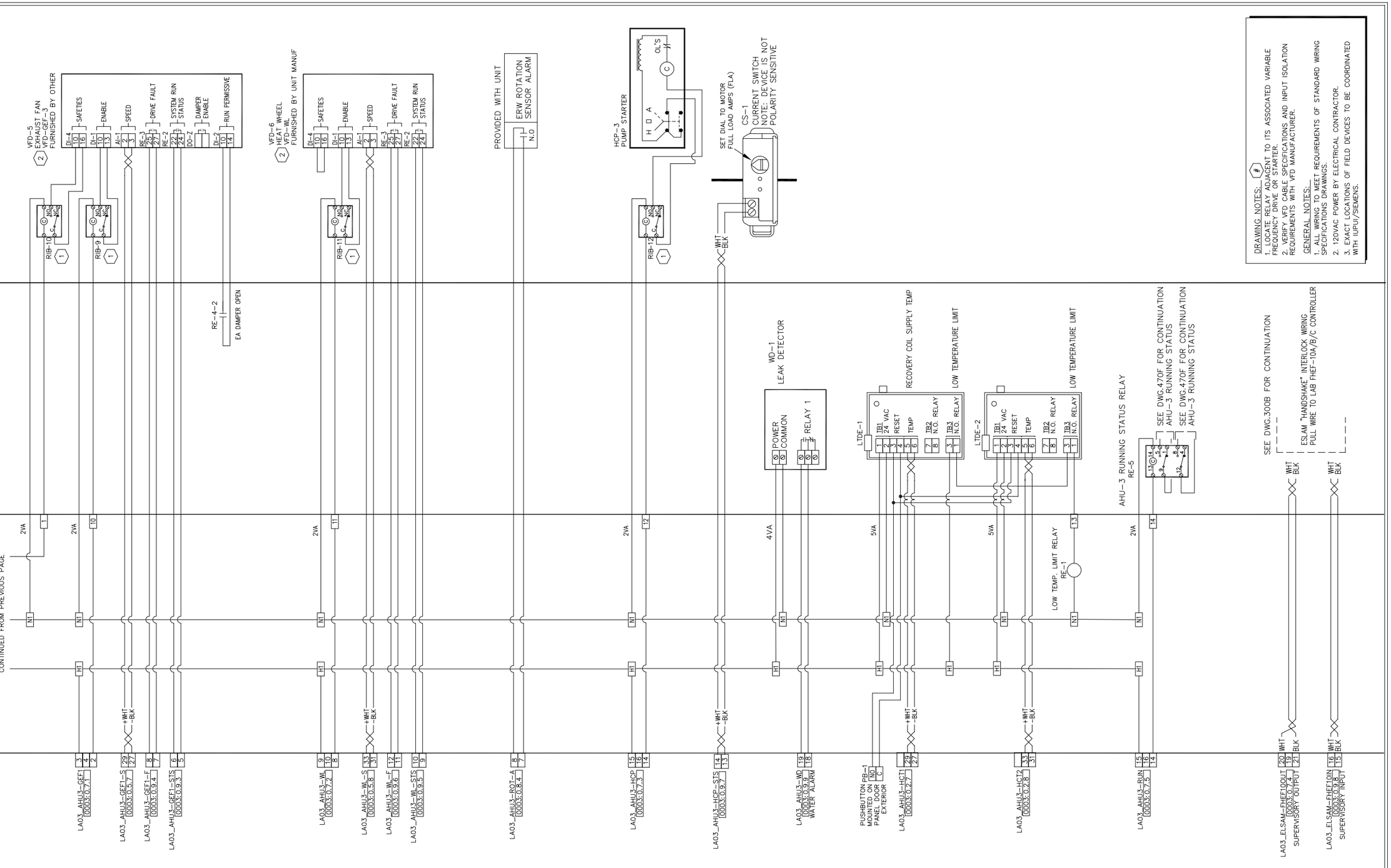
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

AHU-3 ELEC WIRING 2

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

AE – 1 (4)
24Vac, 2 Pos
DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA126.1U/P = 9VA

EXHAUST AIR DAMPER

PROVIDED BY GEF
MANUFACTURER
AE – 2
24Vac, 2 Pos
DAMPER ACTUATOR
SPRING RETURN

COOLING COIL VAVLE

V – 1
SIEMENS FLOWRITE SKC
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKC:
120 sec RUN TIME

ON = 4–20mA
OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKC62U = 28VA

HEATING COIL VAVLE

V – 2
HEATING COIL VALVE
SIEMENS FLOWRITE SKB,
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKB:
120 sec RUN TIME

OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKB62U = 18VA

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.

COMPONENT PANEL / POWER

24V POWER FROM PWR–3 CIRCUIT 2 100VA
24V POWER FROM PWR–3 CIRCUIT 3 100VA
36VA
28VA MAX
18VA MAX
RE–1–2
RE–1–3
DAMPER OPEN STATUS RE–2
DAMPER OPEN STATUS RE–3
DAMPER OPEN STATUS RE–4
RE–3–1
RE–4–1
0–10 VDC
WHT
BLK

FIELD PANEL

LA03_AHU3–OAD 0003:0.6.1
LA03_AHU3–OAD–O 0003:0.8.8 DAMPER OPEN STATUS
LA03_AHU3–EAD 0003:0.6.2
LA03_AHU3–EAD–O 0003:0.8.9 DAMPER OPEN STATUS
LA03_AHU3–CCV 0003:0.5.1
LA03_AHU3–HCV 0003:0.5.2

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-3 ELEC WIRING 3

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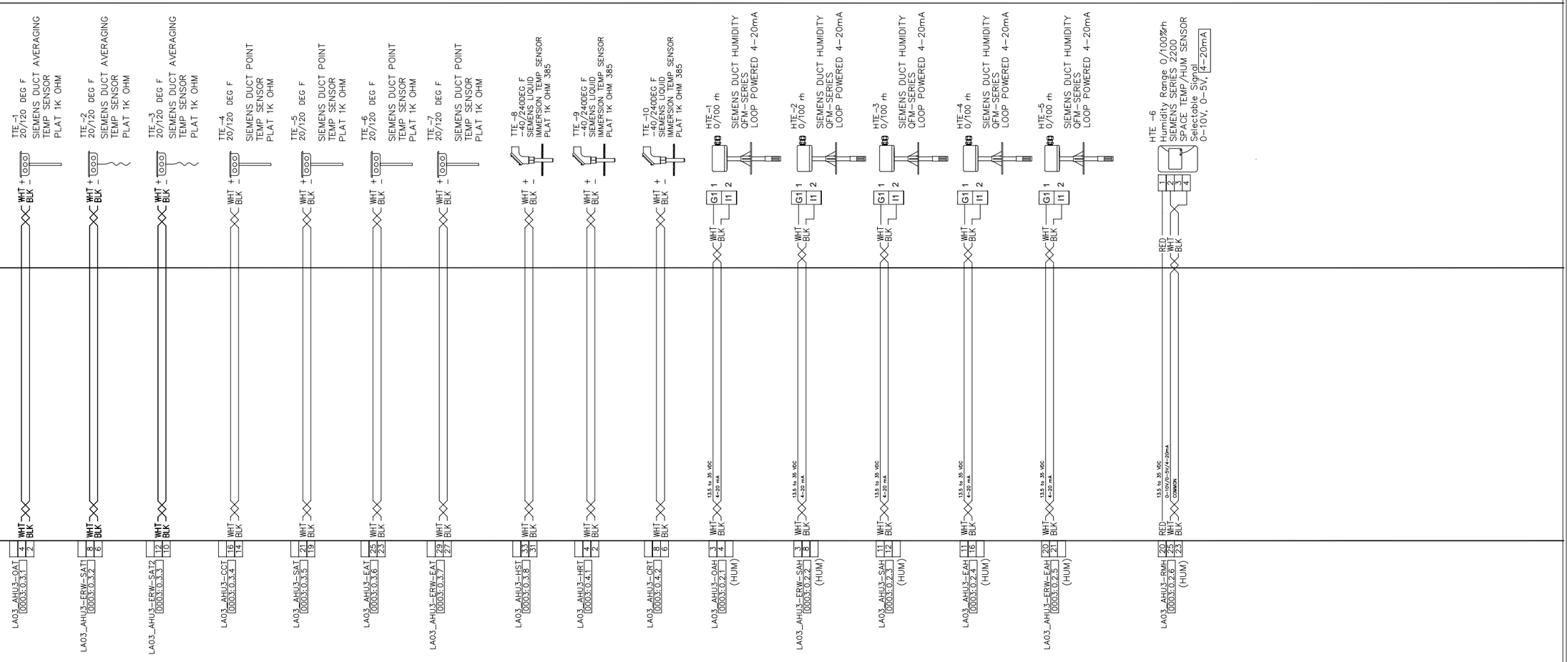
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-3 ELEC WIRING 4

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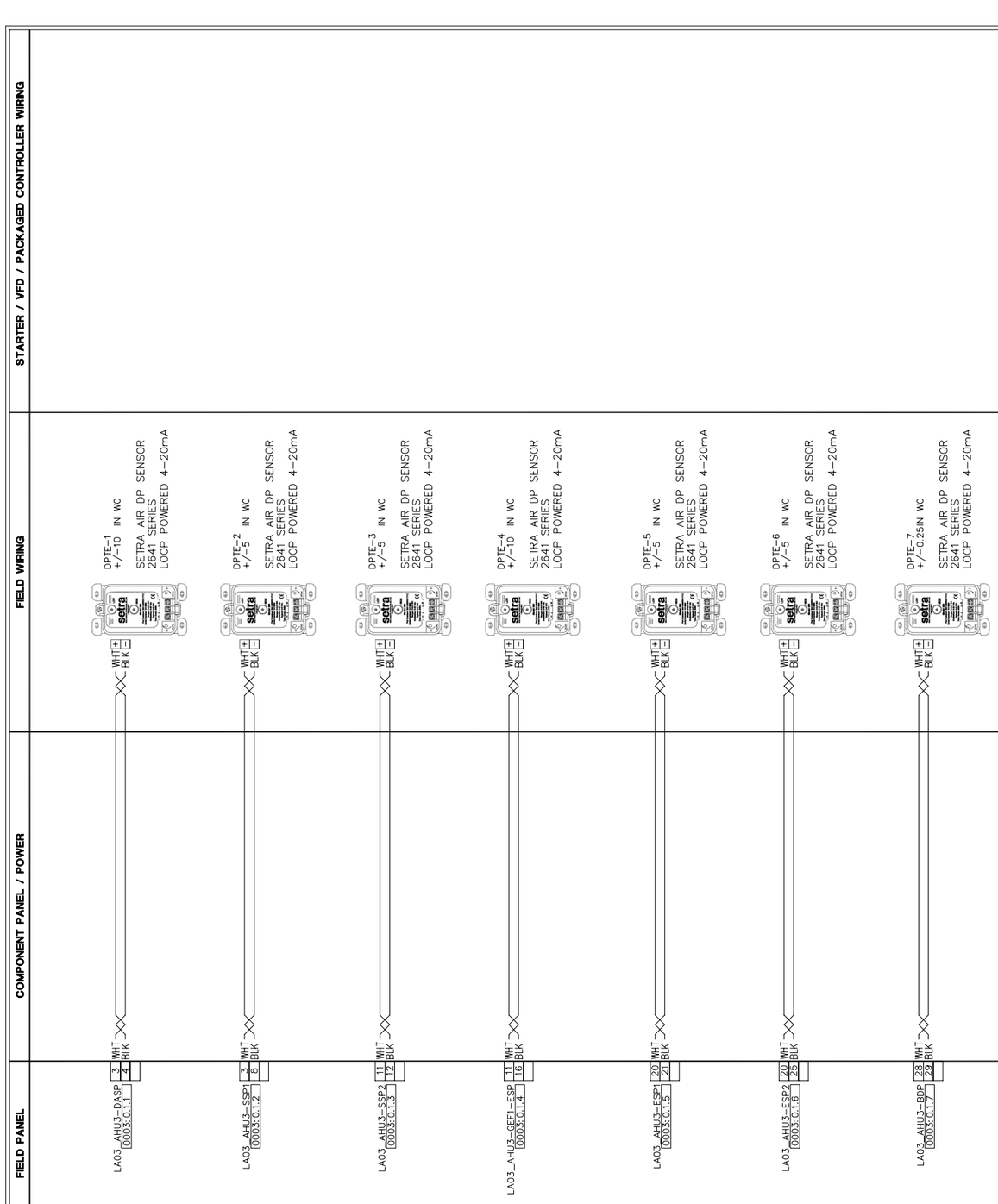

GENERAL NOTES:
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0003	LA03.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-3 ELEC WIRING 5

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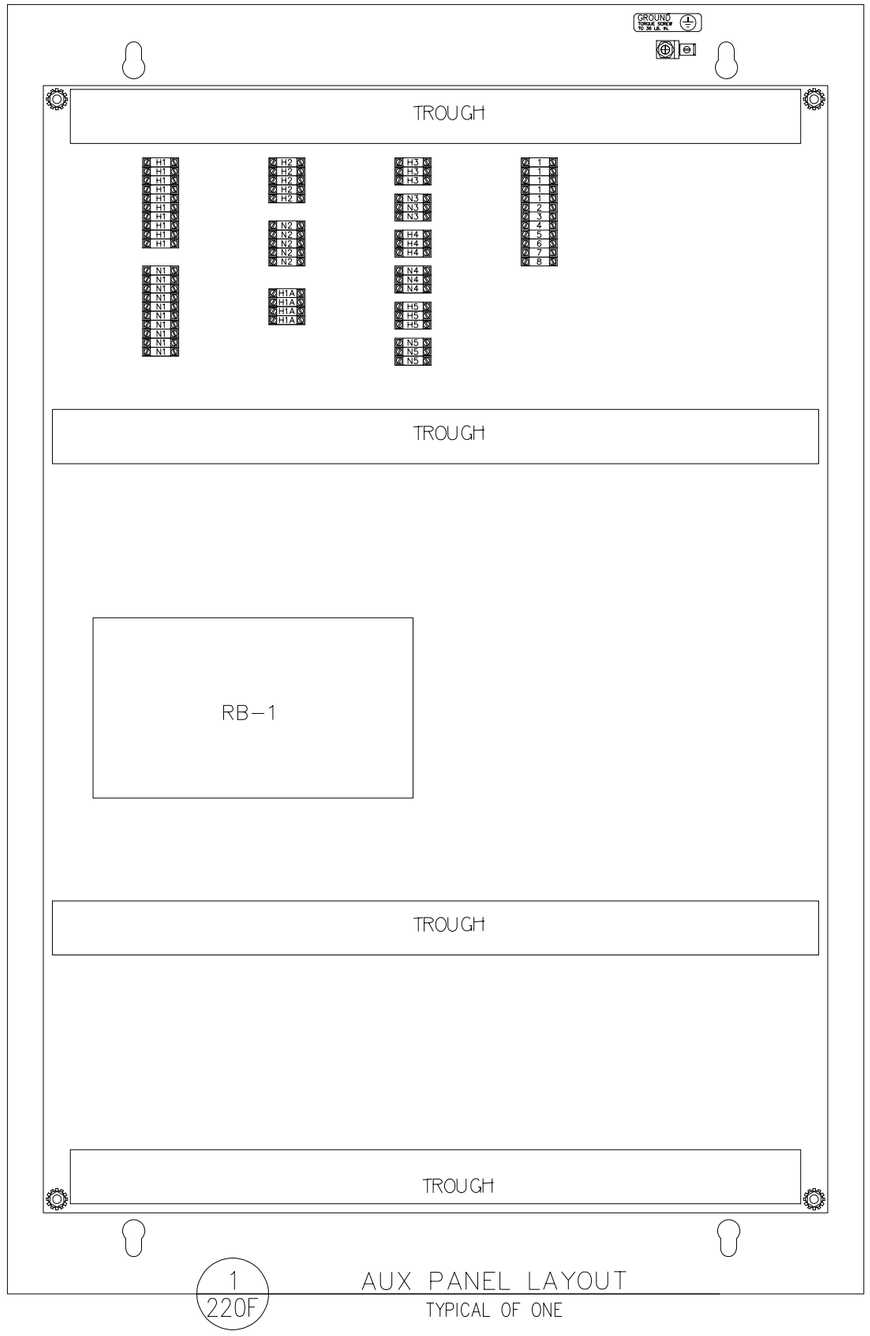

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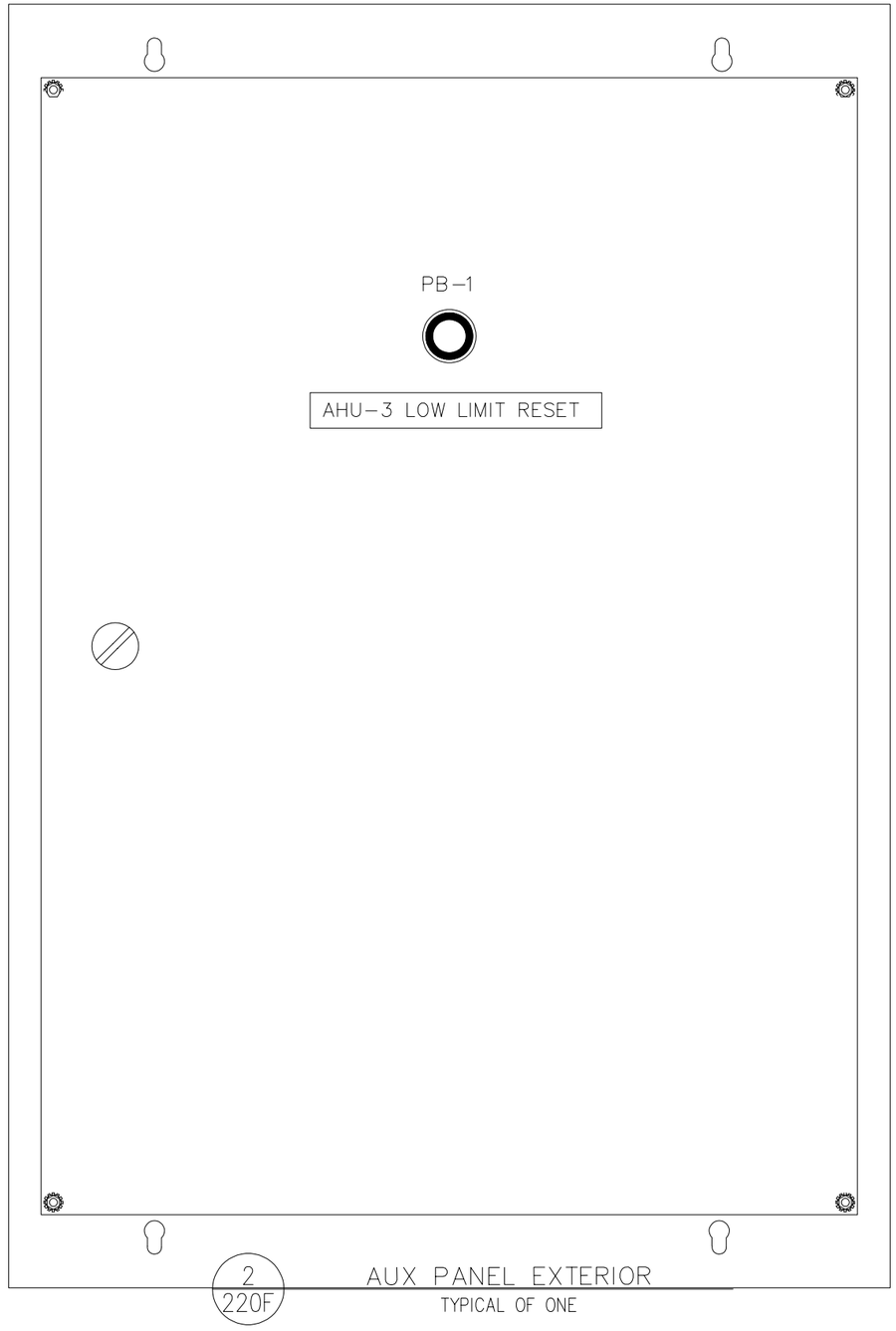
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-3 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	4	GCA126.1P	SIEMENS	154001	2 PT SR,24V,MED/S/PLNM.
	2	ASK73.1	SIEMENS		TANDEM MOUNT KIT
AE 2	1	FBO			FURNISHED BY OTHERS
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2-3	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5-6	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 7	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTE 1-5	5	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 6	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-3	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 3	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-12	12	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 9	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 2-4	3	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 5-7	3	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8-10	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-6	6	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 5	1	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED

REFER TO PAGE 241 FOR AHU SEQUENCE OF OPERATION.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-3 CONTROL BOM

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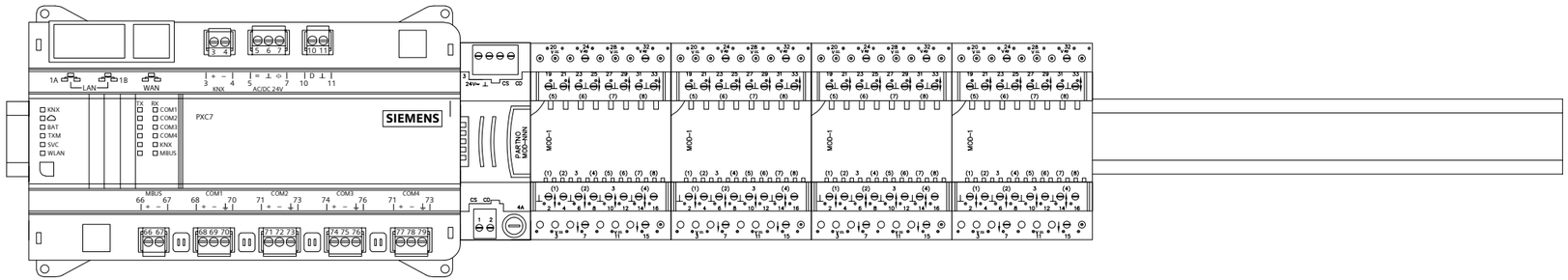
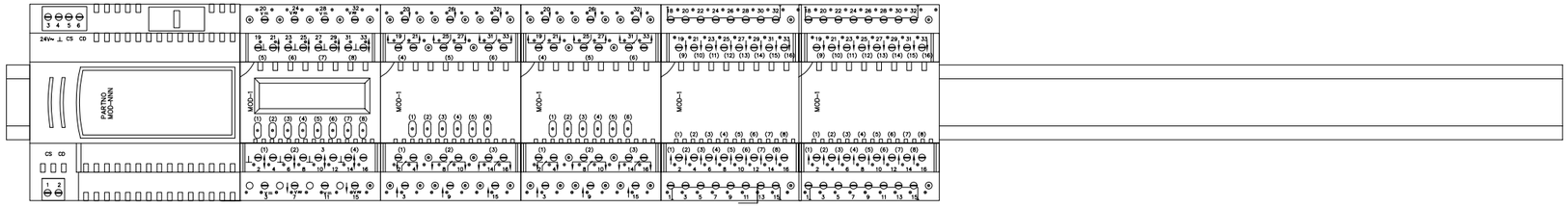
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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UNITED STATES
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FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LA03.PXCA INSTALLATION

440P412785
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E220

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LA03.PXCA BOM

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E220A

PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO-0000X TXS1.EF4

BUS EXTENDER

Module: 2 / Rail: 1

TXIO-00001 TXM1.8X

1

DPTE 1 AHU-3
DPTE 2 AHU-3
DPTE 3 AHU-3
DPTE 4 AHU-3

2 V⎓ (1) LA03_AHU3-DASP 0.1.1 LAI VALUE 4...20 MA DISCH AIR STATIC PRESS
6 V≈ (2) LA03_AHU3-SSP1 0.1.2 LAI VALUE 4...20 MA SA STATIC PRESS
10 V⎓ (3) LA03_AHU3-SSP2 0.1.3 LAI VALUE 4...20 MA SA STATIC PRESS
14 V≈ (4) LA03_AHU3-GEF1-ESP 0.1.4 LAI VALUE 4...20 MA EA FAN INLET STATIC

LA03_AHU3-ESP1 0.1.5 LAI VALUE 4...20 MA EA STATIC PRESSURE (5) V⎓ 19 20 21
LA03_AHU3-ESP2 0.1.6 LAI VALUE 4...20 MA EA STATIC PRESSURE (6) V≈ 23 24 25
LA03_AHU3-BDP 0.1.7 LAI VALUE 4...20 MA BLG DIFF PRESSURE (7) V⎓ 27 28 29
0.1.8 X (8) V≈ 31 32 33

DPTE 5 AHU-3
DPTE 6 AHU-3
DPTE 7 AHU-3

Module: 3 / Rail: 1

TXIO-00002 TXM1.8X

2

HTE 1 AHU-3
HTE 2 AHU-3
HTE 3 AHU-3
HTE 4 AHU-3

2 V⎓ (1) LA03_AHU3-OAH 0.2.1 LAI VALUE 4...20 MA AHU OA HUM
6 V≈ (2) LA03_AHU3-ERW-SAH 0.2.2 LAI VALUE 4...20 MA ERW SUP HUM
10 V⎓ (3) LA03_AHU3-SAH 0.2.3 LAI VALUE 4...20 MA SA HUM
14 V≈ (4) LA03_AHU3-EAH 0.2.4 LAI VALUE 4...20 MA EA HUM

LA03_AHU3-ERW-EAH 0.2.5 LAI VALUE 4...20 MA ERW EA HUM (5) V⎓ 19 20 21
LA03_AHU3-RMH 0.2.6 LAI VALUE 4...20 MA RM HUM (6) V≈ 23 24 25
LA03_AHU3-HCT1 0.2.7 LAI VALUE TEMP (PT1000, NA) HTG COIL AIR TEMP (7) V⎓ 27 28 29
LA03_AHU3-HCT2 0.2.8 LAI VALUE TEMP (PT1000, NA) HTG COIL AIR TEMP (8) V≈ 31 32 33

HTE 5 AHU-3
HTE 6 AHU-3
LTDE 1 AHU-3
LTDE 2 AHU-3

Module: 4 / Rail: 1

TXIO-00003 TXM1.8X

3

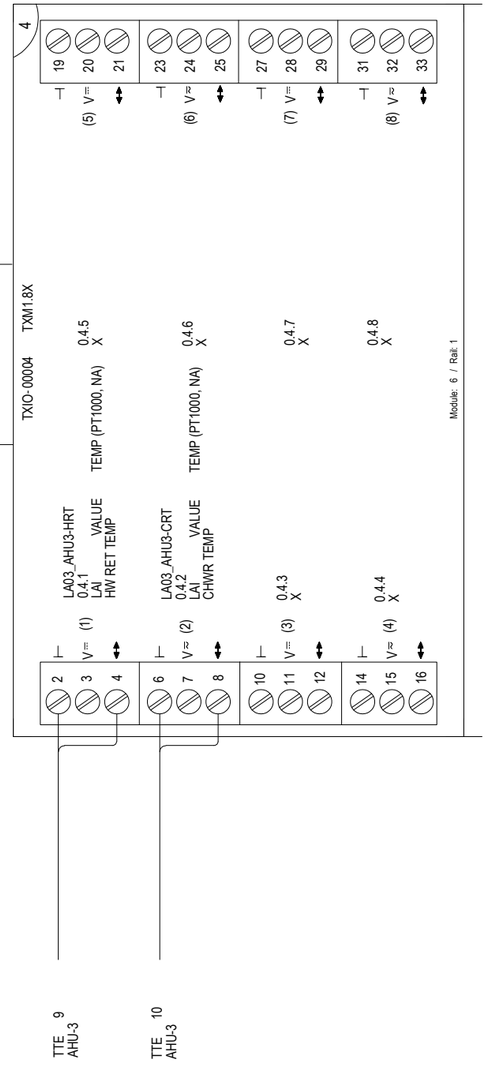
TTE 1 AHU-3
TTE 2 AHU-3
TTE 3 AHU-3
TTE 4 AHU-3

2 V⎓ (1) LA03_AHU3-OAT 0.3.1 LAI VALUE TEMP (PT1000, NA) AHU OA TEMP
6 V≈ (2) LA03_AHU3-ERW-SAT1 0.3.2 LAI VALUE TEMP (PT1000, NA) ERW LEAVING TEMP
10 V⎓ (3) LA03_AHU3-ERW-SAT2 0.3.3 LAI VALUE TEMP (PT1000, NA) ERW LEAVING TEMP
14 V≈ (4) LA03_AHU3-CCT 0.3.4 LAI VALUE TEMP (PT1000, NA) CLG COIL AIR TEMP

LA03_AHU3-SAT 0.3.5 LAI VALUE TEMP (PT1000, NA) SA TEMP (5) V⎓ 19 20 21
LA03_AHU3-EAT 0.3.6 LAI VALUE TEMP (PT1000, NA) EA TEMP (6) V≈ 23 24 25
LA03_AHU3-ERW-EAT 0.3.7 LAI VALUE TEMP (PT1000, NA) ERW EA TEMP (7) V⎓ 27 28 29
LA03_AHU3-HST 0.3.8 LAI VALUE TEMP (PT1000, NA) HW SUP TEMP (8) V≈ 31 32 33

TTE 5 AHU-3
TTE 6 AHU-3
TTE 7 AHU-3
TTE 8 AHU-3

Module: 5 / Rail: 1



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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA03.PXCAp002

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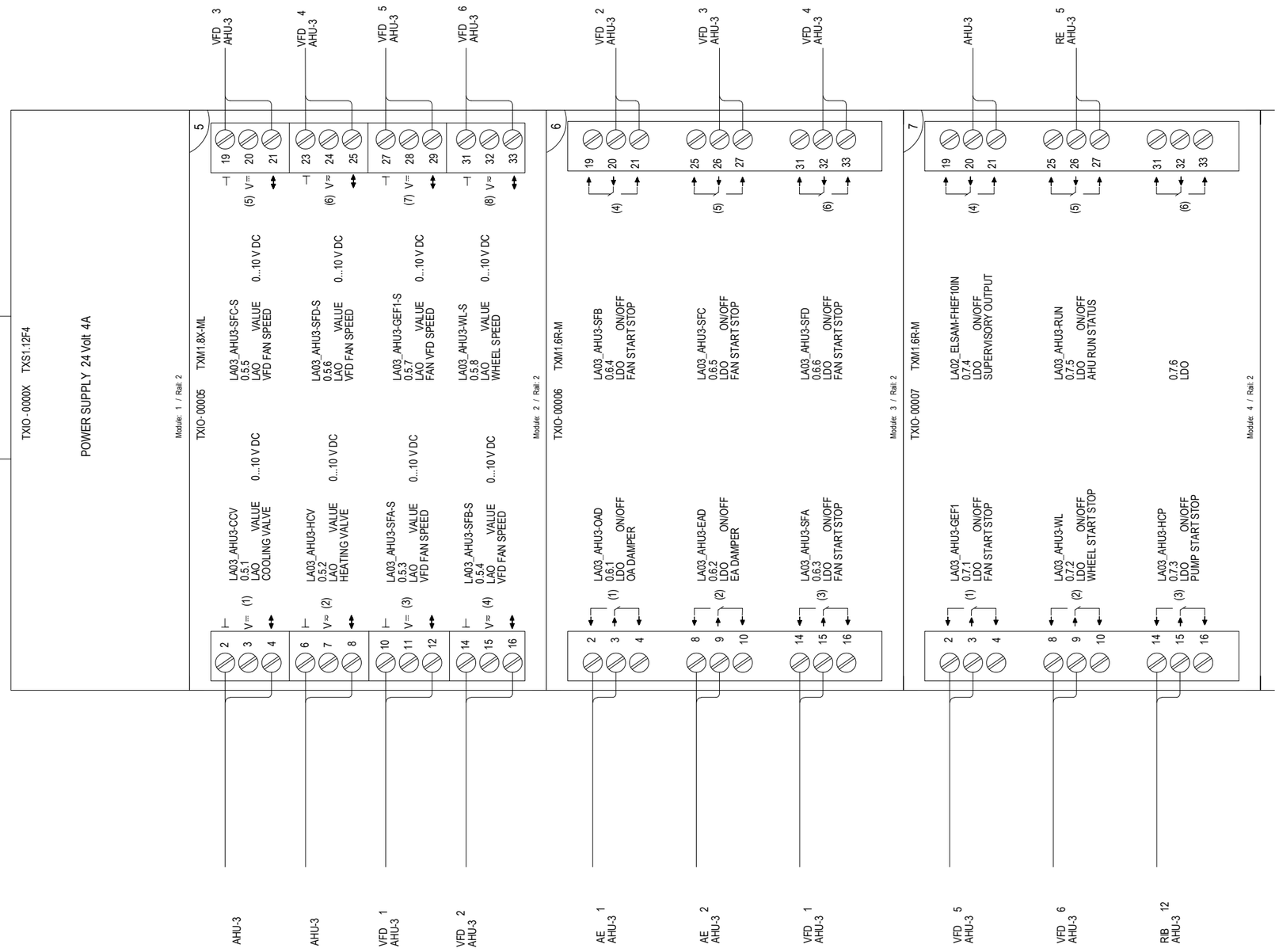
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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LA03.PXCAp003

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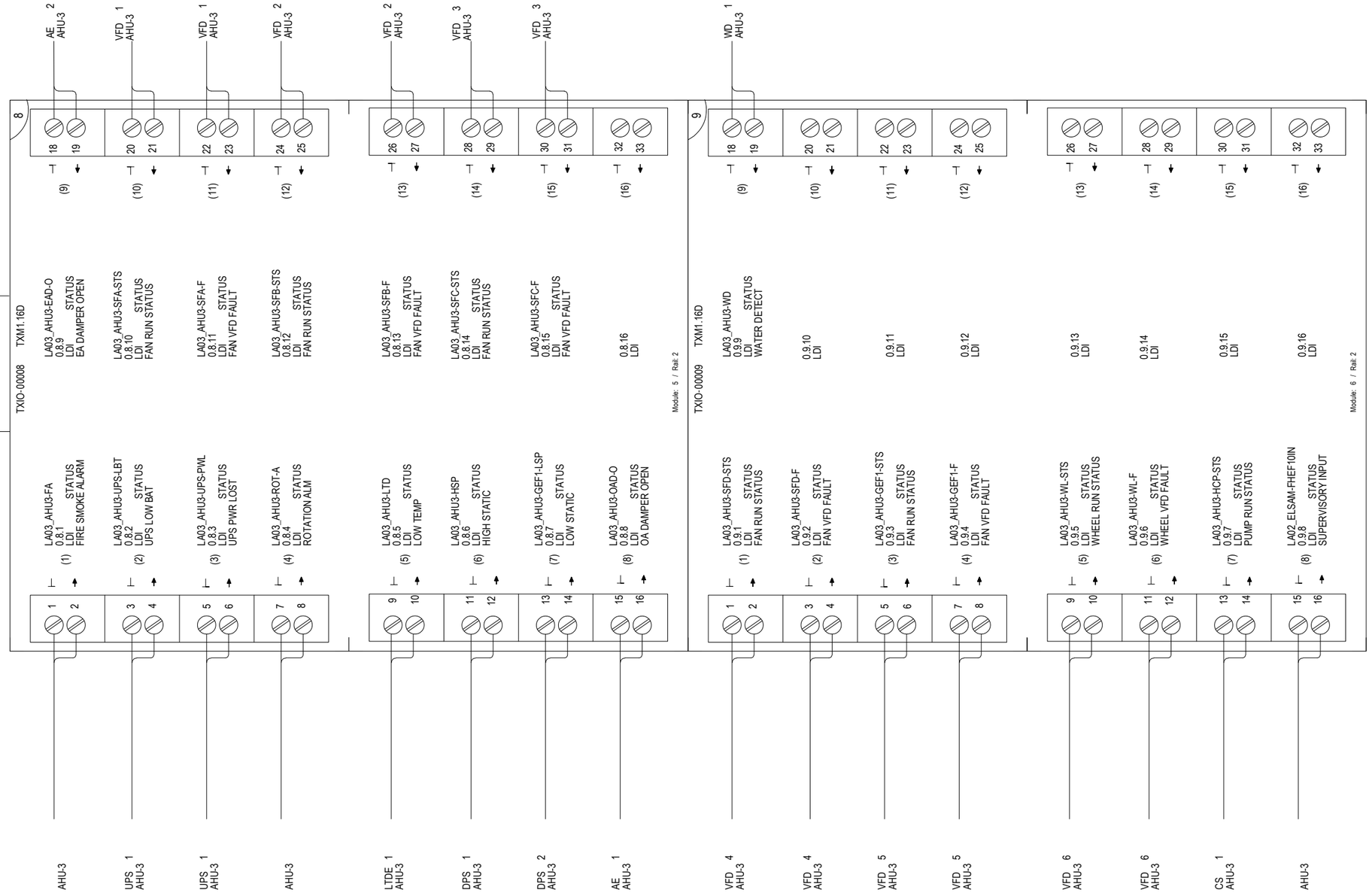

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA03.PXCAp004

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	2	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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IU LAUNCH ACCELERATOR FOR BIO
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AHU-3 & GEF-3

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GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

PNL-4 / AUX-4
RB-1
LA04_AHU4-FA 0004:0.8.1 FIRE ALARM (4)
UPS-1 UPS LO BATT LA04_AHU4-UPS-LBT 0004:0.8.2
POWER LOSS LA04_AHU4-UPS-PWL 0004:0.8.3
PB -1
RE -1 RE -3
RE -2 RE -4

120 VAC
ELECTRICAL TROUGH
PNL-4 | AUX-4 | UPS
PXCA-4 AHU-4 & GEF-4 CONTROL PANEL
AHU-4 & GEF-4
PWR-4

VFD-GEF-4
RIB-10
SAFETY RELAY
RIB-9
LA04_AHU4-GEF1 0004:0.7.1 START/STOP
LA04_AHU4-GEF1-S 0004:0.5.7 SPEED
LA04_AHU4-GEF1-STS 0004:0.9.3 STATUS
LA04_AHU4-GEF1-F 0004:0.9.4 FAULT
VFD-5

(2) DPS-2 -.35IN WG LA04_AHU4-GEF1-LSP 0004:0.8.7
AE -2 (2) 2POS 2 Pos LA04_AHU4-EAD 0004:0.6.2
LA04_AHU4-EAD-O 0004:0.8.9 OPEN STATUS
INTERLOCK TO GEF VFD'S
TTE-7 20/120 DEG F LA04_AHU4-ERW-EAT 0004:0.3.7
HTE-5 0/100 rh LA04_AHU4-ERW-EAH 0004:0.2.5
AHU
TTE-6 20/120 DEG F LA04_AHU4-EAT 0004:0.3.6
HTE-4 0/100 rh LA04_AHU4-EAH 0004:0.2.4
SD-1
EA
SPP-6
D-5 NC
SPP-5
SPP-8
SPP-7
DPTE-6 +/-5 IN WG LA04_AHU4-ESP2 0004:0.1.6
DPTE-5 +/-5 IN WG LA04_AHU4-ESP1 0004:0.1.5
GEF-4 25000 CFM 40 HP
FIELD DUCTWORK
AHU | FIELD DUCT WORK
DPTE-4 +/-10IN WG LA04_AHU4-GEF1-ESP 0004:0.1.4

ENTHALPY WHEEL
LA04_AHU4-ROT-A 0004:0.8.4 ROTATION ALARM

VFD-HEAT WHEEL
RIB-11
LA04_AHU4-WL 0004:0.7.2 START/STOP
LA04_AHU4-WL-STS 0004:0.9.5 VFD STATUS
LA04_AHU4-WL-S 0004:0.5.8 VFD SPEED
LA04_AHU4-WL-F 0004:0.9.6 FAULT
VFD-WL
VFD-6

VFD-SF-4A
RIB-2
SAFETY RELAY
RIB-1
LA04_AHU4-SFA 0004:0.6.3 START/STOP
LA04_AHU4-SFA-S 0004:0.5.3 SPEED
LA04_AHU4-SFA-STS 0004:0.8.10 STATUS
LA04_AHU4-SFA-F 0004:0.8.11 FAULT
VFD-1

VFD-SF-4B
RIB-4
SAFETY RELAY
RIB-3
LA04_AHU4-SFB 0004:0.6.4 START/STOP
LA04_AHU4-SFB-S 0004:0.5.4 SPEED
LA04_AHU4-SFB-STS 0004:0.8.12 STATUS
LA04_AHU4-SFB-F 0004:0.8.13 FAULT
VFD-2

VFD-SF-4C
RIB-6
SAFETY RELAY
RIB-5
LA04_AHU4-SFC 0004:0.6.5 START/STOP
LA04_AHU4-SFC-S 0004:0.5.5 SPEED
LA04_AHU4-SFC-STS 0004:0.8.14 STATUS
LA04_AHU4-SFC-F 0004:0.8.15 FAULT
VFD-3

VFD-SF-4D
RIB-8
SAFETY RELAY
RIB-7
LA04_AHU4-SFD 0004:0.6.6 START/STOP
LA04_AHU4-SFD-S 0004:0.5.6 SPEED
LA04_AHU4-SFD-STS 0004:0.9.1 STATUS
LA04_AHU4-SFD-F 0004:0.9.2 FAULT
VFD-4

DPTE-3 +/-5 IN WG LA04_AHU4-SSP2 0004:0.1.3
SPP-4
SA

AE -1 (4) 2POS 2 Pos LA04_AHU4-OAD 0004:0.6.1
LA04_AHU4-OAD-O 0004:0.8.8 OPEN STATUS
INTERLOCK TO SF VFD'S
D-1 NO
138"x68"
OA
FIELD DUCTWORK | AHU
TTE-1 20/120 DEG F LA04_AHU4-OAT 0004:0.3.1
HTE-1 0/100 rh LA04_AHU4-OAH 0004:0.2.1
TTE-3 20/120 DEG F LA04_AHU4-ERW-SAT2 0004:0.3.3
HTE-2 0/100 rh LA04_AHU4-ERW-SAH 0004:0.2.2
LTDE-1 38 DEG F LA04_AHU4-LTD 0004:0.8.5
-22/158deg F LA04_AHU4-HCT1 0004:0.2.7
LTDE-2 38 DEG F
-22/158deg F LA04_AHU4-HCT2 0004:0.2.8
TTE-4 20/120 DEG F LA04_AHU4-CCT 0004:0.3.4
xx SQFT
TTE-2 20/120 DEG F LA04_AHU4-ERW-SAT1 0004:0.3.2
TTE-9 -40/240DEG F LA04_AHU4-HRT 0004:0.4.1
TTE-8 -40/240DEG F LA04_AHU4-HST 0004:0.3.8
TTE-10 -40/240DEG F LA04_AHU4-CRT 0004:0.4.2
V-2 0/10 V LA04_AHU4-HCV 0004:0.8.2
HWR
HWS
NO-SR
HCP-4
CS-1 LA04_AHU4-HCP-STS 0004:0.9.7
RIB-12 LA04_AHU4-HCP 0004:0.7.3
V-1 0/10 VOLTS LA04_AHU4-CCV 0004:0.5.1
CHWR
CHWS
NO-SR
WD -1 WATER DET LA04_AHU4-WD 0004:0.9.9
SF-4A 7500 CFM 15.0HP
SF-4B 7500 CFM 15.0HP
SF-4C 7500 CFM 15.0HP
SF-4D 7500 CFM 15.0HP
DPS-1 4 IN WG LA04_AHU4-HSP 0004:0.8.6
TTE-5 20/120 DEG F LA04_AHU4-SAT 0004:0.3.5
HTE-3 0/100 rh LA04_AHU4-SAH 0004:0.2.3
SPP-1
SPP-2
SPP-3
DPTE-2 +/-5 IN WG LA04_AHU4-SSP1 0004:0.1.2
DPTE-1 +/-10IN WG LA04_AHU4-DASP 0004:0.1.1
AHU
FIELD DUCT WORK

BUILDING DIFFERENTIAL PRESSURE SENSOR
SSP-9
SSP-8
DPTE-7 +/-0.25 IN H2O LA04_AHU4-BDP 0004:0.1.7
HTE-6 10/90 %RH LA04_AHU4-RMH 0004:0.2.6 HUMIDITY

INSTALLATION NOTES:
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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. DAMPER PROVIDED AND PRE-INSTALLED BY AHU MANUFACTURER.
6. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
7. VFD PROVIDED BY OTHERS.
8. REFER TO PLANS FOR LOCATIONS.
9. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
10. LOCATE WITHIN 12" FROM COOLING COIL DISCHARGE.
11. LOCATE WITHIN 12" FROM HEATING COIL INLET. DEW POINT SENSOR (MEASURING A SINGLE POINT) IS MOUNTED AS FAR AWAY FROM THE WHEEL AS POSSIBLE AT AT THE POINT BETWEEN THE TWO HALVES. IT IS LOCATED IN THE CENTER OF THE UNIT TO READ A WELL MIXED AIRSTREAM.
12. LOCATE AVERAGING SENSOR WITHIN 12" FROM THE HEATING COIL INLET ACROSS THE "COLD HALF" ("COLD HALF" SENSOR LOCATION IS DETERMINED FROM WHEEL ROTATION WHERE THE COLD WHEEL FIRST ROTATES OUT OF THE COLD OUTDOOR AIRSTREAM DURING THE WINTER AND INTO THE WARMER EXHAUST PORTION OF THE UNIT). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
13. LOCATE AVERAGING SENSOR WITHIN 12" FROM HEATING COIL INLET ACROSS THE "WARM HALF" (WARM IN THE WINTER WHERE THE WARM WHEEL FIRST ROTATES INTO THE COLD OUTDOOR AIRSTREAM). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
14. DAMPER AND ACTUATOR (WITH INTEGRAL ENDSWITCH) FURNISHED BY GEF MANUFACTURER.
15. ROTATION SENSOR FURNISHED BY UNIT MANUFACTURER.

1 / 230 AHU-4 CONTROL DIAGRAM
LOCATION: MECHNICAL ROOM - WEST PENTHOUSE

440P412785 0 230

SIEMENS

3602 WOODVIEW TRACE SUITE 240 INDIANAPOLIS, IN 46268 UNITED STATES PHONE: 317-243-9980 FAX: 317-243-9374
SIEMENS INDUSTRY INC. SMART INFRASTRUCTURE DIVISION

LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN
DRAWN BY: HB | CHECKED BY: KG | APPROVED BY: | DATE: 04/02/26 | DATE PLOTTED: 04/02/26
AHU-4 CONTROL

REVISION HISTORY

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME	SUBMITTAL SET
0004	LA04-PXCA		
00	4/2/2026	HB	

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FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

120VAC EMERGENCY POWER BY EC

UPS

BATTERY-BACKED OUTLET

PIN 5= COMMON
PIN 7= LOW BATTERY
PIN 9= LOAD ON BATTERY

18 AWG TP

18 AWG TP

120VAC

HANDI-BOX
METAL COVER
NO FUSE

SERVICE BOX

192VA

500VA

POWER SUPPLY
24V POWER FROM PWR-4
CIRCUIT 1

500 VA
24 VAC

RB-1

INPUT / OUTPUT

SD-1

DPS-1

DPS-2

POWER

VFD-1
SUPPLY FAN
VFD-SF-4A
FURNISHED BY OTHER

VFD-2
SUPPLY FAN
VFD-SF-4B
FURNISHED BY OTHER

VFD-3
SUPPLY FAN
VFD-SF-4C
FURNISHED BY OTHER

VFD-4
SUPPLY FAN
VFD-SF-4D
FURNISHED BY OTHER

SAFETIES
ENABLE
SPEED
DRIVE FAULT
SYSTEM RUN STATUS
DAMPER ENABLE
RUN PERMISSIVE

RIB-1
RIB-2
RIB-3
RIB-4
RIB-5
RIB-6
RIB-7
RIB-8

RE-2-1 0A DAMPER OPEN
RE-2-2 0A DAMPER OPEN
RE-2-3 0A DAMPER OPEN
RE-2-4 0A DAMPER OPEN

LA04_AHU4-UPS-LBT 0004:0.8.2 LOW BATTERY
LA04_AHU4-UPS-PWL 0004:0.8.1 LOSS OF POWER
LA04_AHU4-GEFI-LSP 0004:0.8.7
LA04_AHU4-HSP 0004:0.8.6
LA04_AHU4-LTD 0004:0.8.5
LA04_AHU4-FA 0004:0.8.1
LA04_AHU4-SFA 0004:0.6.3
LA04_AHU4-SFA-S 0004:0.5.3
LA04_AHU4-SFA-F 0004:0.8.11
LA04_AHU4-SFA-STS 0004:0.8.10
LA04_AHU4-SFB 0004:0.6.4
LA04_AHU4-SFB-S 0004:0.5.4
LA04_AHU4-SFB-F 0004:0.8.13
LA04_AHU4-SFB-STS 0004:0.8.12
LA04_AHU4-SFC 0004:0.6.5
LA04_AHU4-SFC-S 0004:0.5.5
LA04_AHU4-SFC-F 0004:0.8.15
LA04_AHU4-SFC-STS 0004:0.8.14
LA04_AHU4-SFD 0004:0.6.6
LA04_AHU4-SFD-S 0004:0.5.6
LA04_AHU4-SFD-F 0004:0.9.2
LA04_AHU4-SFD-STS 0004:0.9.1

+WHT -BLK

CONTINUE TO NEXT PAGE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-4 ELEC WIRING 1

440P412785
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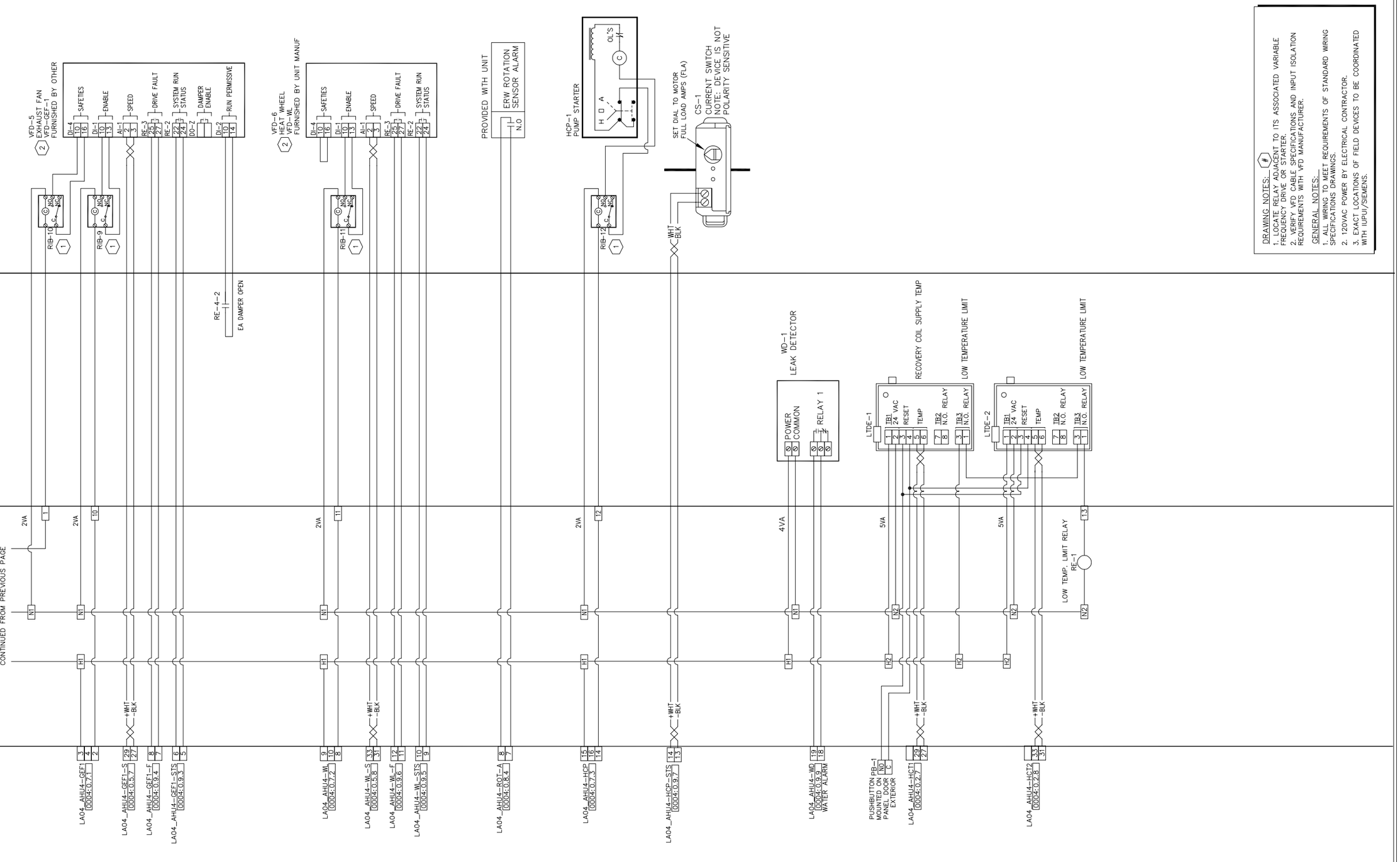
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

CONTINUED FROM PREVIOUS PAGE

FIELD PANEL



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

AHU-4 ELEC WIRING 2

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

EXHAUST AIR DAMPER

COOLING COIL VAVLE

HEATING COIL VAVLE

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.

COMPONENT PANEL / POWER

FIELD PANEL

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.PXCA	

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00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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AHU-4 ELEC WIRING 3

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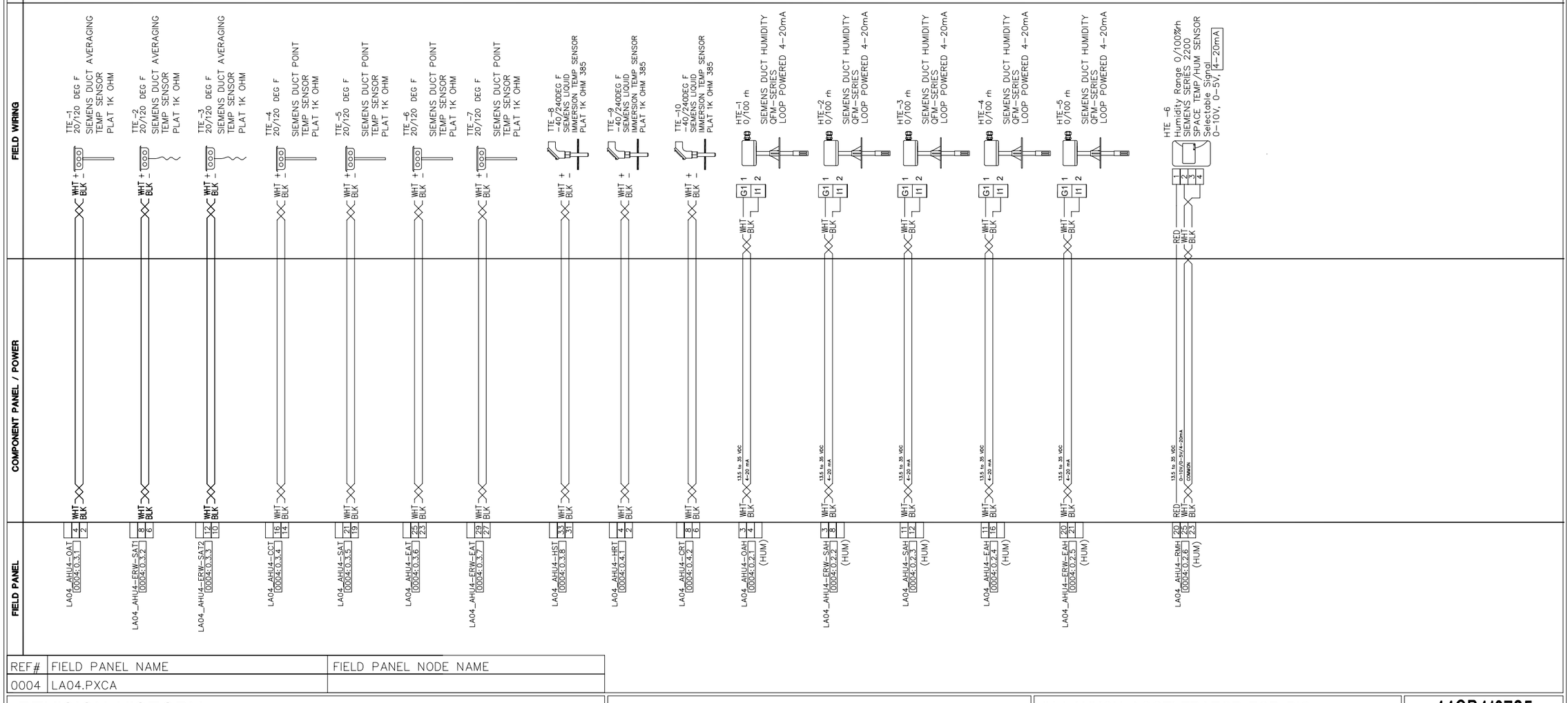
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



COMPONENT PANEL / POWER

FIELD PANEL

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

AHU-4 ELEC WIRING 4

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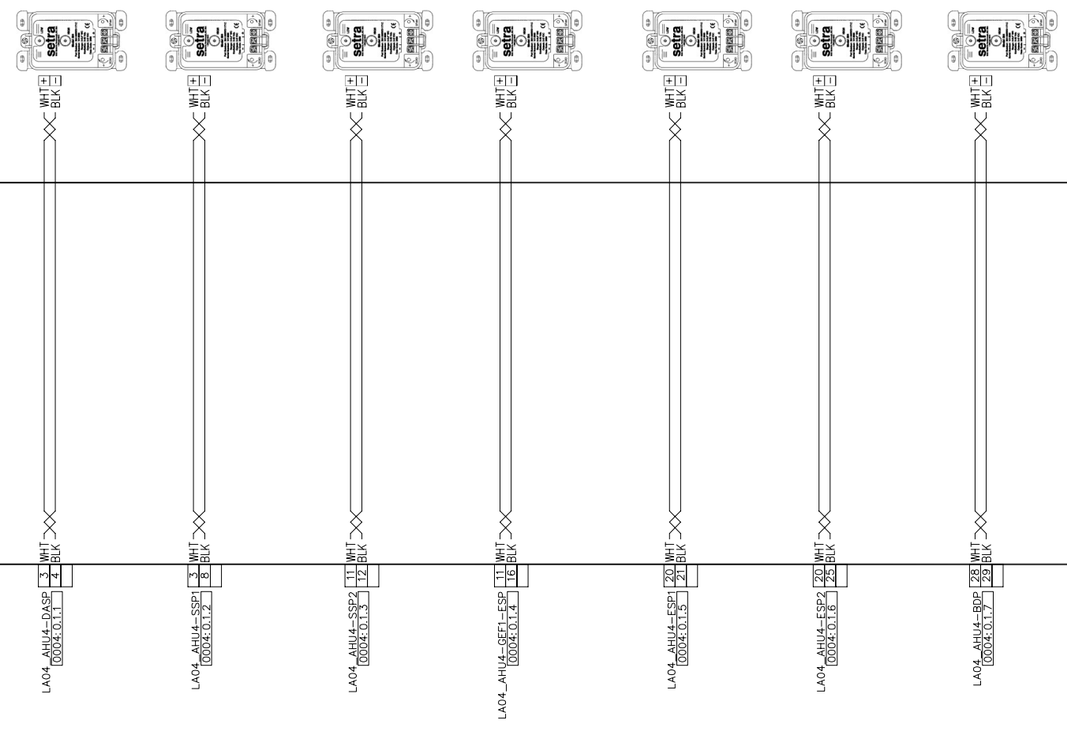
FIELD WIRING | STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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HB	HB	KR	04/02/26	04/02/26

AHU-4 ELEC WIRING 5

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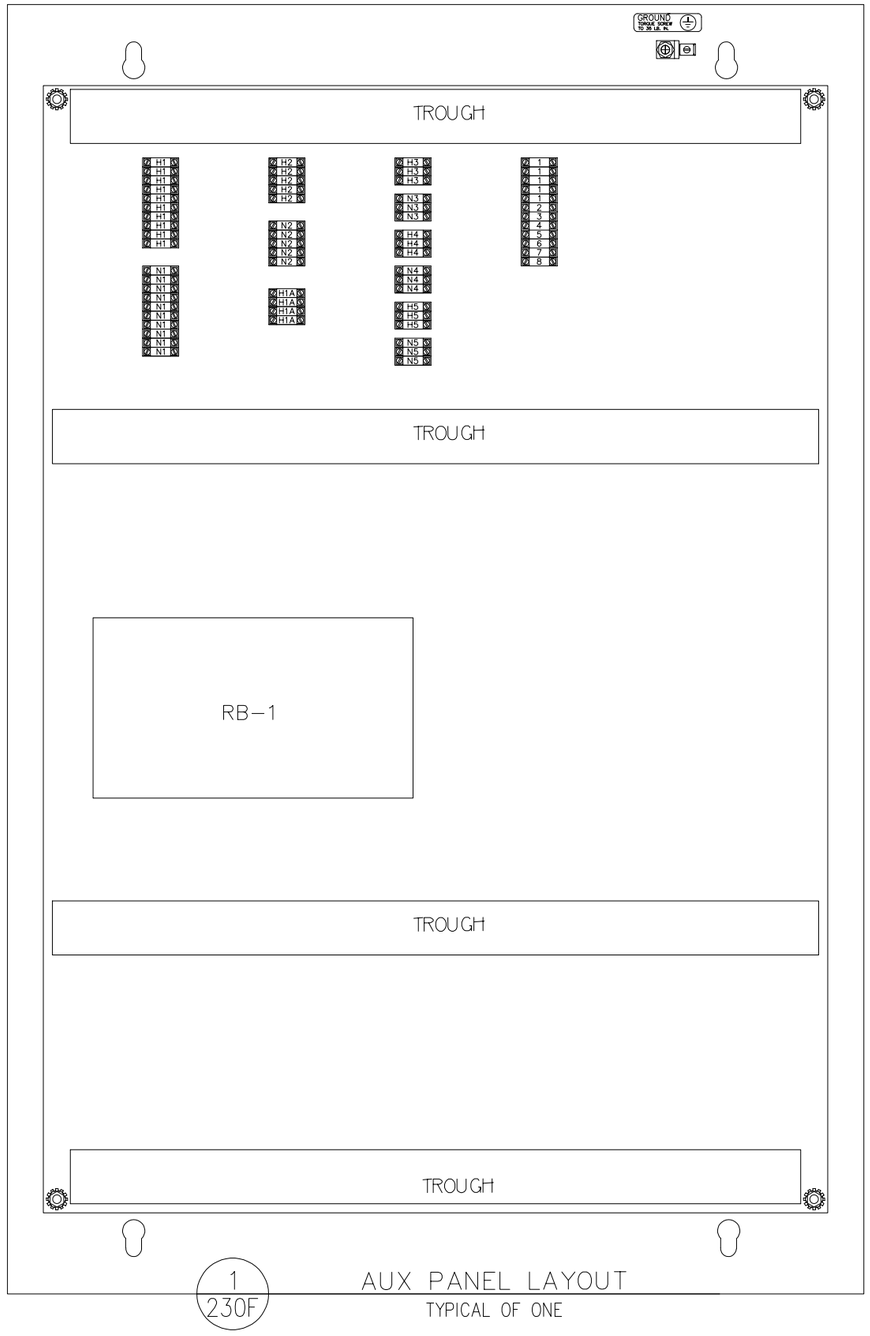
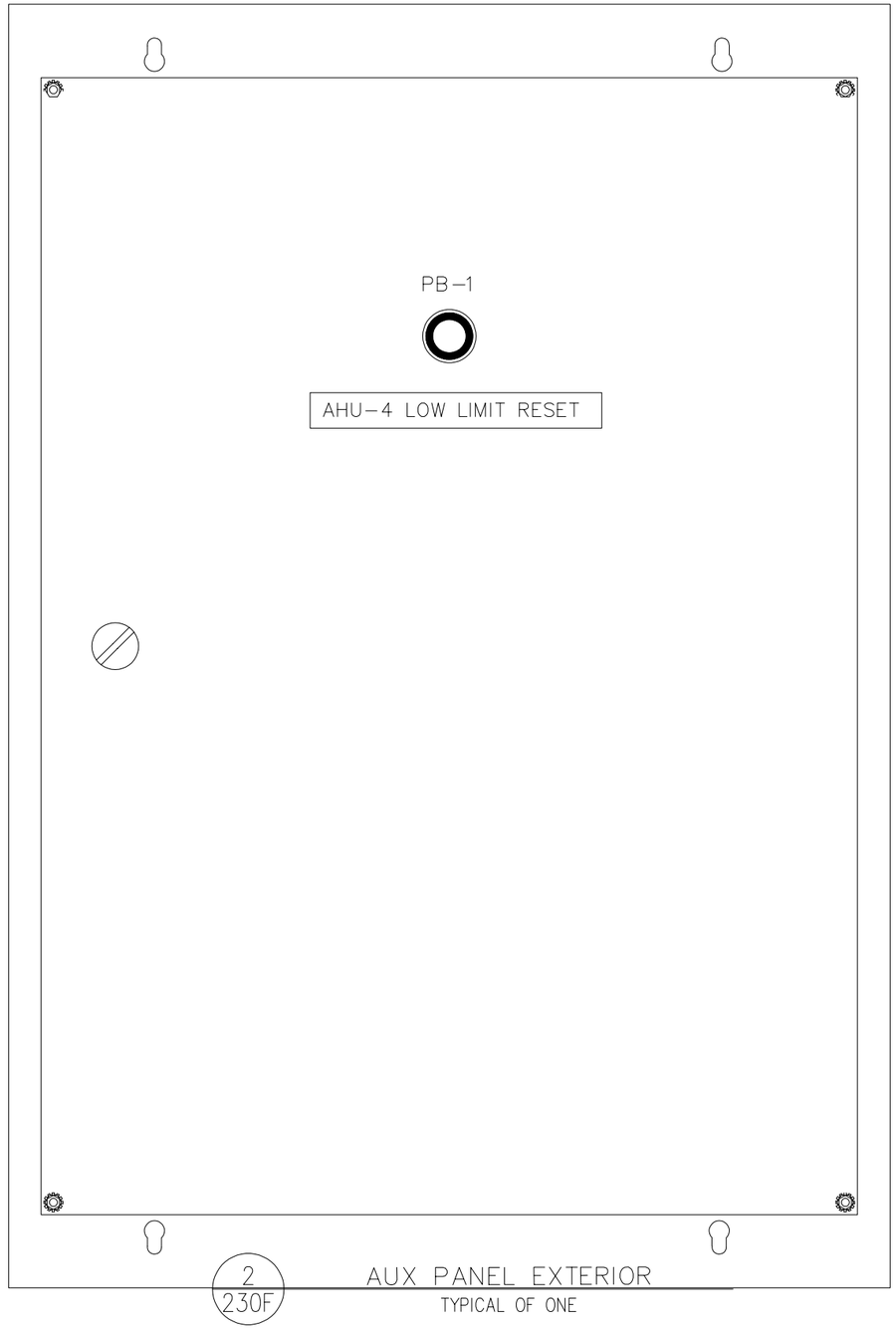


1 230F AUX PANEL LAYOUT
TYPICAL OF ONE



2 230F AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-4 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	4	GCA126.1P	SIEMENS	154001	2 PT SR,24V,MED/S/PLNM.
	2	ASK73.1	SIEMENS		TANDEM MOUNT KIT
AE 2	1	FBO			FURNISHED BY OTHERS
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2-3	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5-6	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 7	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTE 1-5	5	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 6	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-4	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 4	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-12	12	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 9	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 2-4	3	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 5-7	3	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8-10	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-6	6	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

REFER TO PAGE 241 FOR AHU SEQUENCE OF OPERATION.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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PHONE: 317-293-8880
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-4 CONTROL BOM

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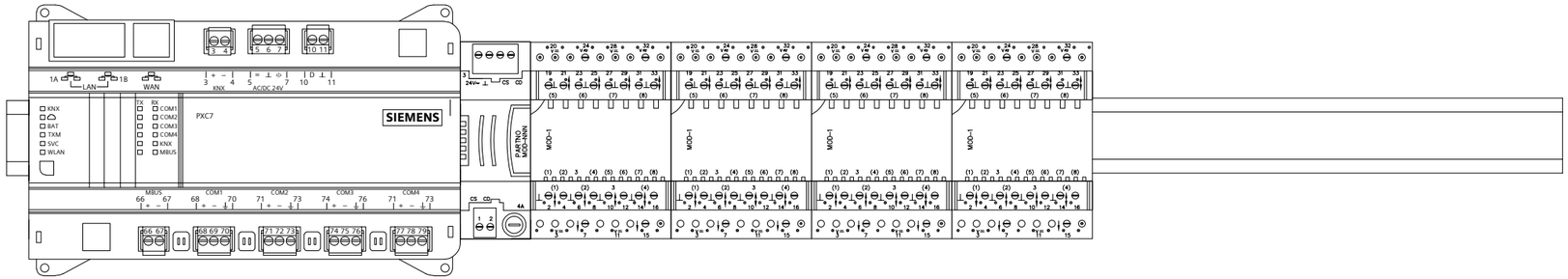
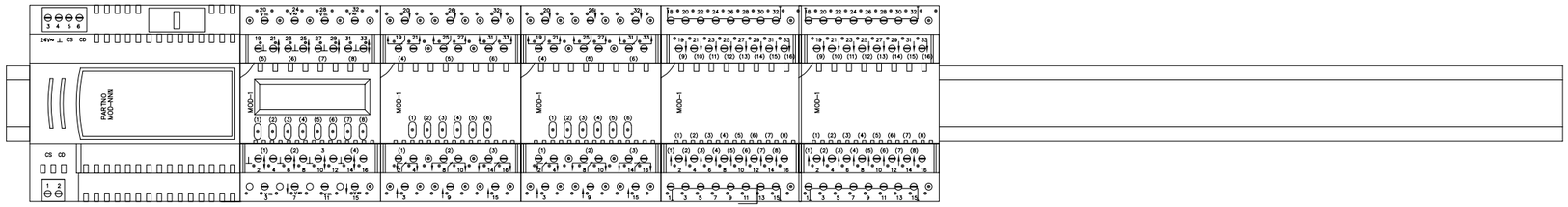
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LA04.PXCA INSTALLATION

440P412785
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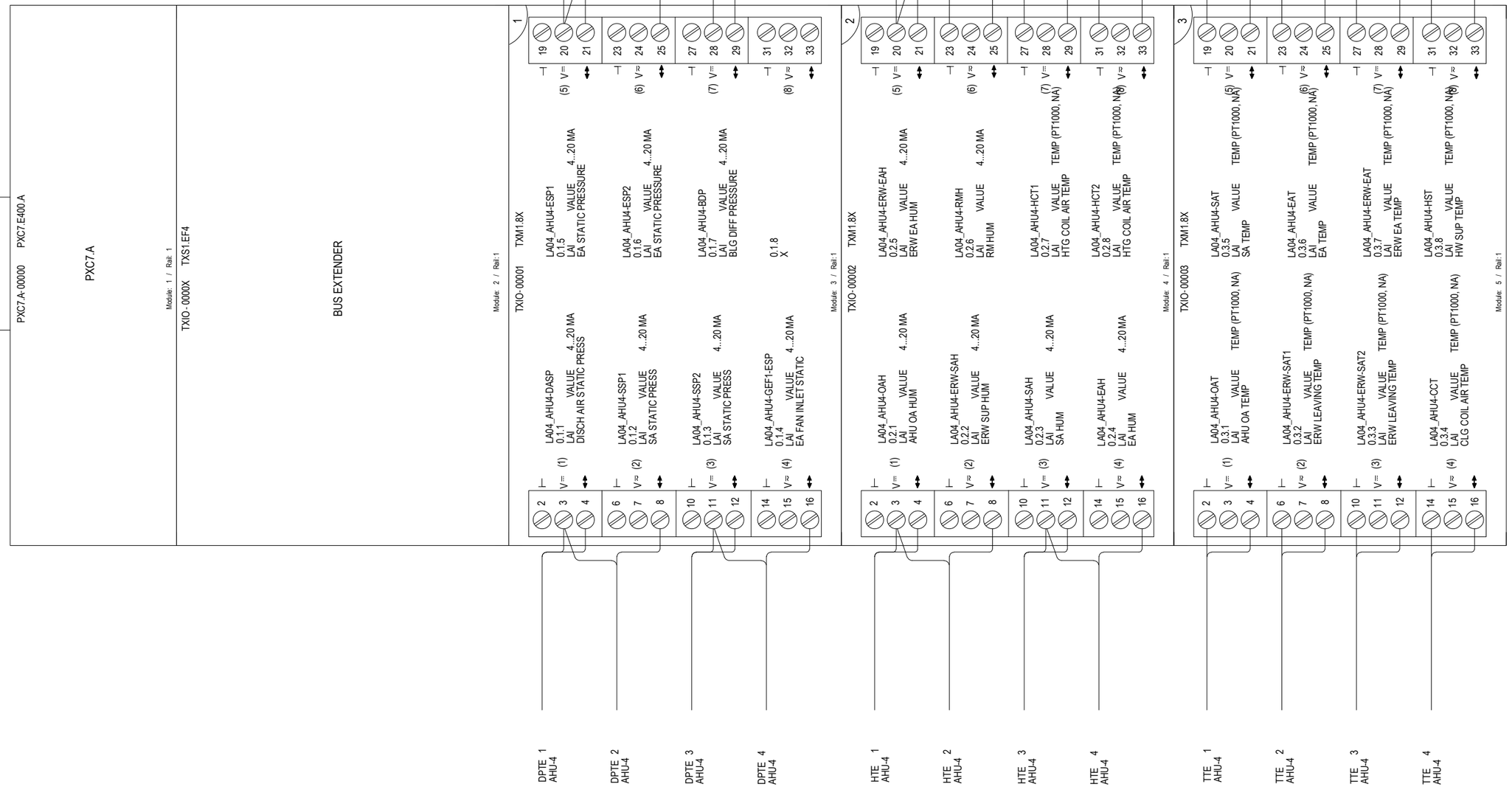
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER



REVISION HISTORY

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AHU-4 & GEF-4

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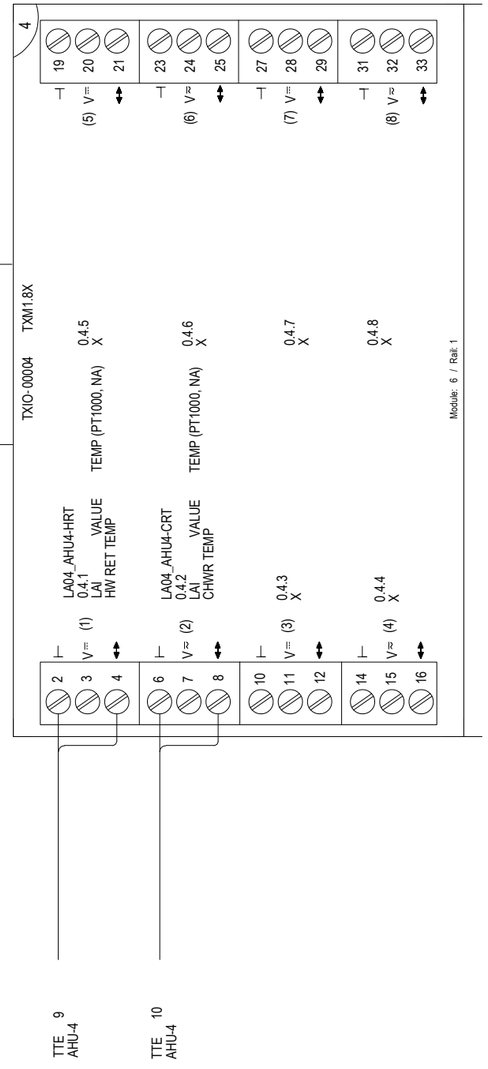

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LA04.PXCAp002

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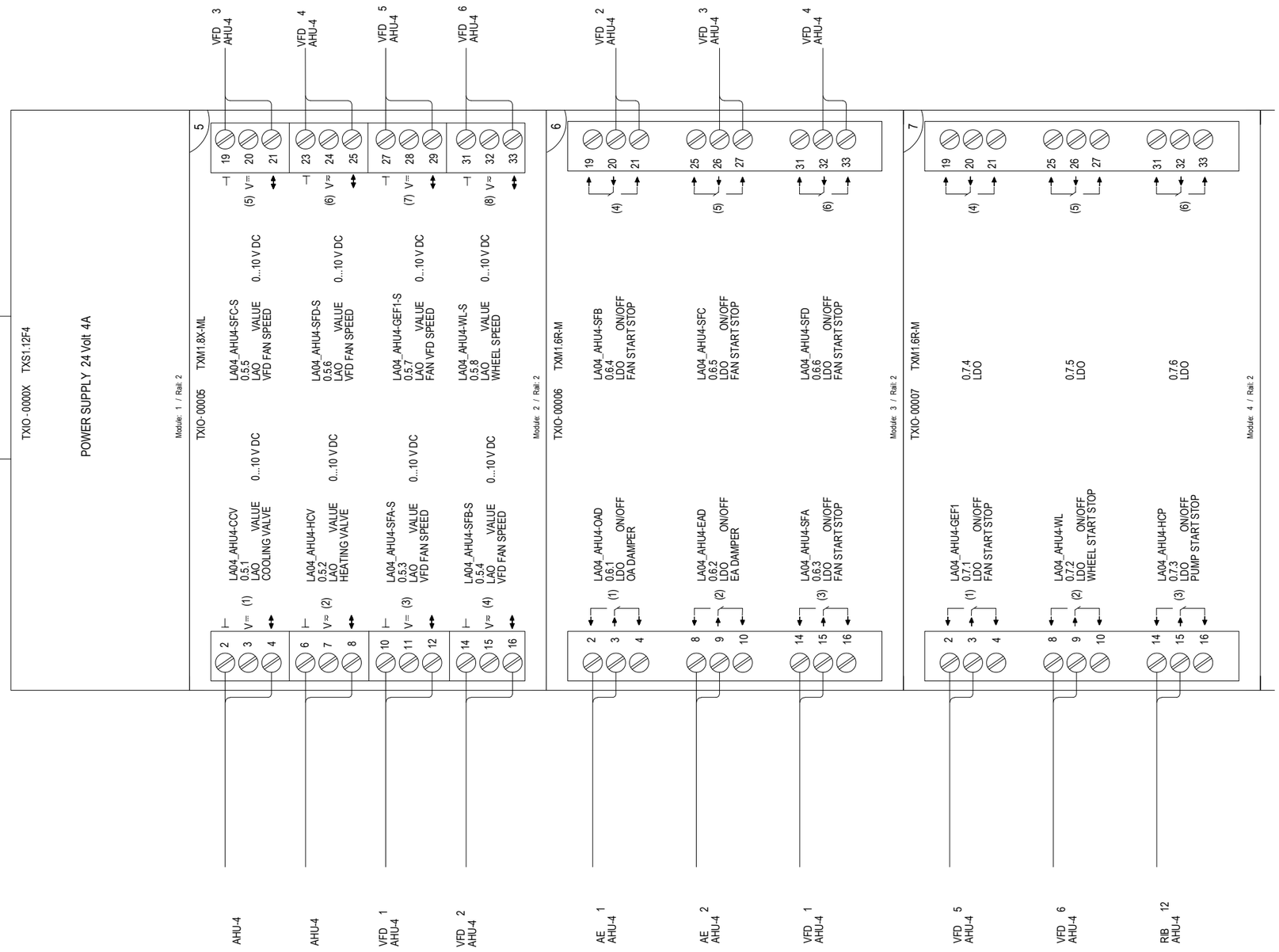
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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LA04.PXCAp003

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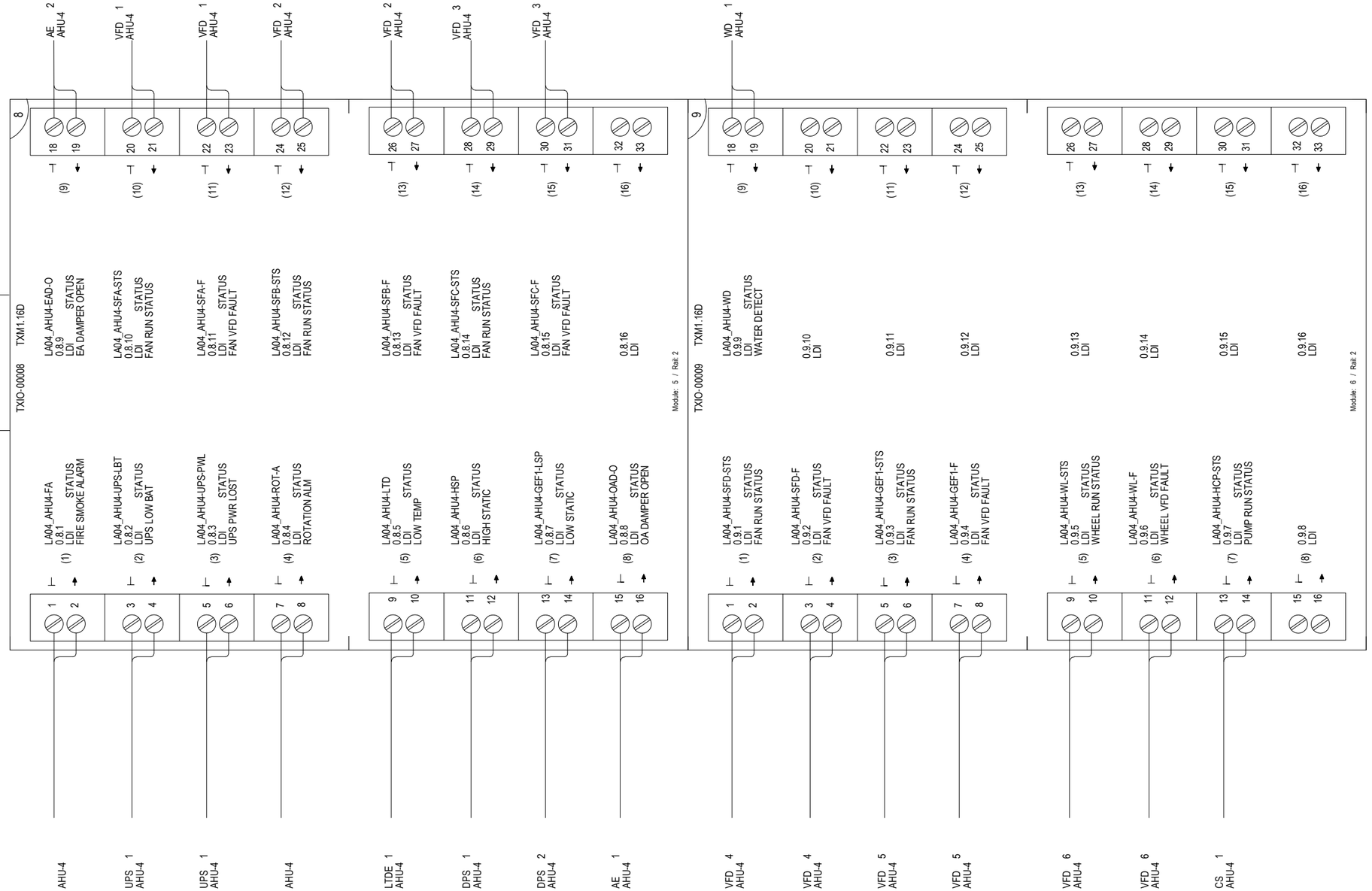

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LA04.PXCAp004

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	2	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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LA04.PXCA BOM

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GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

PNL-5 / AUX-5
RB-1
LA05_AHU5-FA 0005:0.8.1 FIRE ALARM (4)
UPS-1 UPS LO BATT LA05_AHU5-UPS-LBT 0005:0.8.2
POWER LOSS LA05_AHU5-UPS-PWL 0005:0.8.3
PB -1
RE -1 RE -3
RE -2 RE -4

120 VAC
ELECTRICAL TROUGH
PNL-5 (FXCA-5, AHU-5 & GEF-5 CONTROL PANEL)
AUX-5 (AHU-5 & GEF-5)
UPS
PWR-5

INSTALLATION NOTES:
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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" IF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. DAMPER PROVIDED AND PRE-INSTALLED BY AHU MANUFACTURER.
6. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
7. VFD PROVIDED BY OTHERS.
8. REFER TO PLANS FOR LOCATIONS.
9. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
10. LOCATE WITHIN 12" FROM COOLING COIL DISCHARGE.
11. LOCATE WITHIN 12" FROM HEATING COIL INLET. DEW POINT SENSOR (MEASURING A SINGLE POINT) IS MOUNTED AS FAR AWAY FROM THE WHEEL AS POSSIBLE AT AT THE POINT BETWEEN THE TWO HALVES. IT IS LOCATED IN THE CENTER OF THE UNIT TO READ A WELL MIXED AIRSTREAM.
12. LOCATE AVERAGING SENSOR WITHIN 12" FROM THE HEATING COIL INLET ACROSS THE "COLD HALF" ("COLD HALF" SENSOR LOCATION IS DETERMINED FROM WHEEL ROTATION WHERE THE COLD WHEEL FIRST ROTATES OUT OF THE COLD OUTDOOR AIRSTREAM DURING THE WINTER AND INTO THE WARMER EXHAUST PORTION OF THE UNIT). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.
13. LOCATE AVERAGING SENSOR WITHIN 12" FROM HEATING COIL INLET ACROSS THE "WARM HALF" (WARM IN THE WINTER WHERE THE WARM WHEEL FIRST ROTATES INTO THE COLD OUTDOOR AIRSTREAM). AVERAGING SENSOR IS ORIENTED VERTICALLY AND COVERS ONE HALF OF THE WIDTH OF THE UNIT, MAXIMUM 12" SPACING BETWEEN VERTICAL STRANDS ON THE SENSOR TO MINIMIZE EFFECTS OF VARIABLE SPEED WHEEL ROTATION TEMPERATURE STRATIFICATION. CONFIRM WHEEL ROTATION DIRECTION AS INSTALLED.

VFD-GEF-5
RIB-10 SAFETY RELAY
RIB-9
LA05_AHU5-GEF1 0005:0.7.1 START/STOP
LA05_AHU5-GEF1-S 0005:0.5.7 SPEED
LA05_AHU5-GEF1-STS 0005:0.9.3 STATUS
LA05_AHU5-GEF1-F 0005:0.9.4 FAULT
VFD-5

AE -2 (2) 2POS 2 Pos LA05_AHU5-EAD 0005:0.6.2
DPS-2 -3.5 IN WG LA05_AHU5-GEF1-LSP 0005:0.8.7
LA05_AHU5-EAD-O 0005:0.8.9 OPEN STATUS
INTERLOCK TO GEF VFD'S
D-5 NC
SPP-6
TTE-7 20/120 DEG F LA05_AHU5-ERW-EAT 0005:0.3.7
HTE-5 0/100 rh LA05_AHU5-ERW-EAH 0005:0.2.5
AHU
SPP-5
DPTE-4 +/-10IN WG LA05_AHU5-GEF1-ESP 0005:0.1.4
GEF-5 25000 CFM 40 HP
FIELD DUCTWORK
TTE-6 20/120 DEG F LA05_AHU5-EAT 0005:0.3.6
HTE-4 0/100 rh LA05_AHU5-EAH 0005:0.2.4
SD-1
AHU | FIELD DUCT WORK
DPTE-6 +/-5 IN WG LA05_AHU5-ESP2 0005:0.1.6
SPP-8
DPTE-5 +/-5 IN WG LA05_AHU5-ESP1 0005:0.1.5
SPP-7
EA

ENTHALPY WHEEL
LA05_AHU5-ROT-A 0005:0.8.4 ROTATION ALARM

VFD-HEAT WHEEL
RIB-11
LA05_AHU5-WL 0005:0.7.2 START/STOP
LA05_AHU5-WL-STS 0005:0.9.5 VFD STATUS
LA05_AHU5-WL-S 0005:0.5.8 VFD SPEED
LA05_AHU5-WL-F 0005:0.9.6 FAULT
VFD-WL
VFD-6

VFD-SF-5A
RIB-2 SAFETY RELAY
RIB-1
LA05_AHU5-SFA 0005:0.6.3 START/STOP
LA05_AHU5-SFA-S 0005:0.5.3 SPEED
LA05_AHU5-SFA-STS 0005:0.8.10 STATUS
LA05_AHU5-SFA-F 0005:0.8.11 FAULT
VFD-1

VFD-SF-5B
RIB-4 SAFETY RELAY
RIB-3
LA05_AHU5-SFB 0005:0.6.4 START/STOP
LA05_AHU5-SFB-S 0005:0.5.4 SPEED
LA05_AHU5-SFB-STS 0005:0.8.12 STATUS
LA05_AHU5-SFB-F 0005:0.8.13 FAULT
VFD-2

VFD-SF-5C
RIB-6 SAFETY RELAY
RIB-5
LA05_AHU5-SFC 0005:0.6.5 START/STOP
LA05_AHU5-SFC-S 0005:0.5.5 SPEED
LA05_AHU5-SFC-STS 0005:0.8.14 STATUS
LA05_AHU5-SFC-F 0005:0.8.15 FAULT
VFD-3

VFD-SF-5D
RIB-8 SAFETY RELAY
RIB-7
LA05_AHU5-SFD 0005:0.6.6 START/STOP
LA05_AHU5-SFD-S 0005:0.5.6 SPEED
LA05_AHU5-SFD-STS 0005:0.9.1 STATUS
LA05_AHU5-SFD-F 0005:0.9.2 FAULT
VFD-4

AE -1 (4) 2POS 2 Pos LA05_AHU5-OAD 0005:0.6.1
LA05_AHU5-OAD-O 0005:0.8.8 OPEN STATUS
INTERLOCK TO SF VFD'S
D-1 NO
138"x68"
TTE-1 20/120 DEG F LA05_AHU5-OAT 0005:0.3.1
HTE-1 0/100 rh LA05_AHU5-OAH 0005:0.2.1
OA
FIELD DUCTWORK | AHU
TTE-3 20/120 DEG F LA05_AHU5-ERW-SAT2 0005:0.3.3
HTE-2 0/100 rh LA05_AHU5-ERW-SAH 0005:0.2.2
TTE-2 20/120 DEG F LA05_AHU5-ERW-SAT1 0005:0.3.2
LTDE-1 38 DEG F LA05_AHU5-LTD 0005:0.8.5
-22/158deg F LA05_AHU5-HCT1 0005:0.2.7
LTDE-2 38 DEG F
-22/158deg F LA05_AHU5-HCT2 0005:0.2.8
TTE-4 20/120 DEG F LA05_AHU5-CCT 0005:0.3.4
xx sqft
TTE-9 -40/240DEG F LA05_AHU5-HRT 0005:0.4.1
TTE-8 -40/240DEG F LA05_AHU5-HST 0005:0.3.8
TTE-10 -40/240DEG F LA05_AHU5-CRT 0005:0.4.2
V-2 0/10 V LA05_AHU5-HCV 0005:0.8.2
HWR
HWS
NO-SR
HCP-5
CS-1 LA05_AHU5-HCP-STS 0005:0.9.7
RIB-12 LA05_AHU5-HCP 0005:0.7.3
V-1 0/10 VOLTS LA05_AHU5-CCV 0005:0.5.1
CHWR
CHWS
NO-SR
WD -1 WATER DET LA05_AHU5-WD 0005:0.9.9
SF-5A 7500 CFM 15.0HP
SF-5B 7500 CFM 15.0HP
SF-5C 7500 CFM 15.0HP
SF-5D 7500 CFM 15.0HP
DPS-1 4 IN WG LA05_AHU5-HSP 0005:0.8.6
SPP-2
SPP-1
TTE-5 20/120 DEG F LA05_AHU5_SAT 0005:0.3.5
HTE-3 0/100 rh LA05_AHU5-SAH 0005:0.2.3
DPTE-1 +/-10IN WG LA05_AHU5-DASP 0005:0.1.1
AHU | FIELD DUCT WORK
DPTE-3 +/-5 IN WG LA05_AHU5-SSP2 0005:0.1.3
SPP-4
DPTE-2 +/-5 IN WG LA05_AHU5-SSP1 0005:0.1.2
SPP-3
SA

DPTE-7 +/-0.25 IN H2O LA05_AHU5-BDP 0005:0.1.7
SSP-9
SSP-8
BUILDING DIFFERENTIAL PRESSURE SENSOR
HTE-6 40/90 DEG F LA05_AHU5-RMH 0005:0.2.6 HUMIDITY

1 / 240 AHU-5 CONTROL DIAGRAM
LOCATION: MECHNICAL ROOM - WEST PENTHOUSE

440P412785
0
240

SIEMENS
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DATE
HB		KR	HB	04/02/26

BGU LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN
AHU-5 CONTROL

REVISION HISTORY

REF #	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

00	4/2/2026	HB	SUBMITTAL SET

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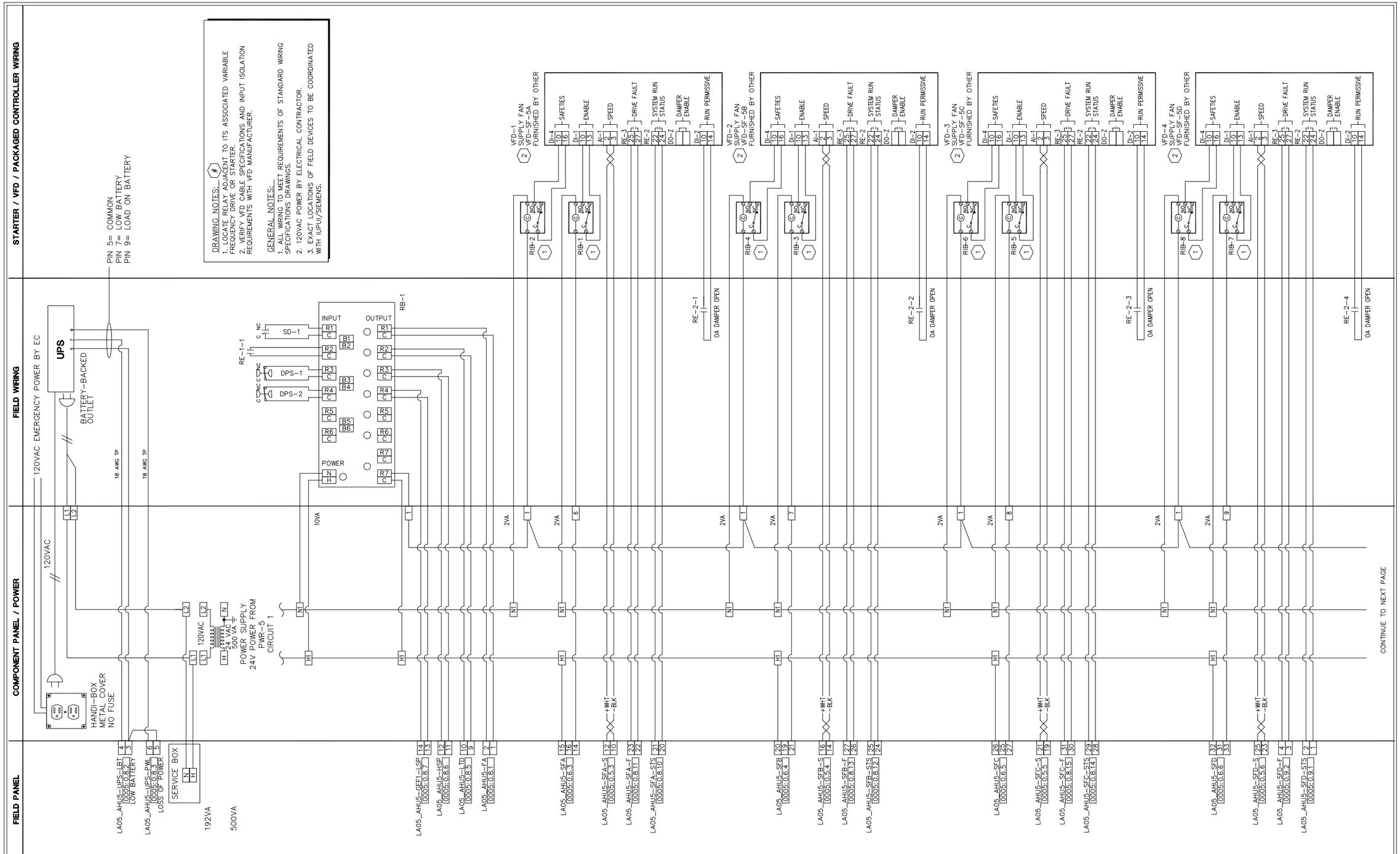

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-5 ELEC WIRING 1

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240A

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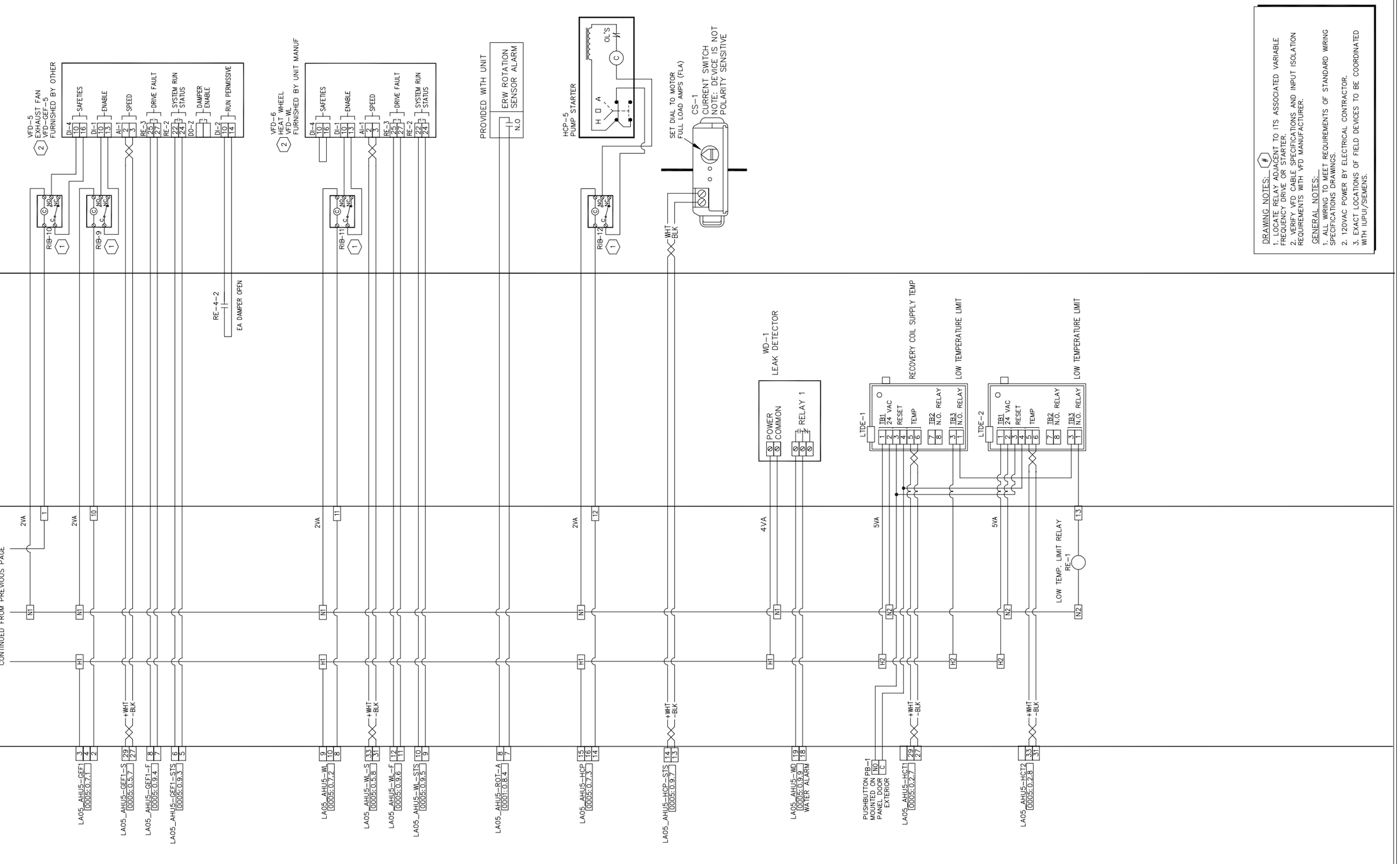
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

CONTINUED FROM PREVIOUS PAGE

FIELD PANEL



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-5 ELEC WIRING 2

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

AE – 1 (4)
24Vac 2 Pos
DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA126.1U/P = 9VA

EXHAUST AIR DAMPER

PROVIDED BY GEF
MANUFACTURER

AE – 2
24Vac 2 Pos
DAMPER ACTUATOR
SPRING RETURN

COOLING COIL VAVLE

V – 1
SIEMENS FLOWRITE SKC
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKC:
120 sec RUN TIME

ON = 4–20mA
OFF = 0/10 Vdc
(DEFAULT)

VA Consumption: –
SKC62U = 28VA

HEATING COIL VAVLE

V – 2
HEATING COIL VALVE
SIEMENS FLOWRITE SKB
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKB:
120 sec RUN TIME

OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKB62U = 18VA

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.

COMPONENT PANEL / POWER

24V POWER FROM PWR–5 CIRCUIT 2 100VA
24V POWER FROM PWR–5 CIRCUIT 3 100VA
RE–1–2
RE–1–3
36VA
28VA MAX
18VA MAX
DAMPER OPEN STATUS RE–2
DAMPER OPEN STATUS RE–3
DAMPER OPEN STATUS RE–4
RE–3–1
RE–4–1
0–10 VDC
WHT
BLK

FIELD PANEL

LA05_AHU5–OAD 0005:0.6.1
LA05_AHU5–OAD–O 0005:0.8.8 DAMPER OPEN STATUS
LA05_AHU5–EAD 0005:0.6.2
LA05_AHU5–EAD–O 0005:0.8.9 DAMPER OPEN STATUS
LA05_AHU5–CCV 0005:0.5.1
LA05_AHU5–HCV 0005:0.5.2

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-5 ELEC WIRING 3

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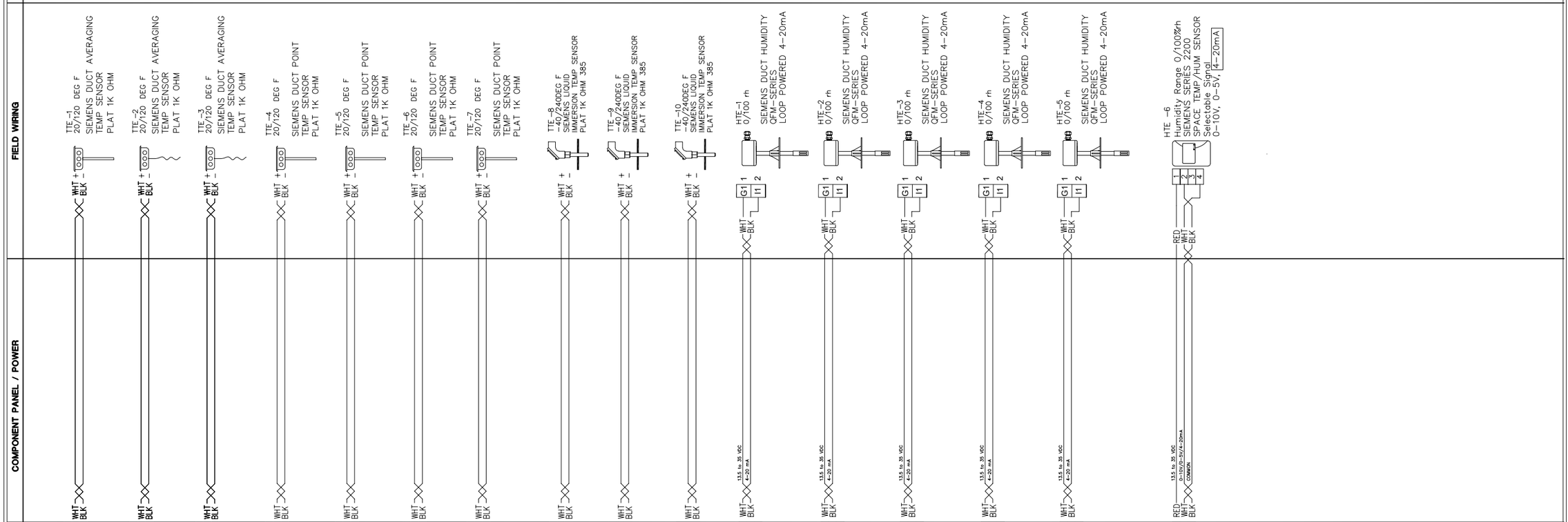
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-5 ELEC WIRING 4

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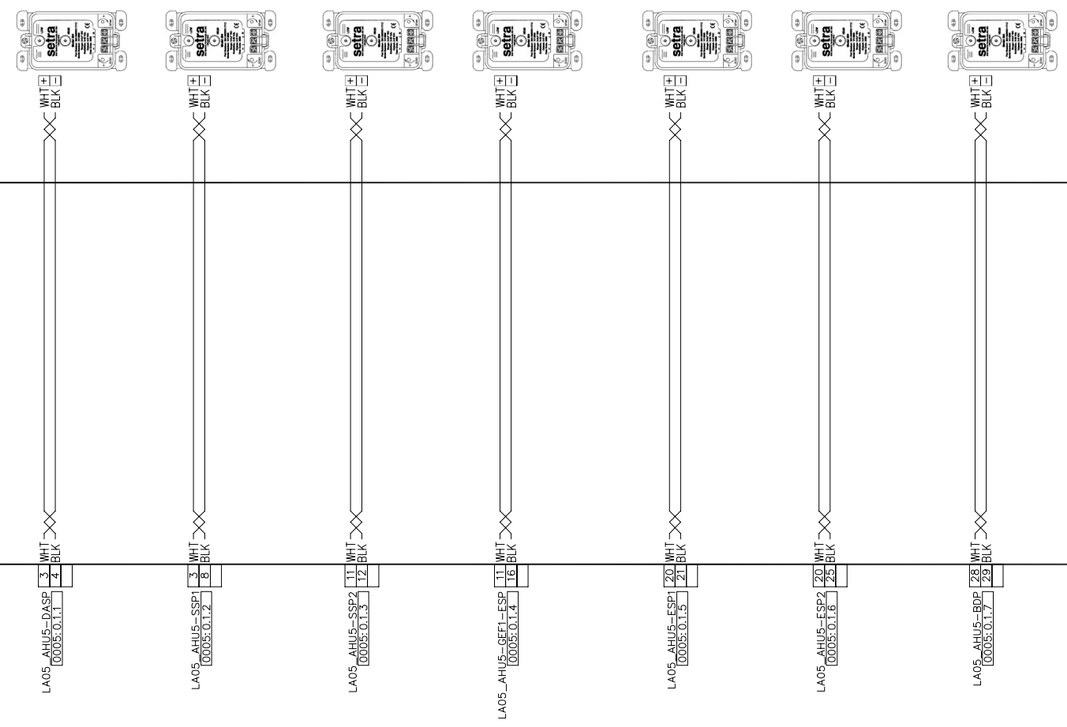
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0005	LA05.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-5 ELEC WIRING 5

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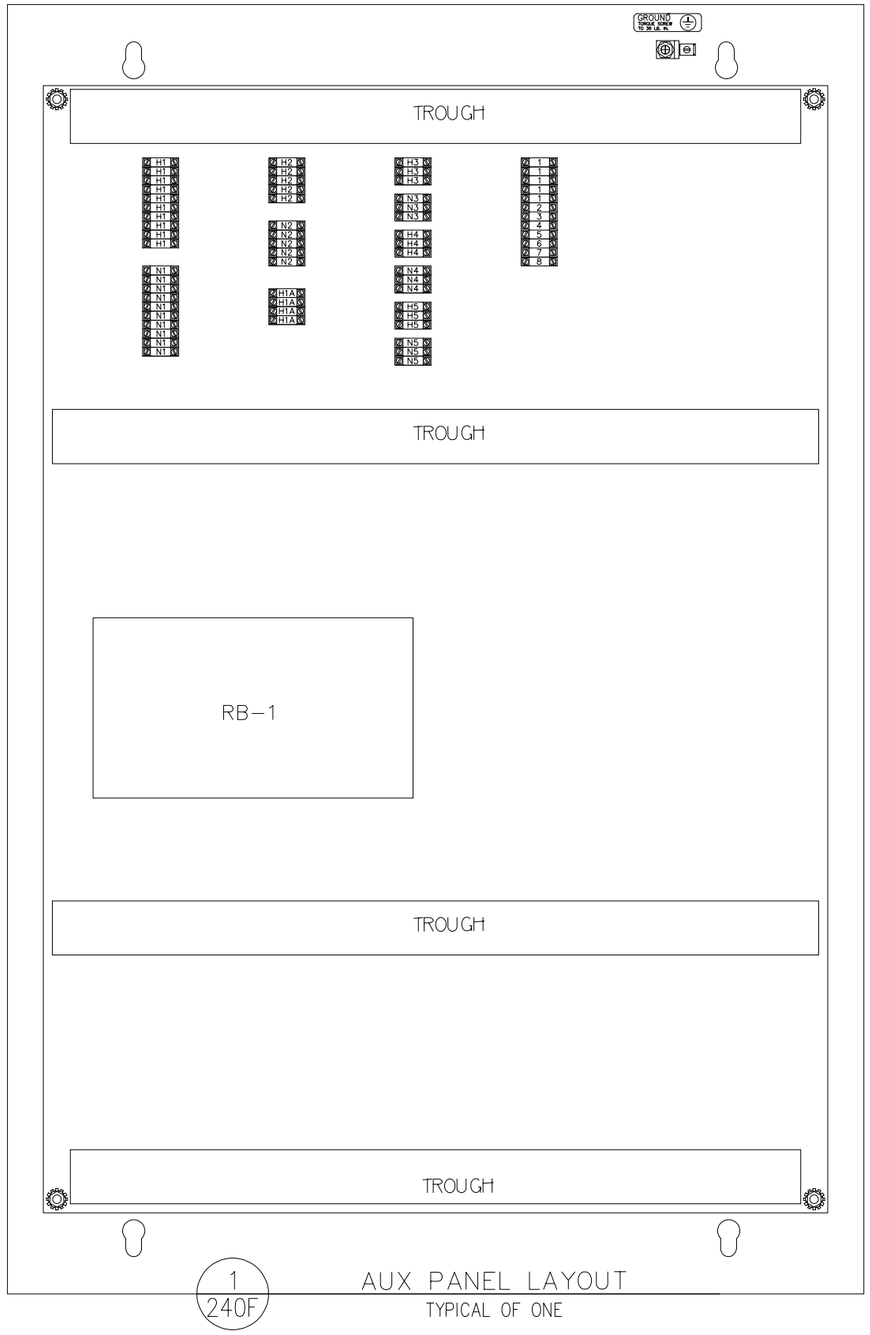

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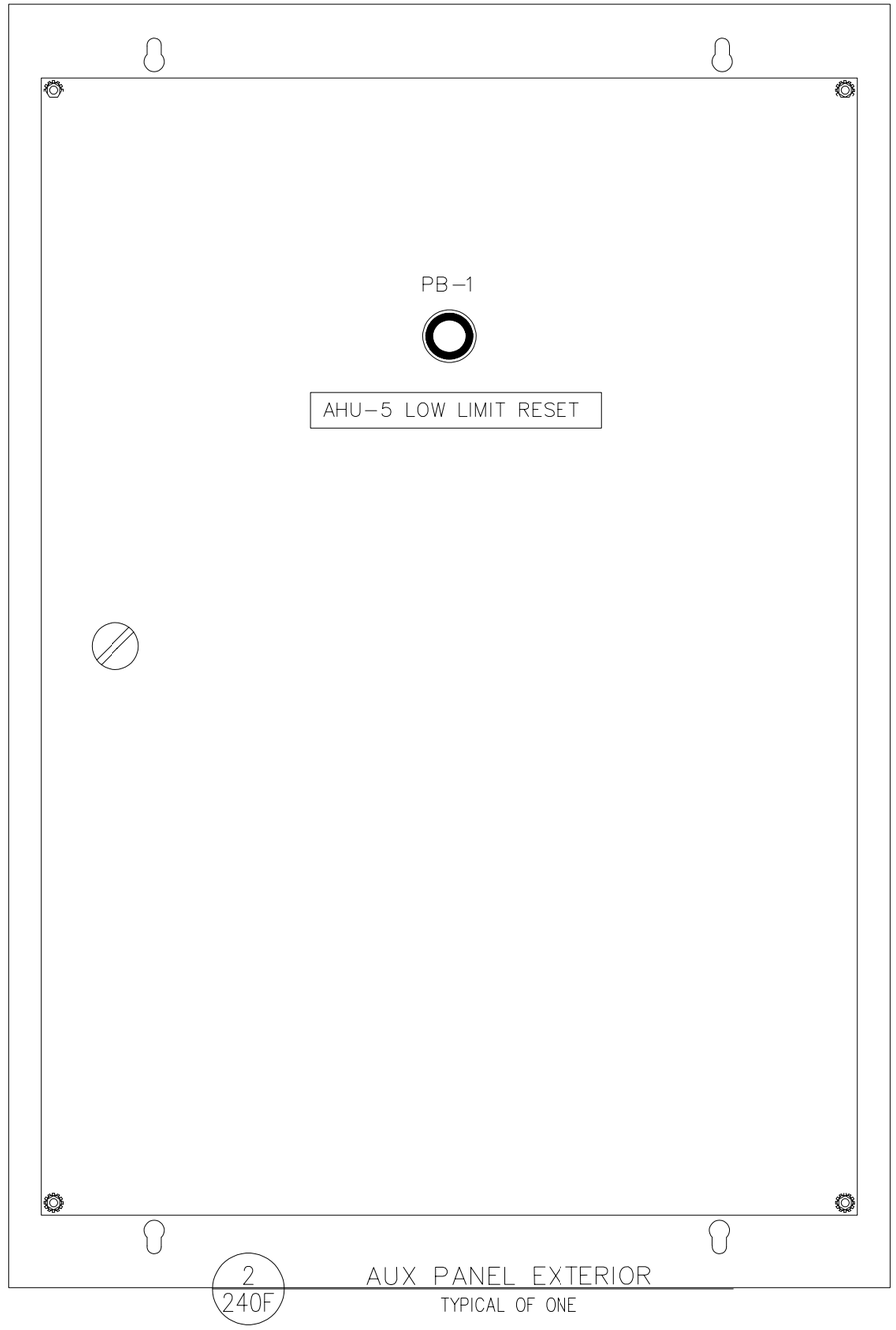
AUX PANEL LAYOUT

TYPICAL OF ONE



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240F

AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-5 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	4	GCA126.1P	SIEMENS	154001	2 PT SR,24V,MED/S/PLNM.
	2	ASK73.1	SIEMENS		TANDEM MOUNT KIT
AE 2	1	FBO			FURNISHED BY OTHERS
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2-3	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5-6	2	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 7	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTE 1-5	5	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 6	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	1	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF50A	MINCO		CHILL-OUT LTDE/TTE 50FT ALUM
	1	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-5	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 5	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-12	12	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 9	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 2-4	3	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 5-7	3	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8-10	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-6	6	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1-4	4	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

REFER TO PAGE 241 FOR AHU SEQUENCE OF OPERATION.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-5 CONTROL BOM

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240G

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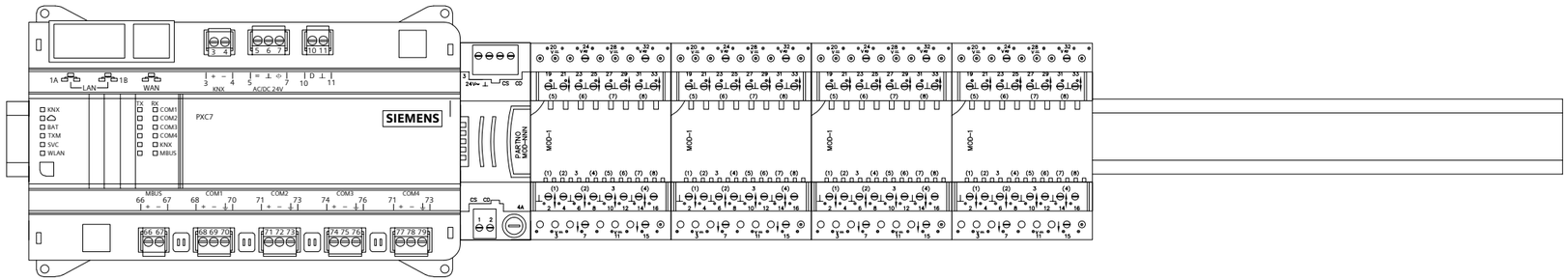
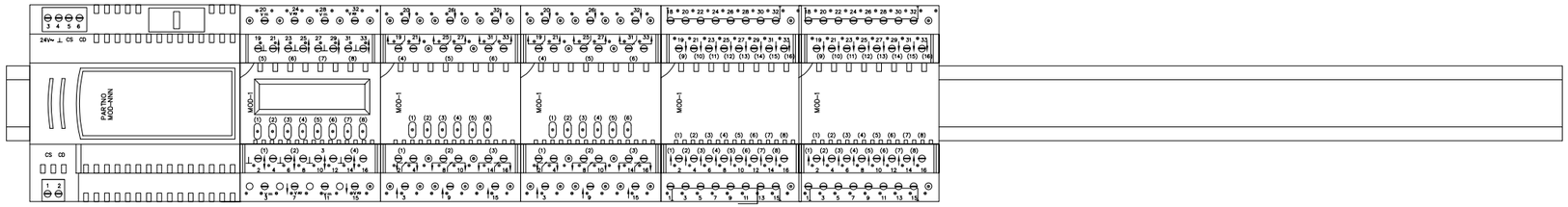
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA05.PXCA INSTALLATION

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E240

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PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

Module: 2 / Rail: 1

TXIO- 00001 TXM1.8X

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓		⊣	V≈		⊣	V⎓		⊣	V≈	
	(5)			(6)			(7)			(8)	
LA05_AHU5-ESP1 0.1.5 LAI EA STATIC PRESSURE VALUE 4...20 MA			LA05_AHU5-ESP2 0.1.6 LAI EA STATIC PRESSURE VALUE 4...20 MA			LA05_AHU5-BDP 0.1.7 LAI BLG DIFF PRESSURE VALUE 4...20 MA			0.1.8 X		

DPTE 5 AHU-5 → 19 20 21

DPTE 6 AHU-5 → 23 24 25

DPTE 7 AHU-5 → 27 28 29

Module: 3 / Rail: 1

TXIO- 00002 TXM1.8X

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓		⊣	V≈		⊣	V⎓		⊣	V≈	
	(5)			(6)			(7)			(8)	
LA05_AHU5-ERW-EAH 0.2.5 LAI ERW EA HUM VALUE 4...20 MA			LA05_AHU5-RMH 0.2.6 LAI RM HUM VALUE 4...20 MA			LA05_AHU5-HCT1 0.2.7 LAI HTG COIL AIR TEMP VALUE TEMP (PT1000, NA)			LA05_AHU5-HCT2 0.2.8 LAI HTG COIL AIR TEMP VALUE TEMP (PT1000, NA)		

HTE 5 AHU-5 → 19 20 21

HTE 6 AHU-5 → 23 24 25

LTDE 1 AHU-5 → 27 28 29

LTDE 2 AHU-5 → 31 32 33

Module: 4 / Rail: 1

TXIO- 00003 TXM1.8X

19	20	21	23	24	25	27	28	29	31	32	33
⊣	V⎓		⊣	V≈		⊣	V⎓		⊣	V≈	
	(5)			(6)			(7)			(8)	
LA05_AHU5-SAT 0.3.5 LAI SA TEMP VALUE TEMP (PT1000, NA)			LA05_AHU5-EAT 0.3.6 LAI EA TEMP VALUE TEMP (PT1000, NA)			LA05_AHU5-ERW-EAT 0.3.7 LAI ERW EA TEMP VALUE TEMP (PT1000, NA)			LA05_AHU5-HST 0.3.8 LAI HW SUP TEMP VALUE TEMP (PT1000, NA)		

TTE 5 AHU-5 → 19 20 21

TTE 6 AHU-5 → 23 24 25

TTE 7 AHU-5 → 27 28 29

TTE 8 AHU-5 → 31 32 33

Module: 5 / Rail: 1

2	3	4	LA05_AHU5-DASP 0.1.1 LAI DISCH AIR STATIC PRESS VALUE 4...20 MA
6	7	8	LA05_AHU5-SSP1 0.1.2 LAI SA STATIC PRESS VALUE 4...20 MA
10	11	12	LA05_AHU5-SSP2 0.1.3 LAI SA STATIC PRESS VALUE 4...20 MA
14	15	16	LA05_AHU5-GEF1-ESP 0.1.4 LAI EA FAN INLET STATIC VALUE 4...20 MA

DPTE 1 AHU-5 ← 2 3 4

DPTE 2 AHU-5 ← 6 7 8

DPTE 3 AHU-5 ← 10 11 12

DPTE 4 AHU-5 ← 14 15 16

2	3	4	LA05_AHU5-OAH 0.2.1 LAI AHU OA HUM VALUE 4...20 MA
6	7	8	LA05_AHU5-ERW-SAH 0.2.2 LAI ERW SUP HUM VALUE 4...20 MA
10	11	12	LA05_AHU5-SAH 0.2.3 LAI SA HUM VALUE 4...20 MA
14	15	16	LA05_AHU5-EAH 0.2.4 LAI EA HUM VALUE 4...20 MA

HTE 1 AHU-5 ← 2 3 4

HTE 2 AHU-5 ← 6 7 8

HTE 3 AHU-5 ← 10 11 12

HTE 4 AHU-5 ← 14 15 16

2	3	4	LA05_AHU5-OAT 0.3.1 LAI AHU OA TEMP VALUE TEMP (PT1000, NA)
6	7	8	LA05_AHU5-ERW-SAT1 0.3.2 LAI ERW LEAVING TEMP VALUE TEMP (PT1000, NA)
10	11	12	LA05_AHU5-ERW-SAT2 0.3.3 LAI ERW LEAVING TEMP VALUE TEMP (PT1000, NA)
14	15	16	LA05_AHU5-CCT 0.3.4 LAI CLG COIL AIR TEMP VALUE TEMP (PT1000, NA)

TTE 1 AHU-5 ← 2 3 4

TTE 2 AHU-5 ← 6 7 8

TTE 3 AHU-5 ← 10 11 12

TTE 4 AHU-5 ← 14 15 16

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-5 & GEF-5

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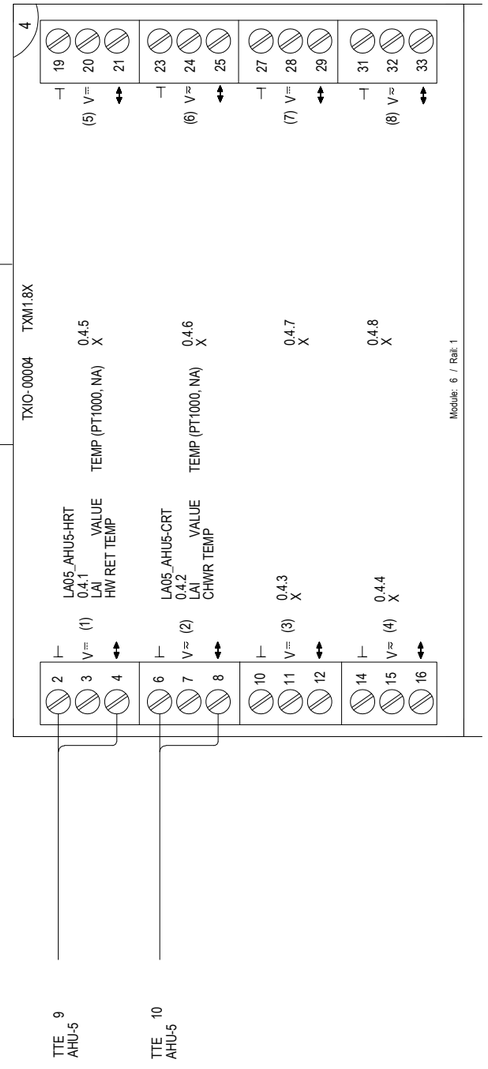

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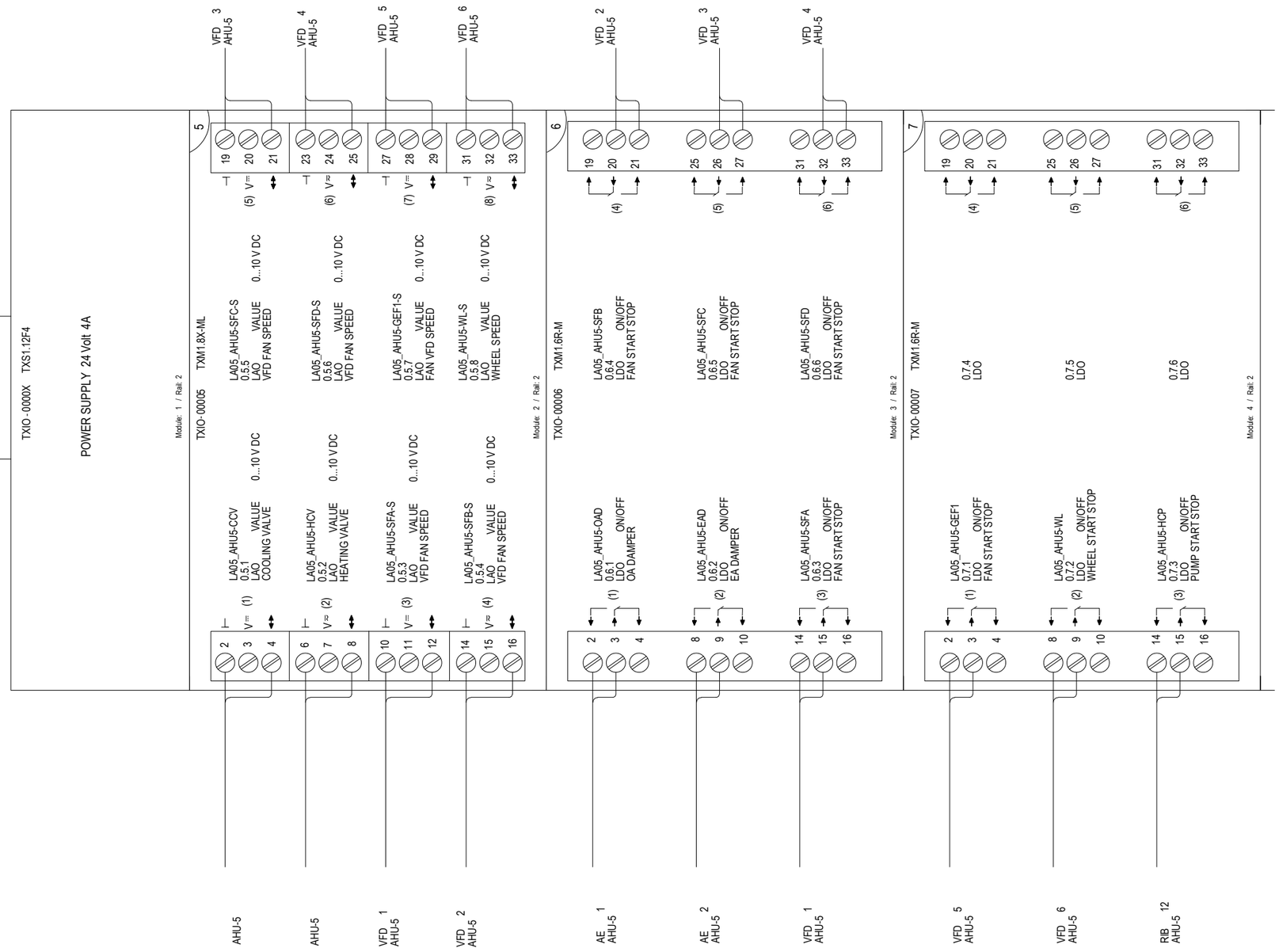
POWER SUPPLY 24 Volt 4A



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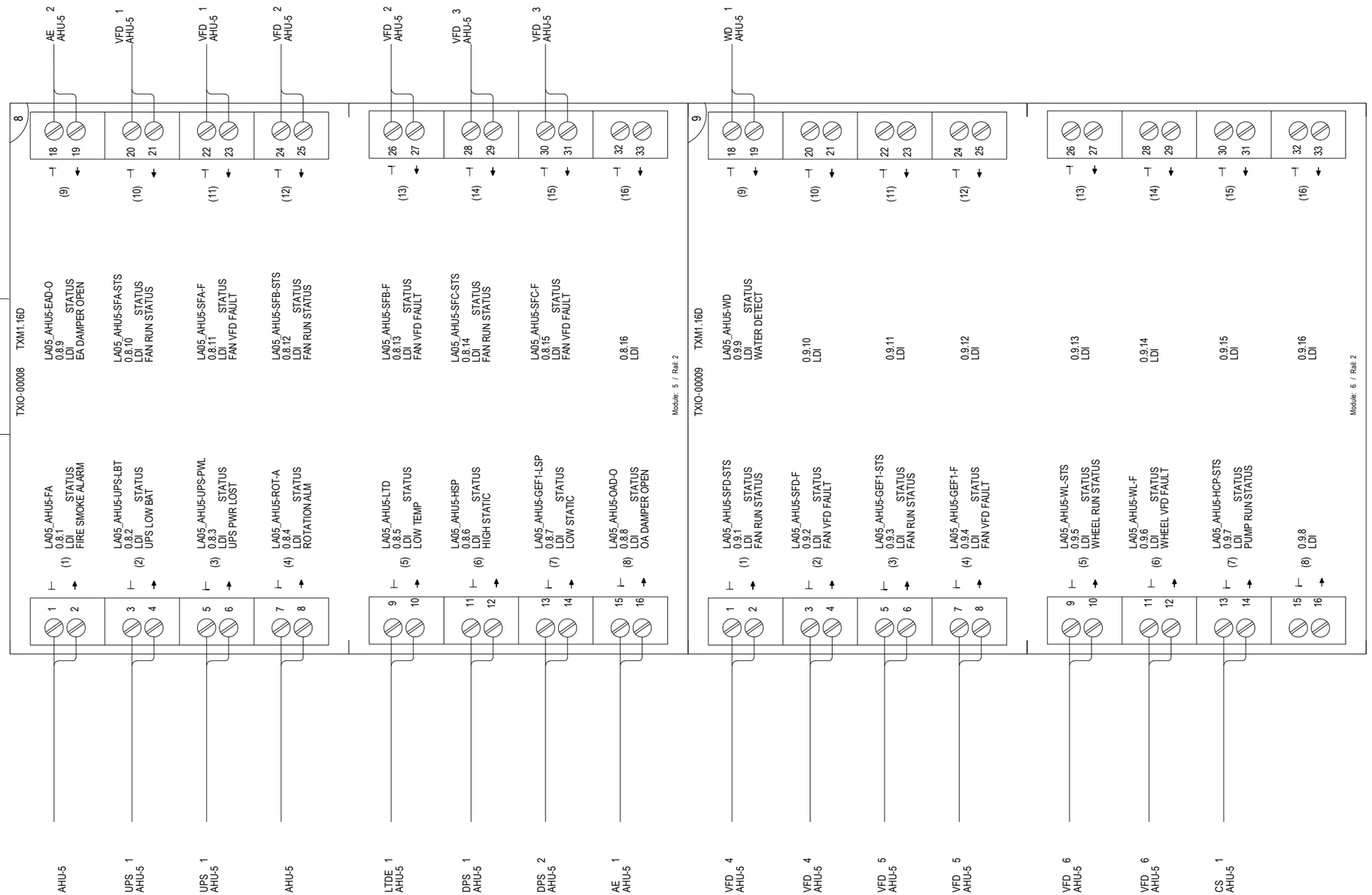

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	2	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.

2. ENABLE: ALL AHUS AND ASSOCIATED EXHAUST FANS OPERATE CONTINUOUSLY AS SCHEDULED ON THE MASTER OPERATOR'S WORK STATION OR DDC CONTROLLER.

3. ON THE AHU GRAPHICS, PROVIDE A SUMMATION OF ALL THE SUPPLY AIR VOLUMES AS MEASURED AT THE INDIVIDUAL ZONES ASSOCIATED WITH THAT AHU (ONE TOTAL AIRFLOW FOR AHUS-1/2/3 AND ONE TOTAL AIRFLOW FOR AHU-4/5). ON THE AHU GEF GRAPHICS, PROVIDE A SUMMATION OF ALL THE EXHAUST AIR VOLUMES AS MEASURED AT THE INDIVIDUAL ZONES ASSOCIATED WITH THAT GEF (ONE TOTAL AIRFLOW FOR GEFS-1/2/3 AND ONE TOTAL AIRFLOW FOR GEF-4/5).

OCCUPIED MODE:

1. STARTUP: ON A COMMAND TO START THE AIR HANDLER THE FOLLOWING SHALL OCCUR:

A. EXHAUST AIR DAMPER SHALL BE COMMANDED OPEN.

B. AFTER THE EXHAUST AIR DAMPER IS PROVED OPEN THE EXHAUST FANS SHALL START AND RUN INITIALLY AT **(20 HZ ADJ).**

C. THE ENERGY WHEEL SHALL START AND RAMP UP TO A STARTUP SPEED OF **10 RPM (ADJ)**.

D. AFTER A PERIOD OF **30 SECONDS (ADJ)** AT THE STARTUP SPEED, THE OUTDOOR AIR DAMPER SHALL BE COMMANDED OPEN.

E. AFTER THE OUTDOOR AIR DAMPER IS PROVED OPEN, THE SUPPLY FAN SHALL START AND THE WHEEL SHALL BE RELEASED FROM ITS STARTUP SPEED TO CONTROL TO NORMAL SETPOINTS. SUPPLY AND EXHAUST FANS RAMP UP TO MAINTAIN RESPECTIVE DUCT STATIC PRESSURE SETPOINTS.

2. SUPPLY AIR TEMPERATURE CONTROL:

A. **50F (ADJ)** AND BELOW OUTDOOR AIR TEMPERATURE:

I. **ENERGY RECOVERY WHEEL:** WHEEL IS ENABLED TO SPIN. MINIMUM AND MAXIMUM WHEEL SPEEDS **(ADJ)** IN HEATING MODE ARE PER MANUFACTURER. WHEEL SPEED MODULATES TO SATISFY THE UNIT DISCHARGE SUPPLY AIR TEMPERATURE SETPOINT. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE **55F (ADJ)** IN THIS TEMPERATURE RANGE.

FROST CONTROL PER WHEEL MANUFACTURER REQUIREMENTS SHALL INCLUDE, AT A MINIMUM, CONTROL LOGIC TO SLOW WHEEL SPEED DOWN SUCH THAT WHEEL EXHAUST DISCHARGE TEMPERATURE DOES NOT DROP BELOW **20F (ADJ)** NOR THE WHEEL OUTDOOR AIR DISCHARGE TEMPERATURE (COLD HALF) DOES NOT DROP BELOW **28F (ADJ)**.

SUPPLY AIR TEMPERATURE SETPOINT RESET SHALL BE ENABLED WITHIN THIS OA TEMPERATURE RANGE:

SUPPLY AIR TEMPERATURE RESET:

A. THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE RESET BASED ON OUTDOOR AIR TEMPERATURE AND COOLING DEMAND

B. THE BASELINE SUPPLY AIR TEMPERATURE SETPOINT WILL BE ESTABLISHED WITH THE FOLLOWING LINEAR RESET TABLE:

OUTDOOR AIR TEMPERATURE	SUPPLY AIR TEMPERATURE SETPOINT
30F (adj) AND BELOW	**60F (adj)**
50F (adj)	**55F (adj)**

c. ONCE THE BASELINE SUPPLY AIR TEMPERATURE SETPOINT IS ESTABLISHED THEN POLLING OF THE SPACES SERVED FOR CHILLED BEAM COOLING COIL REQUESTS WILL ADJUST THE SUPPLY AIR TEMPERATURE SETPOINT BY ADDING A FACTOR ESTABLISHED FROM THE FOLLOWING RESET TABLE:

COOLING REQUEST	ADJUSTMENT FACTOR
0	0
2	-2°F
4	-4°F
5 OR MORE	-5°F

II. **PREHEAT:** ONCE THE WHEEL IS AT THE MAXIMUM WHEEL SPEED FOR HEATING MODE, AND THE PREHEAT DISCHARGE TEMPERATURE REMAINS BELOW SETPOINT, THE PREHEAT COIL CONTROL VALVE SHALL BE MODULATED OPEN TO MAINTAIN PREHEAT DISCHARGE AIR TEMPERATURE AT PREHEAT AIR SETPOINT. THE PREHEAT AIR SETPOINT SHALL BE THE SUPPLY AIR temperature setpoint MINUS **4.0F (ADJ)** TO ACCOUNT FOR TEMP RISE ACROSS FANS AND TO MAXIMIZE THE HEATING POTENTIAL OF THE WHEEL. WHENEVER THE WHEEL IS FAILED OR OFF, THE PREHEAT COIL CONTROL VALVE SHALL BE MODULATED OPEN TO MAINTAIN PREHEAT DISCHARGE AIR TEMPERATURE AT PREHEAT AIR SETPOINT PLUS **3.0F (ADJ)** .

III. **COOLING** COIL VALVE IS DISABLED.

B. OUTDOOR AIR BETWEEN **50F (ADJ) AND 75F (ADJ):**

I. THE WHEEL SHALL BE STOPPED WITH EXCEPTION OF WHEEL STOP/JOG FUNCTION TO MINIMIZE UNEVEN DIRT LOADING ON THE WHEEL WHEN ENERGY TRANSFER IS NOT NEEDED. WHEEL STOP/JOG SHALL BE PER WHEEL MANUFACTURER REQUIREMENTS AND SHALL BE NO LESS THAN 1/8 ROTATION PER MINUTE.

II. **PREHEAT** IS DISABLED.

III. **COOLING COIL** CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE **54F (ADJ)** IN THIS OA TEMPERATURE RANGE.

C. OUTDOOR AIR **75F (ADJ)** AND ABOVE:

I. **ENERGY RECOVERY WHEEL** IS ENABLED. MAXIMUM WHEEL SPEEDS IN COOLING MODE IS PER WHEEL MANUFACTURER. WHEEL SPEED MODULATES TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT MINUS **1.0F (ADJ)** TO MAXIMIZE THE COOLING POTENTIAL OF THE WHEEL.

II. **PREHEAT** IS DISABLED.

III. **COOLING** COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE **53F (ADJ)** IN THIS OA TEMPERATURE RANGE.

SUPPLY AIR TEMPERATURE OVERRIDE:

THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE OVERRIDDEN IF THE EXHAUST AIR HUMIDITY ENTERING THE ERW EXCEEDS **55% RH (ADJ.)** AND THE SUPPLY AIR TEMPERATURE SETPOINT OVERRIDE SCHEDULE BELOW WILL ACTIVATE TO MAINTAIN THE HUMIDITY LEVELS IN THE SPACE. WHEN THE EXHAUST AIR HUMIDITY REACHES **54% RH (ADJ.)** THEN NORMAL SUPPLY AIR TEMPERATURE SETPOINT CONTROL FOR THIS OA TEMPERATURE RANGE MAY RESUME.

THE SUPPLY AIR TEMPERATURE SETPOINT IS RESET DOWNWARD UTILIZING THE FOLLOWING RESET:

RH	SUPPLY AIR TEMPERATURE SETPOINT
0-55%	NORMAL SUPPLY AIR TEMPERATURE SETPOINT
56-57%	SUPPLY AIR TEMPERATURE SETPOINT MINUS **1.0F (ADJ)**
58-59%	SUPPLY AIR TEMPERATURE SETPOINT MINUS **2.0F (ADJ)**
above 59%	SUPPLY AIR TEMPERATURE SETPOINT MINUS **3.0F (ADJ)**

4. SAFETIES: FURNISH SAFETIES AS FOLLOWS TO PROVIDE ALARM AND SHUTDOWN UNIT (TURN OFF SUPPLY FANS AND EXHAUST FAN, CLOSE OUTDOOR AIR DAMPER AND CLOSE EXHAUST AIR DAMPER) FOR EACH OF THESE CONDITIONS:

COOLING COIL INLET TO HAVE TWO (2) OR MORE SAFETY LOW LIMIT THERMOSTATS WIRED IN SERIES TO BREAK BELOW **38F (ADJ).** ON ALARM, PREHEAT AND CHILLED WATER CONTROL VALVES HAVE POWER REMOVED (AND FULLY OPEN), AND HEATING COIL PUMP SHALL RUN.

SUPPLY HIGH LIMIT STATIC PRESSURE SWITCH SET TO (+) **4.0" W.G. (ADJ).**

EXHAUST DUCT LOW LIMIT STATIC SENSOR SWITCH SET TO **(-) 3.5" W.G. (ADJ).**

IN THE EVENT OF SMOKE DETECTED AT THE DUCT EXHAUST DETECTOR BY THE FA SYSTEM. INDICATE "FA SHUTDOWN" ON GRAPHICS FOR AHU. DUCT DETECTOR SHUTDOWN OF EITHER AHU-4 OR AHU-5 SHALL ALSO SEND A SIGNAL TO ALSO SHUT DOWN AHU-6A AND AHU-6B AND DSF-11 AND DSF-12.

IN THE EVENT THAT OA DAMPER ENDSWITCH OR GEF ISOLATION DAMPER ENDSWITCH IS NOT FULLY OPEN AFTER MORE THAN **150 SECONDS (ADJ.)** AFTER COMMANDED.

4. **ALARMS:**

A. ALARM IF PREHEAT COIL RETURN WATER TEMPERATURE FALLS BELOW **43F (ADJ)** AND CONTINUE TO OPERATE THE PREHEAT COIL PUMP; COMMAND THE PREHEAT COIL VALVE FULL OPEN.

B. ALARM IF COOLING COIL RETURN WATER TEMPERATURE FALLS BELOW **35F (ADJ)**; COMMAND THE COOLING COIL VALVE FULL OPEN.

C. ALARM IF COOLING COIL INLET AIR TEMPERATURE FALLS BELOW **40F (ADJ)**; COMMAND THE COOLING COIL VALVE **25% (ADJ)** OPEN.

D. NOT USED.

E. ALARM IF WHEEL ROTATION DETECTOR DOES NOT REGISTER AT LEAST ONE ROTATION EVERY **FIFTEEN MINUTES (ADJ.)**; SIGNIFYING LOSS OF ROTATION.

F. ALARM IF THE MINIMUM OUTDOOR AIR CFM AS MEASURED BY THE SUM OF THE SUPPLY FAN AIRFLOW VOLUME FALLS **15% (ADJ.)** OR MORE BELOW THE SETPOINT FOR **30 MINUTES (ADJ.)**.

G. ALARM IF THE BUILDING PRESSURIZATION READING DROPS BELOW **0.000" W.G (ADJ.)** FOR MORE THAN **TEN MINUTES (ADJ.)**.

5. FAN STAGING

AT INITIAL AHU STARTUP (AFTER A FULL AHU SHUTDOWN) ONLY **TWO** SUPPLY FANS AND THE **ONE** EXHAUST FAN ARE IN OPERATION (THIS IS BASELINE FAN OPERATING MODE AND IT IS ACTIVE FROM INITIAL STARTUP). THE UNIT IS HELD IN BASELINE FAN OPERATING MODE FOR A PERIOD OF **TEN (ADJ)** MINUTES TO ALLOW THE TERMINAL UNITS TO ACHIEVE MORE STEADY INDIVIDUAL CONTROL DAMPER POSITIONS AND THEN THE BASELINE FAN OPERATING MODE HOLD IS RELEASED. THE STATIC PRESSURE RESET ALGORITHM IS MADE ACTIVE **TEN (ADJ)** MINUTES AFTER THE BASELINE FAN OPERATING MODE HOLD IS RELEASED.

EXIT BASELINE FAN OPERATING MODE WHEN THE OPERATING SUPPLY FAN SPEED SIGNAL IS INCREASED TO **65 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES. EXIT BASELINE FAN OPERATING MODE AND ENTER FIRST STAGE OPERATING MODE:

A. AN INOPERATIVE FAN IS TURNED ON (IF AVAILABLE FOR USE) AND IT'S COUNTERWEIGHTED BACKDRAFT DAMPER (NON-ACTUATED) BEGINS TO OPEN WHEN THE FAN HAS REACHED A SPEED SUFFICIENT TO CREATE THE REQUIRED DIFFERENTIAL PRESSURE NEEDED TO OVERCOME THE DAMPER WEIGHT SETTING.

B. THE FANS CONTINUING ON IN OPERATION RAMP DOWN IN SPEED (UTILIZING AN ADJUSTABLE DECEL RAMP TIME) TO MEET THE FAN

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RAMPING UP IN SPEED TO MAINTAIN THE SETPOINT. ALL FANS UTILIZE THE SAME SPEED INPUT SIGNAL AT ALL TIMES.
C. THE **THREE** FANS ATTAIN THE SAME SPEED AND THEN MODULATE TOGETHER TO MEET THE SETPOINT.

SEQUENCE OF OPERATION (CONTINUED):

EXIT FIRST STAGE OPERATING MODE WHEN THE OPERATING SUPPLY FAN SPEED SIGNAL IS INCREASED TO **64 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES. TO EXIT FIRST STAGE OPERATING MODE:
A. THE INOPERATIVE FAN IS TURNED ON (IF AVAILABLE FOR USE) AND IT'S COUNTERWEIGHTED BACKDRAFT DAMPER (NON-ACTUATED) BEGINS TO OPEN WHEN THE FAN HAS REACHED A SPEED SUFFICIENT TO CREATE THE REQUIRED DIFFERENTIAL PRESSURE NEEDED TO OVERCOME THE DAMPER WEIGHT SETTING.
B. THE FANS CONTINUING ON IN OPERATION RAMP DOWN IN SPEED (UTILIZING AN ADJUSTABLE DECEL RAMP TIME) TO MEET THE FAN RAMPING UP IN SPEED TO MAINTAIN THE SETPOINT. ALL FANS UTILIZE THE SAME SPEED INPUT SIGNAL AT ALL TIMES.
C. THE **FOUR** FANS ATTAIN THE SAME SPEED AND THEN MODULATE TOGETHER TO MEET THE SETPOINT.

IF **FOUR** OR **THREE** SUPPLY FANS ARE OPERATING AND THE SPEED SIGNAL IS REDUCED TO **40 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES, THEN THE PRIOR FAN OPERATING MODE IS INITIATED FOR THE SUPPLY FANS (e.g. GO FROM FOUR FANS BACK TO FIRST STAGE THREE FANS. OR GO FROM FIRST STAGE THREE FANS BACK TO BASLINE TWO FANS). TO ENTER THE PRIOR FAN OPERATING MODE:
A. AN OPERATING SUPPLY FAN IS TURNED OFF AND IT'S BACKDRAFT ISOLATION DAMPER FULLY CLOSES; DISABLE THE SUPPLY FAN WITH THE MOST OPERATING HOURS.
B. THE REMAINING OPERATING SUPPLY FANS CONTINUE TO OPERATE AND RAMP UP IN SPEED (UTILIZING AN ADJUSTABLE ACCEL RAMP TIME) TO MAINTAIN THE SETPOINT.

LOSS OF STATUS OF ANY OPERATING FAN TAKES THAT FAN OUT OF SERVICE, OUT OF THE FAN STAGING ROTATION, AND INDICATES AN ALARM AT THE OWS.

6.SUPPLY FAN SPEED: STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH SUPPLY DUCT AND FAN DISCHARGE STATIC PRESSURE SENSOR LOCATED IN AHU DISCHARGE TO FUNCTION WITH SUPPLY FAN VFC CONTROL LOOP TO MODULATE SUPPLY FAN SPEED TO ACHIEVE DUCT STATIC PRESSURE SET AT **1.25" W.G. (ADJ**), NOT TO EXCEED AHU DISCHARGE PRESSURE OF **3.9" W.G. (ADJ).** FINAL SETPOINTS DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER. ALL SUPPLY FANS IN A SINGLE AHU OPERATE AT THE SAME SPEED. ADDITIONALLY, THE FANS (SUPPLY AND EXHAUST) IN AHU-1 & AHU-2 & AHU-3 OPERATE AT THE SAME SPEED (MANIFOLDED DUCTS). THE FANS (SUPPLY AND EXHAUST) IN AHU-4 & AHU-5 OPERATE TOGETHER AT THEIR OWN SEPARATE SAME SPEED (MANIFOLDED DUCTS). CONTROL IS BASED ON IDENTIFICATION OF CRITICAL DUCT STATIC SENSOR SETPOINT AT EACH SENSOR (BY TAB) WHEN MULTIPLE SENSORS ARE UTILIZED; DO NOT AVERAGE THE SENSORS. EACH SENSOR SHALL HAVE IT'S OWN SEPARATE SETPOINT AND THE GOVERNING (MOST NEEDY) SENSOR INDICATED ON THE GRAPHICS.

IF **ZERO OR ONE (ADJ)** TERMINAL BOXES INDICATE A 95% OR GREATER DAMPER POSITION, THE STATIC PRESSURE SETPOINT SHALL DECREASE AT A RATE OF **0.1" W.G. (ADJ.)** EVERY **10 MINUTES (ADJ).**

IF **TWO OR THREE (ADJ)** TERMINAL BOXES IN THE SYSTEM INDICATE 95% OR GREATER OPEN DAMPER POSITION, HOLD THE STATIC PRESSURE AT CURRENT SETPOINT.

IF **FOUR (ADJ)** OR MORE TERMINAL BOXES IN THE SYSTEM INDICATE 95% OPEN DAMPER POSITION, THE SETPOINT SHALL INCREASE AT A RATE OF **0.1" W.G. (ADJ.)** EVERY **5 MINUTES (ADJ.)**.

IF A DAMPER POSITION IS AT 100% OPEN FOR MORE THAN **30 MINUTES (ADJ.)** THE DAMPER POSITION WILL BE LOCKED OUT OF THE POLLING, A DEFAULT VALUE OF THE DAMPER POSITION SETPOINT MINUS 3% ISSUED FOR THE DAMPER AND AN ALARM WILL BE GENERATED. THIS LOCK OUT WILL REMAIN UNTIL THE CONTROLLER AND DAMPER ARE REVIEWED BY MAINTENANCE PERSONNEL TO DETERMINE THE CAUSE OF THE READING. IF IT IS DETERMINED TO BE UNREPAIRABLE, THE BOX IN QUESTION WILL BE PERMANENTLY LOCKED OUT THE POLLING PROCESS. THIS WILL BE TERMED A ROGUE ZONE BOX.

THE SUPPLY FAN DUCT STATIC PRESSURE RESET WILL OPERATE WITHIN A RANGE FROM A LOW LIMIT OF **0.6" (ADJ)** TO A HIGH LIMIT OF **1.75" (ADJ)**. SETPOINT RANGE TO BE DETERMINED BY THE BALANCING CONTRACTOR IN CONJUNCTION WITH THE ENGINEER.

7. EXHAUST FAN SPEED: STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH EXHAUST DUCT AND FAN INLET STATIC PRESSURE SENSOR LOCATED UPSTREAM OF FAN INLET TO FUNCTION WITH EXHAUST FAN VARIABLE FREQUENCY CONTROLLER CONTROL LOOP TO MODULATE EXHAUST FAN SPEED TO ACHIEVE EXHAUST DUCT STATIC PRESSURE SETPOINT OF NEGATIVE **1.0" W.G. (ADJ),** FINAL SETPOINT SET BY TAB), NOT TO EXCEED A FAN INLET PRESSURE OF NEGATIVE **3.5" W.G. (ADJ).** ADDITIONALLY, THE FANS GEF-1 & GEF-2 & GEF-3 OPERATE AT THE SAME SPEED. AND THE FANS GEF-4 & GEF-5 OPERATE TOGETHER AT THEIR OWN SEPARATE SAME SPEED. CONTROL IS BASED ON IDENTIFICATION OF CRITICAL DUCT STATIC SENSOR SETPOINT AT EACH SENSOR (BY TAB) WHEN MULTIPLE SENSORS ARE UTILIZED; DO NOT AVERAGE THE SENSORS. EACH SENSOR SHALL HAVE IT'S OWN SEPARATE SETPOINT AND THE GOVERNING (MOST NEEDY) SENSOR INDICATED ON THE GRAPHICS.

EMERGENCY LOW SUPPLY AIR MODE (ELSAM) **(LAB AHU-1, AHU-2 AND AHU-3 ONLY)**: LOSS OF THREE OR FOUR SUPPLY FANS IN ANY OF THE INDIVIDUAL LAB AHUS SHALL INITIATE ELSAM MODE FOR THAT AHU'S EXHAUST FAN. ELSAM IS TRIGGERED OFF (RETURN TO NORMAL OPERATION) WHEN AT LEAST THREE SUPPLY FANS RETURN TO OPERATION IN THAT AHU. INITIATION OF ELSAM MODE AT THIS AHU SHALL MODIFY THE EXHAUST DUCT STATIC PRESSURE SETPOINT FOR THIS AHU TO BE THE ELSAM1 SETTING OF NEGATIVE **0.80" W.G.** (ADJUSTABLE SETPOINT AS CLARIFIED WITH THE ENGINEER). INITIATION OF ELSAM MODE AT **TWO** OF THE LAB AHUS SHALL MODIFY THE EXHAUST DUCT STATIC PRESSURE SETPOINT TO BE THE ELSAM2 SETTING OF NEGATIVE **0.60" W.G.** (ADJUSTABLE SETPOINT AS CLARIFIED WITH THE ENGINEER) AT ALL **THREE** LAB AHUS.

EXHAUST FAN INTERLOCKS **(all five AHUs)**: THE EXHAUST FAN SHALL BE LOGIC INTERLOCKED WITH SUPPLY FANS TO STOP THE MATCHING EXHAUST FAN WHENEVER ALL FOUR SUPPLY FANS ARE OFF IN ANY SINGLE AHU.

8. PREHEAT COIL PUMP SHALL RUN WHEN:
A. THE "OUTDOOR AIR TEMPERATURE LEAVING THE ERW – COLD SIDE" IS LESS THAN **40F (ADJ.)** EVEN IF THERE IS NO CALL FOR HEAT.
B. UPON ANY CALL FOR HEAT TO OPEN THE HEATING WATER VALVE.
THE PREHEAT COIL PUMP SHALL BE OFF WHILE THE UNIT IS IN NORMAL OPERATION AND THE OUTDOOR AIR TEMPERATURE IS ABOVE **45F (ADJ)**.

9. BUILDING PRESSURIZATION THE PRIMARY BUILDING PRESSURIZATION SETPOINT SHALL BE POSITIVE **0.015" W.G. (ADJ.)**. IF THE AHU'S BUILDING PRESSURIZATION READING EXCEEDS THE PRIMARY BUILDING PRESSURIZATION SETPOINT BY **0.010" W.G. (ADJ.)** THE CIRCULATION SPACE EXHAUST AIR VALVE DESIGNATED FOR BUILDING PRESSURIZATION SHALL INCREASE TOWARD IT'S MAXIMUM AIRFLOW UNTIL THE BUILDING PRESSURIZATION READING EQUALS THE PRIMARY BUILDING PRESSURIZATION SETPOINT. IF THE AHU'S BUILDING PRESSURIZATION READING IS LOWER THAN THE PRIMARY BUILDING PRESSURIZATION SETPOINT BY **0.010" W.G. (ADJ.)** THE CIRCULATION SPACE EXHAUST AIR VALVE DESIGNATED FOR BUILDING PRESSURIZATION SHALL DECREASE IT'S AIRFLOW UNTIL THE BUILDING PRESSURIZATION READING EQUALS THE PRIMARY BUILDING PRESSURIZATION SETPOINT. IF THE AHU'S BUILDING PRESSURIZATION READING IS WITHIN THE DEADBAND RANGE OF THE PRIMARY BUILDING PRESSURIZATION SETPOINT THE CIRCULATION SPACE EXHAUST AIR VALVE DESIGNATED FOR BUILDING PRESSURIZATION SHALL MAINTAIN IT'S CURRENT AIRFLOW SETPOINT. CIRCULATION ZONE EXHAUST VALVES ASSOCIATED WITH AHU PRESSURE READINGS ARE: AHU-1: 102; AHU-2: 212; AHU-3: 309; AHU-4: 410; AHU-5: 510.

EMPLOY ERROR CHECKING TO IDENTIFY ANY BUILDING PRESSURE READING WHICH IS MORE THAN OR LESS THAN **0.015" W.G. (ADJ.)** FROM THE AVERAGE OF THE FIVE BUILDING PRESSURE SENSORS FOR MORE THAN **THIRTY MINUTES (ADJ.)** AND SIGNAL AN ALARM FOR MAINTENANCE OF THAT SENSOR.

10. SHUTDOWN: ON AHU SHUTDOWN , SUPPLY AND EXHAUST FANS SHALL STOP, OUTDOOR AIR DAMPERS AND EXHAUST AIR DAMPERS CLOSE, WHEEL STOPS CONTROLLING FOR TEMPERATURE (AND GOES INTO MAINTENANCE MODE). MAINTAIN PREHEAT DISCHARGE AIR TEMPERATURE SETPONT OF **60F (ADJ)** BY MODULATING PREHEAT COIL VALVE WITH COIL PUMP OFF. CLOSE COOLING COIL VALVE EXCEPT ON LOW LIMIT SAFETY SHUTDOWN. LOSS OF A SINGLE SUPPLY FAN SHALL NOT SHUTDOWN THE UNIT.

AHU UNOCCUPIED MODE **(OFFICE AHU-4 AND AHU-5 ONLY)**
1. UNIT IS INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL REGULAR UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER. DURING UNOCCUPIED MODE THE AHUS ARE TURNED OFF.

2. **UNOCCUPIED OVERRIDE:** MAINTAIN MINIMUM SPACE TEMPERATURES AND MAXIMUM SPACE TEMPERATURES OF **62F (ADJ)** AND **82F (ADJ)** BY POLLING INDIVIDUAL SPACE TEMPERATURE SENSORS. ALLOW FOR FIVE CRITICAL SPACES TEMPERATURE SENSORS IN THE PROGRAMMING (INITIALLY SET AS **ROOMS 100, 104, 207, 308, AND 420** WITH CRITICAL SPACES GRAPHICALLY SELECTABLE); IF TWO OF THE FIVE CRITICAL SPACES FALL OUT OF UNOCCUPIED TEMPERATURE RANGE THEN RETURN THE UNIT TO OCCUPIED MODE FOR **TWO (ADJ)** HOURS, AT THE END OF WHICH TIME THE UNIT RESUMES REGULAR SCHEDULING. IF SIX OF THE TOTAL SPACES SERVED BY THE UNIT FALL OUT OF UNOCCUPIED TEMPERATURE RANGE THEN RETURN THE UNIT TO OCCUPIED MODE FOR THE REMAINDER OF THE PERIOD, AT THE END OF WHICH TIME THE UNIT RESUMES REGULAR SCHEDULING. USE OF A HYSTERESIS OF **2F (ADJ)** IS REQUIRED TO PREVENT SHORT CYCLING (I.E. UNIT ON AT 62°F/OFF AT 64°F TO PROVIDE HEAT; UNIT ON AT 82°F/OFF AT 80°F TO PROVIDE COOLING).

3. **HUMIDITY CONTROL:** UNIT IS CYCLED ON TO MAINTAIN MAXIMUM UNOCCUPIED SPACE RH BELOW **65% RH (ADJ)**. IF FOUR OF THE FIVE CRITICAL SPACES HUMIDITY SENSORS EXCEED THE MAXIMUM UNOCCUPIED RH LEVEL WHEN THE OUTDOOR AIR TEMPERATURE EXCEEDS **70F (ADJ)** THEN RETURN THE UNIT TO OCCUPIED MODE FOR **THREE (ADJ)** HOURS, AT THE END OF WHICH TIME THE UNIT RESUMES REGULAR SCHEDULING. HUMIDIFICATION CONTROL CYCLE SHALL EMPLOY DEHUMIDIFICATION THROUGH COOLING COIL WITH SPACE REHEAT AS NEEDED. USE OF A HYSTERESIS OF **3 % RH (ADJ)** IS REQUIRED TO PREVENT SHORT CYCLING (I.E. UNIT TURNS ON WHEN FOUR REACH 65% RH AND UNIT TURNS OFF WHEN FOUR DECREASE BELOW 62% RH).

TRANSITION TO UNOCCUPIED: UPON TRANSITION TO UNOCCUPIED CYCLE, SUPPLY AND EXHAUST FANS SHALL STOP ACCORDING TO SHUTDOWN SEQUENCE DESCRIBED ABOVE. SPACE TEMPERATURES SHALL BE MAINTAINED AT UNOCCUPIED SETPOINTS PER ZONE LEVEL

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-1 THRU AHU-5 SOO 2

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241B

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TEMPERATURE CONTROL SEQUENCES.?

TRANSITION TO OCCUPIED MODE: UNIT IS INDEXED TO OCCUPIED MODE BASED ON AHU SCHEDULE.

TRANSITION TO OCCUPIED MODE MORNING WARM-UP/COOL DOWN:

MORNING WARM–UP/COOL DOWN SHALL BE ACCOMPLISHED USING THE SSTO TIME OPTIMIZATION SEQUENCE OR A SIMILAR "CANNED" OPTIMAL START SEQUENCE WHICH TAKES INTO ACCOUNT OUTDOOR AIR TEMPERATURES.

REVISION HISTORY

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AHU-1 THRU AHU-5 SOO 3

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GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110

RIB-9
LA06_DSF11
0006:0.6.5
START/STOP
CS-1
LA06_DSF11-STS
0006:0.9.9
STATUS

DSF-11

DSF-12

RIB-10
LA06_DSF12
0006:0.6.6
START/STOP
CS-2
LA06_DSF12-STS
0006:0.9.10
STATUS

2/250 DSF-11 & 12 CONTROL DIAGRAM

PNL-6 / AUX-6

RB-1
LA06_AHU6A-FA
0006:0.8.1
6A FA
4
UPS-1
UPS LO BATT
LA06_AHU6AB-UPS-LBT
0006:0.8.4
POWER LOSS
LA06_AHU6AB-UPS-PWL
0006:0.8.5
RE-1

RB-2
LA06_AHU6B-FA
0006:0.8.2
6B FA
4
LA06_DSF11-12-FA
0006:0.8.3
DS-11&12 FA
4

ELECTRICAL TROUGH
PNL-6
PXCA-6
AHU-6A & 6B CONTROL PANEL
AUX-6
AHU-6A & 6B
120 VAC
UPS
PWR-6

INSTALLATION NOTES:
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. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
6. VFD PROVIDED BY OTHERS.
7. REFER TO PLANS FOR LOCATIONS.
8. REFER TO PLANS FOR PRESSURE PROBE LOCATIONS. COORDINATE WITH OWNER FOR EXACT LOCATION OF BUILDING STATIC PRESSURE SENSOR AND ASSOCIATED PROBES.
9. LOCATE 3" FROM PREFILTER OUTLET.

7
HTTE-3
10/90 %RH
LA06_AHU6B-RMH2
0006:0.2.7
HUMIDITY
LA06_AHU6B-RMT2
0006:0.2.8
TEMPERATURE

7
CO2-3
0/2000 ppm
LA06_AHU6B-CO2-2
0006:0.2.4

3RD LEVEL

TTE-7
20/120 DEG F
LA06_AHU6B-RAT
0006:0.3.6

3 4
SD-2

RA

CLOSET 397

VFD-SF-6B1
RIB-6
SAFETY RELAY
RIB-5
LA06_AHU6B-SF1
0006:0.6.3
START/STOP
LA06_AHU6B-SF1-S
0006:0.5.7
SPEED
LA06_AHU6B-SF1-STS
0006:0.9.5
STATUS
LA06_AHU6B-SF1-F
0006:0.9.6
FAULT

6
VFD-3

VFD-SF-6B2
RIB-8
SAFETY RELAY
RIB-7
LA06_AHU6B-SF2
0006:0.6.4
START/STOP
LA06_AHU6B-SF2-S
0006:0.5.8
SPEED
LA06_AHU6B-SF2-STS
0006:0.9.7
STATUS
LA06_AHU6B-SF2-F
0006:0.9.8
FAULT

6
VFD-4

DPS-3
-2 IN WG
LA06_AHU6B-LSP
0006:0.8.9
2
HI LO
SPP-7

TTE-5
20/120 DEG F
LA06_AHU6B-MAT
0006:0.3.4
9

DPTE-4
+/-10IN WG
LA06_AHU6B-DASP
0006:0.3.1
H L
SPP-8

TTE-6
20/120 DEG F
LA06_AHU6B-DAT
0006:0.3.5

DPS-4
3 IN WG
LA06_AHU6B-HSP
0006:0.8.8
2
HI LO
SPP-9

TTE-10
20/120 DEG F
LA06_AHU6B-SAT
0006:0.3.8

SPP-10
2
H
DPTE-5
+/-5 IN WC
LA06_AHU6B-SSP
0006:0.3.2

SA

SF-6B1
5250 CFM
5.0 HP
SF-6B2
5250 CFM
5.0 HP
5

WD-2
WATER DET
LA06_AHU6B-WD
0006:0.8.11

FIELD DUCTWORK

AHU-6B FILED DUCTWORK
CLOSET 298

CLOSET 298

xx SQ/FT
H
C

INJECTION VAV BOX 4-240
SEE DRAWING 454 FOR DETAILS

FROM AHU-4/5

AE-2
0-10 V

V-1
0-10 VDC
F.I/P
HWR
CHWS

TTE-2
20/120 DEG F

BOX 4-240

TTE-8
-40/240DEG F
LA06_AHU6B-CRT
0006:0.3.7

V-3
0/10 VOLTS
LA06_AHU6B-CCV
0006:0.5.5
CHWR
NO-SR
CHWS

V-4
0/10 VOLTS
LA06_AHU6B-HCV
0006:0.5.6
HWR
NO-SR
HWS

TTE-3
20/120 DEG F
LA06_AHU6A-RAT
0006:0.2.1

RA

2ND LEVEL

3 4
SD-1

INJECTION VAV BOX 4-153
SEE DRAWING 454 FOR DETAILS

FROM AHU-4/5

AE-2
0-10 V

V-1
0-10 VDC
F.I/P
HWR
CHWS

TTE-2
20/120 DEG F

BOX 4-153

VFD-SF-6A1
RIB-2
SAFETY RELAY
RIB-1
LA06_AHU6A-SF1
0006:0.6.1
START/STOP
LA06_AHU6A-SF1-S
0006:0.5.3
SPEED
LA06_AHU6A-SF1-STS
0006:0.9.1
STATUS
LA06_AHU6A-SF1-F
0006:0.9.2
FAULT

6
VFD-1

VFD-SF-6A2
RIB-4
SAFETY RELAY
RIB-3
LA06_AHU6A-SF2
0006:0.6.2
START/STOP
LA06_AHU6A-SF2-S
0006:0.5.4
SPEED
LA06_AHU6A-SF2-STS
0006:0.9.3
STATUS
LA06_AHU6A-SF2-F
0006:0.9.4
FAULT

6
VFD-2

DPS-1
-2 IN WG
LA06_AHU6A-LSP
0006:0.8.7
2
HI LO
SPP-1

TTE-1
20/120 DEG F
LA06_AHU6A-MAT
0006:0.1.7
9

DPTE-1
+/-10IN WG
LA06_AHU6A-DASP
0006:0.1.1
H L
SPP-2

TTE-2
20/120 DEG F
LA06_AHU6A-DAT
0006:0.1.6

DPS-2
3 IN WG
LA06_AHU6A-HSP
0006:0.8.6
2
HI LO
SPP-3

TTE-9
20/120 DEG F
LA06_AHU6A-SAT
0006:0.4.1

SPP-4
2
H
DPTE-2
+/-5 IN WC
LA06_AHU6A-SSP
0006:0.1.2

SA

SF-6A1
5250 CFM
5.0 HP
SF-6A2
5250 CFM
5.0 HP
5

WD-1
WATER DET
LA06_AHU6A-WD
0006:0.8.10

FIELD DUCTWORK

AHU-6A FILED DUCTWORK
CLOSET 198A

CLOSET 198A

H
C

TTE-4
-40/240DEG F
LA06_AHU6A-CRT
0006:0.2.2

V-1
0/10 VOLTS
LA06_AHU6A-CCV
0006:0.5.1
CHWR
NO-SR
CHWS

V-2
0/10 VOLTS
LA06_AHU6A-HCV
0006:0.5.2
HWR
NO-SR
HWS

1/250 AHU-6A AND AHU-6B CONTROL DIAGRAM

DPTE-6
+/-0.25 IN H2O
LA06_AHU6B-BDP
0006:0.9.3
H L
SSP-12
SSP-11 8

BUILDING DIFFERENTIAL PRESSURE SENSOR

7
HTTE-2
10/90 %RH
LA06_AHU6B-RMH1
0006:0.2.5
HUMIDITY
LA06_AHU6B-RMT1
0006:0.2.6
TEMPERATURE

7
CO2-2
0/2000 ppm
LA06_AHU6B-CO2-1
0006:0.2.3

DPTE-3
+/-0.25 IN H2O
LA06_AHU6A-BDP
0006:0.1.3
H L
SSP-6
SSP-5 8

BUILDING DIFFERENTIAL PRESSURE SENSOR

7
HTTE-1
10/90 %RH
LA06_AHU6A-RMH
0006:0.1.5
HUMIDITY
LA06_AHU6A-RMT
0006:0.1.6
TEMPERATURE

7
CO2-1
0/2000 ppm
LA06_AHU6A-CO2
0006:0.1.4

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GJ LAUNCH ACCELERATOR FOR BIO
ID# 202500072, IN

ENGR	DRAFTER	CHECKED BY	WORK STARTED	LAST EDIT DATE
HB		KG	04/02/26	04/02/26

AHU-6A/B CONTROL

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250

REF#	FIELD PANEL NAME
0006	LA06.PXCA

FIELD PANEL NODE NAME

REVISION HISTORY

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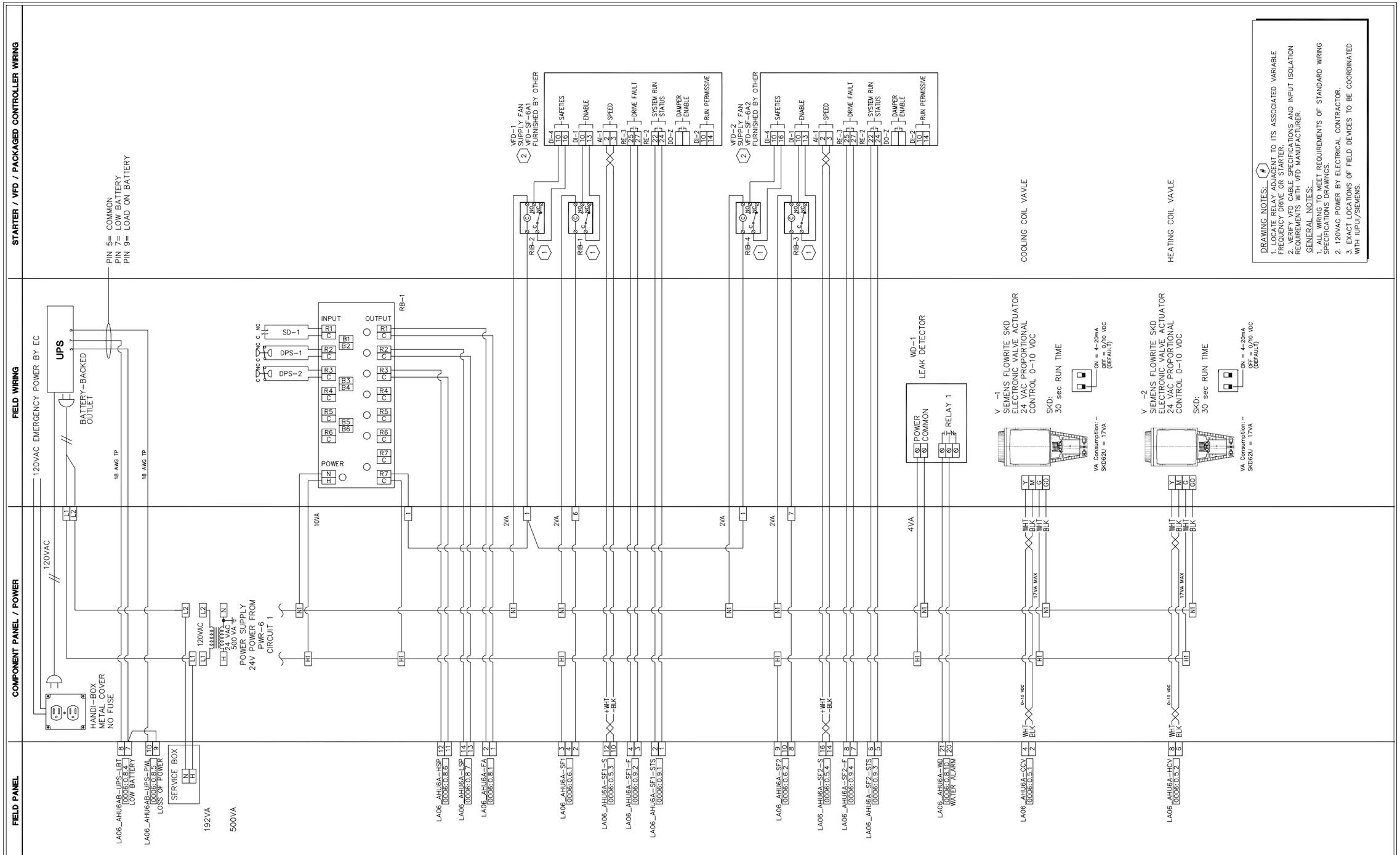
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL



DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0006	LA06.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-6A ELEC. WIRING 1

440P412785
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250A

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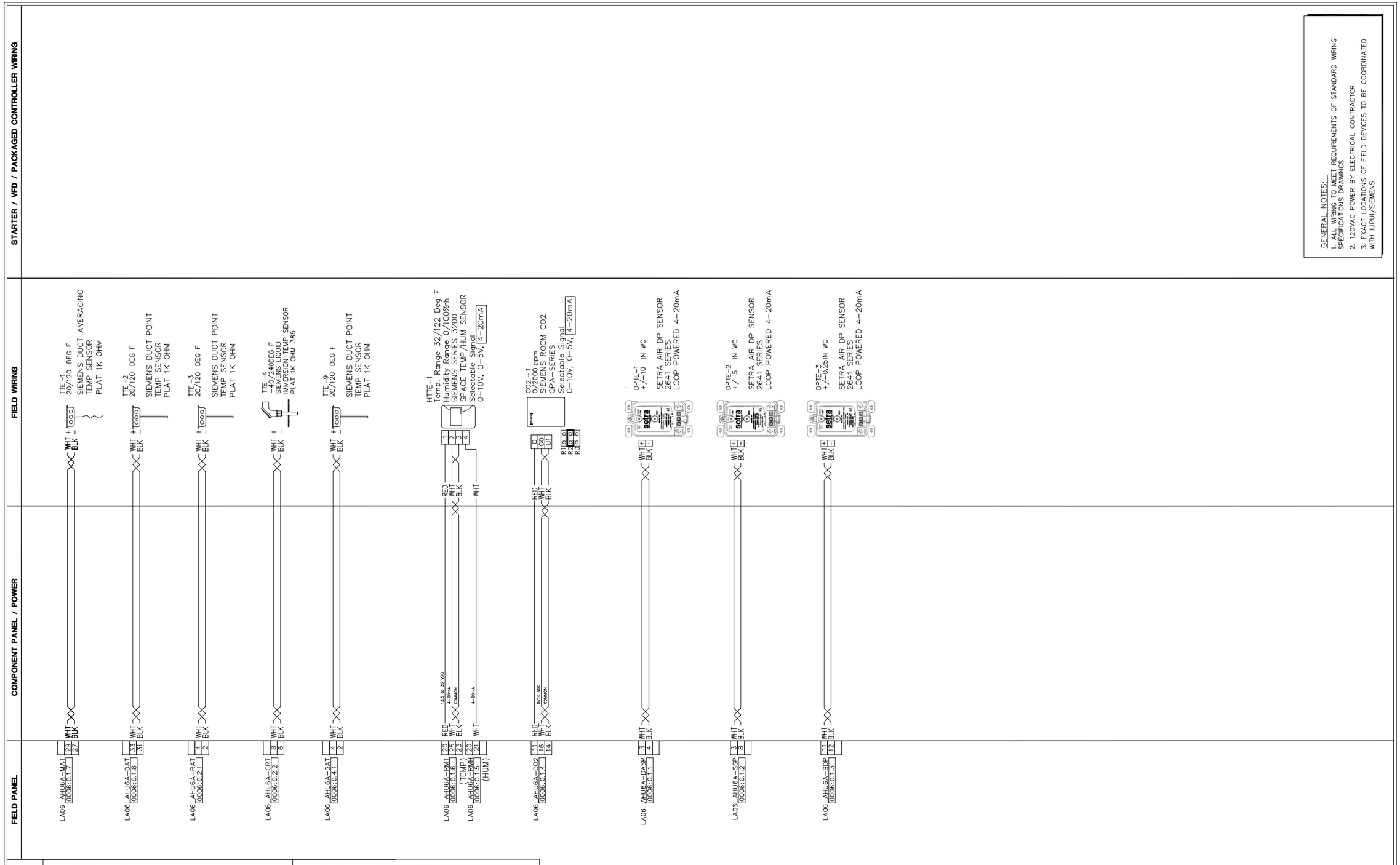

GENERAL NOTES:
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0006	LA06.PXCA	

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AHU-6A ELEC. WIRING 2

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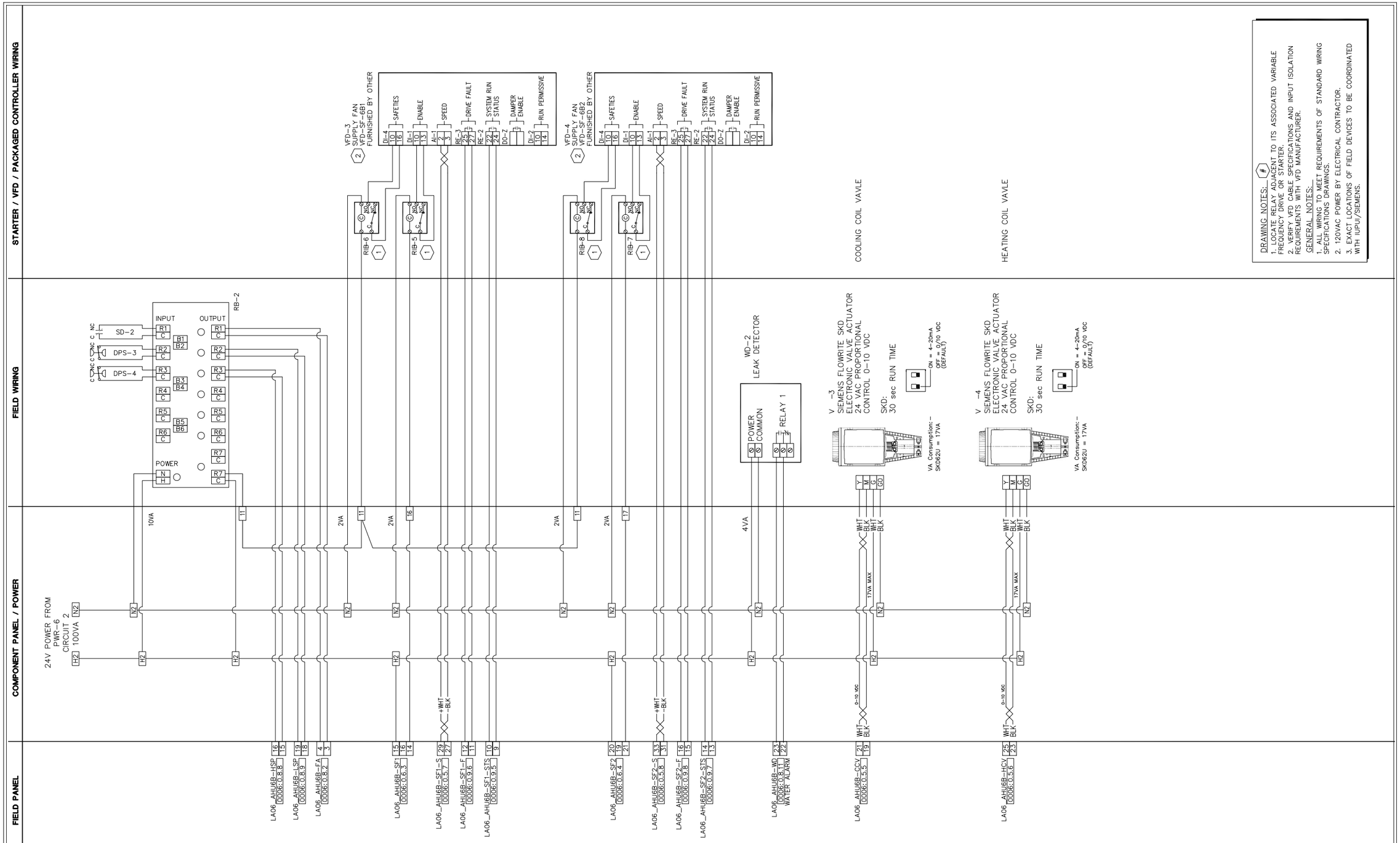

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
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AHU-6B ELEC. WIRING 1

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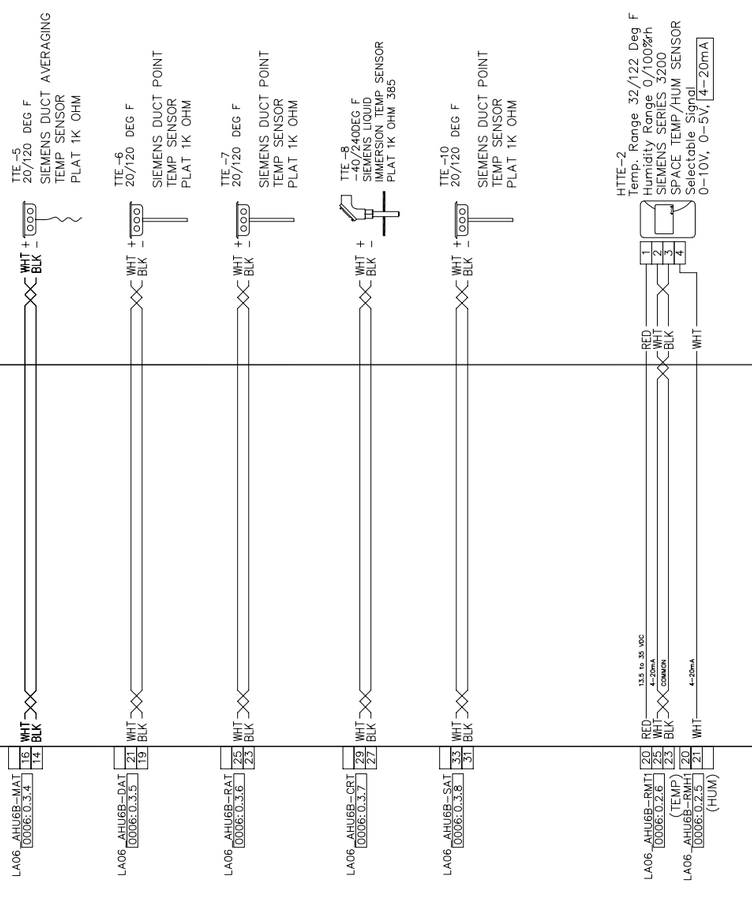
FIELD WIRING | STARTER / VFD / PACKAGED CONTROLLER WIRING



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	
0006	LA06.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-6B ELEC. WIRING 2

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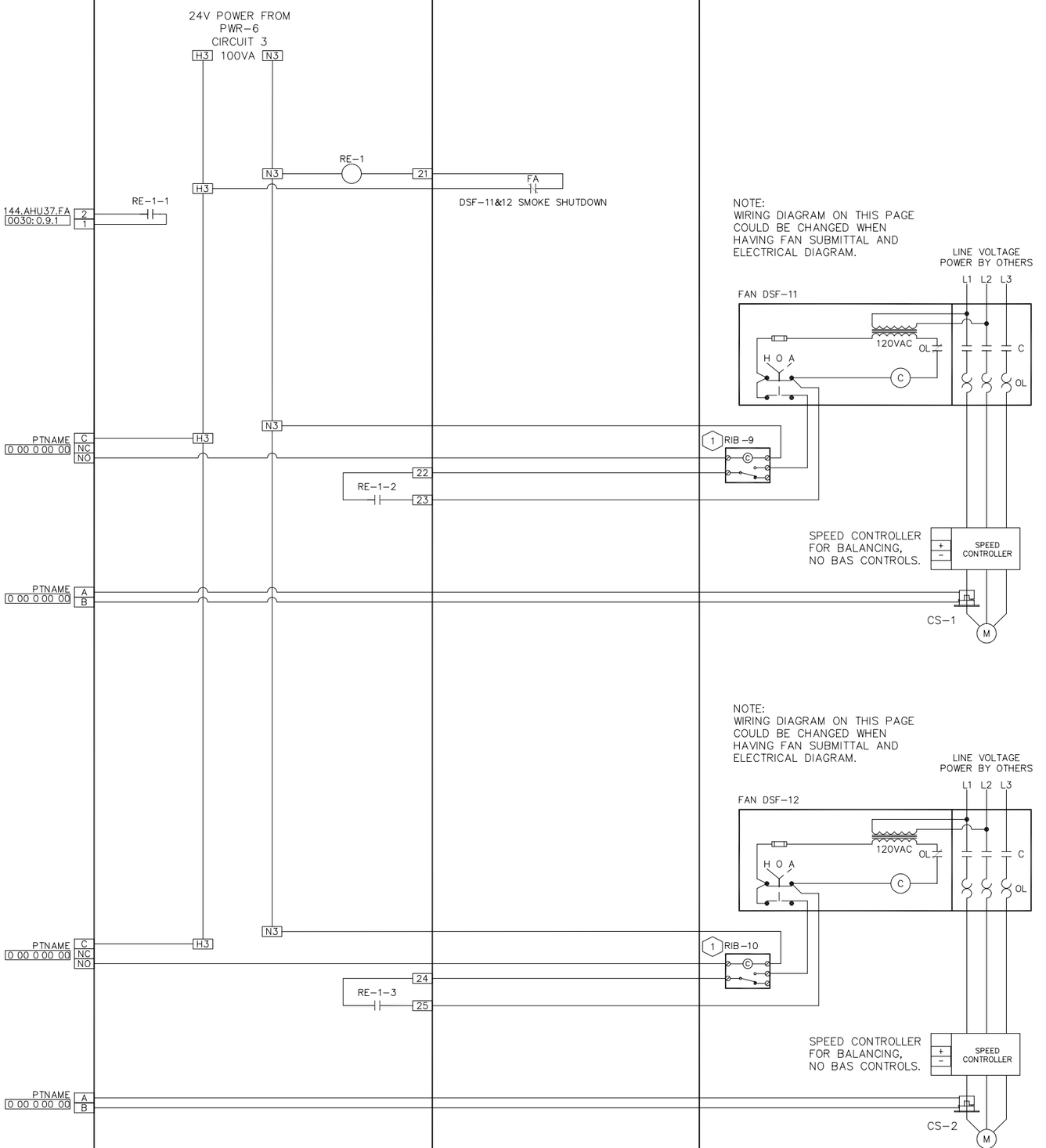
FIELD PANEL	AUX PANEL / POWER	FIELD WIRING	STARTER WIRING



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

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.

REF#	FIELD PANEL NAME		FIELD PANEL NODE NAME
0001	LW.MECH05A.10100		LW.MECH05A.10100

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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DSF-11&12 ELEC WIRING

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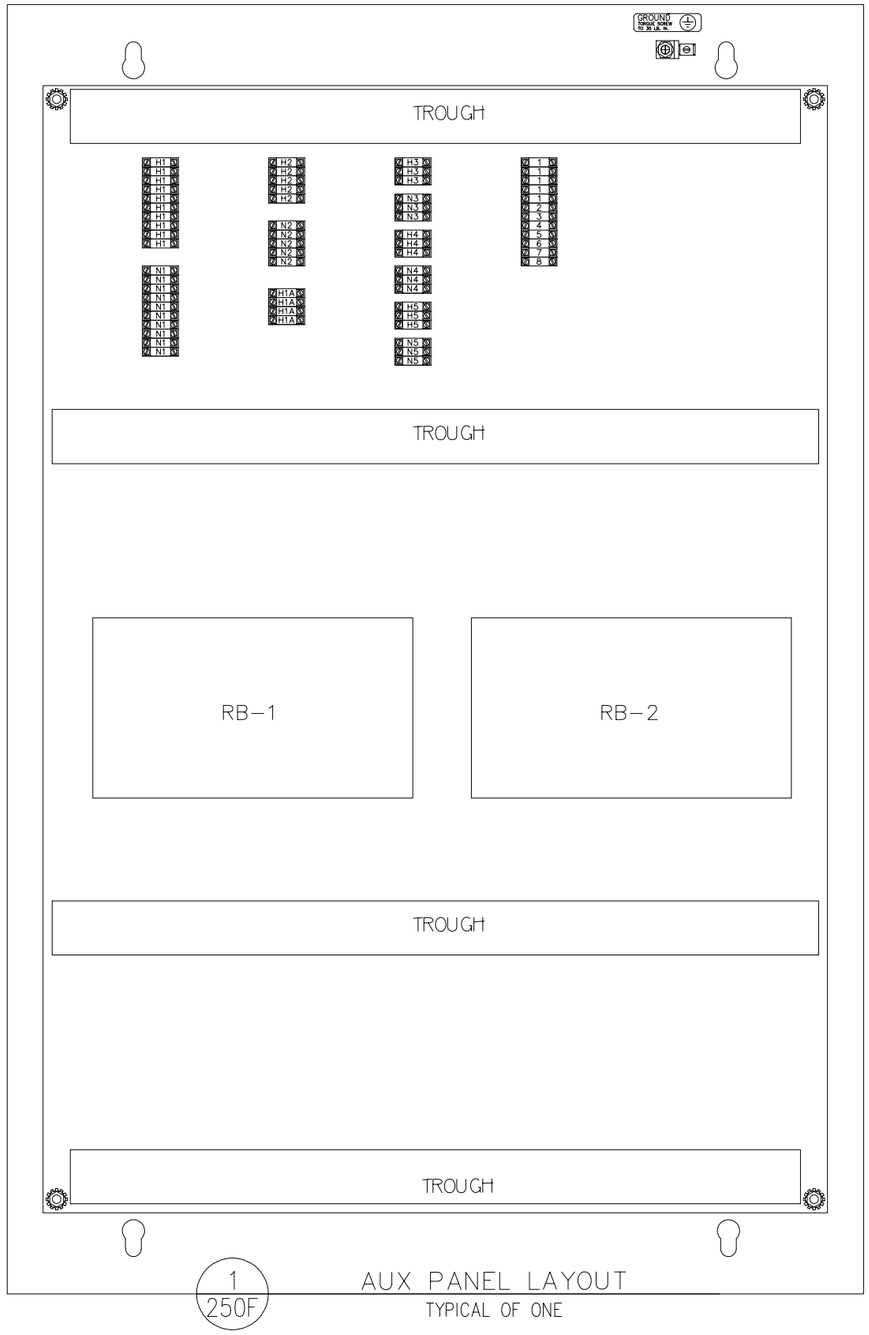

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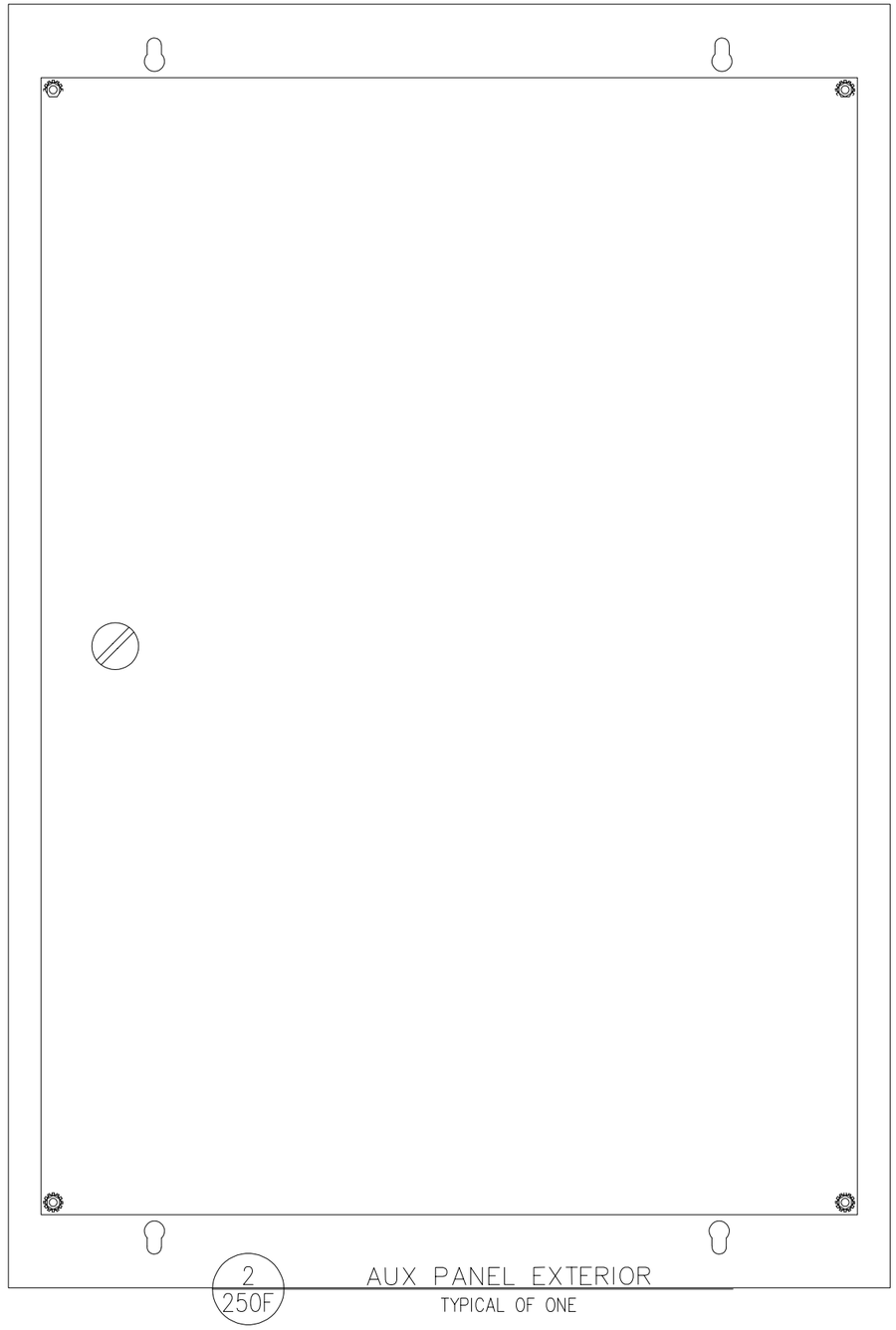
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-6A&B AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CO2 1	1	QPA2000	SIEMENS	149910	ROOM CO2 SENSOR, 0-10V
	1	ARG70	SIEMENS	149399	T'STAT WALL PLATE ESCUTCHEON
CO2 2	1	QPA2000	SIEMENS	149910	ROOM CO2 SENSOR, 0-10V
	1	ARG70	SIEMENS	149399	T'STAT WALL PLATE ESCUTCHEON
CO2 3	1	QPA2000	SIEMENS	149910	ROOM CO2 SENSOR, 0-10V
	1	ARG70	SIEMENS	149399	T'STAT WALL PLATE ESCUTCHEON
CS 1-2	2	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-4	4	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2	1	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 3	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
DPTE 4	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 5	1	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 6	1	2641R25WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-0.25" ENC
HTTE 1	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
HTTE 2	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
HTTE 3	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
PNL AUX-6	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 6	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-10	10	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-4	4	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 5	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 6	1	SPH10	VAISALA		STATIC PRESSURE HEAD
SPP 7-10	4	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 11	1	S.A.P./B	AIR MONITOR		STATIC AIR PROBE
SPP 12	1	SPH10	VAISALA		STATIC PRESSURE HEAD
TTE 1	1	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 2-3	2	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 4	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 5	1	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 6-7	2	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 8	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 9-10	2	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-4	4	FBO			FURNISHED BY OTHERS
WD 1-2	2	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
RB 1-2	2	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.
2. **ENABLE:** AIR HANDLER IS STARTED FROM DDC PANEL OR FROM COMMAND OF FACILITY MANAGEMENT SYSTEM.

OCCUPIED MODE:

1. STARTUP:

- **NORMAL STARTUP:** SUPPLY FAN SHALL START AND RAMP UP TO STATIC PRESSURE SETPOINT. ONCE FAN STATUS PROOFS ARE ON, COOLING CONTROL LOOP WILL START. SUPPLY AIR TEMPERATURE CONTROL LOOP IS ACTIVE.

2. NORMAL OPERATION: AIR HANDLER TO RUN CONTINUOUSLY IN NORMAL OPERATION.

OCCUPIED CYCLE (8760 HOURS PER YEAR):

1. THE CONTROL TEMPERATURE IS CALCULATED BASED ON A WEIGHTED AVERAGE OF THE SPACE TEMPERATURE READING AND THE FAN INLET TEMPERATURE READING. THE DEFAULT WEIGHTING SHALL BE CONTROL TEMPERATURE EQUALS **50% (ADJ)** TIMES THE SPACE TEMPERATURE READING **PLUS 50% (ADJ)** TIMES THE FAN INLET TEMPERATURE READING. THIS IS A SINGLE ZONE AHU WITHOUT ANY ZONE TERMINAL UNITS.

2. WHILE THE CONTROL TEMPERATURE IS BELOW **74.5F (ADJ)** THE FAN OPERATES AT MINIMUM SPEED SETPOINT **20HZ (ADJ)** AND THE CHILLED WATER VALVE IS COMMANDED FULLY CLOSED. PARTIAL USE OF THE ROOM (e.g. ONLY ONE RACK INSTALLED IN THE ROOM WHICH IS SIZED FOR EIGHT RACKS) WILL BE ACCOMODATED BY ADJUSTING SUPPLY AIR MANUAL VOLUME DAMPERS TO DIRECT THE COOL SUPPLY AIR TO THE PORTION OF THE ROOM WHERE THE HEAT IS BEING PRODUCED AND WHERE THE USERS OF THE ROOM PREFER THE

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-6A/B CNTRL BOM & SOO 1

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THE SUPPLY AIR TO DISCHARGE BASED ON THEIR CURRENT PHYSICAL ARRANGEMENT OF EQUIPMENT WITHIN THE SPACE.

A. FAN STAGING

AT INITIAL AHU STARTUP (AFTER A FULL AHU SHUTDOWN) ONLY **ONE** SUPPLY FAN IS IN OPERATION (THIS IS BASELINE FAN OPERATING MODE AND IT IS ACTIVE FROM INITIAL STARTUP). THE UNIT IS HELD IN BASELINE FAN OPERATING MODE FOR A PERIOD OF **TEN (ADJ)** MINUTES TO ALLOW THE SYSTEM TO ACHIEVE STEADY OPERATION AND THEN THE BASELINE FAN OPERATING MODE HOLD IS RELEASED. THE NORMAL CONTROL ALGORITHM IS MADE ACTIVE **TEN (ADJ)** MINUTES AFTER THE BASELINE FAN OPERATING MODE HOLD IS RELEASED.

EXIT BASELINE FAN OPERATING MODE WHEN THE OPERATING SUPPLY FAN SPEED SIGNAL IS INCREASED TO **65 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES. EXIT BASELINE FAN OPERATING MODE AND ENTER FIRST STAGE OPERATING MODE:
A. AN INOPERATIVE FAN IS TURNED ON (IF AVAILABLE FOR USE) AND IT'S COUNTERWEIGHTED BACKDRAFT DAMPER (NON–ACTUATED) BEGINS TO OPEN WHEN THE FAN HAS REACHED A SPEED SUFFICIENT TO CREATE THE REQUIRED DIFFERENTIAL PRESSURE NEEDED TO OVERCOME THE DAMPER WEIGHT SETTING.
B. THE FAN CONTINUING ON IN OPERATION RAMPS DOWN IN SPEED (UTILIZING AN ADJUSTABLE DECEL RAMP TIME) TO MEET THE FAN RAMPING UP IN SPEED TO MAINTAIN THE SETPOINT. ALL FANS UTILIZE THE SAME SPEED INPUT SIGNAL AT ALL TIMES.
C. THE **TWO** FANS ATTAIN THE SAME SPEED AND THEN MODULATE TOGETHER TO MEET THE SETPOINT.

IF TWO SUPPLY FANS ARE OPERATING AND THE SPEED SIGNAL IS REDUCED TO **40 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES, THEN THE PRIOR FAN OPERATING MODE IS INITIATED FOR THE SUPPLY FANS (E.G. GO FROM TWO FANS BACK TO BASELINE STAGE ONE FAN. TO ENTER THE PRIOR FAN OPERATING MODE:
A. AN OPERATING SUPPLY FAN IS TURNED OFF AND IT'S BACKDRAFT ISOLATION DAMPER FULLY CLOSES; DISABLE THE SUPPLY FAN WITH THE MOST OPERATING HOURS.
B. THE REMAINING OPERATING SUPPLY FANS CONTINUE TO OPERATE AND RAMP UP IN SPEED (UTILIZING AN ADJUSTABLE ACCEL RAMP TIME) TO MAINTAIN THE SETPOINT.

B. SUPPLY AIR TEMPERATURE:

1. WHEN THE CONTROL TEMPERATURE RISES ABOVE **75.0F (ADJ)** THE FAN SPEED LINEARLY INCREASES UP TO THE CURRENT MAXIMUM SPEED SETPOINT OF **30 HZ (ADJ)** WHEN THE CONTROL TEMPERATURE READING IS **76.0F (ADJ)**. AT **75.5F (ADJ)** CONTROL TEMPERATURE THE CHILLED WATER COIL VALVE IS ENABLED TO BE MODULATED TO ACHIEVE A CONTROL TEMPERATURE READING OF **75.5F (ADJ)**. WHEN THE CHILLED WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF **ONE MINUTE (ADJ)** THE FAN OPERATION IS RETURNED TO MINIMUM SPEED.

2. ALARM AT THE OPERATOR'S WORKSTATION IF THE SPACE TEMPERATURE READING EXCEEDS **80F (ADJ)** FOR **ONE MINUTE (ADJ).**

C. SUPPLY FAN SPEED:

STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH SUPPLY DUCT AND FAN DISCHARGE STATIC PRESSURE SENSOR LOCATED IN AHU DISCHARGE TO FUNCTION WITH SUPPLY FAN VFC CONTROL LOOP TO MONITOR THE APPROPRIATENESS OF THE CURRENT MAXIMUM SPEED SETPOINT BASED ON THE POSITION OF THE MANUAL DAMPERS. SUPPLY FAN SPEED SHALL GENERALLY ACHIEVE DUCT STATIC PRESSURE OF 0.3" W.G., WITH DISCHARGE PRESSURE NOT TO EXCEED 1.5" W.G. . FINAL CURRENT MAXIMUM SPEED SETPOINT DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER.

3. SAFETIES: FURNISH SAFETIES AS FOLLOWS TO PROVIDE ALARM AND SHUT DOWN UNIT.
a. IN THE EVENT OF SMOKE DETECTED BY FA SYSTEM AT AHU RETURN DUCT DETECTOR: SHUT THE UNIT DOWN. INDICATE "FA SHUTDOWN" ON GRAPHICS FOR AHU.

4. MONITORING:
a. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE CO2 EXCEEDS **1,200 PPM (ADJ.)** FOR LONGER THAN **15 MINUTES**.
b. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE RH EXCEEDS **65% (ADJ.)** FOR LONGER THAN **15 MINUTES**.

5. SHUTDOWN: ON AHU SHUTDOWN SUPPLY STOPS. CLOSE COOLING COIL VALVE.

UNOCCUPIED MODE:
THERE IS NO UNOCCUPIED MODE FOR THIS AHU; IT SHALL CONTINUALLY RECIRCULATE AIR TO THE SPACE.

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-6A/B CONTROL SOO 2

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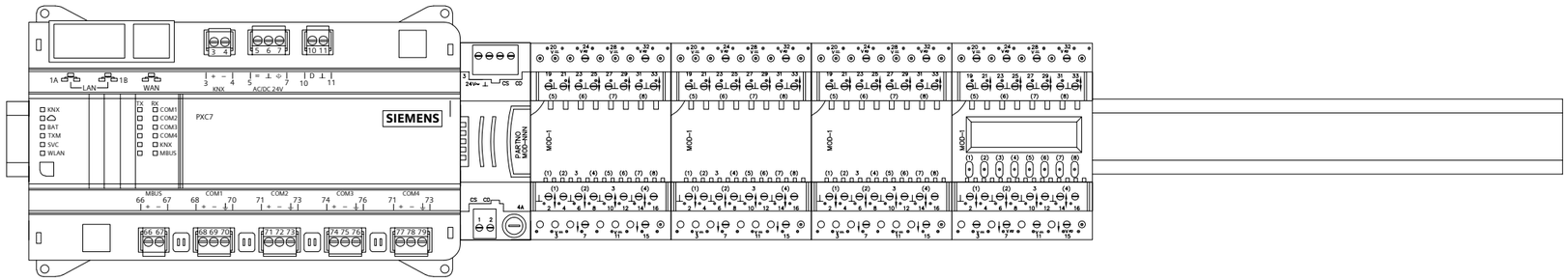
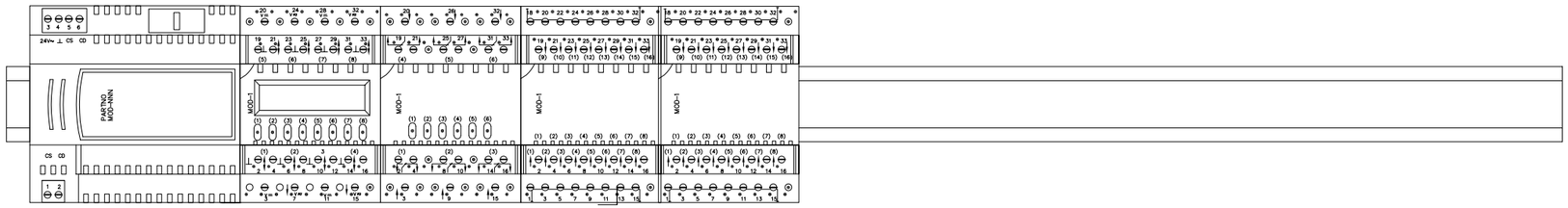
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





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LA06.PXCA INSTALLATION

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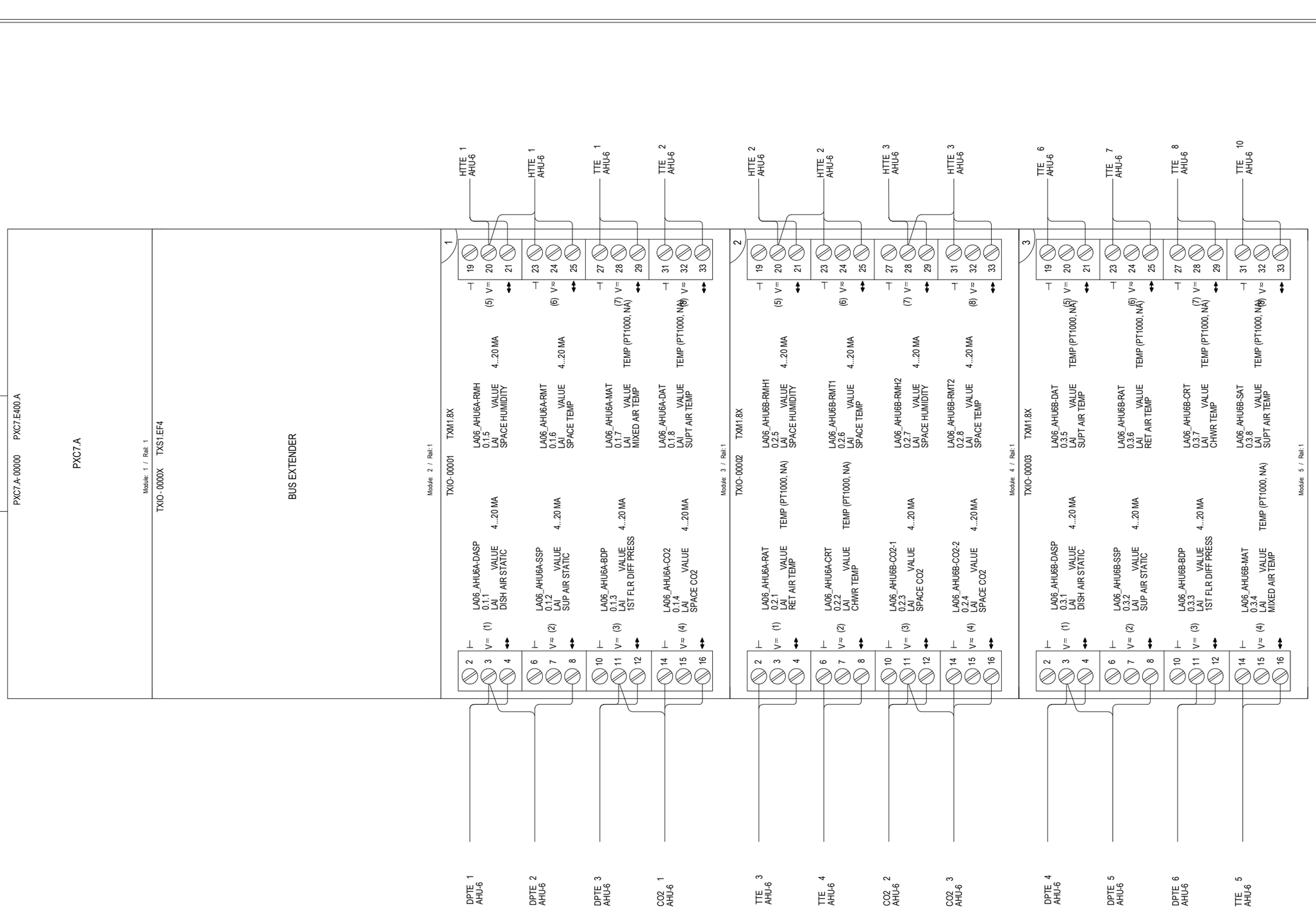

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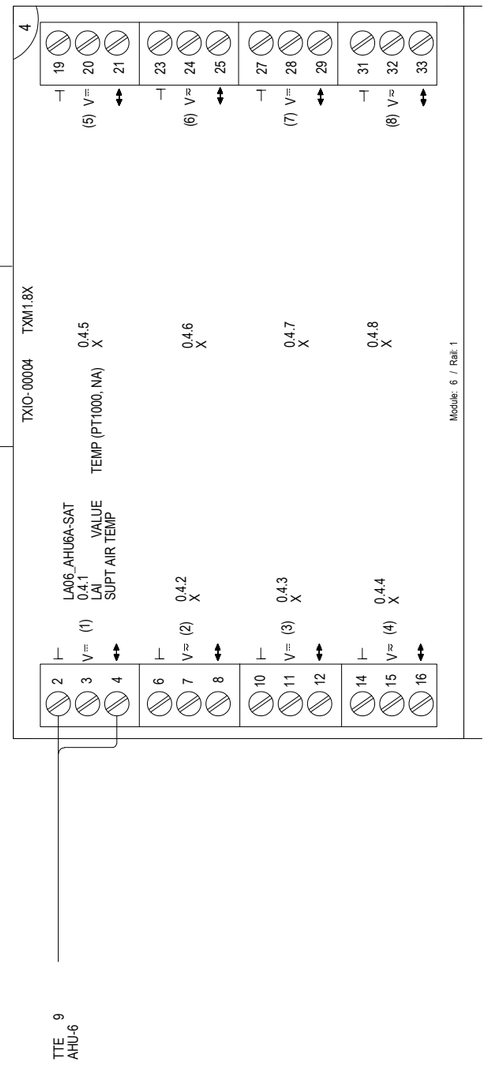

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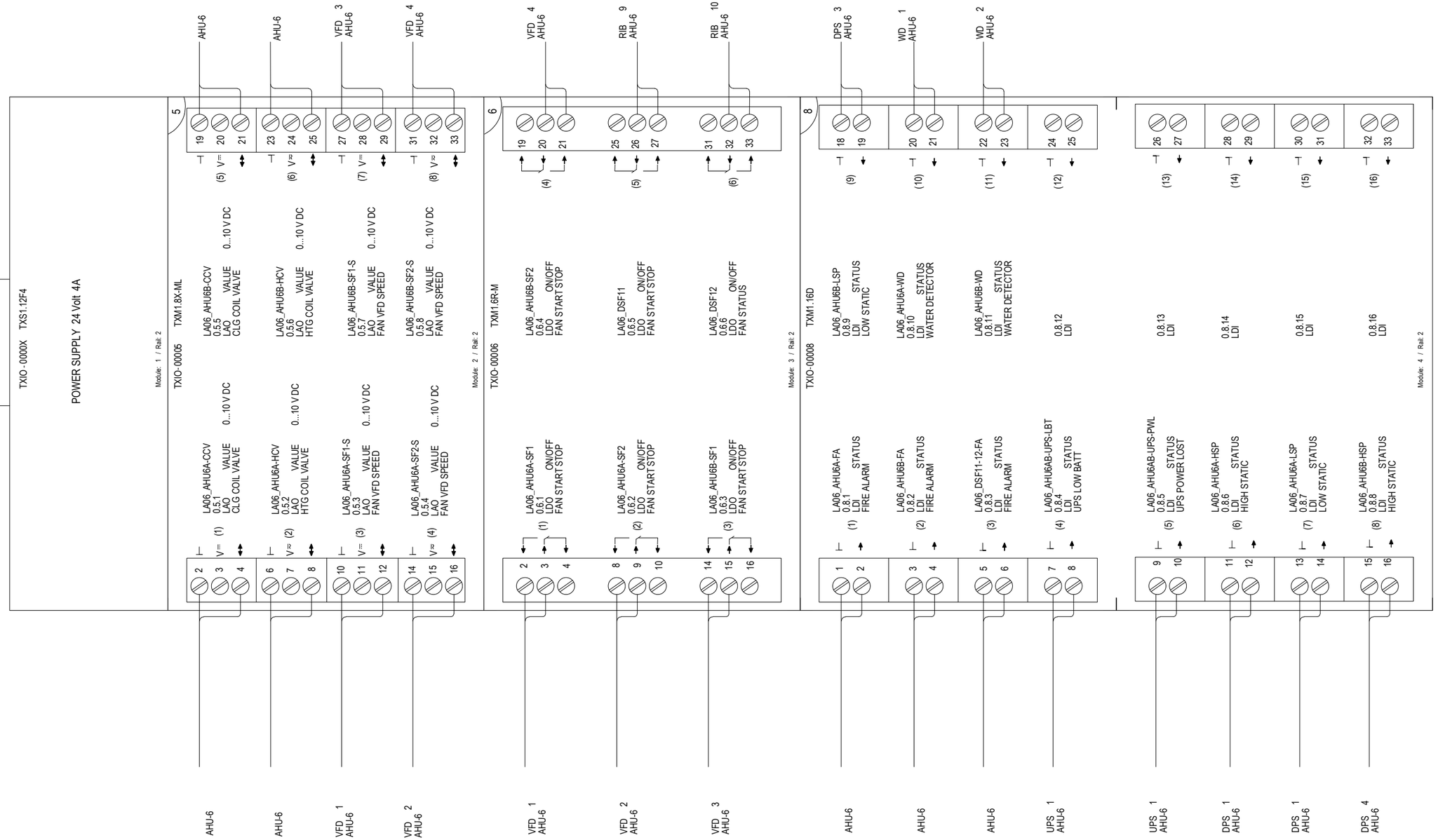
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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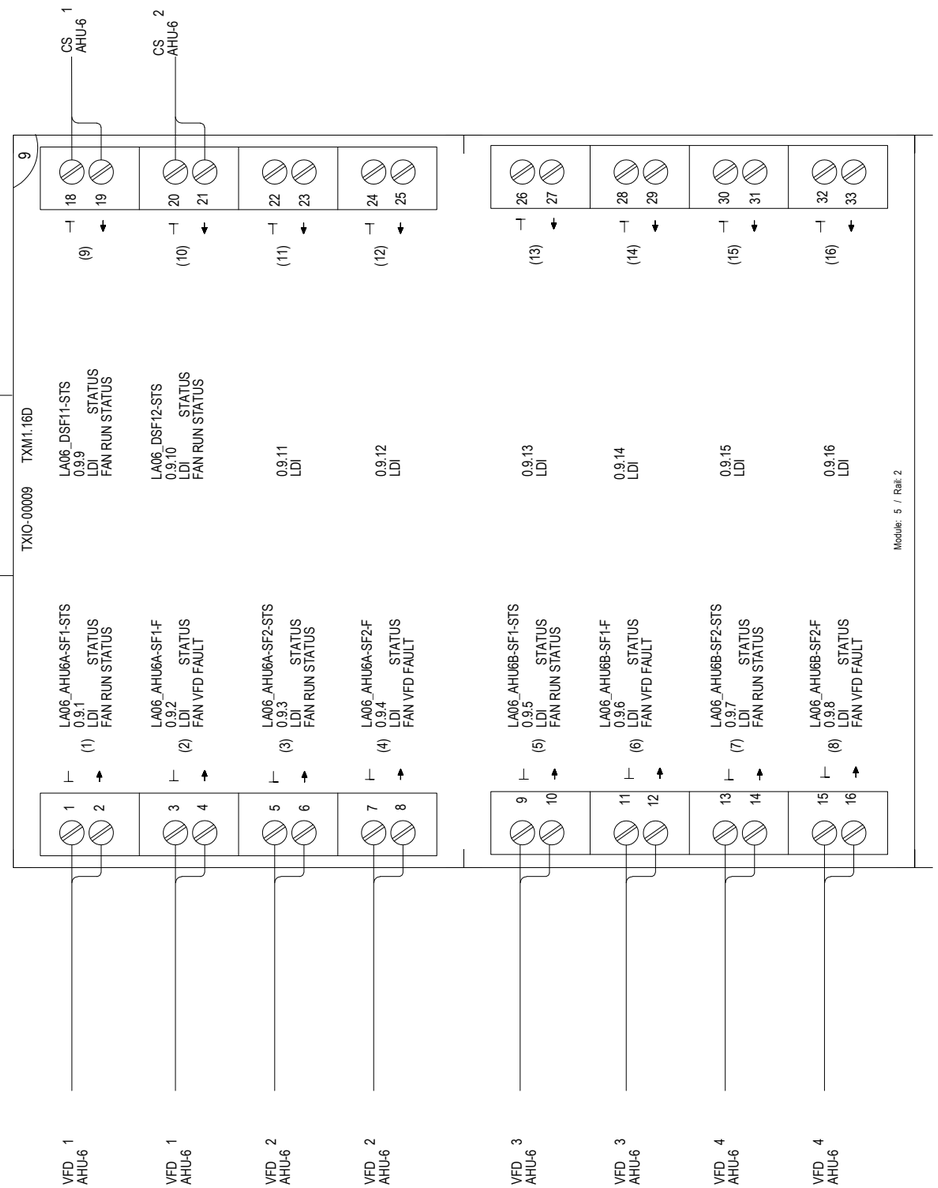

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
	4	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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LA06.PXCA BOM

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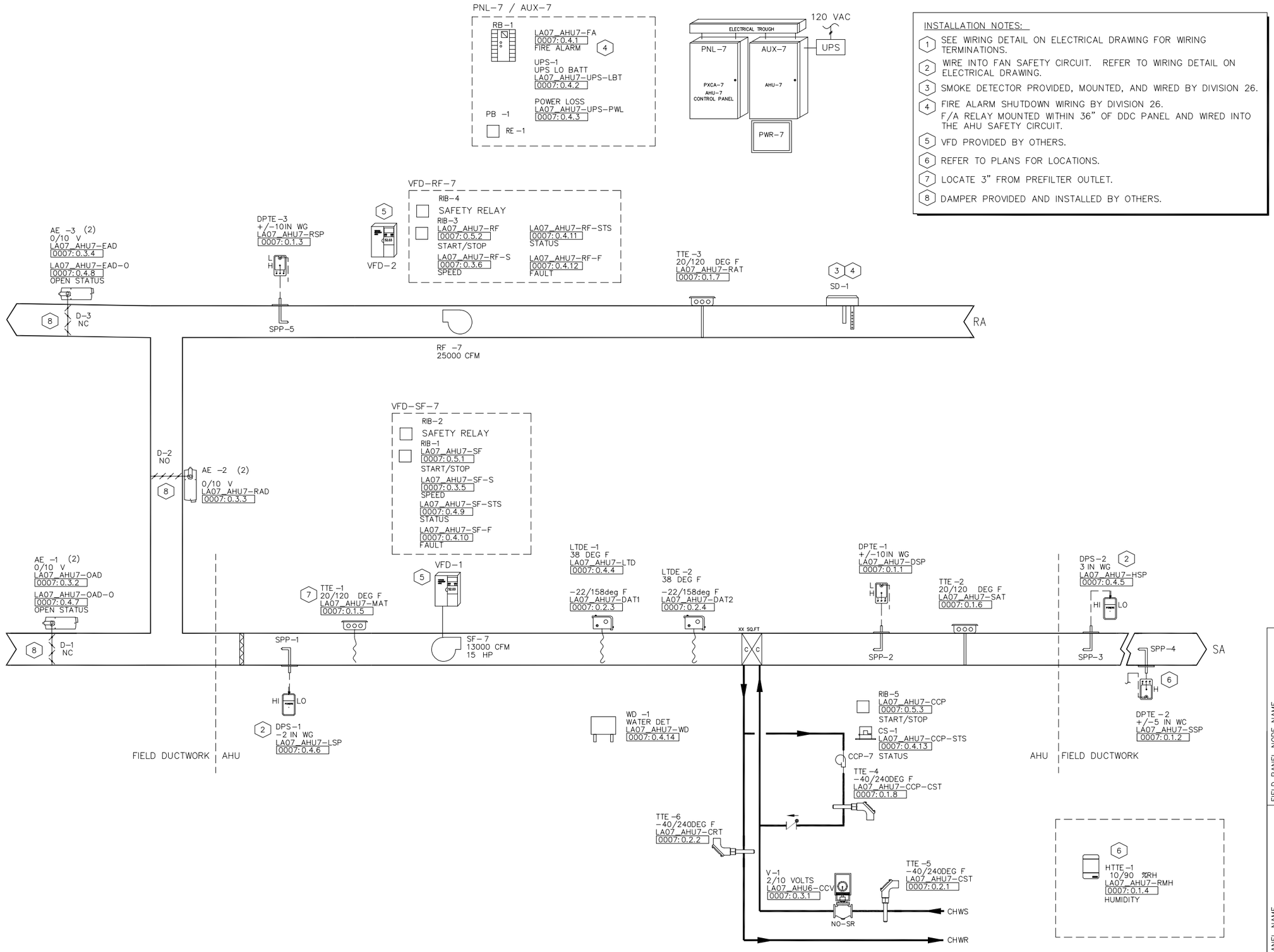

1/260 AHU-7 CONTROL DIAGRAM

REF #	FIELD PANEL NAME
0007	LA07.PXCA

FIELD PANEL NODE NAME

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU■ 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/13/26

AHU-7 CONTROL

440P412785
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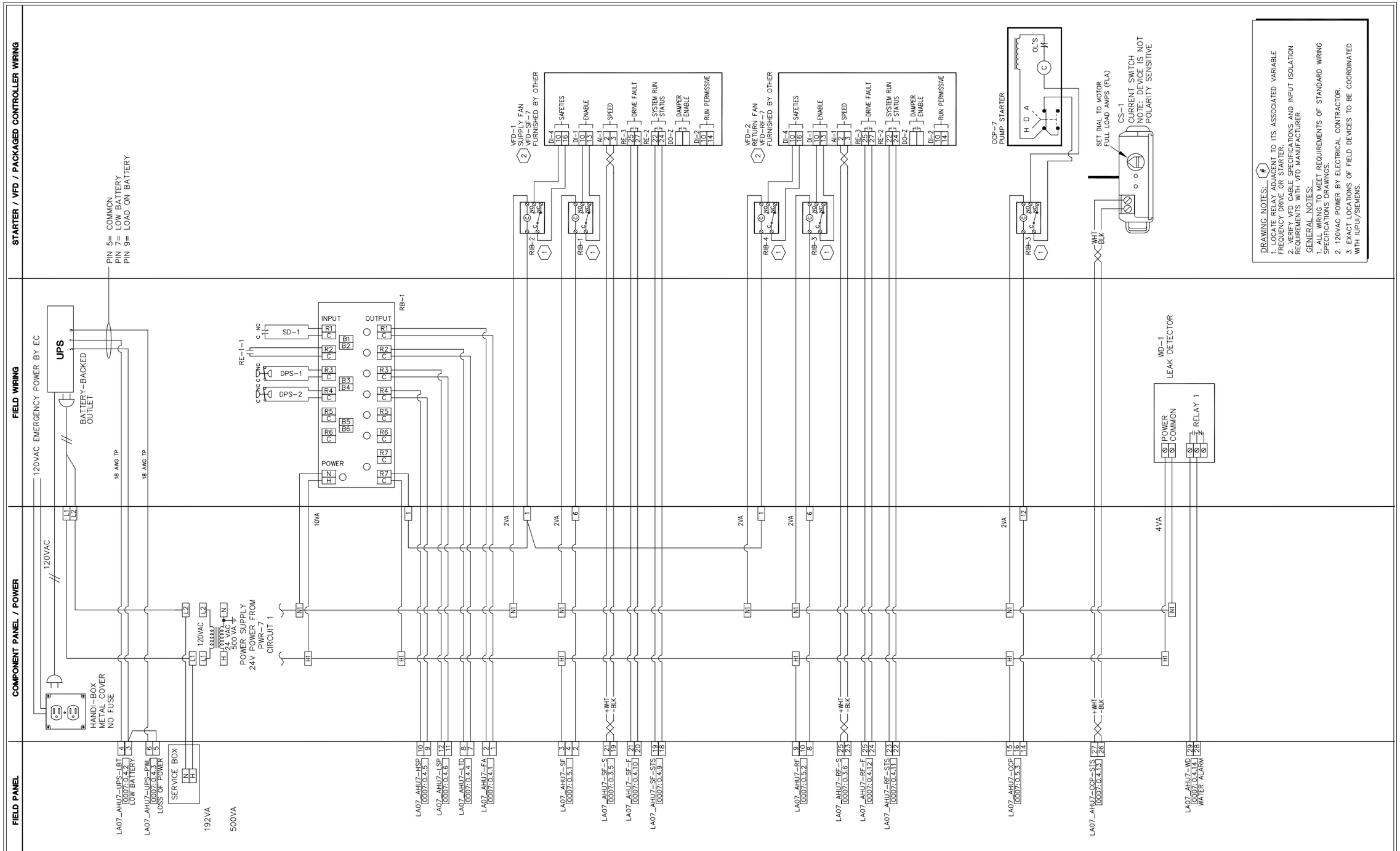

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0007	LA07.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-7 ELEC WIRING 1

440P412785
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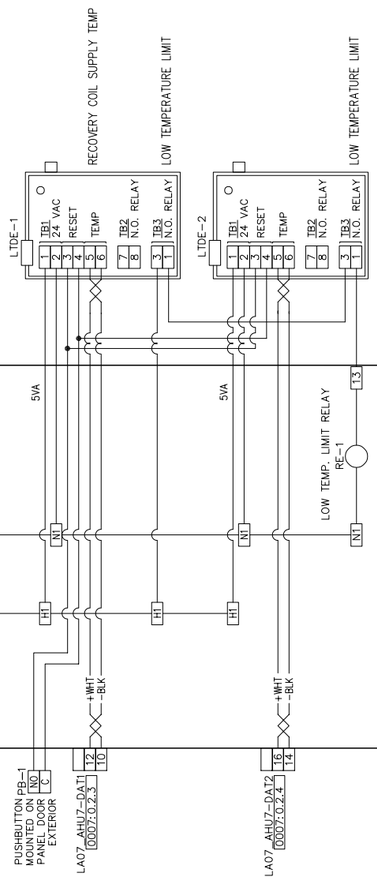
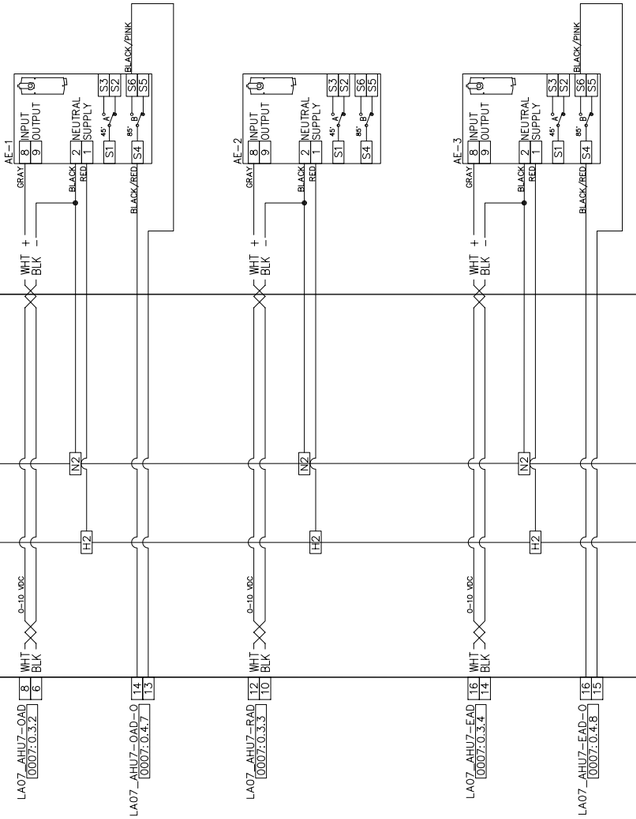
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING





AE – 1 (2)
0/10 V

ELECTRONIC DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
24 Vac, 0 to 10 Vdc
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA156.1U/P = 9VA

AE – 2 (2)
0/10 V

ELECTRONIC DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
24 Vac, 0 to 10 Vdc
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA156.1U/P = 9VA

AE – 3 (2)
0/10 V

ELECTRONIC DAMPER ACTUATOR
OPENAIR GCA SERIES
SPRING RETURN
24 Vac, 0 to 10 Vdc
GCA = 160 lb-in TORQUE

VA Consumption: –
GCA156.1U/P = 9VA

COOLING COIL VAVLE

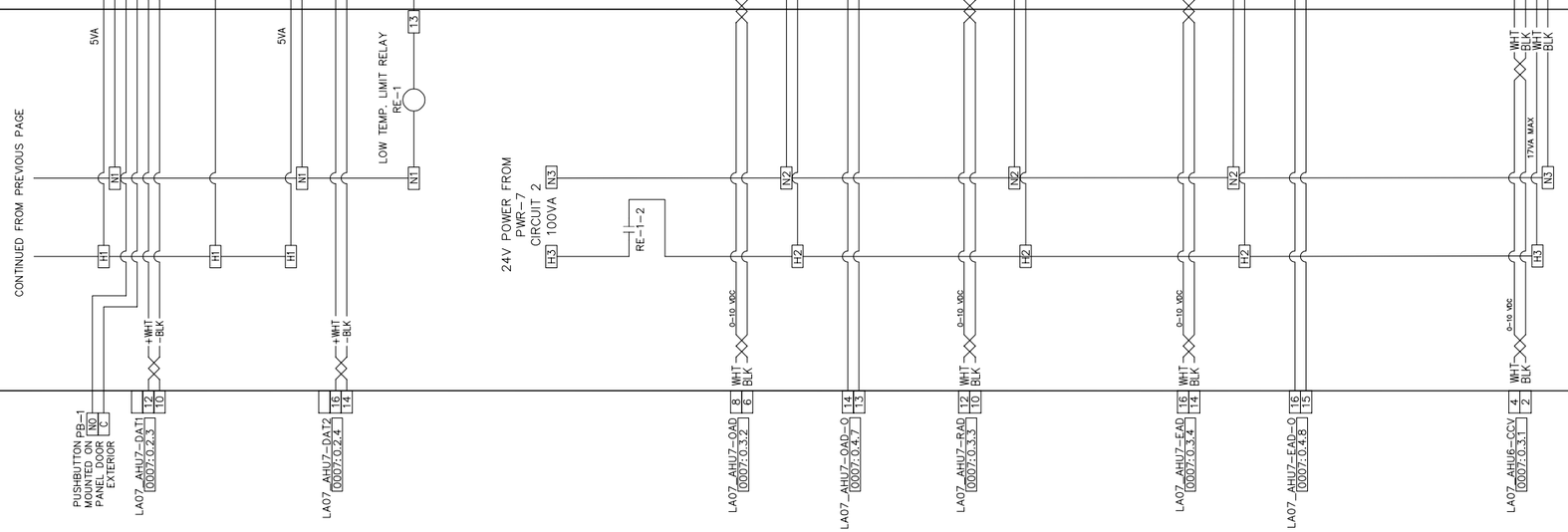
V –1
SIEMENS FLOWRITE SKD
ELECTRONIC VALVE ACTUATOR
24 VAC PROPORTIONAL
CONTROL 0–10 VDC

SKD:
30 sec RUN TIME

ON = 4–20mA
OFF = 0/10 VDC
(DEFAULT)

VA Consumption: –
SKD62U = 17VA

Y
M
G
GO



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0007	LA07.PXCA	

REVISION HISTORY

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AHU-7 ELEC WIRING 2

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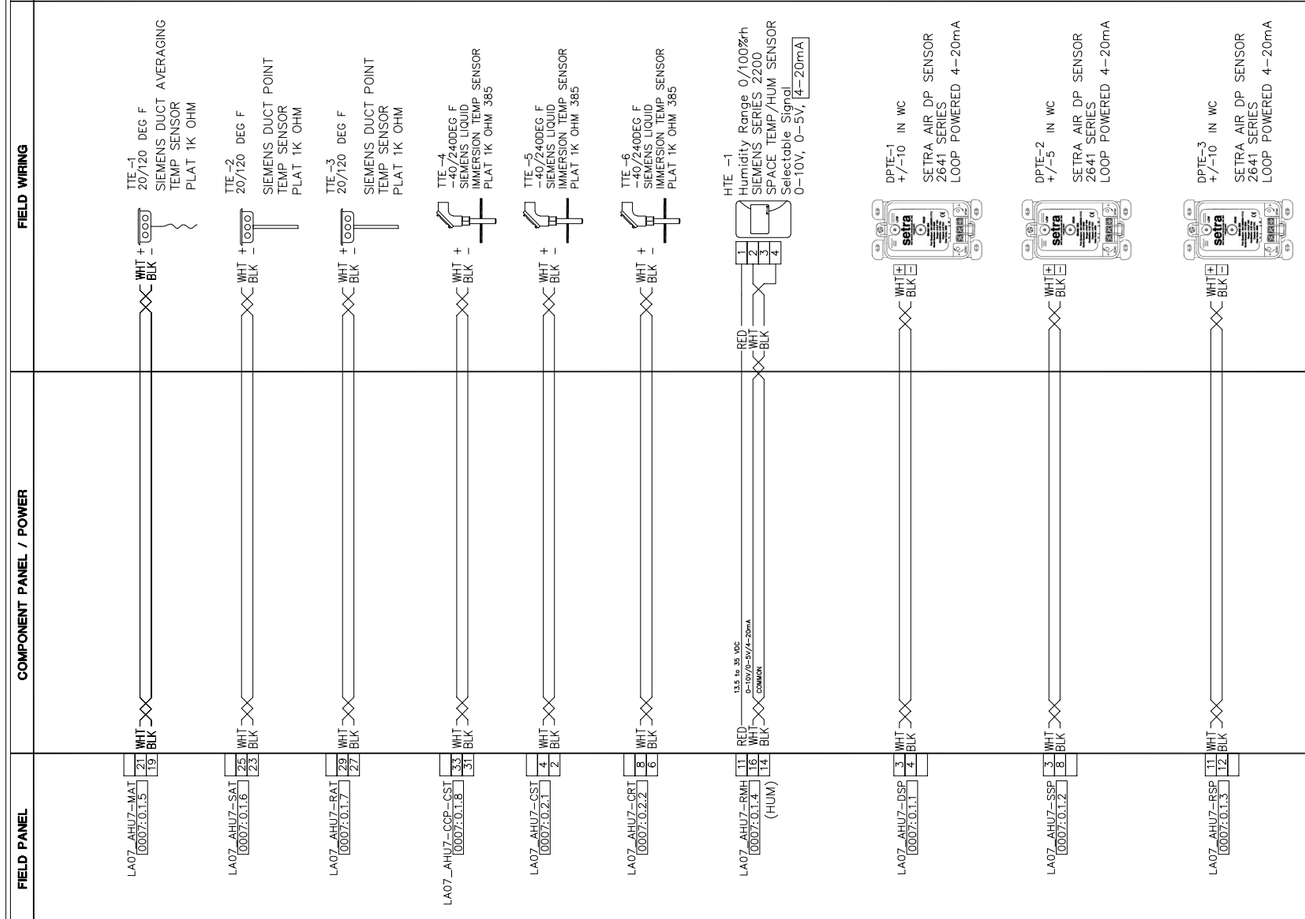
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



GENERAL NOTES:
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0007	LA07.PXCA	

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IU# 20250072, IN

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AHU-7 ELEC WIRING 3

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260C

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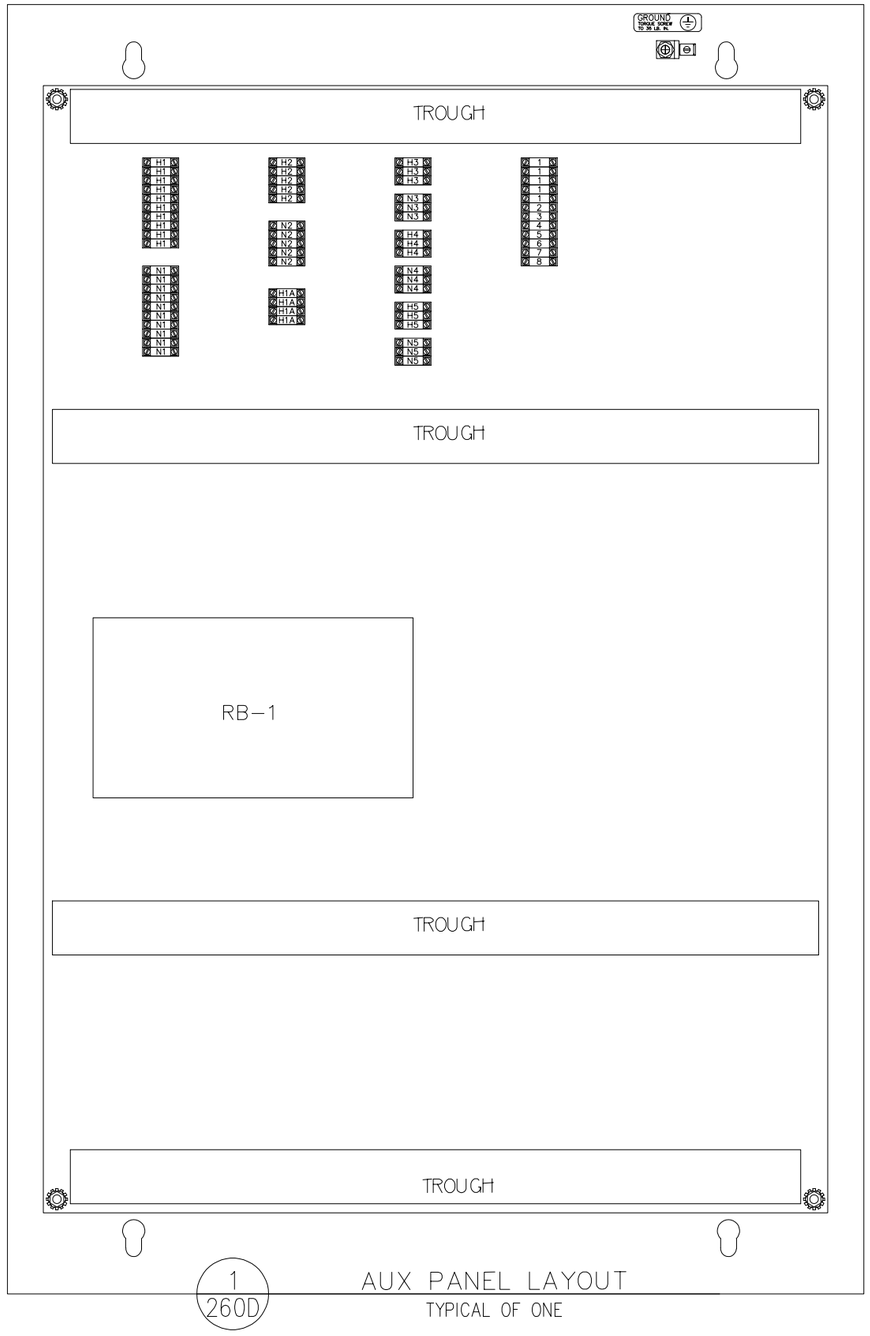
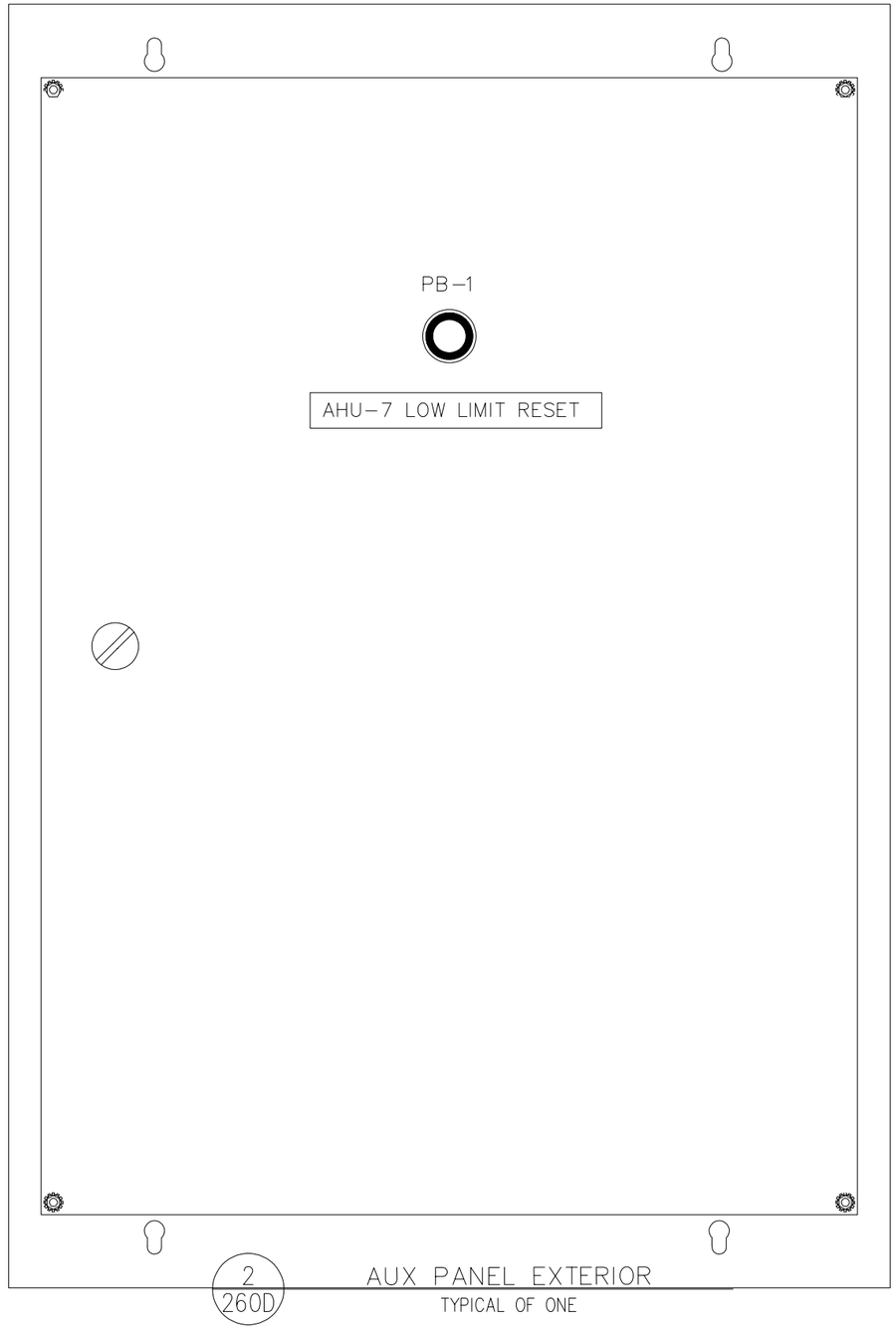


1 260D AUX PANEL LAYOUT
TYPICAL OF ONE



2 260D AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-7 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-3	6	GCA156.1P	SIEMENS	154001	MOD(1) SR,24V, MED/S PLNM
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
DPS 1-2	2	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2	1	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 3	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
HTTE 1	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
LTDE 1	1	AS570PF25A	MINCO		CHILL-OUT LTDE/TTE 25FT ALUM
	10	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
LTDE 2	1	AS570PF25A	MINCO		CHILL-OUT LTDE/TTE 25FT ALUM
	1	M-648-K	KELE INC		CAPILLARY MOUNTING CLIP-INDIVIDUAL PIECE
PNL AUX-7	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 7	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-5	5	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-5	5	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
TTE 1	1	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 2-3	2	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 4-6	3	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-2	2	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
PB 1	1	ABW111-B,G,R	KELE		PB NO&NC MOMNTRY FLSH BLKGRNRD
RB 1	1	RIBMNLB-6NO	FUNCTIONAL	RIBMNLB-6N	AHU FAN SAFETY ALR CIRC,6-IN,NO OUT
RE 1	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.
2. **ENABLE:** AIR HANDLER IS STARTED FROM DDC PANEL OR FROM COMMAND OF FACILITY MANAGEMENT SYSTEM.
3. ON THE AHU GRAPHICS, PROVIDE A SUMMATION OF ALL THE SUPPLY AIR VOLUMES AS MEASURED AT THE INDIVIDUAL TERMINAL BOX ZONES ASSOCIATED WITH THIS AHU.

OCCUPIED MODE:

1. STARTUP:

? **COLD WEATHER STARTUP:** WHEN OUTDOOR AIR TEMPERATURE IS LESS THAN **40F (ADJ)**, SUPPLY FAN TO RUN AT **20 HZ (ADJ)**, FOR **ONE MIN (ADJ)** BEFORE BEING RELEASED TO RAMP UP TO STATIC PRESSURE SETPOINT. ECONOMIZER MIXED AIR TEMPERATURE CONTROL LOOP SHALL BE DISABLED FOR **5 MIN. (ADJ)** BEFORE BEING ENABLED. THE COOLING CONTROL LOOP WILL CALCULATE AS SOON AS THE UNIT IS CALLED TO RUN, AND THE SUPPLY AIR SETPOINT WILL BE ELEVATED TO **65F (ADJ)**. ONCE SUPPLY FAN STATUS IS ON, THE COOLING SETPOINT WILL DECREASE AT A RATE OF **1F (ADJ)** EVERY MINUTE, UNTIL THE ORIGINAL COOLING SETPOINT HAS BEEN ACHIEVED. STARTING SPEEDS, RAMP SPEEDS AND TIME DELAYS TO BE TESTED AND COORDINATED IN FIELD PRIOR TO SYSTEM COMMISSIONING.

? **NORMAL STARTUP:** WHEN THE OUTDOOR AIR TEMPERATURE IS **40F (ADJ)** OR GREATER, SUPPLY FAN SHALL START AND RAMP UP TO STATIC PRESSURE SETPOINT. ONCE FAN STATUS PROOFS ARE ON, COOLING CONTROL LOOP WILL START. SUPPLY AIR TEMPERATURE CONTROL LOOP IS ACTIVE. ECONOMIZER MIXED AIR TEMPERATURE CONTROL LOOP SHALL BE ACTIVE WHEN OUTDOOR AIR TEMPERATURE IS LESS THAN THE ECONOMIZER SWITCHOVER SETPOINT.

2.NORMAL OPERATION: AIR HANDLER TO RUN CONTINUOUSLY IN NORMAL OPERATION.

A. SUPPLY AIR TEMPERATURE: THE SUPPLY AIR CONTROL LOOP SHALL PERFORM AS DESCRIBED BELOW:

i. BELOW **70F (ADJ)** OAT:

a. MODULATE THE ECONOMIZER DAMPERS TO MAINTAIN MIXED AIR TEMPERATURE AT SETPOINT. MIXED AIR TEMPERATURE SETPOINT SHALL TRACK SUPPLY AIR TEMPERATURE SETPOINT **MINUS 3F (ADJ)** TO ACCOUNT FOR TEMPERATURE RISE ACROSS FAN.

b. ECONOMIZER DAMPER SPAN IS AS FOLLOWS:

DAMPER	MIN % OPEN	MAX % OPEN
OAD	**0 (ADJ)**	100
RAD	**100 (ADJ)**	0
EAD	**0 (ADJ)**	100

c. ONCE THE RELIEF/EXHAUST AIR DAMPERS ARE **100% (ADJ**) OPEN AND THE SUPPLY AIR TEMPERATURE RISES, THE COOLING COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT.

d. IF THERE IS A DROP IN SUPPLY AIR TEMPERATURE, THE COOLING COIL CONTROL VALVE SHALL BE MODULATED CLOSED AND IN SEQUENCE THE ECONOMIZER DAMPERS SHALL BE MODULATED TOWARD THE MINIMUM POSITION.

e. RESET SUPPLY AIR TEMPERATURE SETPOINT FROM **53F TO 59F (ADJ)** AS OUTDOOR AIR TEMPERATURE VARIES FROM **70F TO 30F (ADJ).**

f. IN THE EVENT THE PLUMBING ROOM SPACE AIR HUMIDITY EXCEEDS **63% RH (ADJ),** THE UNIT SUPPLY TEMPERATURE SETPOINT SHALL BE RESET TO **53F (ADJ)** AND THIS OVERRIDE SHALL BE IDENTIFIED ON THE OWS GRAPHICS. AFTER **15 MINUTES (ADJ)** THE SUPPLY TEMPERATURE SHALL BE RESET BACK UP TO SUPPLY TEMPERATURE SETPOINT IN **1F (ADJ) INCREMENTS EVERY 10 MINUTES (ADJ)**.

ii. ABOVE **70F (ADJ)** OAT:

a. THE ECONOMIZER DAMPERS SHALL BE FIXED IN MINIMUM POSITION AND THE COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT.

B. SUPPLY FAN SPEED:

STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH SUPPLY DUCT AND FAN DISCHARGE STATIC PRESSURE SENSOR LOCATED IN AHU DISCHARGE TO FUNCTION WITH SUPPLY FAN VFC CONTROL LOOP TO MODULATE SUPPLY FAN SPEED TO ACHIEVE DUCT STATIC PRESSURE SET AT **1.25" W.G. (ADJ), NOT TO EXCEED DISCHARGE PRESSURE OF 3.9" W.G. (ADJ).** FINAL SETPOINT DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER.

IF **ZERO OR ONE (ADJ)** CRITICAL TERMINAL BOXES INDICATE A 95% OR GREATER DAMPER POSITION, THE STATIC PRESSURE SETPOINT SHALL DECREASE AT A RATE OF **0.1" W.G. EVERY TEN MINUTES (ADJ)**.

IF **TWO (ADJ)** CRITICAL TERMINAL BOXES IN THE SYSTEM INDICATE 95% OR GREATER OPEN DAMPER POSITION, HOLD THE STATIC PRESSURE AT CURRENT SETPOINT.

IF **THREE (ADJ)** OR MORE CRITICAL TERMINAL BOXES IN THE SYSTEM INDICATE 95% OPEN DAMPER POSITION, THE SETPOINT SHALL INCREASE AT A RATE OF **0.1" W.G. EVERY 5 MINUTES (ADJ)**.

DUCT STATIC PRESSURE SETPOINT RESET SHALL HAVE A MINIMUM AND MAXIMUM RANGE OF **SETPOINT +/- 0.3" WG (ADJ).**

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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C. RETURN FAN SPEED:
STATIC PRESSURE SENSOR LOCATED IN FAN DISCHARGE TO FUNCTION WITH RETURN FAN VFC CONTROL LOOP TO MODULATE RETURN FAN SPEED TO ACHIEVE FAN DISCHARGE STATIC PRESSURE SET AT **0.5" W.G. (ADJ), NOT TO EXCEED DISCHARGE PRESSURE OF 0.8" W.G. (ADJ).** FINAL SETPOINT DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER.

D. COOLING COIL PUMP:
WHEN THE OUTDOOR AIR TEMPERATURE IS LESS THAN **35F (ADJ)**, THE COOLING COIL PUMP SHALL BE ENERGIZED TO OPERATE (EVEN IF THE AHU IS OFF). ALARM AT THE CONTROL ROOM IF THE COOLING COIL PUMPED WATER TEMPERATURE IS LESS THAN **35F (ADJ)** AND CONTINUE OPERATING THE PUMP.

3. SAFETIES: FURNISH SAFETIES AS FOLLOWS TO PROVIDE ALARM AND SHUT DOWN UNIT.

a. COOLING COIL INLET TO HAVE TWO (2) OR MORE SAFETY LOW LIMIT THERMOSTATS WIRED IN SERIES TO BREAK BELOW **38F (ADJ).** ON ALARM, CHILLED WATER CONTROL VALVES OPEN **100% (ADJ).**

b. SUPPLY HIGH LIMIT STATIC PRESSURE SWITCH SET TO **3.0" W.G. (ADJ).**

c. RETURN DUCT LOW LIMIT STATIC SENSOR SWITCH SET TO **(-) 2.0" W.G. (ADJ).**

d. IN THE EVENT OF SMOKE DETECTED BY FA SYSTEM AT AHU RETURN DUCT DETECTOR: SHUT THE UNIT DOWN, FULLY CLOSE OA DAMPER AND FULLY CLOSE EA DAMPER. INDICATE "FA SHUTDOWN" ON GRAPHICS FOR AHU.

4. SHUTDOWN: ON AHU SHUTDOWN SUPPLY FAN AND RETURN FAN STOPS, OUTDOOR AND RELIEF DAMPERS CLOSE, AND RETURN DAMPER OPENS. CLOSE COOLING COIL VALVE EXCEPT ON LOW LIMIT SAFETY SHUTDOWN.

UNOCCUPIED MODE:
THERE IS NO UNOCCUPIED MODE FOR THIS AHU; IT SHALL CONTINUALLY RECIRCULATE AIR TO THE SPACES.

GENERATOR ENGINE OPERATING SEQUENCE OF OPERATION:
1. WHEN THE ATS "PRESIGNAL" RELAY INDICATES (SIGNIFYING THE GENERATOR ENGINE IS OPERATING, EVEN IF ENGINE IS UNLOADED – e.g. DURING A MONTHLY GENERATOR TEST) THE FOLLOWING SHALL OCCUR:

A. OUTDOOR AIR DAMPER IS FULLY CLOSED.

B. RELIEF EXHAUST DAMPER IS FULLY CLOSED.

2. **FIVE MINUTES (ADJ.)** AFTER THE "PRESIGNAL" RELAY INDICATES THE GENERATOR ENGINE IS BACK TO "OFF CONDITION", THE OUTDOOR AIR DAMPER AND RELIEF EXHAUST DAMPER ARE RELEASED TO CONTROL NORMALLY.

REVISION HISTORY

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AHU-7 CONTROL SOO 2

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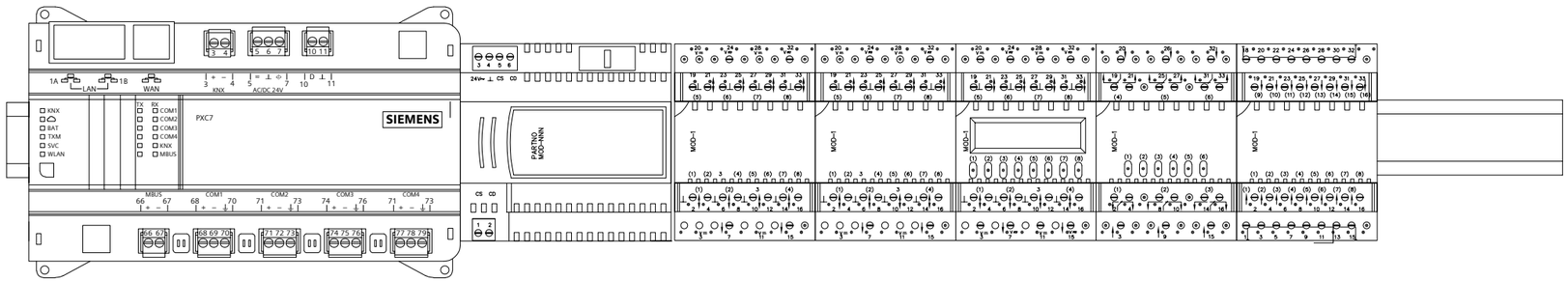
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.



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LA07..PXCA INSTALLATION

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PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A

Module: 2 / Rail: 1

TXIO- 00001 TXM1.8X

19			LA07_AHU7-MAT	
20			0.1.5	
21	V⎓	(5)	LAI	TEMP (PT1000, NA)
22			MIXED AIR TEMP	
23			LA07_AHU7-SAT	
24	V≂	(6)	0.1.6	4...20 MA
25			LAI	TEMP (PT1000, NA)
26			SA TEMP	
27			LA07_AHU7-RAT	
28	V⎓	(7)	0.1.7	4...20 MA
29			LAI	TEMP (PT1000, NA)
30			RA TEMP	
31			LA07_AHU7-CCP-CST	
32	V≂	(8)	0.1.8	4...20 MA
33			LAI	TEMP (PT1000, NA)
			CHW SUP TEMP	

Module: 3 / Rail:1

TXIO- 00002 TXM1.8X

19				
20			0.2.5	
21	V⎓	(5)	X	TEMP (PT1000, NA)
22				
23				
24	V≂	(6)	0.2.6	TEMP (PT1000, NA)
25			X	
26				
27				
28	V⎓	(7)	0.2.7	TEMP (PT1000, EU)
29			X	
30				
31				
32	V≂	(8)	0.2.8	TEMP (PT1000, EU)
33			X	

Module: 4 / Rail:1

TXIO- 00003 TXM1.8X-ML

19				
20			LA07_AHU7-SF-S	
21	V⎓	(5)	0.3.5	0...10 V DC
22			LAO	VALUE
23			FAN VFD SPEED	
24	V≂	(6)	LA07_AHU7-RF-S	
25			0.3.6	0...10 V DC
26			LAO	VALUE
27			FAN VFD SPEED	
28	V⎓	(7)	0.3.7	0...10 V DC
29			X	
30				
31				
32	V≂	(8)	0.3.8	0...10 V DC
33			X	

Module: 5 / Rail:1

2			LA07_AHU7-DSP	
3	V⎓	(1)	0.1.1	4...20 MA
4			LAI	VALUE
			DISH AIR STATIC	
6			LA07_AHU7-SSP	
7	V≂	(2)	0.1.2	4...20 MA
8			LAI	VALUE
			SUP AIR STATIC	
10			LA07_AHU7-RSP	
11	V⎓	(3)	0.1.3	4...20 MA
12			LAI	VALUE
			RA STATIC	
14			LA07_AHU7-RMH	
15	V≂	(4)	0.1.4	4...20 MA
16			LAI	VALUE
			ROOM HUMIDITY	

2			LA07_AHU7-CST	
3	V⎓	(1)	0.2.1	TEMP (PT1000, NA)
4			LAI	VALUE
			CHW SUP TEMP	
6			LA07_AHU7-CRT	
7	V≂	(2)	0.2.2	TEMP (PT1000, NA)
8			LAI	VALUE
			CHW RET TEMP	
10			LA07_AHU7-DAT1	
11	V⎓	(3)	0.2.3	TEMP (PT1000, EU)
12			LAI	VALUE
			DISH AIR TEMP	
14			LA07_AHU7-DAT2	
15	V≂	(4)	0.2.4	TEMP (PT1000, EU)
16			LAI	VALUE
			DISH AIR TEMP	

2			LA07_AHU6-CCV	
3	V⎓	(1)	0.3.1	0...10 V DC
4			LAO	VALUE
			CLG COIL VALVE	
6			LA07_AHU7-OAD	
7	V≂	(2)	0.3.2	0...10 V DC
8			LAO	VALUE
			OA DAMPER	
10			LA07_AHU7-RAD	
11	V⎓	(3)	0.3.3	0...10 V DC
12			LAO	VALUE
			RA DAMPER	
14			LA07_AHU7-EAD	
15	V≂	(4)	0.3.4	0...10 V DC
16			LAO	VALUE
			EA DAMPER	

TTE 1 AHU-7
TTE 2 AHU-7
TTE 3 AHU-7
TTE 4 AHU-7
VFD 1 AHU-7
VFD 2 AHU-7

DPTE 1 AHU-7
DPTE 2 AHU-7
DPTE 3 AHU-7
HTTE 1 AHU-7
TTE 5 AHU-7
TTE 6 AHU-7
LTDE 1 AHU-7
LTDE 2 AHU-7
AHU-7
AE 1 AHU-7
AE 2 AHU-7
AE 3 AHU-7

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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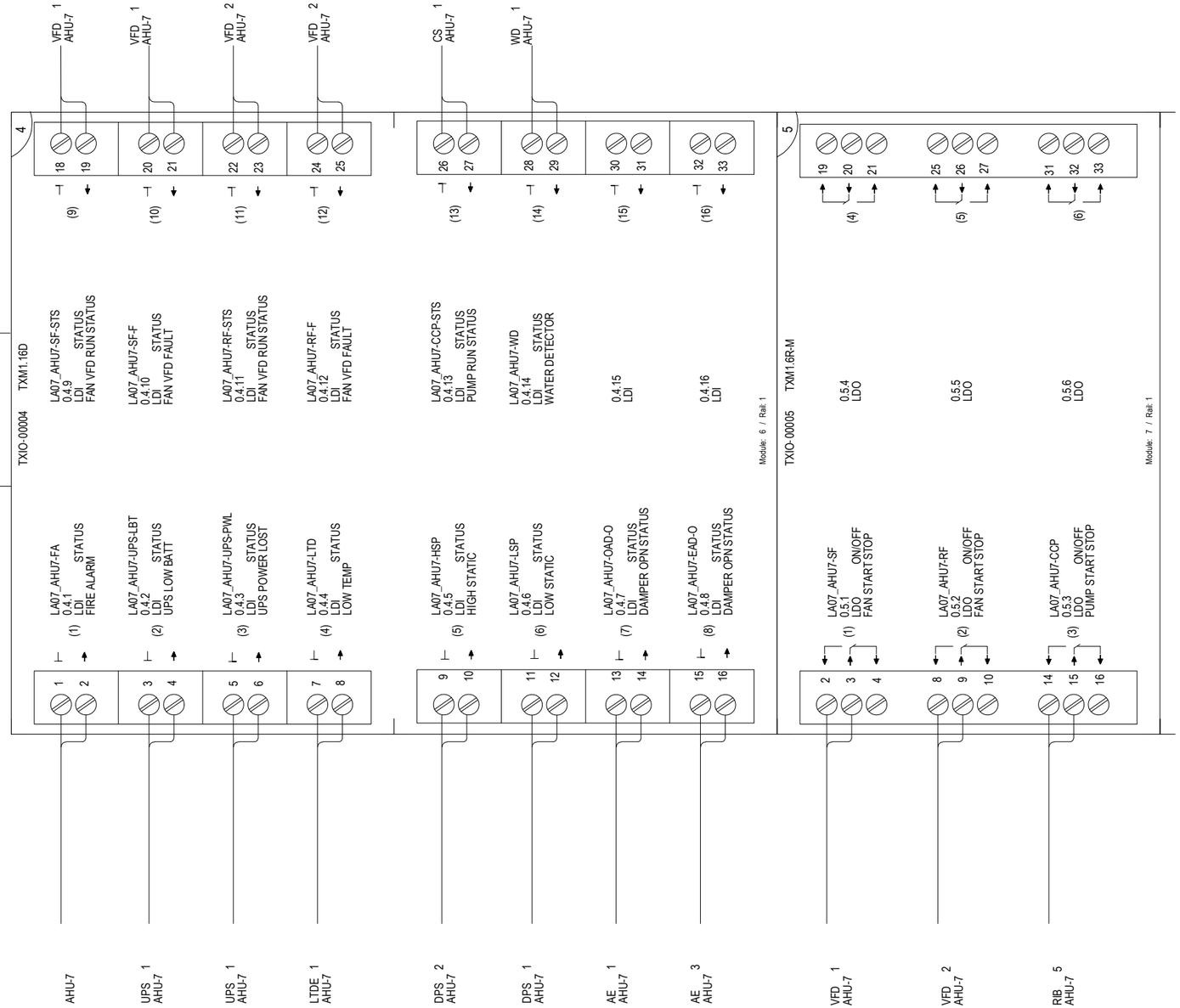

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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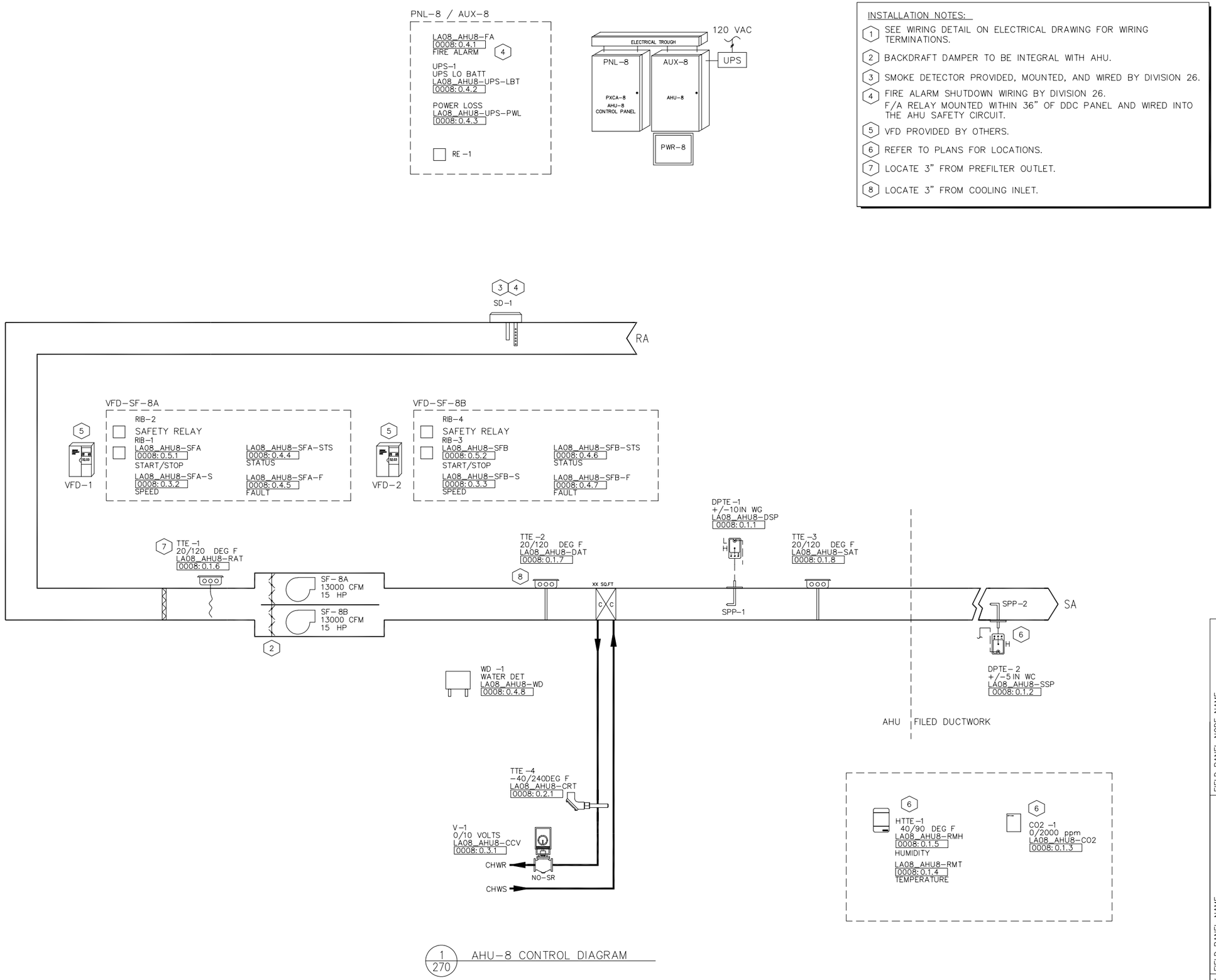

1 270 AHU-8 CONTROL DIAGRAM

INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. BACKDRAFT DAMPER TO BE INTEGRAL WITH AHU.
3. SMOKE DETECTOR PROVIDED, MOUNTED, AND WIRED BY DIVISION 26.
4. FIRE ALARM SHUTDOWN WIRING BY DIVISION 26. F/A RELAY MOUNTED WITHIN 36" OF DDC PANEL AND WIRED INTO THE AHU SAFETY CIRCUIT.
5. VFD PROVIDED BY OTHERS.
6. REFER TO PLANS FOR LOCATIONS.
7. LOCATE 3" FROM PREFILTER OUTLET.
8. LOCATE 3" FROM COOLING INLET.

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-8 CONTROL

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SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

REF#	FIELD PANEL NAME
0008	LA08.PXCA

FIELD PANEL NODE NAME

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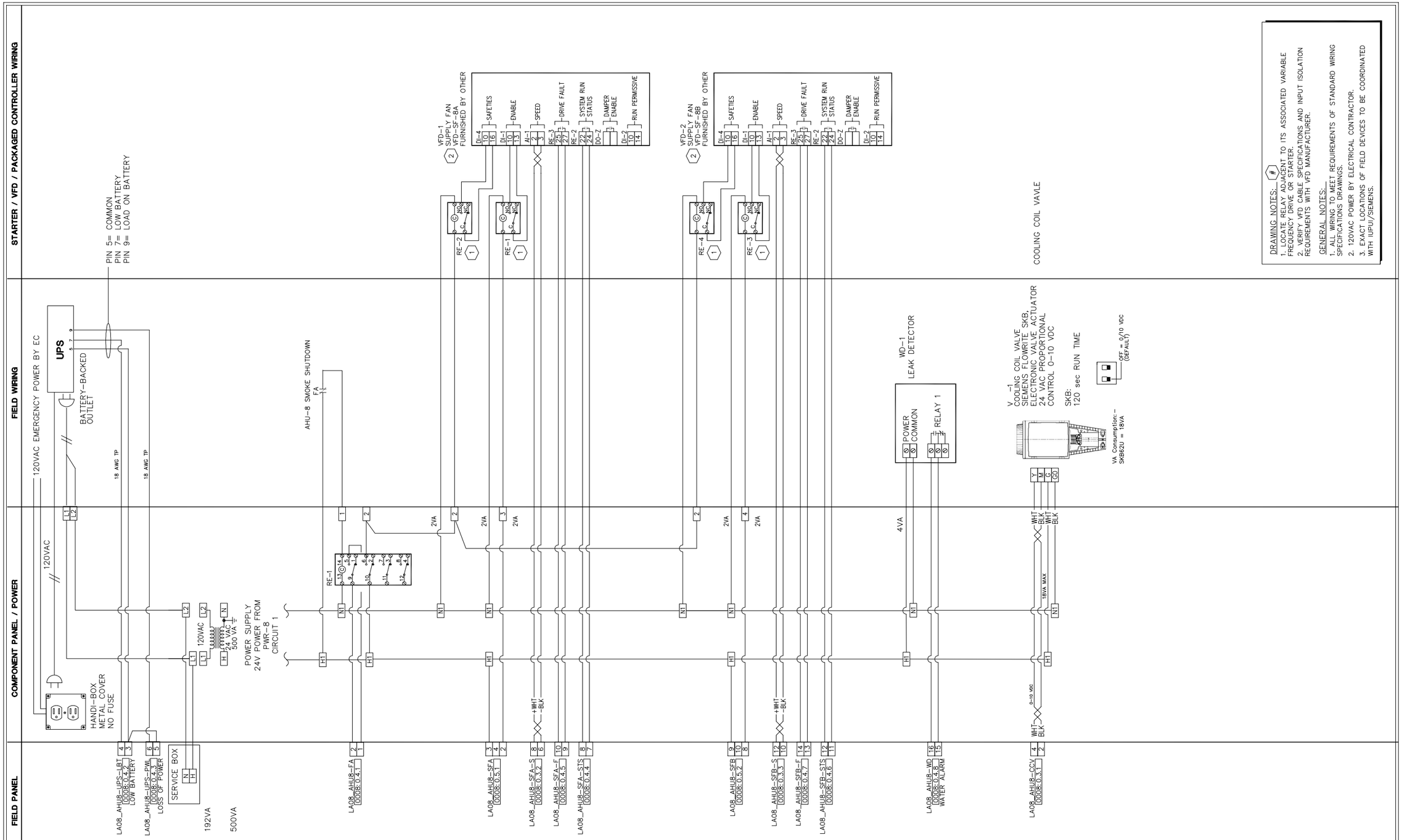
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0008	LA08.PXCA	

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00	4/2/2026	HB	SUBMITTAL SET

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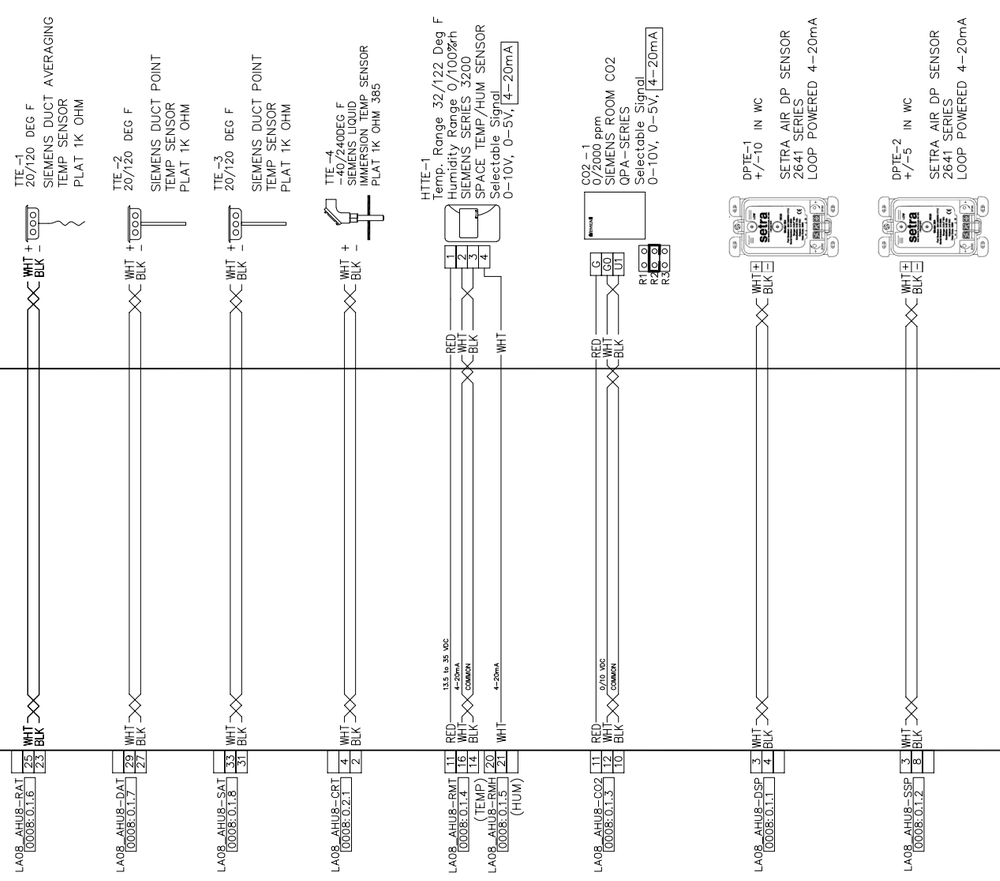
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



COMPONENT PANEL / POWER

FIELD PANEL

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0008	LA08.PXCA	

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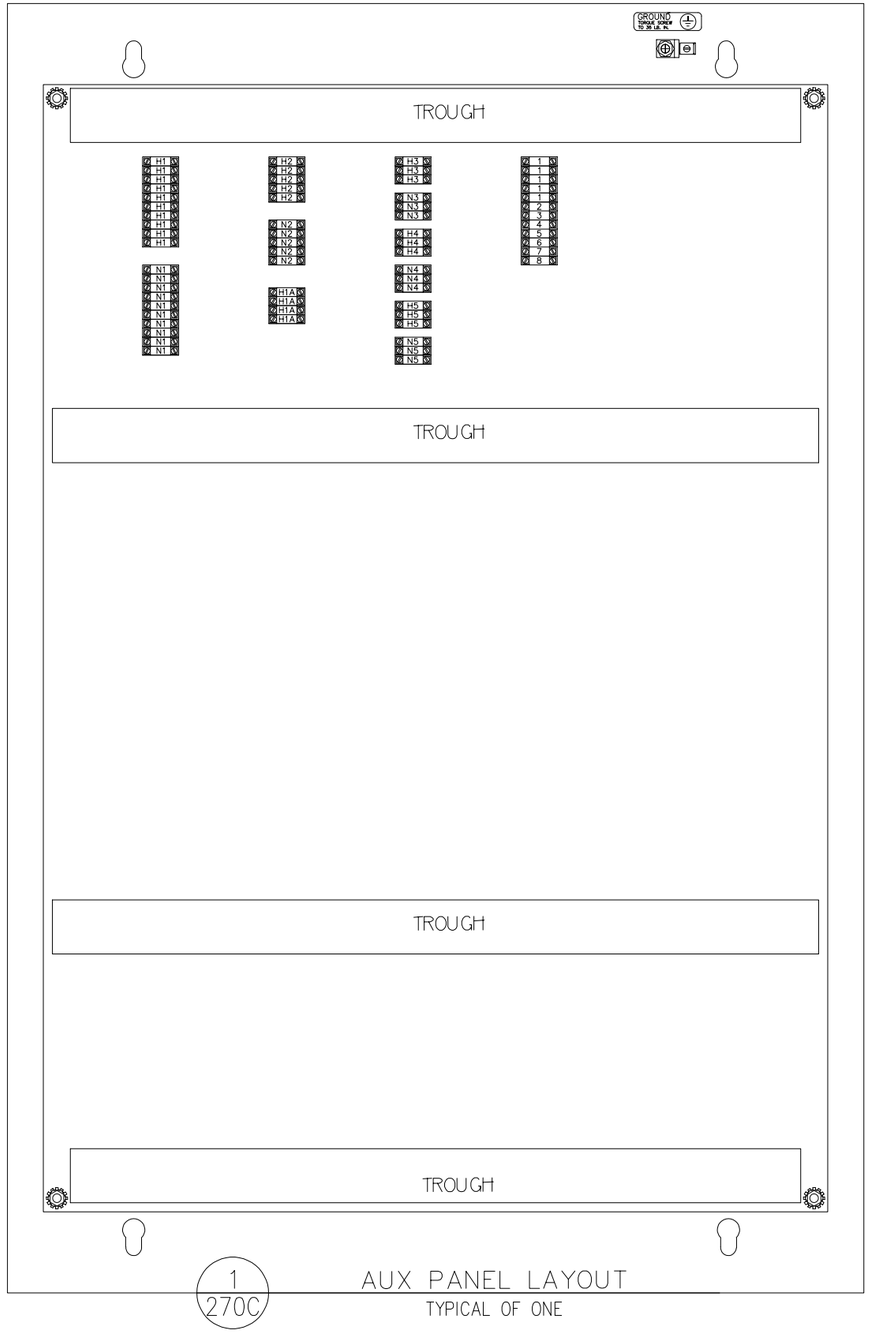

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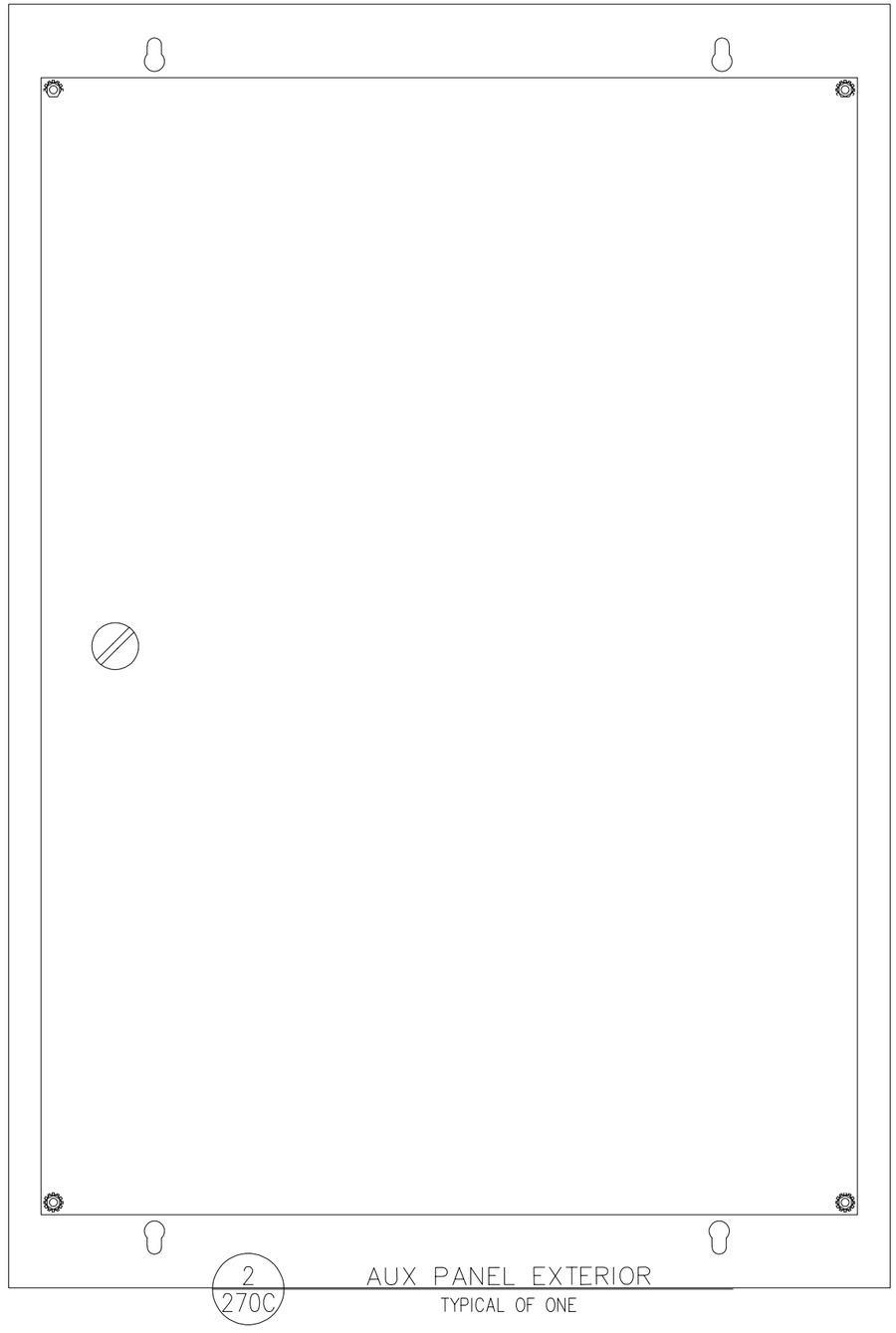
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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AHU-8 AUX PANEL LAYOUT

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CO2 1	1	QPA2000	SIEMENS	149910	ROOM CO2 SENSOR, 0-10V
	1	ARG70	SIEMENS	149399	T'STAT WALL PLATE ESCUTCHEON
DPTE 1	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
DPTE 2	1	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
HTTE 1	1	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	1	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
PNL AUX-8	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 8	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-4	4	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-2	2	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
TTE 1	1	544-342-24	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 24', FLEX
TTE 2-3	2	544-343-18	SIEMENS	149261	DCT AV. TEMP, 1K OHM PT(375), 18", RIGID
TTE 4	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-2	2	FBO			FURNISHED BY OTHERS
WD 1	1	WD-1B-C	KELE INC		WATER DETECTOR SPDT W/DEENERGIZED RELAY
Panel Mounted Devices					
RE 1	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.
2. **ENABLE:** AIR HANDLER IS STARTED FROM DDC PANEL OR FROM COMMAND OF FACILITY MANAGEMENT SYSTEM.

OCCUPIED MODE:

1. STARTUP:

- **NORMAL STARTUP:** SUPPLY FAN SHALL START AND RAMP UP TO STATIC PRESSURE SETPOINT. ONCE FAN STATUS PROOFS ARE ON, COOLING CONTROL LOOP WILL START. SUPPLY AIR TEMPERATURE CONTROL LOOP IS ACTIVE.

2. NORMAL OPERATION: AIR HANDLER TO RUN CONTINUOUSLY IN NORMAL OPERATION.

OCCUPIED CYCLE (8760 HOURS PER YEAR):

1. THE CONTROL TEMPERATURE IS CALCULATED BASED ON A WEIGHTED AVERAGE OF THE SPACE TEMPERATURE READING AND THE FAN INLET TEMPERATURE READING. THE DEFAULT WEIGHTING SHALL BE CONTROL TEMPERATURE EQUALS **50% (ADJ)** TIMES THE SPACE TEMPERATURE READING **PLUS 50% (ADJ)** TIMES THE FAN INLET TEMPERATURE READING. THIS IS A SINGLE ZONE AHU WITHOUT ANY ZONE TERMINAL UNITS.

2. WHILE THE CONTROL TEMPERATURE IS BELOW **74.5F (ADJ)** THE FAN OPERATES AT MINIMUM SPEED SETPOINT **20HZ (ADJ)** AND THE CHILLED WATER VALVE IS COMMANDED FULLY CLOSED. PARTIAL USE OF THE ROOM (e.g. ONLY ONE RACK INSTALLED IN THE ROOM WHICH IS SIZED FOR EIGHT RACKS) WILL BE ACCOMODATED BY ADJUSTING SUPPLY AIR MANUAL VOLUME DAMPERS TO DIRECT THE COOL SUPPLY AIR TO THE PORTION OF THE ROOM WHERE THE HEAT IS BEING PRODUCED AND WHERE THE USERS OF THE ROOM PREFER THE THE SUPPLY AIR TO DISCHARGE BASED ON THEIR CURRENT PHYSICAL ARRANGEMENT OF EQUIPMENT WITHIN THE SPACE.

A. FAN STAGING

AT INITIAL AHU STARTUP (AFTER A FULL AHU SHUTDOWN) ONLY **ONE** SUPPLY FAN IS IN OPERATION (THIS IS BASELINE FAN OPERATING MODE AND IT IS ACTIVE FROM INITIAL STARTUP). THE UNIT IS HELD IN BASELINE FAN OPERATING MODE FOR A PERIOD OF **TEN (ADJ)** MINUTES TO ALLOW THE SYSTEM TO ACHIEVE STEADY OPERATION AND THEN THE BASELINE FAN OPERATING MODE HOLD IS RELEASED. THE NORMAL CONTROL ALGORITHM IS MADE ACTIVE **TEN (ADJ)** MINUTES AFTER THE BASELINE FAN OPERATING MODE HOLD IS RELEASED.

EXIT BASELINE FAN OPERATING MODE WHEN THE OPERATING SUPPLY FAN SPEED SIGNAL IS INCREASED TO **65 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES. EXIT BASELINE FAN OPERATING MODE AND ENTER FIRST STAGE OPERATING MODE:
A. AN INOPERATIVE FAN IS TURNED ON (IF AVAILABLE FOR USE) AND IT'S COUNTERWEIGHTED BACKDRAFT DAMPER (NON-ACTUATED) BEGINS TO OPEN WHEN THE FAN HAS REACHED A SPEED SUFFICIENT TO CREATE THE REQUIRED DIFFERENTIAL PRESSURE NEEDED TO OVERCOME THE DAMPER WEIGHT SETTING.
B. THE FAN CONTINUING ON IN OPERATION RAMPS DOWN IN SPEED (UTILIZING AN ADJUSTABLE DECEL RAMP TIME) TO MEET THE FAN RAMPING UP IN SPEED TO MAINTAIN THE SETPOINT. ALL FANS UTILIZE THE SAME SPEED INPUT SIGNAL AT ALL TIMES.
C. THE **TWO** FANS ATTAIN THE SAME SPEED AND THEN MODULATE TOGETHER TO MEET THE SETPOINT.

IF TWO SUPPLY FANS ARE OPERATING AND THE SPEED SIGNAL IS REDUCED TO **40 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES, THEN THE PRIOR FAN OPERATING MODE IS INITIATED FOR THE SUPPLY FANS (E.G. GO FROM TWO FANS BACK TO BASELINE STAGE ONE FAN. TO ENTER THE PRIOR FAN OPERATING MODE:
A. AN OPERATING SUPPLY FAN IS TURNED OFF AND IT'S BACKDRAFT ISOLATION DAMPER FULLY CLOSES; DISABLE THE SUPPLY FAN WITH THE MOST OPERATING HOURS.
B. THE REMAINING OPERATING SUPPLY FANS CONTINUE TO OPERATE AND RAMP UP IN SPEED (UTILIZING AN ADJUSTABLE ACCEL RAMP TIME) TO MAINTAIN THE SETPOINT.

B. SUPPLY AIR TEMPERATURE:

1. WHEN THE CONTROL TEMPERATURE RISES ABOVE **75.0F (ADJ)** THE FAN SPEED LINEARLY INCREASES UP TO THE CURRENT MAXIMUM SPEED SETPOINT OF **30 HZ (ADJ)** WHEN THE CONTROL TEMPERATURE READING IS **76.0F (ADJ)**. AT **75.5F (ADJ)** CONTROL TEMPERATURE THE CHILLED WATER COIL VALVE IS ENABLED TO BE MODULATED TO ACHIEVE A CONTROL TEMPERATURE READING OF **75.5F (ADJ)**. WHEN THE CHILLED WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF **ONE MINUTE (ADJ)** THE FAN OPERATION IS RETURNED TO MINIMUM SPEED.

2. ALARM AT THE OPERATOR'S WORKSTATION IF THE SPACE TEMPERATURE READING EXCEEDS **80F (ADJ)** FOR **ONE MINUTE (ADJ).**

C. SUPPLY FAN SPEED:

STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH SUPPLY DUCT AND FAN DISCHARGE STATIC PRESSURE SENSOR LOCATED IN AHU DISCHARGE TO FUNCTION WITH SUPPLY FAN VFC CONTROL LOOP TO MONITOR THE APPROPRIATENESS OF THE CURRENT MAXIMUM SPEED SETPOINT BASED ON THE POSITION OF THE MANUAL DAMPERS. SUPPLY FAN SPEED SHALL GENERALLY ACHIEVE DUCT STATIC PRESSURE OF 0.3" W.G., WITH DISCHARGE PRESSURE NOT TO EXCEED 1.5" W.G. . FINAL CURRENT MAXIMUM SPEED SETPOINT DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER.

3. SAFETIES: FURNISH SAFETIES AS FOLLOWS TO PROVIDE ALARM AND SHUT DOWN UNIT.
a. IN THE EVENT OF SMOKE DETECTED BY FA SYSTEM AT AHU RETURN DUCT DETECTOR: SHUT THE UNIT DOWN. INDICATE "FA SHUTDOWN" ON GRAPHICS FOR AHU.

4. MONITORING:

a. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE CO2 EXCEEDS **1,200 PPM (ADJ.)** FOR LONGER THAN **15 MINUTES**.
b. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE RH EXCEEDS **65% (ADJ.)** FOR LONGER THAN **15 MINUTES**.

5. SHUTDOWN: ON AHU SHUTDOWN SUPPLY STOPS. CLOSE COOLING COIL VALVE.
?

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

AHU-8 CONTROL

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UNOCCUPIED MODE:

THERE IS NO UNOCCUPIED MODE FOR THIS AHU; IT SHALL CONTINUALLY RECIRCULATE AIR TO THE SPACE.

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AHU-8 CONTROL

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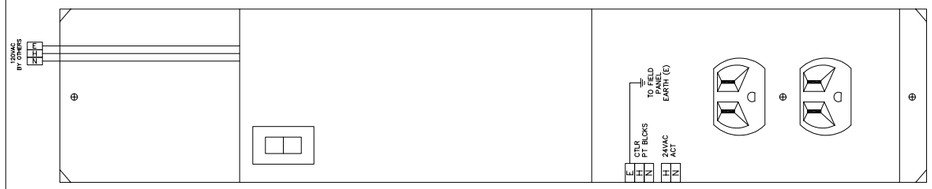
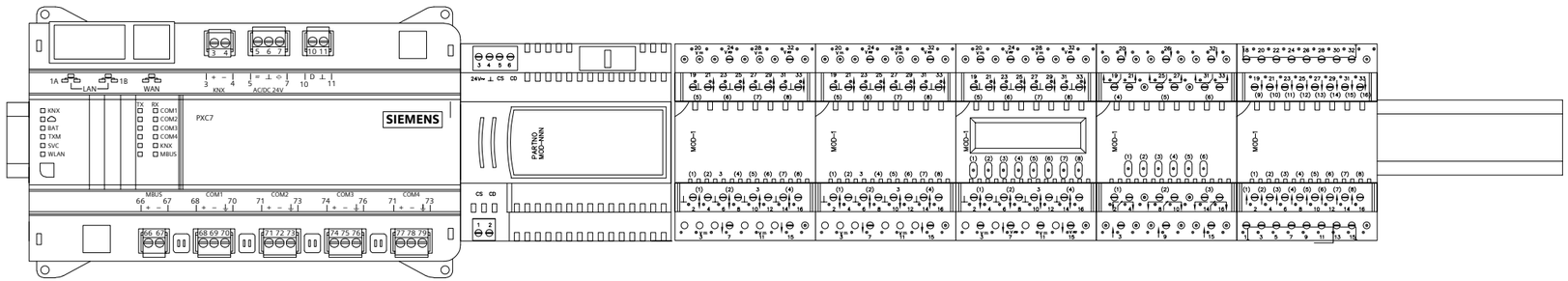
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





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LA08.PXCA INSTALLATION

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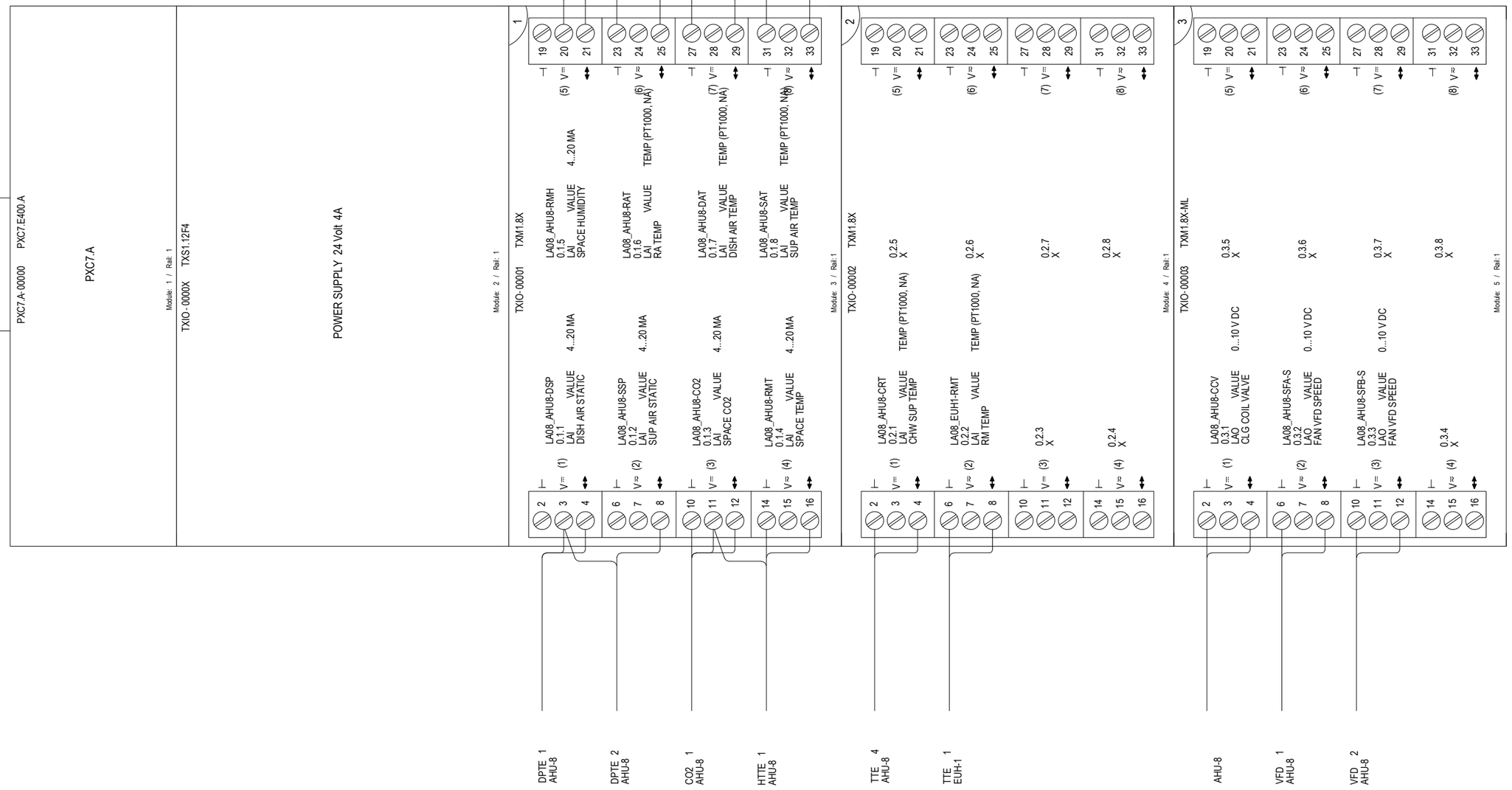
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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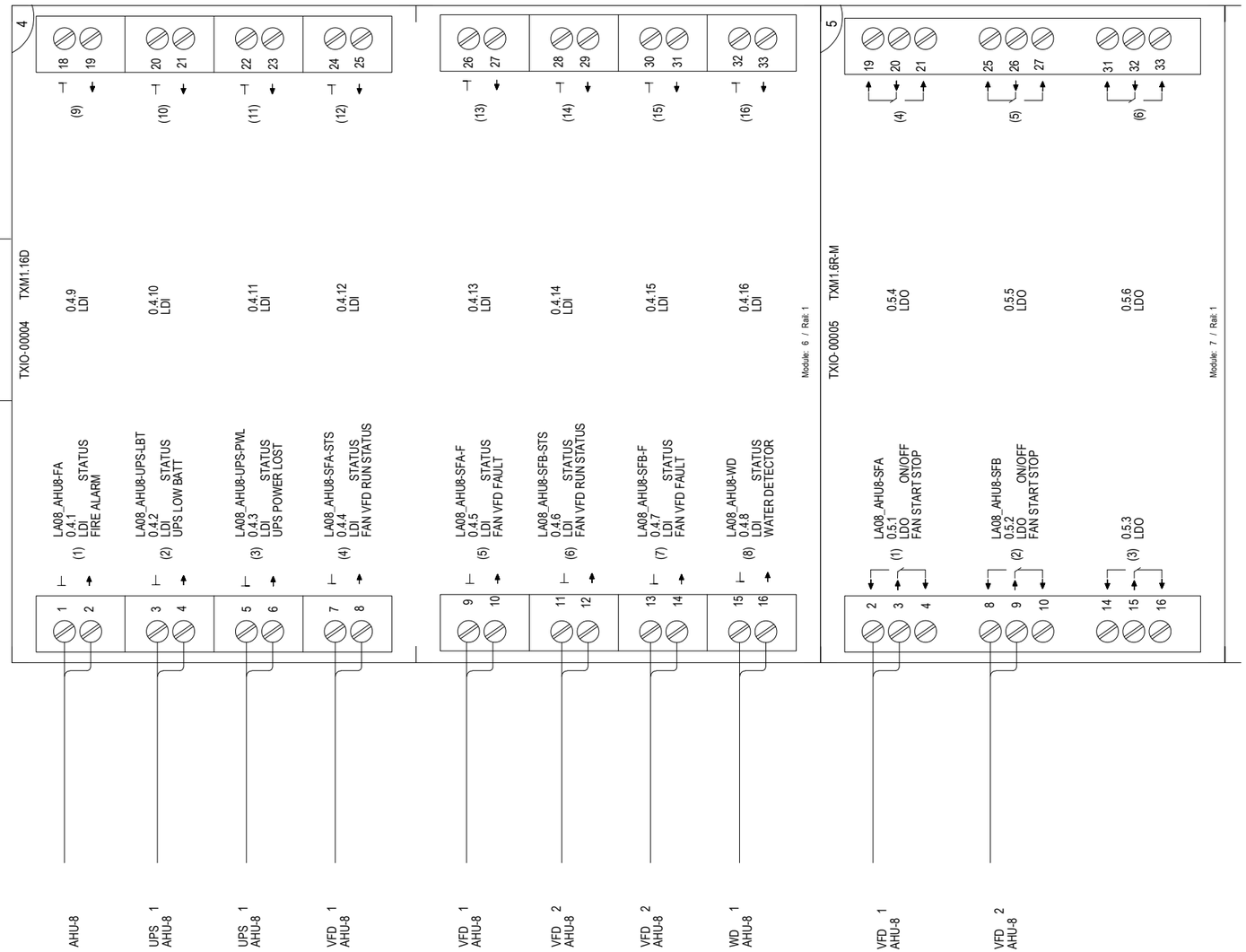

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LA08.PXCA BOM

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E270C

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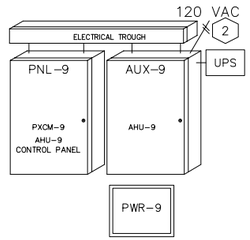
INSTALLATION NOTES:

1. AHU TO BE WORKED ON IN THE FUTURE. INSTALL CONTROL PANE AND AUX PANEL ENCLOSURE
2. REFER TO PLANS FOR PANEL LOCATION. COORDINATE WITH OWNER FOR EXACT LOCATION.
3. CONNECT TO SIEMENS ETHERNET NETWORK. SEE SYSTEM ARCHITECTURE DRAWINGS (R01) FOR DETAILS.



1/280 AHU-9 CONTROL PANEL ENCLOSURES, UPS AND POWER TRANSFORMER FOR FUTURE USE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/13/26

FUTURE AHU-9

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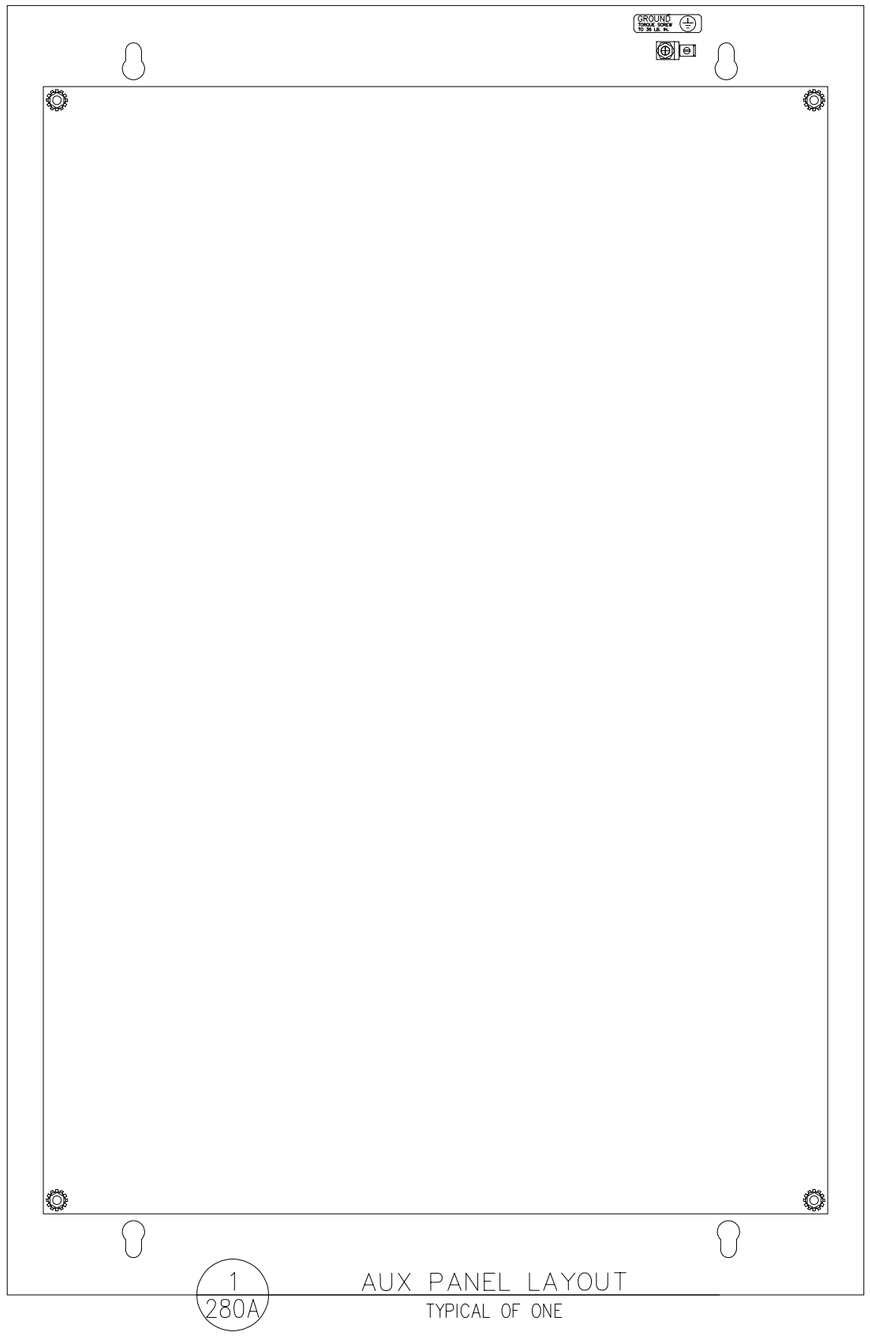
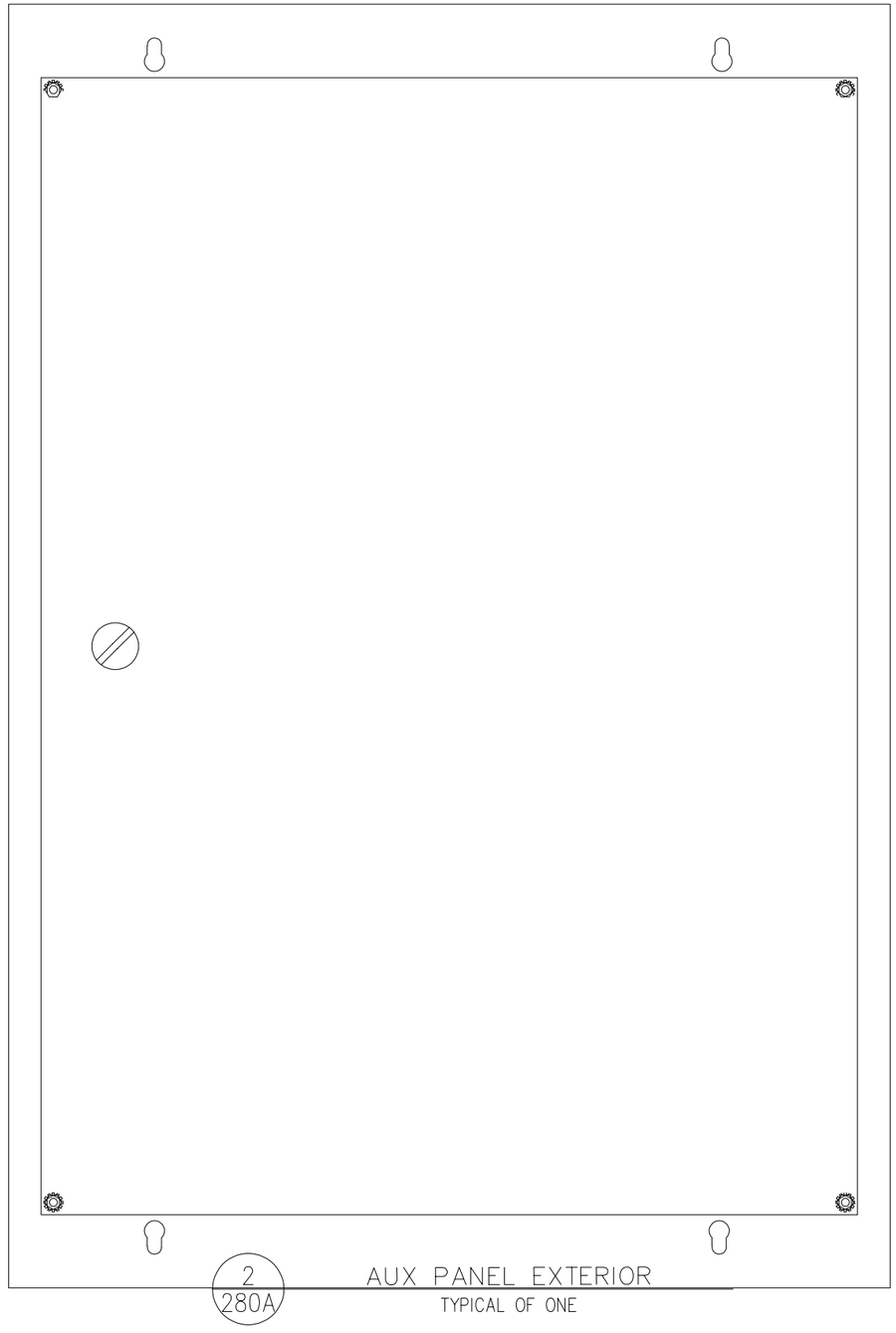


1 280A AUX PANEL LAYOUT
TYPICAL OF ONE



2 280A AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

03	9/4/2025	HB	AS-BUILT DRAWING
01	7/20/2023	HB	SUBMITTAL FOR APPROVAL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

FUTURE AHU-9 CONTROL

440P412785
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 9	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
PNL AUX-9	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 9	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

FUTURE AHU-9 BOM

440P412785
0
280B

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ESLAM "HANDSHAKE" INTERLOCK WIRING
PULL WIRE TO AHU-1, AHU-2 AND AHU-3 CONTROLLER

LA11_ELSAMEF10-A1OUT
0011:0.4.4
SUPERVISORY OUTPUT

LA11_ELSAMEF10-A1IN
0011:0.4.5
SUPERVISORY INPUT

LA11_ELSAMEF10-A2OUT
0011:0.4.5
SUPERVISORY OUTPUT

LA11_ELSAMEF10-A2IN
0011:0.4.6
SUPERVISORY INPUT

LA11_ELSAMEF10-A3OUT
0011:0.4.6
SUPERVISORY OUTPUT

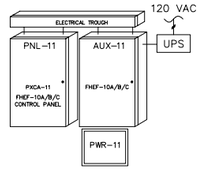
LA11_ELSAMEF10-A3IN
0011:0.4.7
SUPERVISORY INPUT

PNL-11 PNL-AUX-11

UPS-1
UPS LO BATT
LA11_FHEF10-UPS-LBT
0011:0.3.2

POWER LOSS
LA11_FHEF10-UPS-PWL
0011:0.3.3

RE-1
SAFETY RELAY



INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. WIRE INTO FAN SAFETY CIRCUIT. REFER TO WIRING DETAIL ON ELECTRICAL DRAWING.
3. VFD FURNISHED BY OTHERS.
4. DAMPER AND ACTUATOR BE PROVIDED WITH FAN.
5. SUPERVISORY SIGNAL BY E.C. TO FA ANNUNCIATOR ONLY, DETECTOR IS NOT WIRED TO ANY FAN STARTERS. EC TO PROGRAM DETECTOR FOR HAZARDOUS LOCATION.

VFD-FHEF-10A
RIB-2
SAFETY RELAY
RIB-1
LA11_FHEF10A
0011:0.4.1
START/STOP
LA11_FHEF10A-S
0011:0.2.3
SPEED
LA11_FHEF10A-STS
0011:0.3.11
STATUS
LA11_FHEF10A-F
0011:0.3.12
FAULT
VFD-1

VFD-FHEF-10B
RIB-4
SAFETY RELAY
RIB-3
LA11_FHEF10B
0011:0.4.2
START/STOP
LA11_FHEF10B-S
0011:0.2.4
SPEED
LA11_FHEF10B-STS
0011:0.3.13
STATUS
LA11_FHEF10B-F
0011:0.3.14
FAULT
VFD-2

VFD-FHEF-10C
RIB-6
SAFETY RELAY
RIB-5
LA11_FHEF10C
0011:0.4.3
START/STOP
LA11_FHEF10C-S
0011:0.2.5
SPEED
LA11_FHEF10C-STS
0011:0.3.15
STATUS
LA11_FHEF10C-F
0011:0.3.16
FAULT
VFD-3

FHEF-10A
21000 CFM
40.0 HP
460V/3/60
EA
INTERLOCK
AE -1
2POS 24V
D-1
NO
LA11_FHEF10A-ISD-0
0011:0.3.8
DAMPER OPEN

FHEF-10B
21000 CFM
40.0 HP
460V/3/60
EA
INTERLOCK
AE -2
2POS 24V
D-2
NO
LA11_FHEF10B-ISD-0
0011:0.3.9
DAMPER OPEN

FHEF-10C
21000 CFM
40.0 HP
460V/3/60
EA
INTERLOCK
AE -3
2POS 24V
D-3
NO
LA11_FHEF10C-ISD-0
0011:0.3.10
DAMPER OPEN

OA
D-4
NC
AE -4
0/10 VDC
LA11_FHEF10-BYD1
0011:0.2.1

PLENUM

D-5
NC
OA
AE -5
0/10 VDC
LA11_FHEF10-BYD2
0011:0.2.2

DPTE-5
+/-5 IN WG
LA11_FHEF10-ESP5
0011:0.1.5
SPP-5
EA

DPTE-4
+/-5 IN WG
LA11_FHEF10-ESP4
0011:0.1.4
SPP-4
EA

DPTE-3
+/-5 IN WG
LA11_FHEF10-ESP3
0011:0.1.3
SPP-3
EA

DPTE-2
+/-5 IN WG
LA11_FHEF10-ESP2
0011:0.1.2
SPP-2
EA

DPTE-1
+/-5 IN WG
LA11_FHEF10-ESP1
0011:0.1.1
SPP-1
EA

DPTE-6
+/-10IN WG
LA11_FHEF10-ESP
0011:0.1.6
SPP-7

SPP-6

SSP-8

DPS-1
-5.5 IN WG
LA11_FHEF10-LSP
0011:0.3.4
LO HI

INSIDE PENTHOUSE

EXTERIOR OF BUILDING

1/300 LAB EXHAUST FANS FHEF-10A/B/C
LOCATION: ROOF

440P412785
D
300

SIEMENS

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

GJ LAUNCH ACCELERATOR FOR BIO
ID# 202500372, IN

ENGR	DRAFTER	CHECKED BY	WORK ORDER	LAST EDIT DATE
HB	HB	KG	04/02/26	04/13/26

FUME HOOD EXH FAN SYSTEM

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0011	LA11-PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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FIELD WIRING — **STARTER / VFD / PACKAGED CONTROLLER WIRING**

120VAC EMERGENCY POWER BY EC

UPS

BATTERY-BACKED OUTLET

18 AWG TP

18 AWG TP

P/N 5= COMMON
P/N 7= LOW BATTERY
P/N 9= LOAD ON BATTERY

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

FHEF LOW STATIC SHUTDOWN

DPS-1

VFD-1 FUME HOOD EXHAUST FAN VFD-FHEF-10A FURNISHED BY OTHER

VFD-2 FUME HOOD EXHAUST FAN VFD-FHEF-10B FURNISHED BY OTHER

VFD-3 FUME HOOD EXHAUST FAN VFD-FHEF-10C FURNISHED BY OTHER

SAFETIES · ENABLE · SPEED · DRIVE FAULT · SYSTEM RUN STATUS · DAMPER ENABLE · RUN PERMISSIVE

AE-1 24V 2 Pos ELECTRONIC DAMPER ACTUATOR PROVIDED WITH UNIT

AE-2 24V 2 Pos ELECTRONIC DAMPER ACTUATOR PROVIDED WITH UNIT

AE-3 24V 2 Pos ELECTRONIC DAMPER ACTUATOR PROVIDED WITH UNIT

COMPONENT PANEL / POWER

120VAC

HANDI-BOX METAL COVER NO FUSE

SERVICE BOX

120VAC

24 VAC 500 VA

POWER SUPPLY 24V POWER FROM PWR-11 CIRCUIT 1

192VA

500VA

FIELD PANEL

LA11_FHEF10-UPS-LBT 0011:0.3.2 LOW BATTERY

LA11_FHEF10-UPS-PWL 0011:0.3.1 LOSS OF POWER

LA11_FHEF10-LSP 0011:0.3.4

LA11_FHEF10A 0011:0.4.1

LA11_FHEF10A-S 0011:0.2.3

LA11_FHEF10A-F 0011:0.3.12

LA11_FHEF10A-STS 0011:0.3.11

LA11_FHEF10A-ISD-O 0011:0.3.8

LA11_FHEF10B 0011:0.4.2

LA11_FHEF10B-S 0011:0.2.4

LA11_FHEF10B-F 0011:0.3.14

LA11_FHEF10B-STS 0011:0.3.13

LA11_FHEF10B-ISD-O 0011:0.3.9

LA11_FHEF10C 0011:0.4.3

LA11_FHEF10C-S 0011:0.2.5

LA11_FHEF10C-F 0011:0.3.16

LA11_FHEF10C-STS 0011:0.3.15

LA11_FHEF10C-ISD-O 0011:0.3.10

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0011	LA11.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

FH EXH FAN ELEC. WIRING 1

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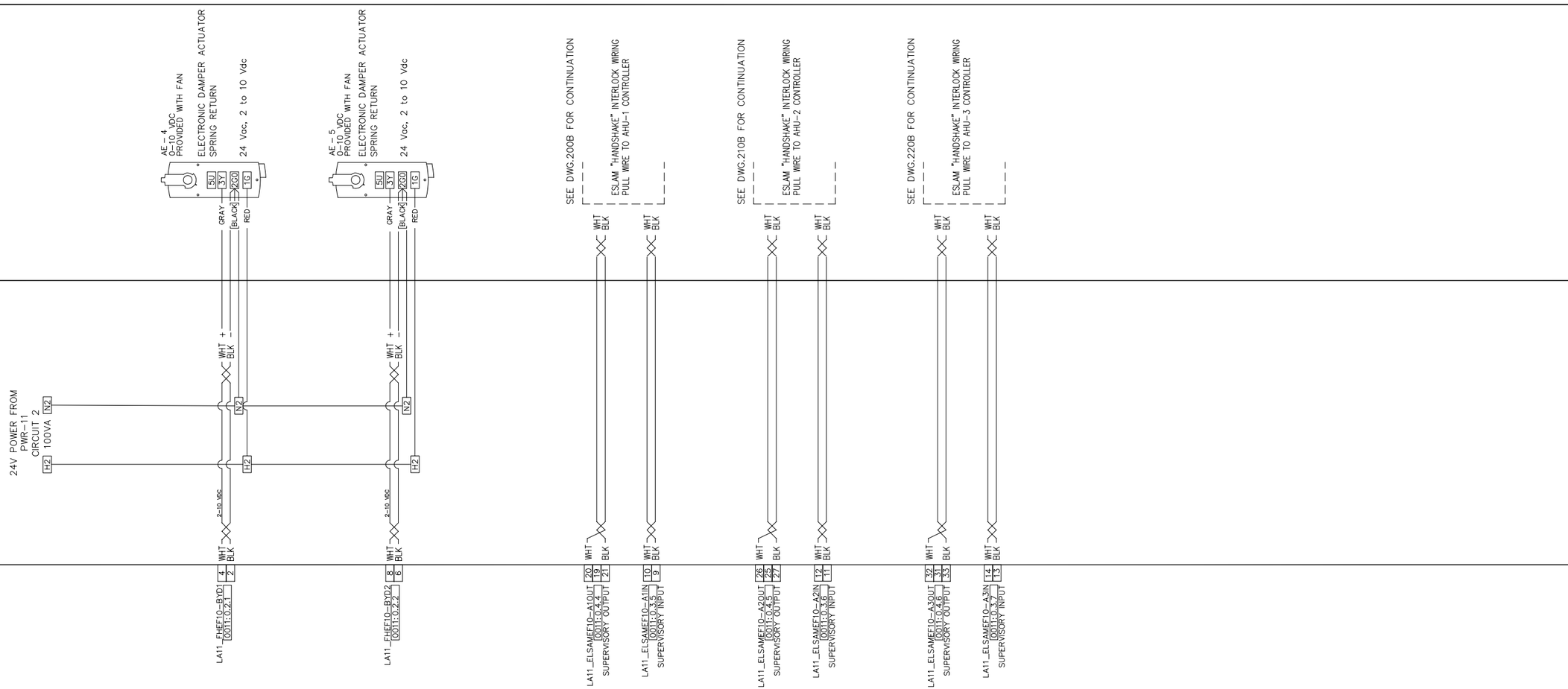
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL



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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0011	LA11.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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FH EXH FAN ELEC. WIRING 2

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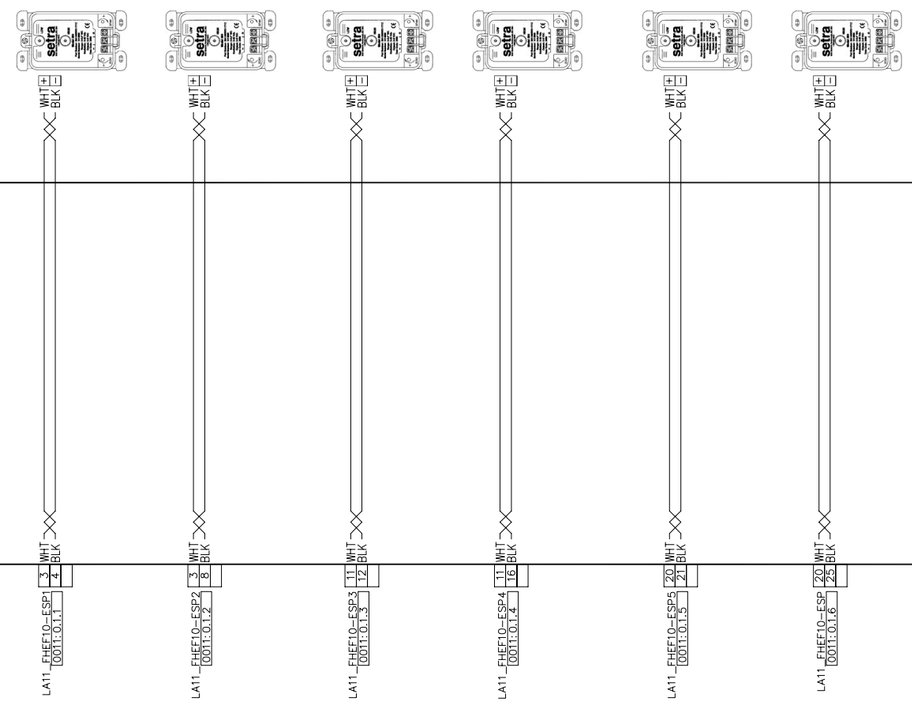
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER



FIELD PANEL

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0011	LA11.PXCA	

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.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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FH EXH FAN ELEC. WIRING 3

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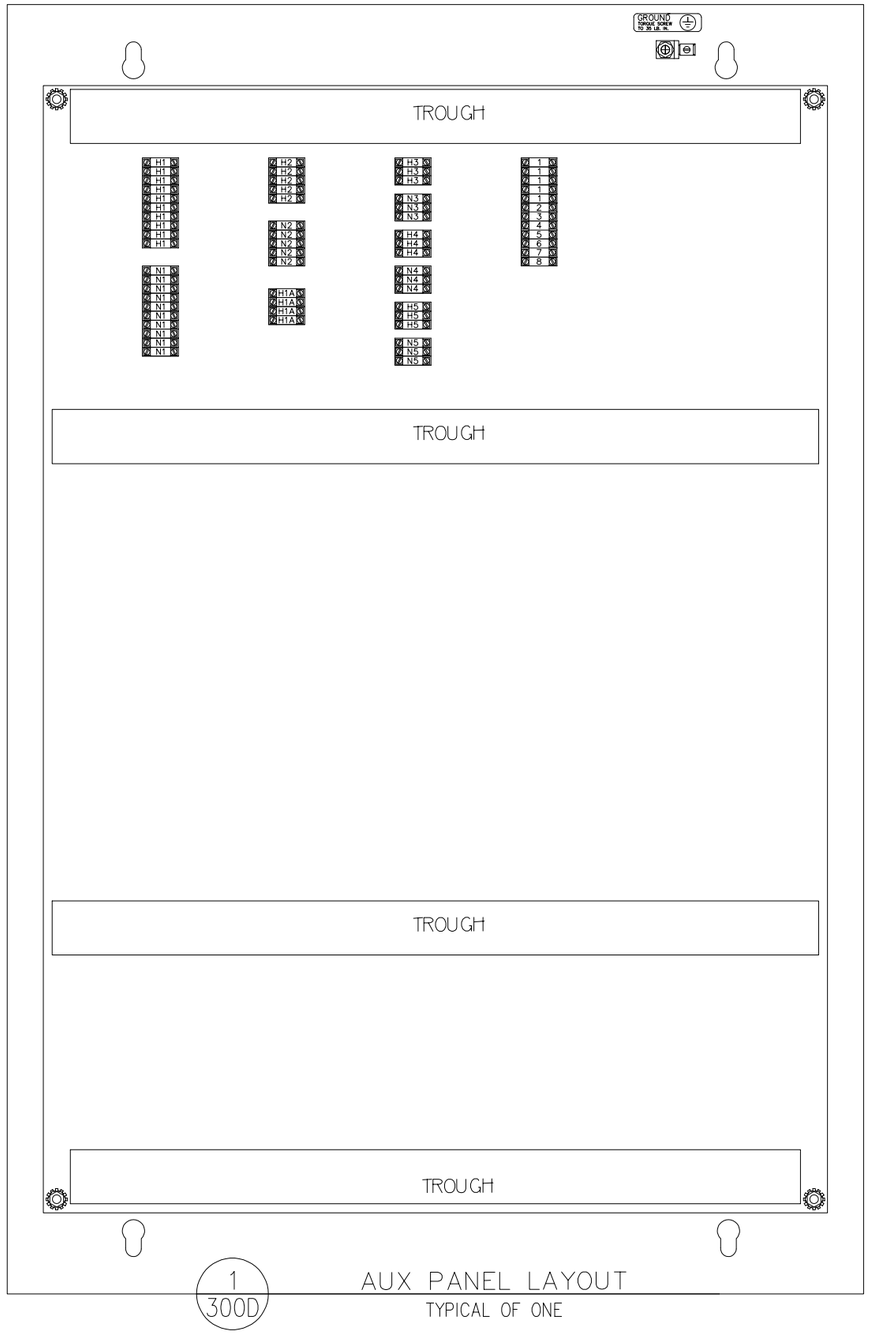

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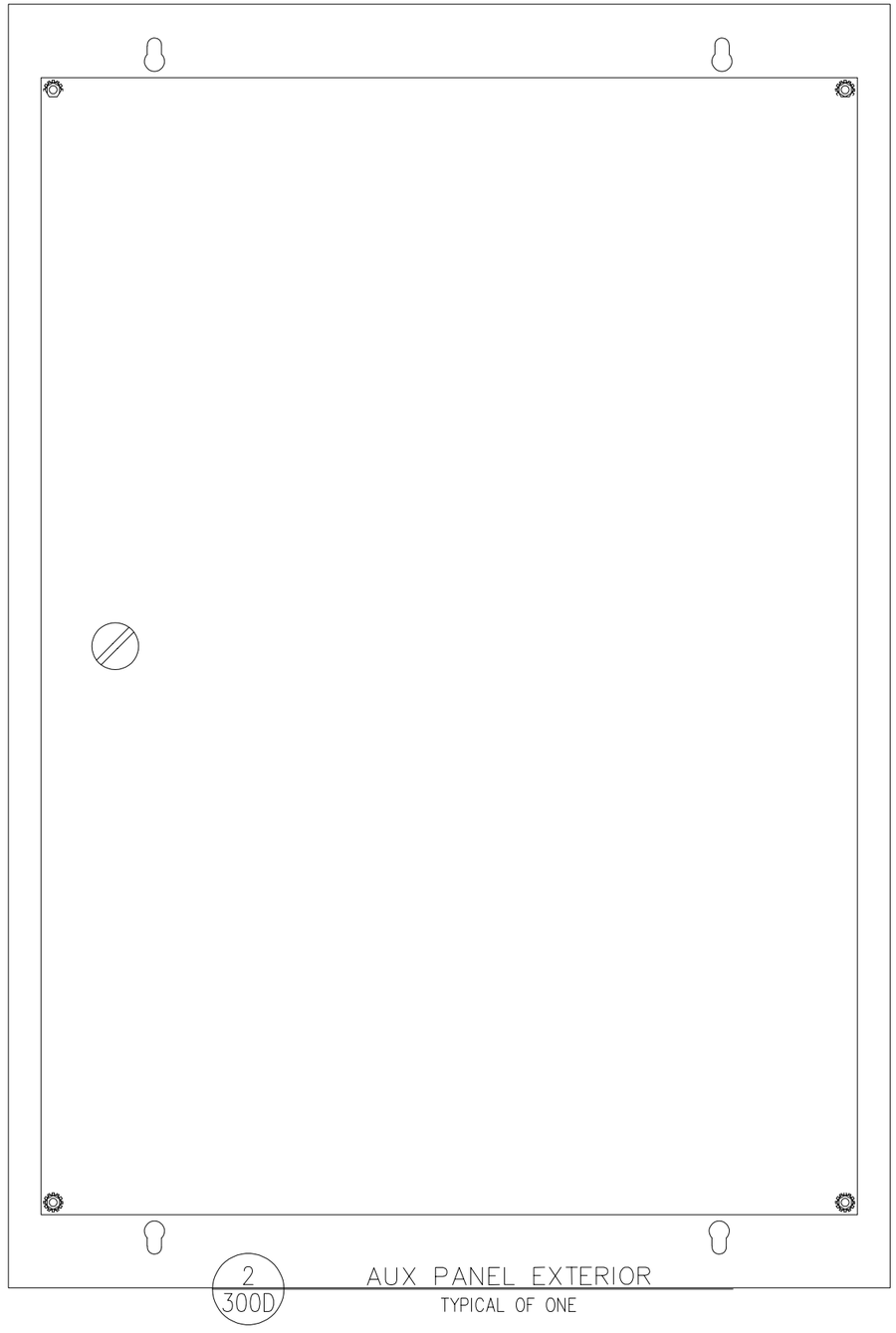
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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FHEF AUX PANEL LAYOUT

440P412785
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-5	5	FBO			FURNISHED BY OTHERS
DPS 1	1	AFS-460-DSS	KELE INC		2-12in SWITCH W/2 SPST CONTACTS
DPTE 1-5	5	2641005WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-5" ENC
DPTE 6	1	2641010WB11A1C	SETRA	0608cut003	DP TRAN AIR,1%,+/-10" ENC
PNL 11	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR AUX-11	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
RIB 1-6	6	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
SPP 1-7	7	269-062	SIEMENS		PR269 ACCESSORY, SENSING TUBE
SPP 8	1	SPH10	VAISALA		STATIC PRESSURE HEAD
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE
VFD 1-3	3	FBO			FURNISHED BY OTHERS

SEQUENCE OF OPERATION:

1. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.
2. **ENABLE:** AIR HANDLER IS STARTED FROM DDC PANEL OR FROM COMMAND OF FACILITY MANAGEMENT SYSTEM.

OCCUPIED MODE:

1. STARTUP:

? **NORMAL STARTUP:** SUPPLY FAN SHALL START AND RAMP UP TO STATIC PRESSURE SETPOINT. ONCE FAN STATUS PROOFS ARE ON, COOLING CONTROL LOOP WILL START. SUPPLY AIR TEMPERATURE CONTROL LOOP IS ACTIVE.

2. NORMAL OPERATION: AIR HANDLER TO RUN CONTINUOUSLY IN NORMAL OPERATION.

OCCUPIED CYCLE (8760 HOURS PER YEAR):

1. THE CONTROL TEMPERATURE IS CALCULATED BASED ON A WEIGHTED AVERAGE OF THE SPACE TEMPERATURE READING AND THE FAN INLET TEMPERATURE READING. THE DEFAULT WEIGHTING SHALL BE CONTROL TEMPERATURE EQUALS **50% (ADJ)** TIMES THE SPACE TEMPERATURE READING **PLUS 50% (ADJ)** TIMES THE FAN INLET TEMPERATURE READING. THIS IS A SINGLE ZONE AHU WITHOUT ANY ZONE TERMINAL UNITS.

2. WHILE THE CONTROL TEMPERATURE IS BELOW **74.5F (ADJ)** THE FAN OPERATES AT MINIMUM SPEED SETPOINT **20HZ (ADJ)** AND THE CHILLED WATER VALVE IS COMMANDED FULLY CLOSED. PARTIAL USE OF THE ROOM (e.g. ONLY ONE RACK INSTALLED IN THE ROOM WHICH IS SIZED FOR EIGHT RACKS) WILL BE ACCOMODATED BY ADJUSTING SUPPLY AIR MANUAL VOLUME DAMPERS TO DIRECT THE COOL SUPPLY AIR TO THE PORTION OF THE ROOM WHERE THE HEAT IS BEING PRODUCED AND WHERE THE USERS OF THE ROOM PREFER THE THE SUPPLY AIR TO DISCHARGE BASED ON THEIR CURRENT PHYSICAL ARRANGEMENT OF EQUIPMENT WITHIN THE SPACE.

A. FAN STAGING

AT INITIAL AHU STARTUP (AFTER A FULL AHU SHUTDOWN) ONLY **ONE** SUPPLY FAN IS IN OPERATION (THIS IS BASELINE FAN OPERATING MODE AND IT IS ACTIVE FROM INITIAL STARTUP). THE UNIT IS HELD IN BASELINE FAN OPERATING MODE FOR A PERIOD OF **TEN (ADJ)** MINUTES TO ALLOW THE SYSTEM TO ACHIEVE STEADY OPERATION AND THEN THE BASELINE FAN OPERATING MODE HOLD IS RELEASED. THE NORMAL CONTROL ALGORITHM IS MADE ACTIVE **TEN (ADJ)** MINUTES AFTER THE BASELINE FAN OPERATING MODE HOLD IS RELEASED.

EXIT BASELINE FAN OPERATING MODE WHEN THE OPERATING SUPPLY FAN SPEED SIGNAL IS INCREASED TO **65 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES. EXIT BASELINE FAN OPERATING MODE AND ENTER FIRST STAGE OPERATING MODE:

A. AN INOPERATIVE FAN IS TURNED ON (IF AVAILABLE FOR USE) AND IT'S COUNTERWEIGHTED BACKDRAFT DAMPER (NON-ACTUATED) BEGINS TO OPEN WHEN THE FAN HAS REACHED A SPEED SUFFICIENT TO CREATE THE REQUIRED DIFFERENTIAL PRESSURE NEEDED TO OVERCOME THE DAMPER WEIGHT SETTING.

B. THE FAN CONTINUING ON IN OPERATION RAMPS DOWN IN SPEED (UTILIZING AN ADJUSTABLE DECEL RAMP TIME) TO MEET THE FAN RAMPING UP IN SPEED TO MAINTAIN THE SETPOINT. ALL FANS UTILIZE THE SAME SPEED INPUT SIGNAL AT ALL TIMES.

C. THE **TWO** FANS ATTAIN THE SAME SPEED AND THEN MODULATE TOGETHER TO MEET THE SETPOINT.

IF TWO SUPPLY FANS ARE OPERATING AND THE SPEED SIGNAL IS REDUCED TO **40 HZ (ADJ)** FOR A PERIOD OF **FIVE (ADJ)** MINUTES, THEN THE PRIOR FAN OPERATING MODE IS INITIATED FOR THE SUPPLY FANS (E.G. GO FROM TWO FANS BACK TO BASELINE STAGE ONE FAN. TO ENTER THE PRIOR FAN OPERATING MODE:

A. AN OPERATING SUPPLY FAN IS TURNED OFF AND IT'S BACKDRAFT ISOLATION DAMPER FULLY CLOSES; DISABLE THE SUPPLY FAN WITH THE MOST OPERATING HOURS.

B. THE REMAINING OPERATING SUPPLY FANS CONTINUE TO OPERATE AND RAMP UP IN SPEED (UTILIZING AN ADJUSTABLE ACCEL RAMP TIME) TO MAINTAIN THE SETPOINT.

B. SUPPLY AIR TEMPERATURE:

1. WHEN THE CONTROL TEMPERATURE RISES ABOVE **75.0F (ADJ)** THE FAN SPEED LINEARLY INCREASES UP TO THE CURRENT MAXIMUM SPEED SETPOINT OF **30 HZ (ADJ)** WHEN THE CONTROL TEMPERATURE READING IS **76.0F (ADJ)**. AT **75.5F (ADJ)** CONTROL TEMPERATURE THE CHILLED WATER COIL VALVE IS ENABLED TO BE MODULATED TO ACHIEVE A CONTROL TEMPERATURE READING OF **75.5F (ADJ)**. WHEN THE CHILLED WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF **ONE MINUTE (ADJ)** THE FAN OPERATION IS RETURNED TO MINIMUM SPEED.

2. ALARM AT THE OPERATOR'S WORKSTATION IF THE SPACE TEMPERATURE READING EXCEEDS **80F (ADJ)** FOR **ONE MINUTE (ADJ).**

C. SUPPLY FAN SPEED:

STATIC PRESSURE SENSOR LOCATED 90% OF DISTANCE THROUGH SUPPLY DUCT AND FAN DISCHARGE STATIC PRESSURE SENSOR LOCATED IN AHU DISCHARGE TO FUNCTION WITH SUPPLY FAN VFC CONTROL LOOP TO MONITOR THE APPROPRIATENESS OF THE CURRENT MAXIMUM SPEED SETPOINT BASED ON THE POSITION OF THE MANUAL DAMPERS. SUPPLY FAN SPEED SHALL GENERALLY ACHIEVE DUCT STATIC PRESSURE OF 0.3" W.G., WITH DISCHARGE PRESSURE NOT TO EXCEED 1.5" W.G. . FINAL CURRENT MAXIMUM SPEED SETPOINT DETERMINED BY TAB CONTRACTOR AND APPROVED BY ENGINEER.

3. SAFETIES: FURNISH SAFETIES AS FOLLOWS TO PROVIDE ALARM AND SHUT DOWN UNIT.

a. IN THE EVENT OF SMOKE DETECTED BY FA SYSTEM AT AHU RETURN DUCT DETECTOR: SHUT THE UNIT DOWN. INDICATE "FA SHUTDOWN" ON GRAPHICS FOR AHU.

4. MONITORING:

a. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE CO2 EXCEEDS **1,200 PPM (ADJ.)** FOR LONGER THAN **15 MINUTES**.
b. INTIATE AN ALARM TO THE OWS IN THE EVENT SPACE RH EXCEEDS **65% (ADJ.)** FOR LONGER THAN **15 MINUTES**.

5. SHUTDOWN: ON AHU SHUTDOWN SUPPLY STOPS. CLOSE COOLING COIL VALVE.

?

UNOCCUPIED MODE:

THERE IS NO UNOCCUPIED MODE FOR THIS AHU; IT SHALL CONTINUALLY RECIRCULATE AIR TO THE SPACE.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

FH EXH FAN SYS BOM & SOO

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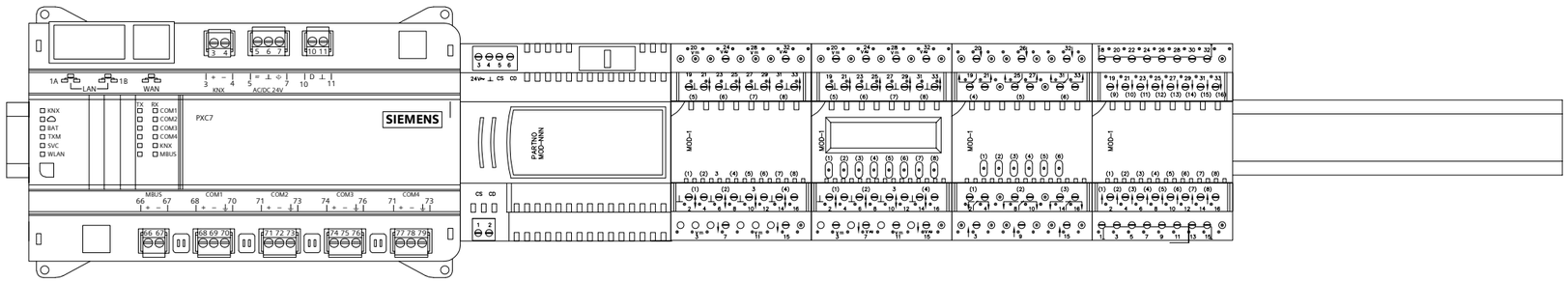
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.



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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA11.PXCA INSTALLATION

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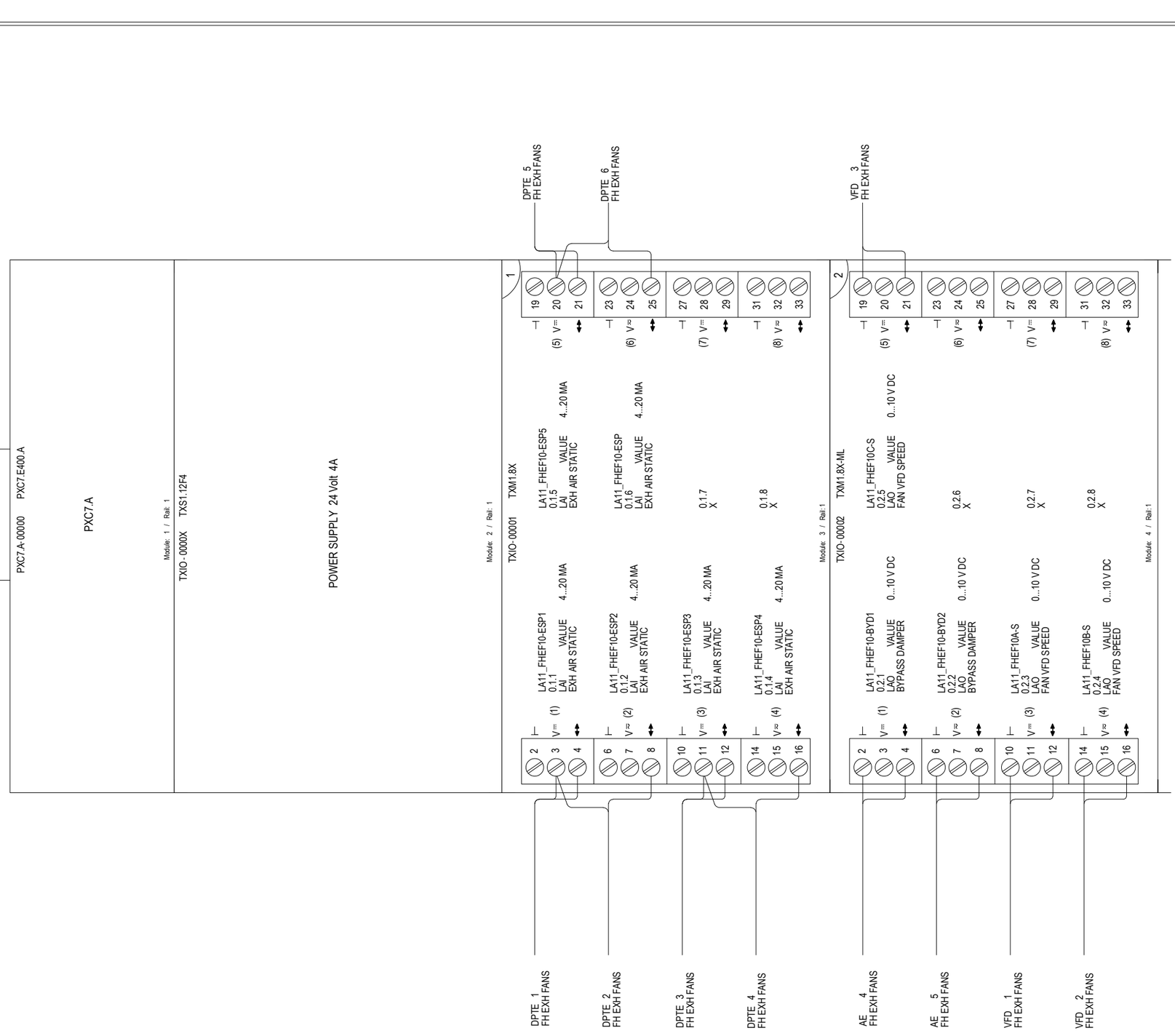
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU# 20250072, IN

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FHEF-10A/B/C

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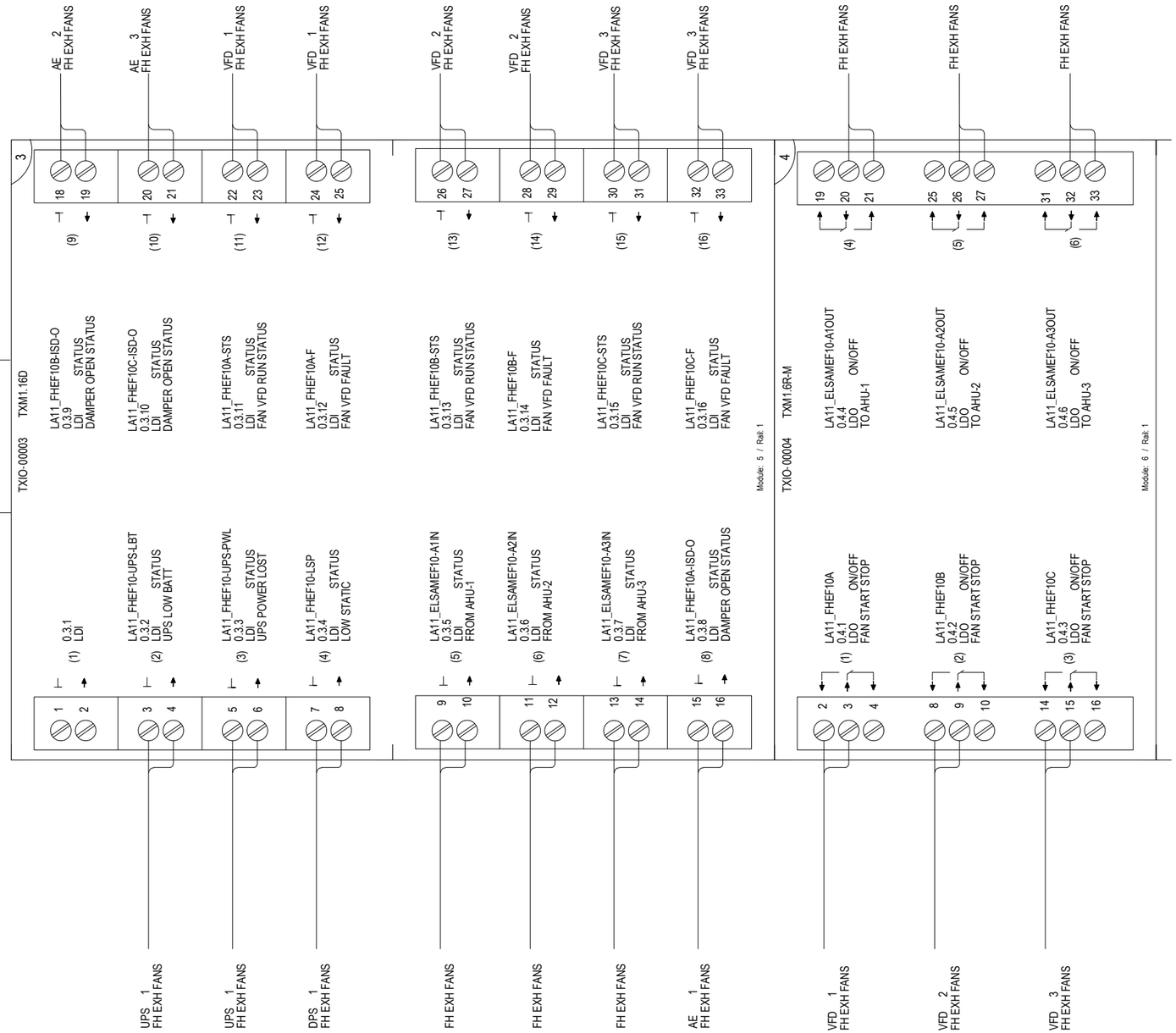

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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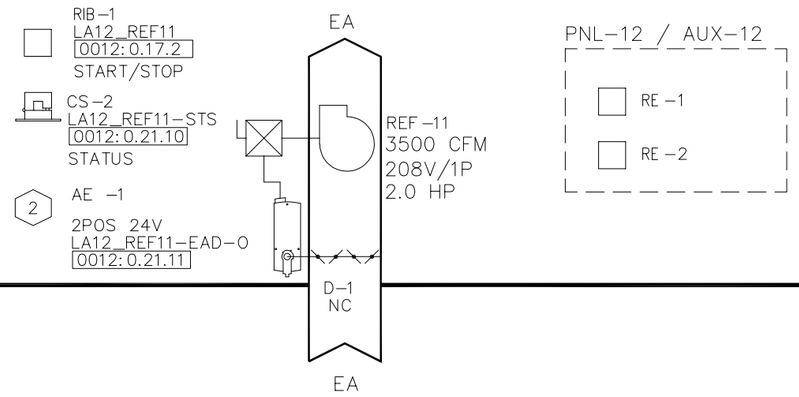
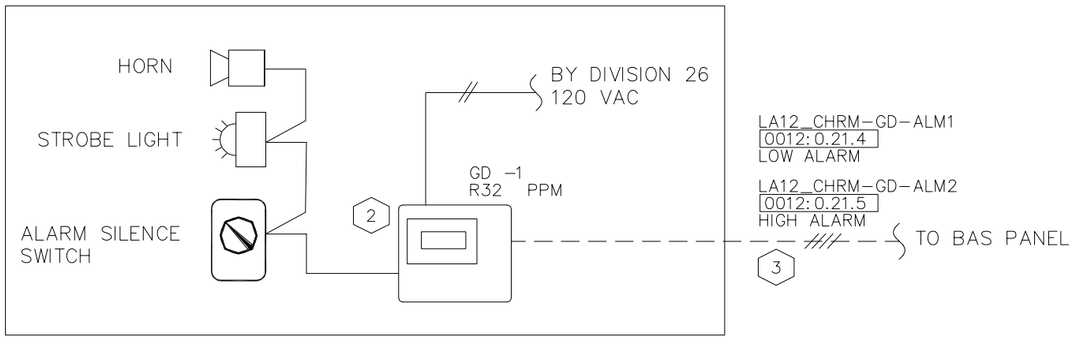
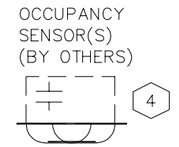
INSTALLATION NOTES:

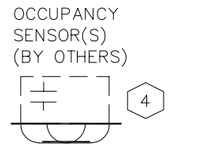
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. FURNISHED BY OTHERS / MECHANICAL CONTRACTOR.
3. WIRED BY C.I.C
4. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. TTC WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

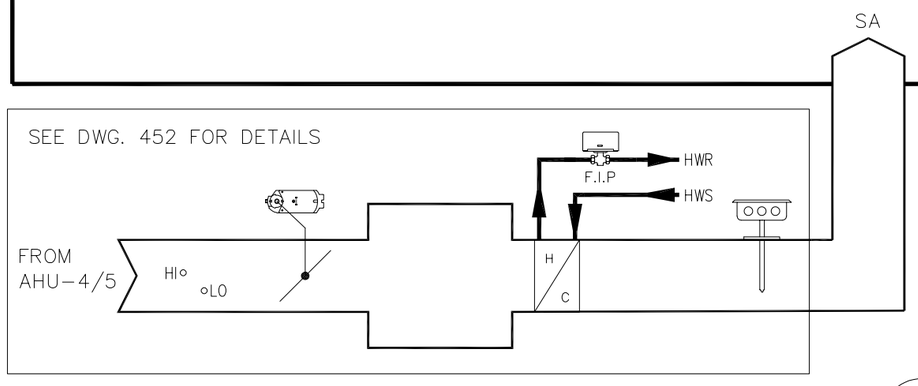


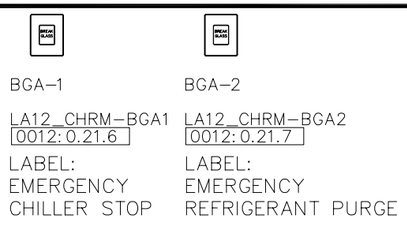
REFRIGERANT MONITOR, HORN, STROBE LIGHT, ALARM SILENCE SWITCH, WIRED, TESTING BY OTHERS.











1/310 REF-11 CHILLER ROOM REFRIGERANT EXHAUST

LOCATION: PENTHOUSE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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CH ROOM FAN CONTROL

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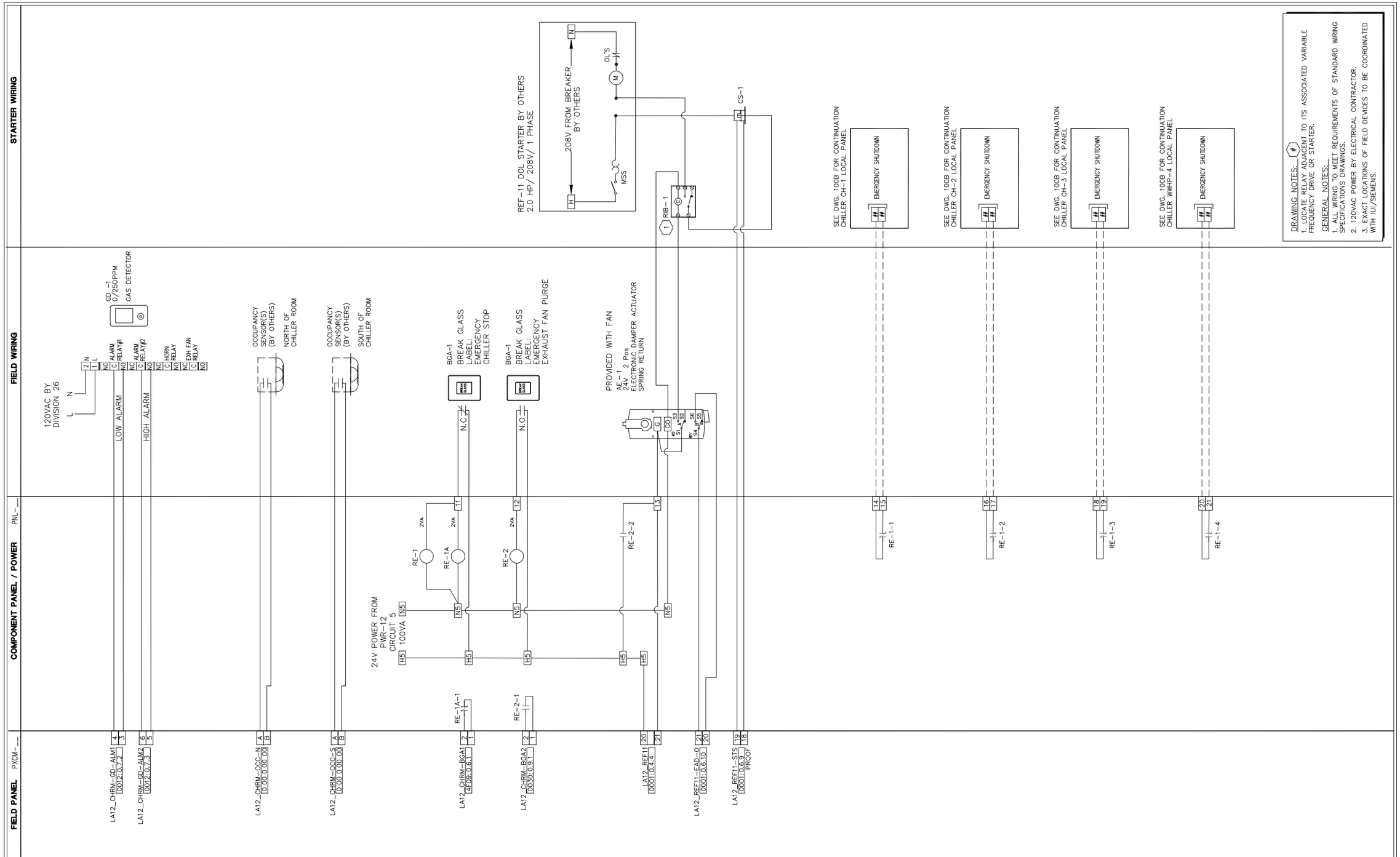

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	IT12_CH1_PXCM	IT12CH1PXCM

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CH ROOM FAN ELEC. WIRING

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	1	FBO			FURNISHED BY OTHERS
BGA 1	1	ST120-FN1-BP2-CS	KELE		BREAK GLASS
	1	PILNCCB	KELE		N.C CONTACT BLK
	1	PILNOCB	KELE		N.O CONTACT BLK FOR PB-1
BGA 2	1	ST120-FN1-BP2-RPG	KELE		BREAK GLASS
	1	PILNCCB	KELE		N.C CONTACT BLK
	1	PILNOCB	KELE		N.O CONTACT BLK FOR PB-1
CS 1	1	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
GD 1	1	FBO			FURNISHED BY OTHERS
RIB 1	1	RIB2401B	FUNCTIONAL DEVICES	1208cut021	20A SPDT 24VAC/DC/120VAC
Panel Mounted Devices					
RE 1-2	2	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket
RE 1A	1	RH4B-ULAC24V-KIT	LECTRO COM		(1) RH4B-ULAC24V and (1) SH4B-05 socket

SEQUENCE OF OPERATION:

1. ON DETECTION OF OCCUPANCY:
   - o EXHAUST FAN IS ENERGIZED TO RUN AT MINIMUM FLOW (3,500 CFM). EC MOTOR SPEED IS MANUALLY ADJUSTED DURING TAB.
   - o MAKEUP TERMINAL BOX IS OPENED AND OPERATES AT MAXIMUM FLOW (3,000 CFM).?

EXHAUST FAN CONTINUES TO RUN FOR A MINIMUM OF **10 MINUTES (ADJ.)** AFTER DETECTION OF OCCUPANCY. IF AFTER 10 MINUTES, NO OCCUPANCY IS DETECTED, THE EXHAUST FAN SHUTS DOWN AND THE TERMINAL BOX FULLY CLOSES.?

IN THE EVENT THE REFRIGERANT MONITOR GOES INTO ALARM, THE FOLLOWING SHALL OCCUR: p LEVELS OF ALARM TO BE UTILIZED I.E.

LOW ALARM – 50% OF ALLOWABLE VOLUME
- o ENERGIZE LOCAL ALARM.
- o EXHAUST FAN EF IS TURNED ON.
- o ALARM AT THE OWS

HIGH ALARM – 100% OF ALLOWABLE VOLUME
- o CHILLERS ARE SHUTDOWN.
- o EF CONTINUES TO OPERATE AT MAXIMUM FLOW.
- o ALARM AT THE OWS

TWO BREAK GLASS TYPE ALARM SWITCHES SHALL BE LOCATED IN THE CHILLER ROOM
- o BGA1 SHALL FUNCTION TO SHUT DOWN THE FOLLOWING EMERGENCY:
  - o CHILLERS CH-1, CH-2, CH-3, WWHP.
- o BGA2 EXHAUST FAN EF IS ENERGIZED TO RUN AT MINIMUM FLOW.
- o ALARM AT THE OWS FOR EITHER BGA BEING ACTIVATED.

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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CH ROOM FAN CTRL BOM & SOO

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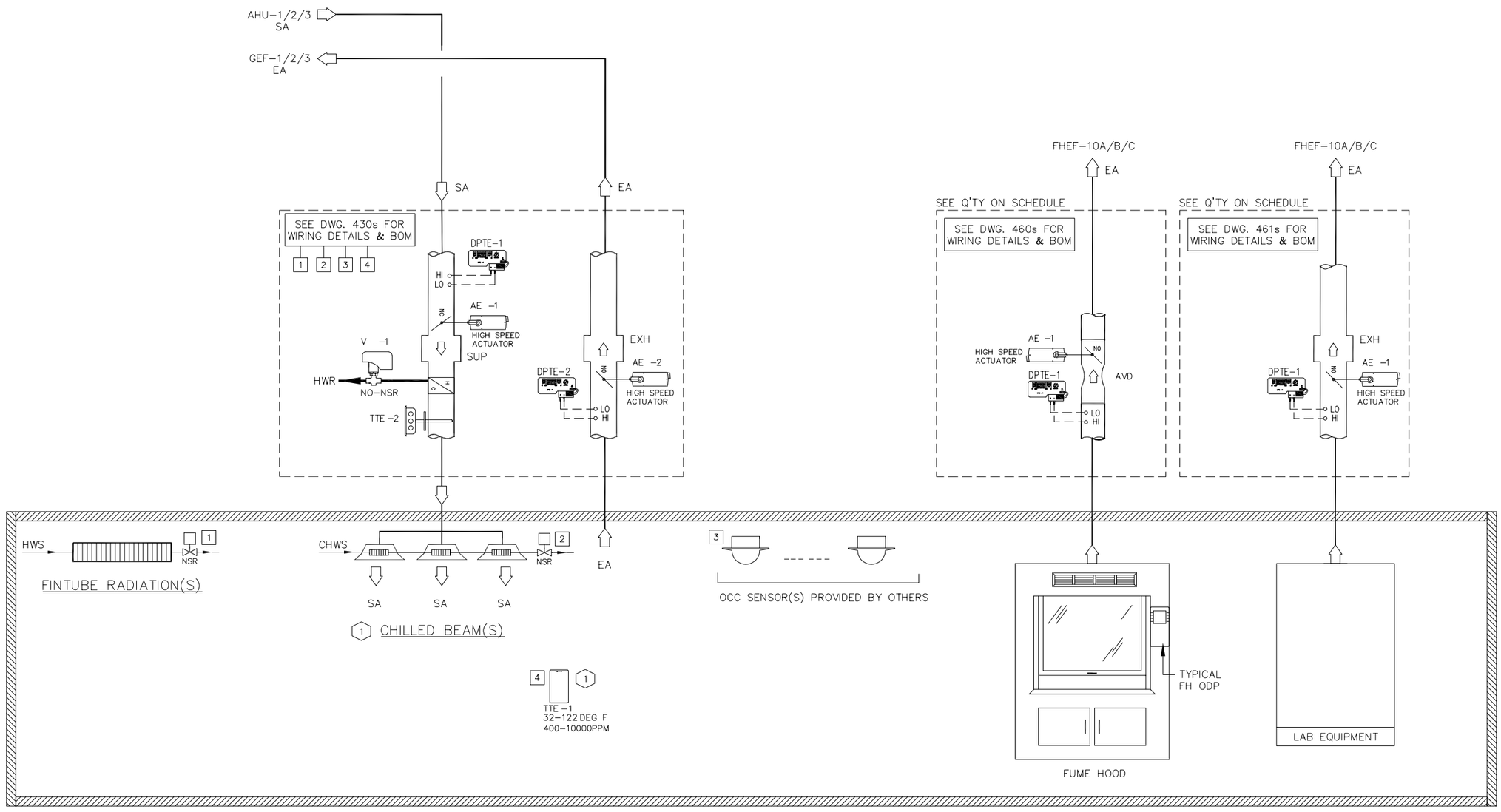
INSTALLATION NOTES:

(1) LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.



1/410 LAB ROOM SCENARIO_1

TYPICAL OF Q'TY : (5)

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LAB ROOM SCENARIO_1

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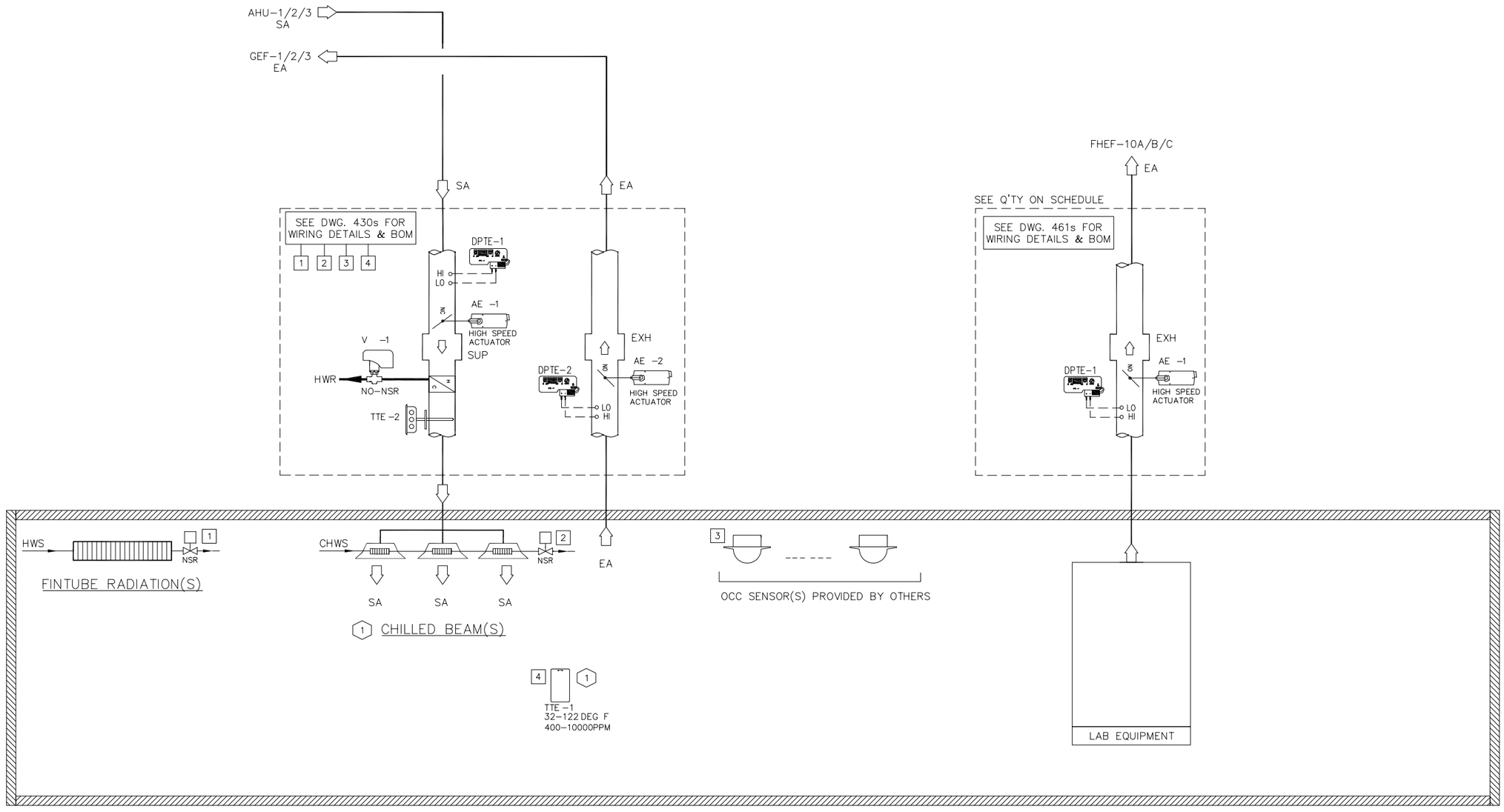

1/410 LAB ROOM SCENARIO_2

TYPICAL OF Q'TY : (2)

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401

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LAB ROOM SCENARIO_2

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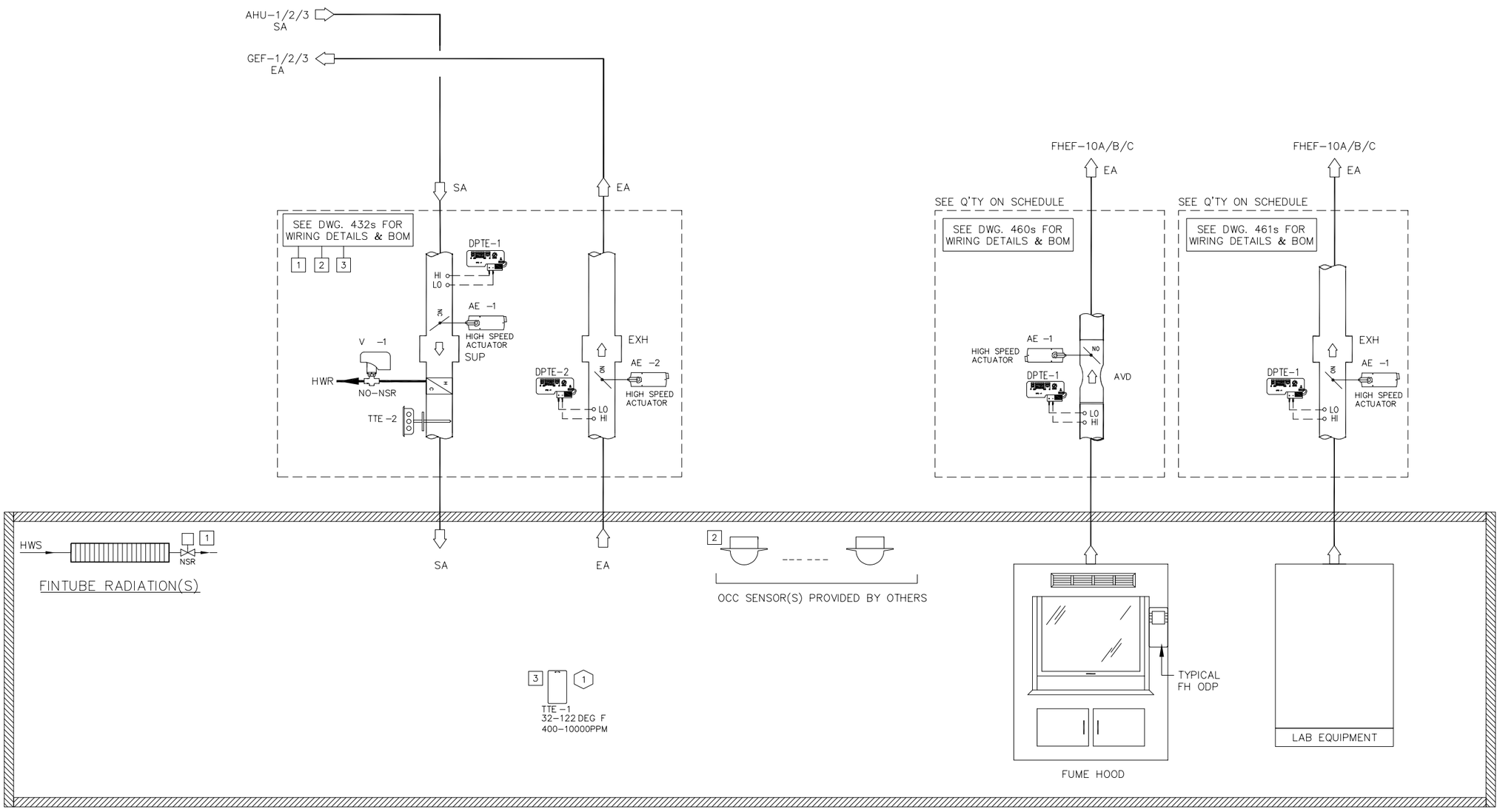

1/410 LAB ROOM SCENARIO_3

TYPICAL OF Q'TY : (1)

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LAB ROOM SCENARIO_3

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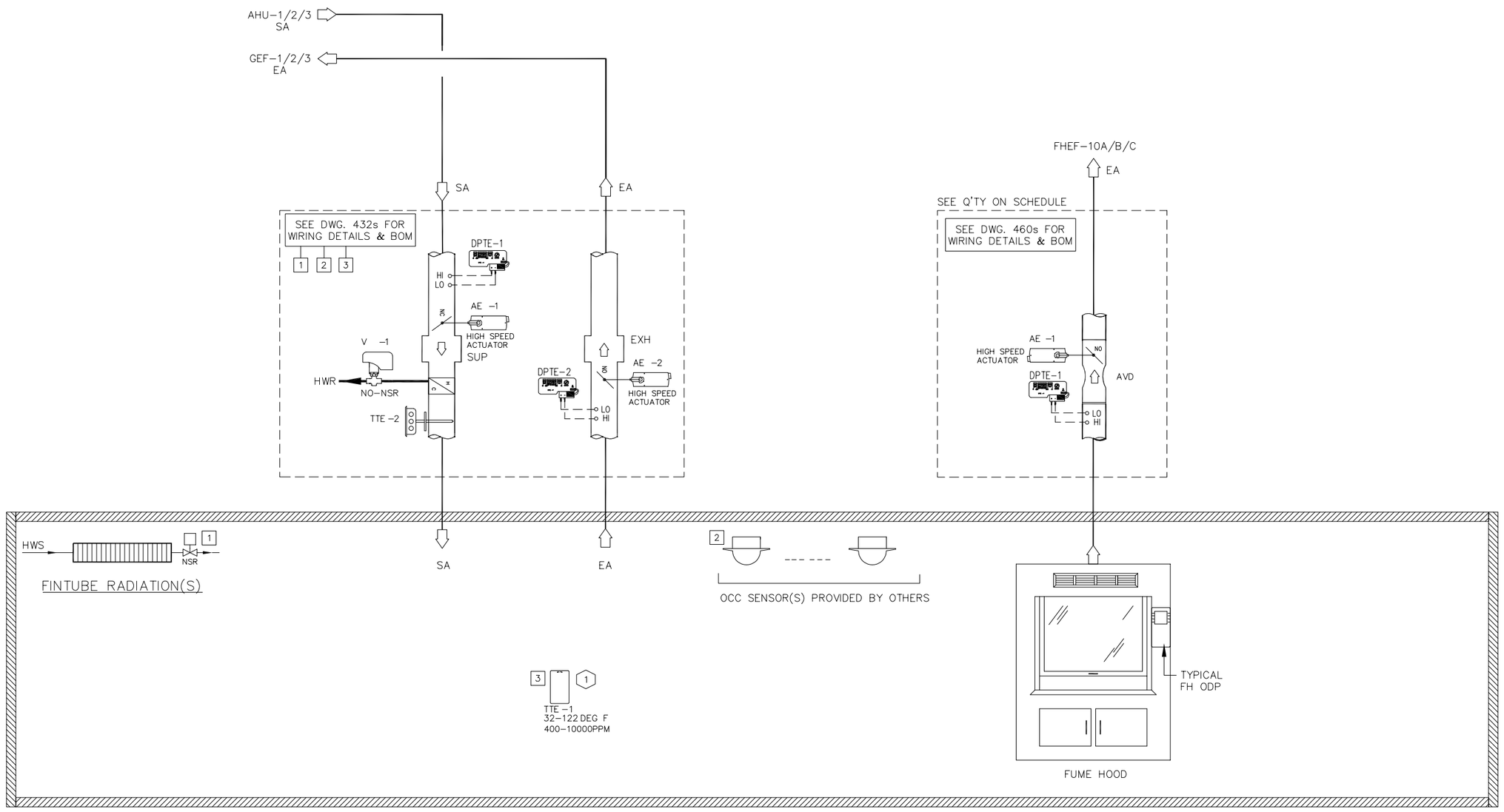

1 / 410 LAB ROOM SCENARIO_4

TYPICAL OF Q'TY : (1)

440P412785
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403

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LAB ROOM SCENARIO_4

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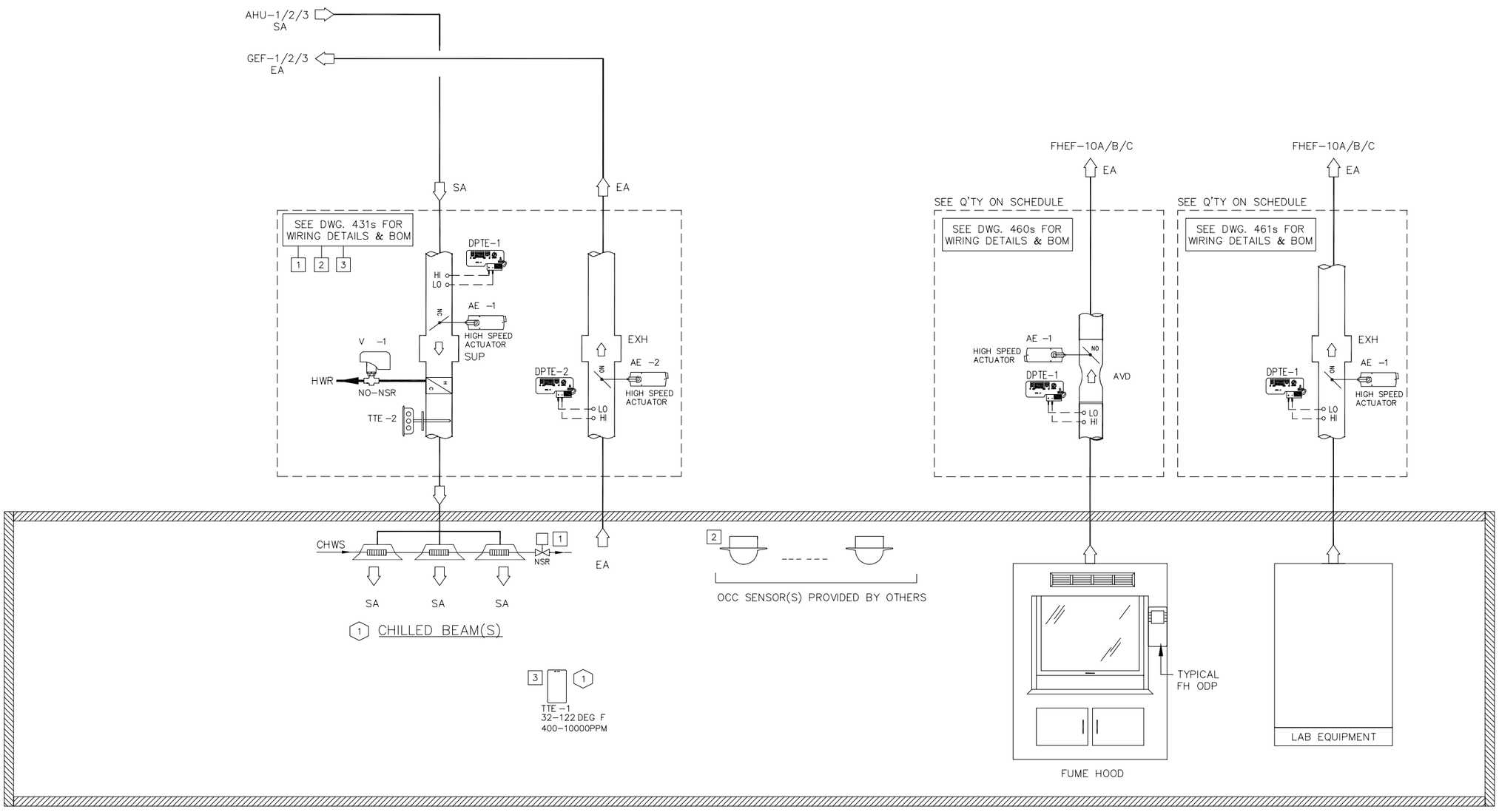

1/410 LAB ROOM SCENARIO_5

TYPICAL OF Q'TY : (1)

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404

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LAB ROOM SCENARIO_5

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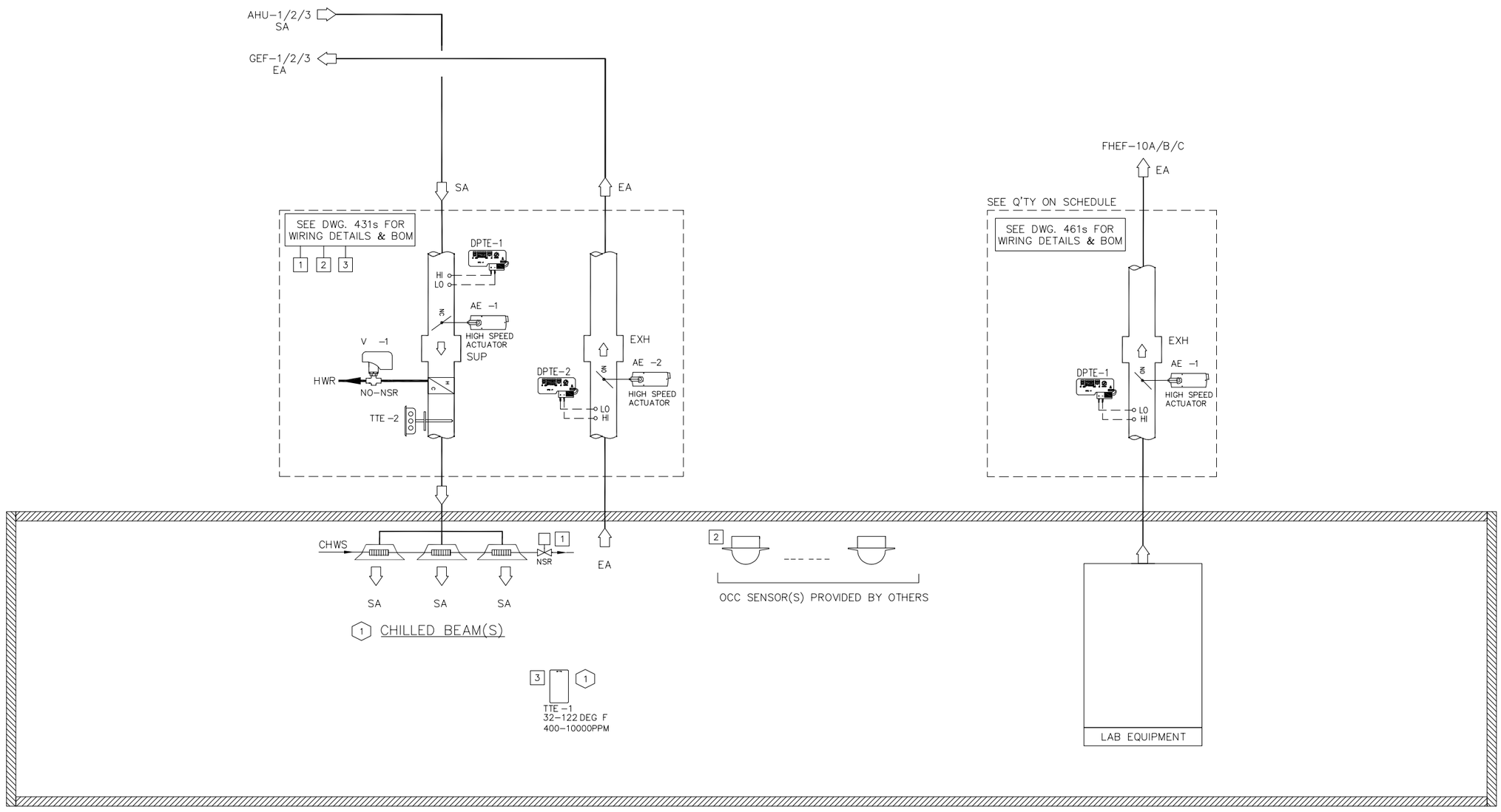

1/410 LAB ROOM SCENARIO_6

TYPICAL OF Q'TY : (4)

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405

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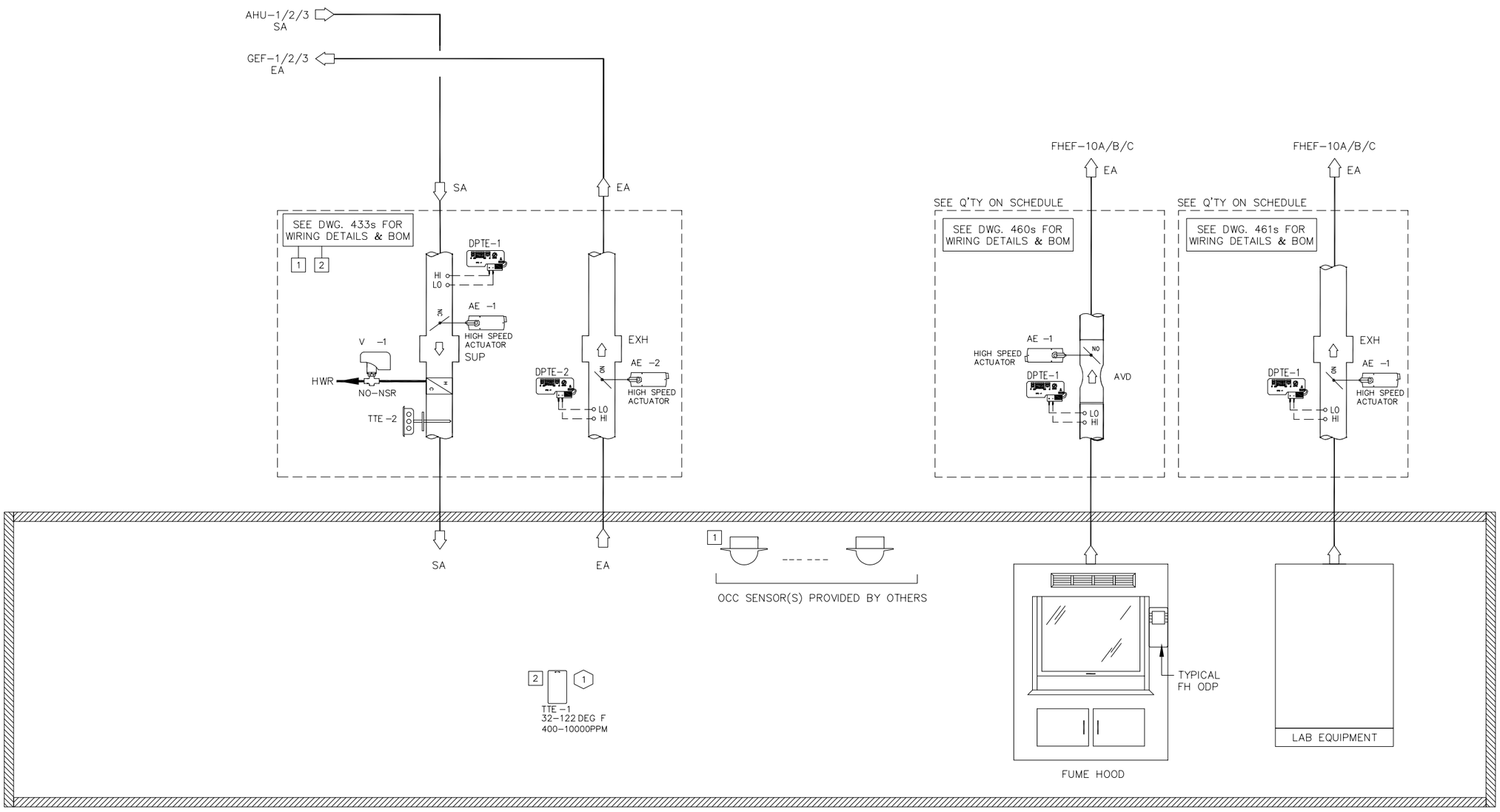

1/410 LAB ROOM SCENARIO_7

TYPICAL OF Q'TY : (9)

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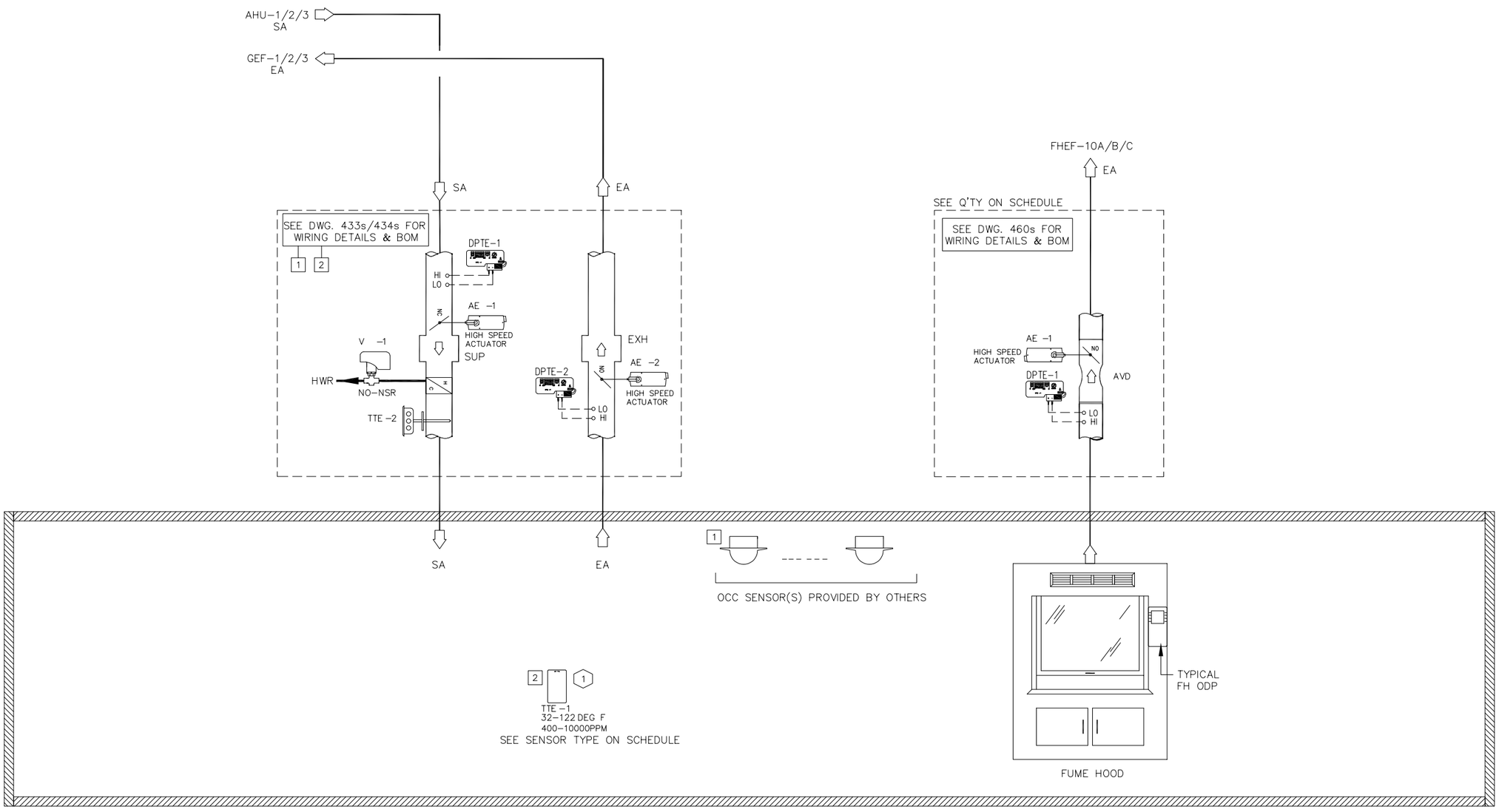

1/410 LAB ROOM SCENARIO_8

TYPICAL OF Q'TY : (14)

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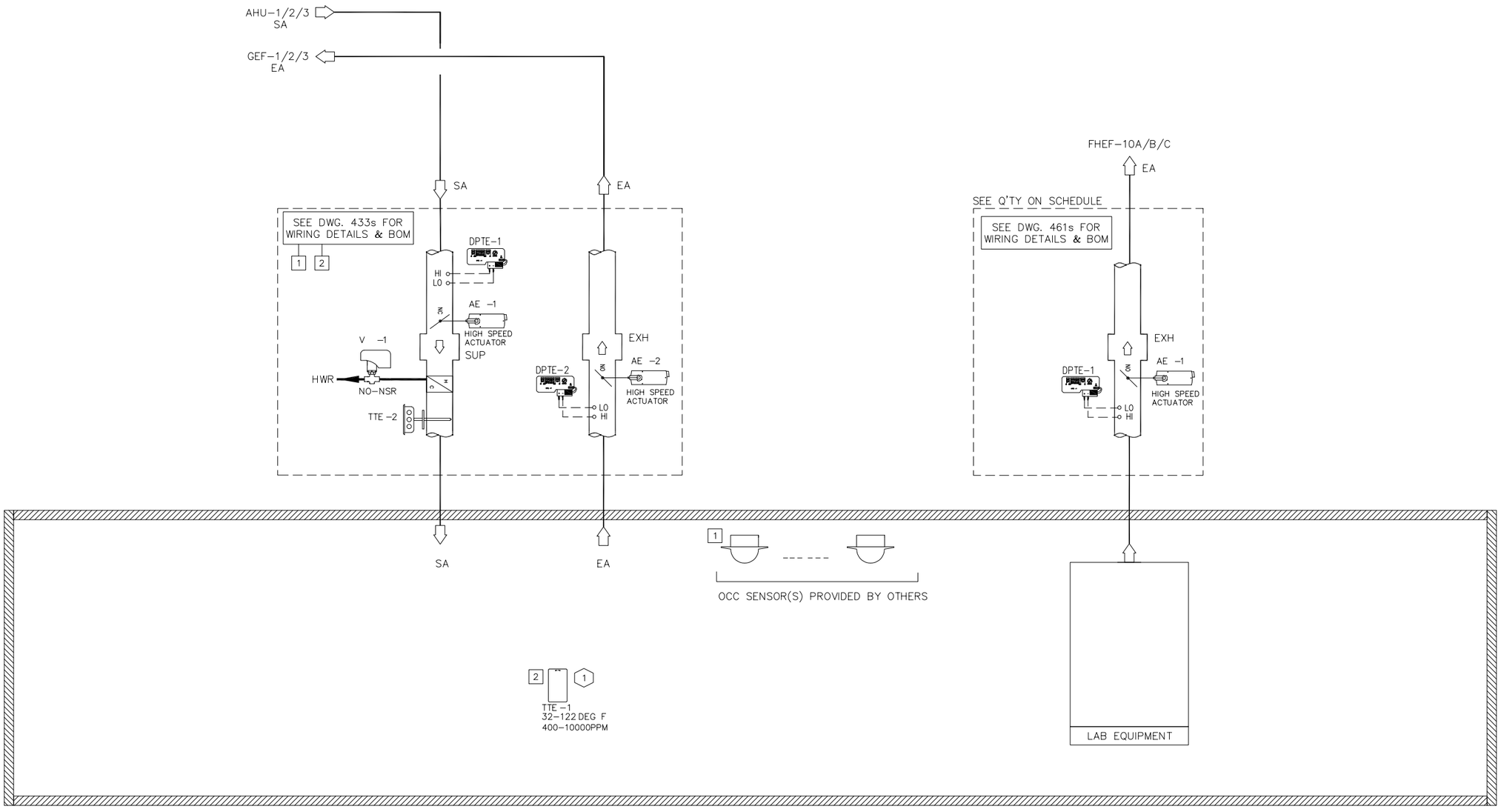

1/408 LAB ROOM SCENARIO_9

TYPICAL OF Q'TY : (8)

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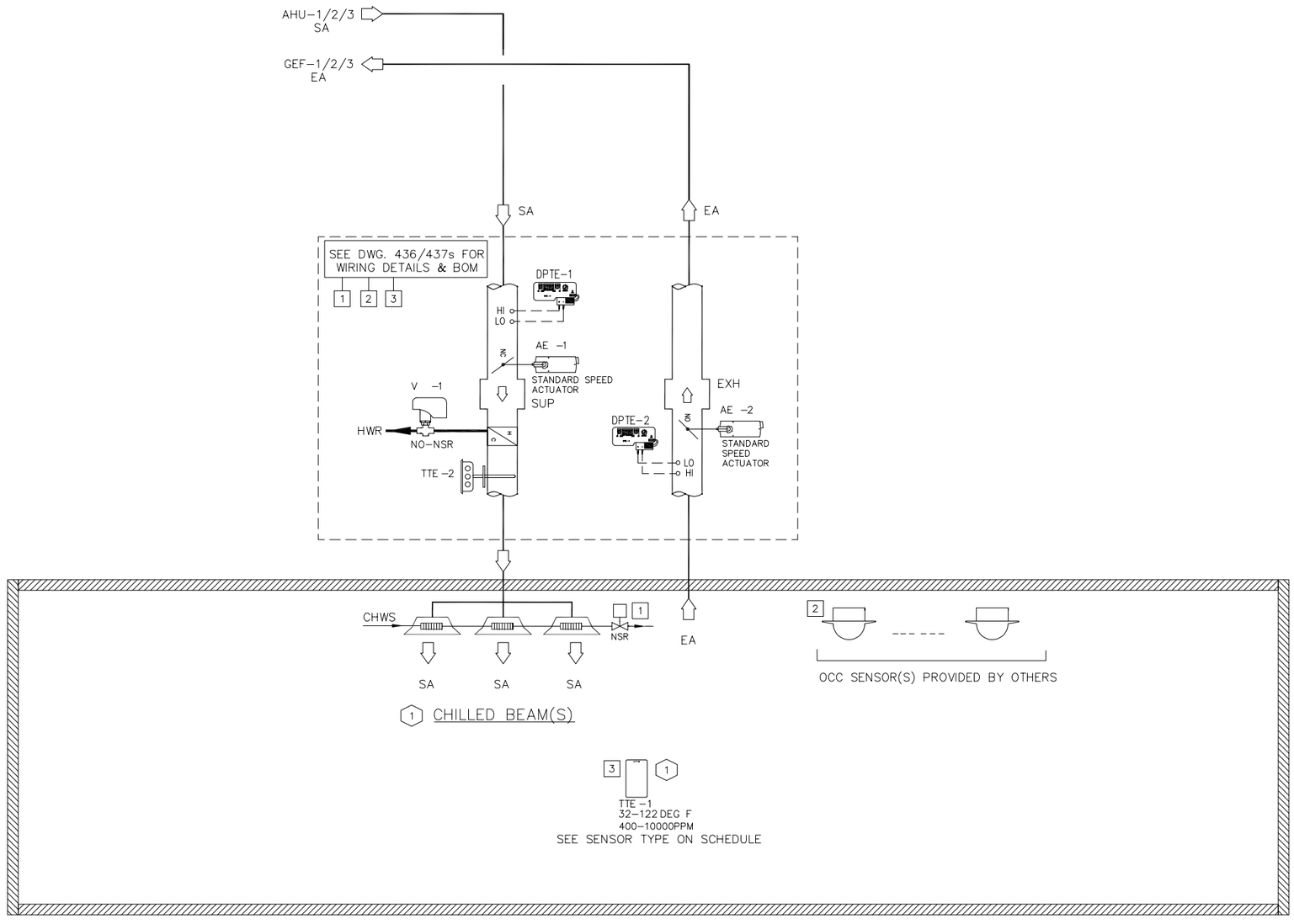

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TYPICAL OF Q'TY : (10)

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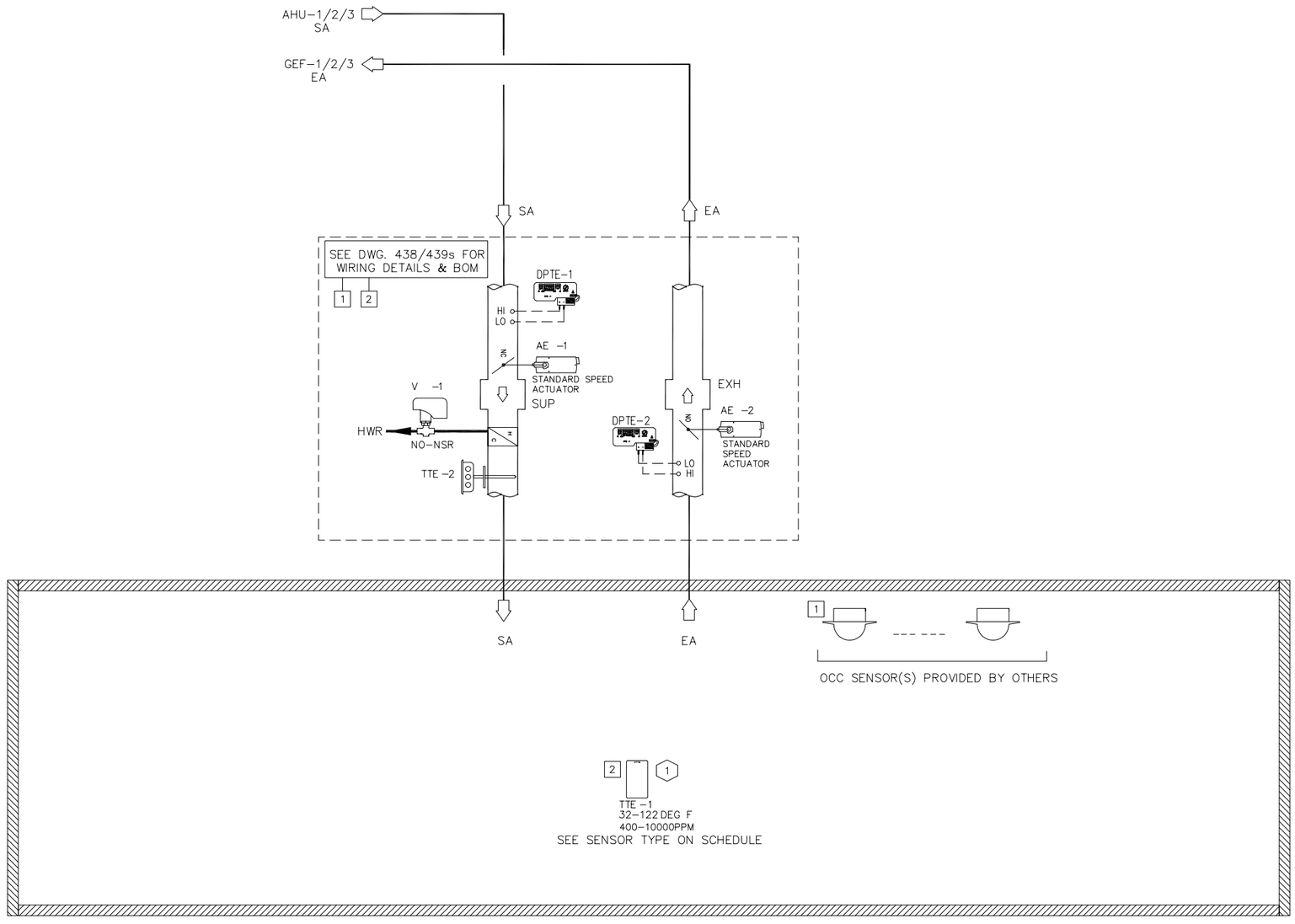

1 / 410 LAB ROOM SCENARIO_11

TYPICAL OF Q'TY : (26)

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LAB ROOM SEQUENCE OF OPERATION

1. LABORATORY HOOD FACE VELOCITY IS TO BE MAINTAINED AT A CONSTANT 80 FPM AS THE VERTICAL SASH (AND COMBINATION HORIZONTAL SASHES AS APPLICABLE) MOVES THROUGH USE OF SASH POSITION SENSING. VOLUME CONTROLLER MODULATES FHEV IN EXHAUST DUCT TO MAINTAIN CONSTANT FACE VELOCITY. FUME HOOD EXHAUST SHALL VARY TO MAINTAIN FACE VELOCITY WHILE NOT VARYING BELOW THE MINIMUM AIRFLOW VALUE (200 CFM FOR A SIX FOOT WIDE FUME HOOD; 175 CFM FOR A FIVE FOOT WIDE FUME HOOD; 150 CFM FOR A FOUR FOOT WIDE FUME HOOD; 125 CFM FOR A THREE FOOT WIDE FUME HOOD; 100 CFM FOR A TWO FOOT WIDE FUME HOOD). THE MAXIMUM AIRFLOW AT 80 FPM AT 18" SASH HEIGHT (675 CFM IN A SIX FOOT HOOD; 550 CFM IN A FIVE FOOT HOOD; 425 CFM IN A FOUR FOOT HOOD) SHALL NOT BE EXCEEDED WHEN THE SASH IS RAISED ABOVE 18" (FACE VELOCITY WILL DROP BELOW SETPOINT AS SASH IS RAISED ABOVE 18" AND ALARM WHEN LOW FACE VELOCITY LIMIT IS REACHED).

2. ALL AIR: SPACE TEMPERATURE TO BE MAINTAINED AT AN OCCUPIED CONTROL SETPOINT THROUGH MODULATION OF THE LAB GENERAL EXHAUST VALVE WHILE ACHIEVING THE SCHEDULED AIRFLOW OFFSET. SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.

   A. CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE TO MODULATE EXHAUST AIR VALVE FROM SCHEDULED MINIMUM TO MAXIMUM AIRFLOW TO MAINTAIN THE SPACE TEMPERATURE. WHEN THE EXHAUST VALVE IS AT MINIMUM AND HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE A MAXIMUM OF 90°F +/– 5.0°F (ADJ.) LEAVING AIR TEMPERATURE. HEATING AIRFLOW IS THEN MODULATED FROM MINIMUM TO MAXIMUM HEATING AIRFLOW TO MAINTAIN 90°F +/– 5.0°F (ADJ.) DISCHARGE TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED.

   B. THE TOTAL SUPPLY AIR VOLUME IS TO BE COMPARED TO THE TOTAL LABORATORY EXHAUST AIR VOLUME AND THE SUPPLY MODULATED SUCH THAT THE TOTAL EXHAUST EXCEEDS THE SUPPLY AIR VOLUME BY THE REQUIRED SCHEDULED OFFSET (SUPPLY TRACKS EXHAUST). TOTAL LABORATORY EXHAUST AIR VOLUME IS THE SUM OF THE GENERAL EXHAUST AIRFLOW VALUE, THE FUME HOOD EXHAUST FLOW VALUES (WHERE APPLICABLE), AND THE MULTIPLE EQUIPMENT EXHAUST FLOW VALUES (WHERE APPLICABLE). TOTAL LABORATORY EXHAUST AIR VOLUME SHALL NOT DROP BELOW THE SCHEDULED MINIMUM OCCUPIED AND UNOCCUPIED AIRFLOWS. AIRFLOWS SHALL BE MEASURED IN REAL TIME.

   C. THE LAB SPACE TEMPERATURE SETPOINT IS MAINTAINED BY MODULATING OF THE HEATING VALVE(S). IN THE EVENT THAT THE SUPPLY AIRFLOW SIGNAL IS OUT OF RANGE (AS IN THE CASE OF REDUCED AIR HANDLING SUPPLY CAPACITY), THE LAB GENERAL EXHAUST VALVE SHALL BE COMMANDED FULLY CLOSED AND THE SPACE TEMPERATURE ALLOWED TO RISE ABOVE SETPOINT (TO REDUCE THE EXCESS NEGATIVE PRESSURE POTENTIAL IN THE BUILDING)

3. WITH FINNED TUBE RADIATION: SAME AS THE ALL AIR CONTROL SEQUENCE EXCEPT THAT:
   A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 45°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 48°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.
   B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
   C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WITH CHILLED BEAMS (COOLING ONLY): SAME AS THE ALL AIR CONTROL SEQUENCE EXCEPT THAT:
   A. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.
   B. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER FLOW INCREASES. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER FLOW DECREASES TOWARD SHUTOFF.

5. WITH LAB EQUIPMENT EXHAUST VALVES: LEEV CONTROLLER SHALL RESPOND TO VARIATIONS IN SYSTEM STATIC PRESSURE TO MODULATE LEEV AIR VALVE FROM MINIMUM AIRFLOW TO MAXIMUM AIRFLOW. ALL LEEV ARE CONSTANT VOLUME: MINIMUM AIRFLOW EQUALS MAXIMUM AIRFLOW, UNLESS NOTED OTHERWISE. REFER TO SNORKEL CONNECTION DETAIL AND SEQUENCER EXHAUST DROP DETAIL FOR MORE INFORMATION.

6. LARGE LAB SPACES CONSISTING OF MULTIPLE LAB CONTROL SYSTEM MODULES WHERE THERE ARE MULTIPLE SPACE SENSORS INSTALLED WITHIN THE BOUNDING WALLS OF THE SPACE SHALL HAVE PROVISIONS PROGRAMMED TO WEIGHT INDIVIDUAL SENSORS (DEFAULT EQUAL WEIGHTING) AND TO UTILIZE THE LOW, HIGH OR AVERAGE SENSOR AS THE SPACE SENSOR INPUT (DEFAULT AVERAGE) FOR ALL LAB SYSTEM MODULES IN THE MULTIPLE LAB SYSTEM MODULE SPACE. THE CONTROLLER SHALL PROHIBIT DIFFERING SPACE SENSOR SETTINGS WHICH WOULD LEAD TO HEATING ONE PORTION OF THE LARGE LAB SPACE WHILE ANOTHER PORTION IS CALLING FOR COOLING.

7. PROVIDE DISCREET OUTPUTS FOR EACH AIR VALVE (LTB OR LGEV) IN A GIVEN LAB CONTROLLER SO THAT EACH AIR VALVE OUTPUT CAN BE SCALED TO MATCH ACTUAL DELIVERED AIRFLOW AS DETERMINED THROUGH THE TAB PROCESS.

8. PROVIDE ALL HARDWARE AND SOFTWARE FOR ALL SIGNALS TO BE COMPLETELY CONTAINED WITHIN THE INDIVIDUAL LABORATORY. NO NECESSARY SIGNALS SHALL PASS IN NOR OUT OF THE PHYSICAL LIMITS OF THE LAB EXCEPT FOR TIME/DATE INFORMATION AND THE DEMAND INDICATORS.

9. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CONTROL IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
   – UNOCCUPIED MODE (BUILDING SCHEDULED TO BE UNOCCUPIED)
   HEATING SET POINT = **68.0 DEGREES**
   COOLING SET POINT = **78.0 DEGREES**

10. BUILDING OCCUPANCY FOR LABS PER THE ABOVE SHALL BE: SCHEDULE OCCUPIED – 6:00 A.M. TO 6:00 P.M., SCHEDULE UNOCCUPIED – 6:00 P.M. TO 6:00 A.M., 365 DAYS PER YEAR. SENSING OF OCCUPANCY DURING UNOCCUPIED MODE RETURNS THE SPACE TO OCCUPIED SPACE TEMPERATURE SETPOINTS. SENSING OF NO OCCUPANCY DURING OCCUPIED MODE DOES NOT REVISE TEMPERATURE SETPOINTS.

SEQUENCE OF OPERATION FOR 2-PIPE CHILLED BEAM.

ZONES WITH A CONDENSATE SENSOR: 103, 104, 131, 138, 139, 211, 212, 217, 218, 306, 314, 321, 402, 413, 416, 503, 506.

OCCUPIED MODE:

1. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

2. THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT IS 70°F (ADJ) AND THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT IS 75°F (ADJ). THE CHILLED BEAM HEATING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS GREATER THAN THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE BOTH WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW. STANDARD TERMINAL BOX CONTROL MODIFICATION: WHILE ACTIVELY HEATING THE TERMINAL BOX DISCHARGE TEMPERATURE MAY PROVIDE A MAXIMUM OF 120 DEGF (ADJ) DISCHARGE AIR TEMPERATURE (CHILLED BEAM MIXED AIR DELIVERY TEMPERATURE WILL BE APPROX 85 DEGF WITH 120 DEGF PRIMARY AIR TEMPERATURE).

4. THE ZONE CONTROL SYSTEM SHALL BE INDEXED FROM UNOCCUPIED MODE TO OCCUPIED MODE BY THE VACANCY SENSOR AND REMAINS IN OCCUPIED MODE FOR TEN MINUTES AFTER OCCUPANCY WAS LAST SENSED.

5. AFTER EVERY CHANGE OF STATUS TO "ON" OF THE AHU SERVING THE SPACE, THE ZONE CONTROLLER SHALL BE FORCED INTO OCCUPIED MODE FOR ONE HOUR (ADJUSTABLE). AFTER THE END OF THE FORCED OCCUPIED TIME PERIOD, THE ZONE CONTROLLER SHALL BE IN UNOCCUPIED MODE UNLESS THE ZONE VACANCY SENSOR IS ACTIVATED.

6. FOR ALL SPACES WHICH HAVE CONDENSATE SENSORS:
   A. THE TERMINAL BOX AIRFLOW REMAINS AT THE NORMAL SCHEDULED / NORMAL CONTROLLED COOLING / HEATING AIRFLOW UNLESS THE AIRFLOW WAS RAISED FOR HUMIDITY OVERRIDE.

   B. AS SPACE HUMIDITY INCREASES ABOVE A LEVEL OF 58% RH (ADJ), HUMIDITY OVERRIDE IS ENABLED AND THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO THE SCHEDULED MAXIMUM AIRFLOW TO REDUCE THE RELATIVE HUMIDITY IN THE SPACE. BELOW 53% RH (ADJ) READING THE SUPPLY AIRFLOW IS RELEASED FOR NORMAL CONTROL. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE SPACE HUMIDITY SENSOR READING EXCEEDS 65% RH (ADJ).

   C. WHILE IN HUMIDITY OVERRIDE IF THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT (e.g. 70 degF) THE TERMINAL BOX/DUCT–MOUNTED HEATING COIL VALVE MODULATES OPEN TO PROVIDE ADDITIONAL HEATING AND TO MAINTAIN THE OCCUPIED HEATING SETPOINT.

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D. IF AT ANY TIME, THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM CHILLED WATER SUPPLY PIPING, THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO MAXIMUM OCCUPIED SCHEDULED AIRFLOW TO PROVIDE MORE DRY AIR AND REMAINS AT MAXIMUM OCCUPIED SCHEDULED AIRFLOW UNTIL THE CONDENSATE DETECTION IS CLEARED. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE CONDENSATE SENSOR DETECTOR INDICATION EXCEEDS 24 HOURS (ADJ) STRAIGHT.

E. HUMIDITY OVERRIDE CONTROL IS ACTIVE IN UNOCCUPIED MODE. IF SPACE HUMIDITY EXCEEDS 58% RH (ADJ) THEN THE TERMINAL BOX SUPPLY AIR DAMPER CONTROLS THE SUPPLY AIR VOLUME TO THE OCCUPIED AIRFLOW SETTINGS FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

F. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED DURING THE SCHEDULED UNOCCUPIED TIMES, THAT INDIVIDUAL CLASSROOM SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

UNOCCUPIED MODE:

THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

1. IN UNOCCUPIED MODE THE SPACE TEMPERATURE READING IS ALLOWED TO FLOAT BETWEEN THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT OF 65°F (ADJ) AND THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT OF 80°F (ADJ).

2. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

4. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED, THAT INDIVIDUAL SPACE SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR A MINIMUM OF TWENTY MINUTES (ADJ). AT THE END OF THE TWENTY MINUTE PERIOD, THE OCCUPIED ROOM SHALL RETURN TO NORMAL OPERATION AND THE VACANCY SENSOR MAY THEN RETURN THE ROOM TO OCCUPIED OR UNOCCUPIED AS SENSED AND AS SCHEDULED.

EITHER MODE:

1. IF THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM WATER SUPPLY PIPING, THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED. NOTE THAT ONLY THOSE ZONES SPECIFICALLY NOTED CONTAIN A CONDENSATE SENSOR.

2. IF POWER HAS BEEN TRANSFERRED TO THE GENERATOR, FULLY CLOSE THE CB COOLING VALVE. UPON RETURN TO NORMAL POWER, RETURN CB COOLING VALVE TO NORMAL CONTROL.

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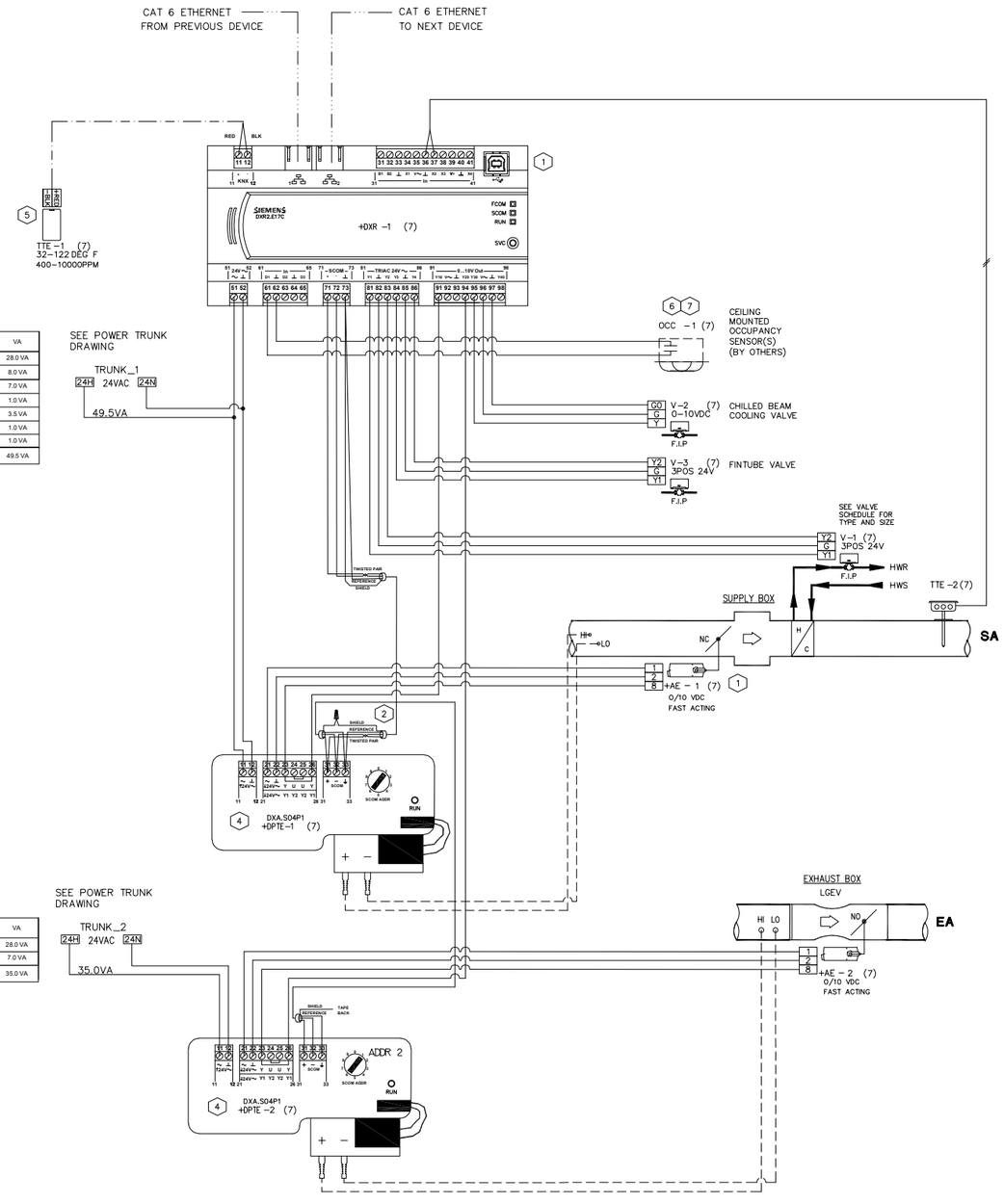


VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
SUP AIR VALVE FAST ACTING ACTUATOR - GNP	1	28.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	1	7.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
FINTUBE VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	49.5 VA

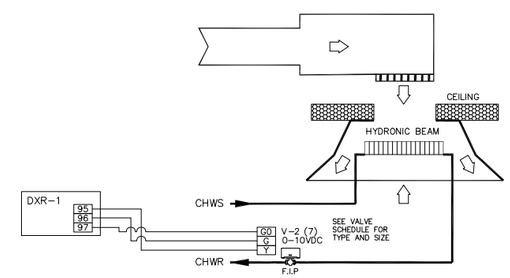
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE FAST ACTING ACTUATOR - GNP	1	28.0 VA
DPTE MODULE - DXA	1	7.0 VA
	TOTAL	35.0 VA

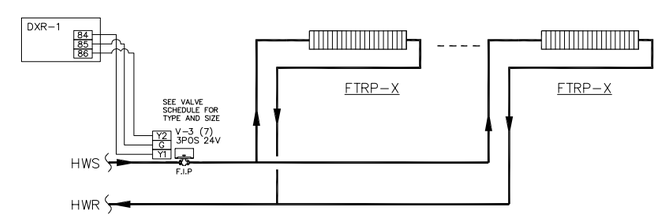
INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM



NOTE:
Q'TY.(1) VALVE TO CONTROL MULTIPLE FTRPs.

FINTUBE RADIATION

1/430 SUP AIR BOX AND RET AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (7)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16751

440P412785
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430

SIEMENS
3502 WOODVIEW TRACE
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UNITED STATES
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FAX: 317-293-0374
SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-CB-RAD-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	7	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	7	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	14	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1-2	14	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	7	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-CB-RAD-P70-OCC BOM

440P412785
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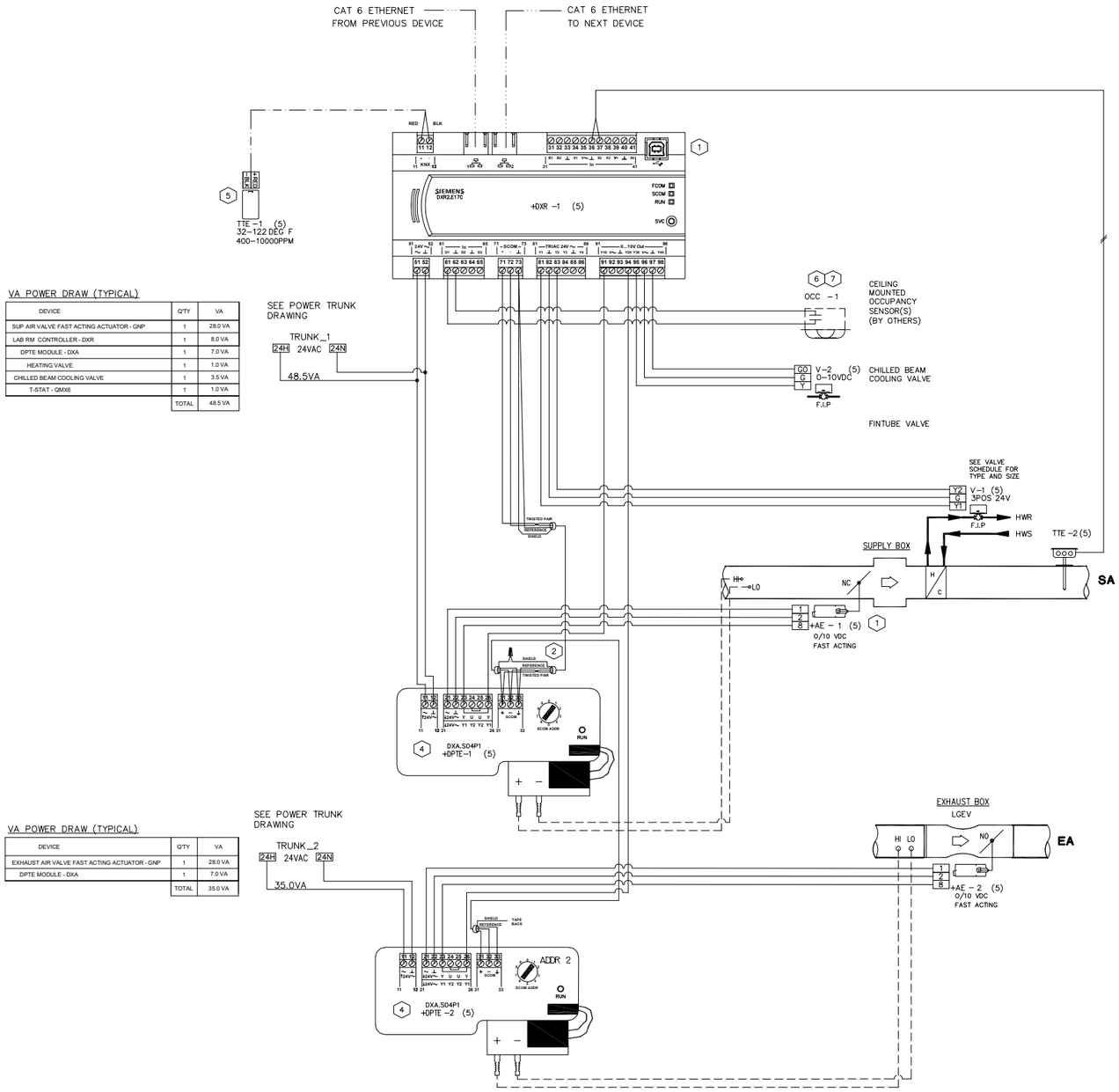
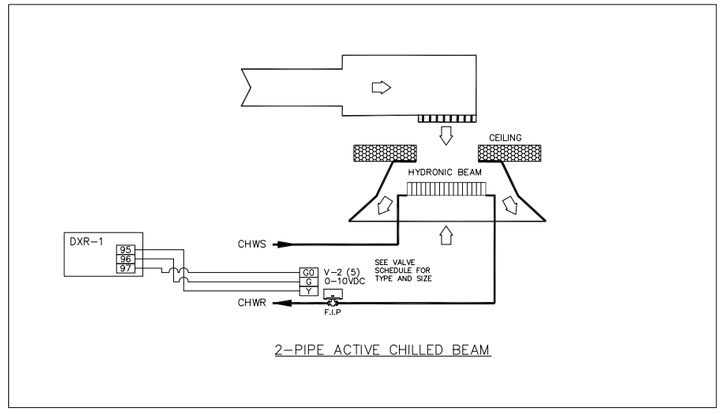
INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR–1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.





2–PIPE ACTIVE CHILLED BEAM

1 / 431 SUP AIR BOX AND RET AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (5)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16751

440P412785 0

431

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

LGU LAUNCH ACCELERATOR FOR BIO
ILH 202500072, IN

DESIGNED BY	DRAFTED BY	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/06/26

LTB-LGEV-FAST-CB-P70-OCC

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REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	5	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	5	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	10	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1-2	10	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	5	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/06/26

LTB-LGEV-FAST-CB-P70-OCC BOM

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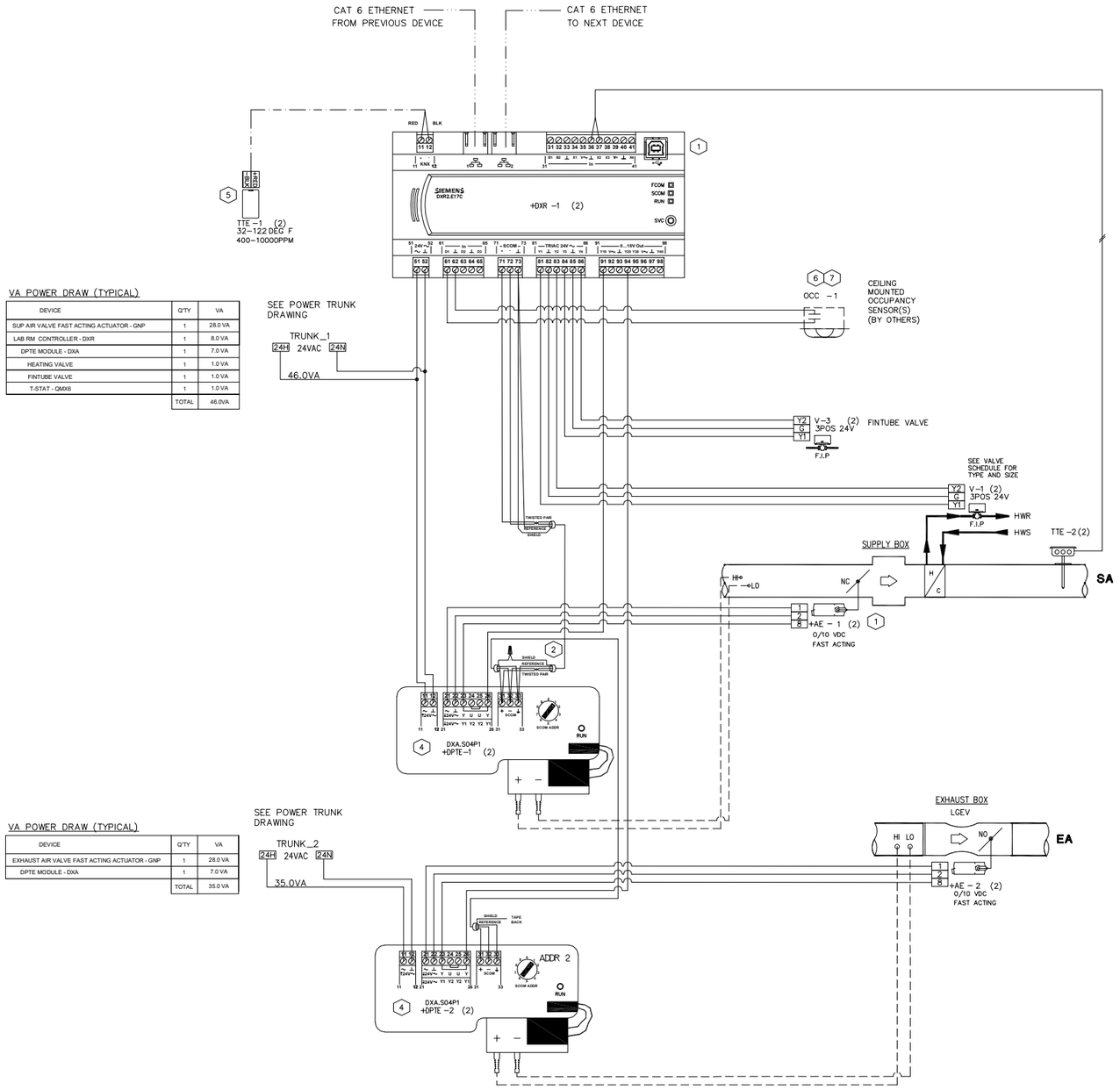
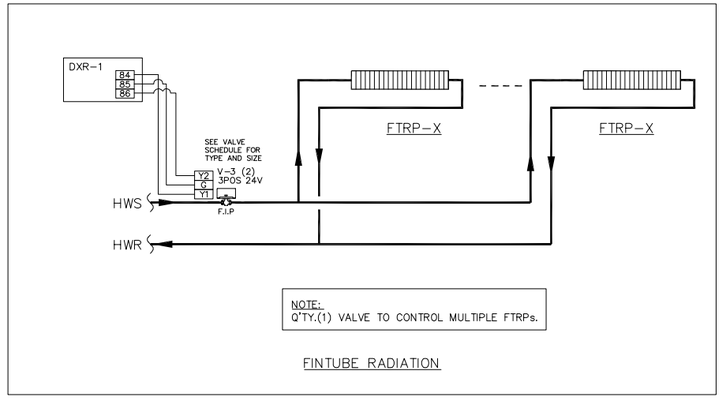


INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



FINTUBE RADIATION

1 / 432 SUP AIR BOX AND RET AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (2)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16751

440P412785
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432

SIEMENS

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

LBU LAUNCH ACCELERATOR FOR BIO
ILN: 202500072, IN

DESIGNED BY	DRAWN BY	CHECKED BY	DRAWN RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-RAD-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	2	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	2	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	4	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1-2	4	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	2	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-RAD-P70-OCC BOM

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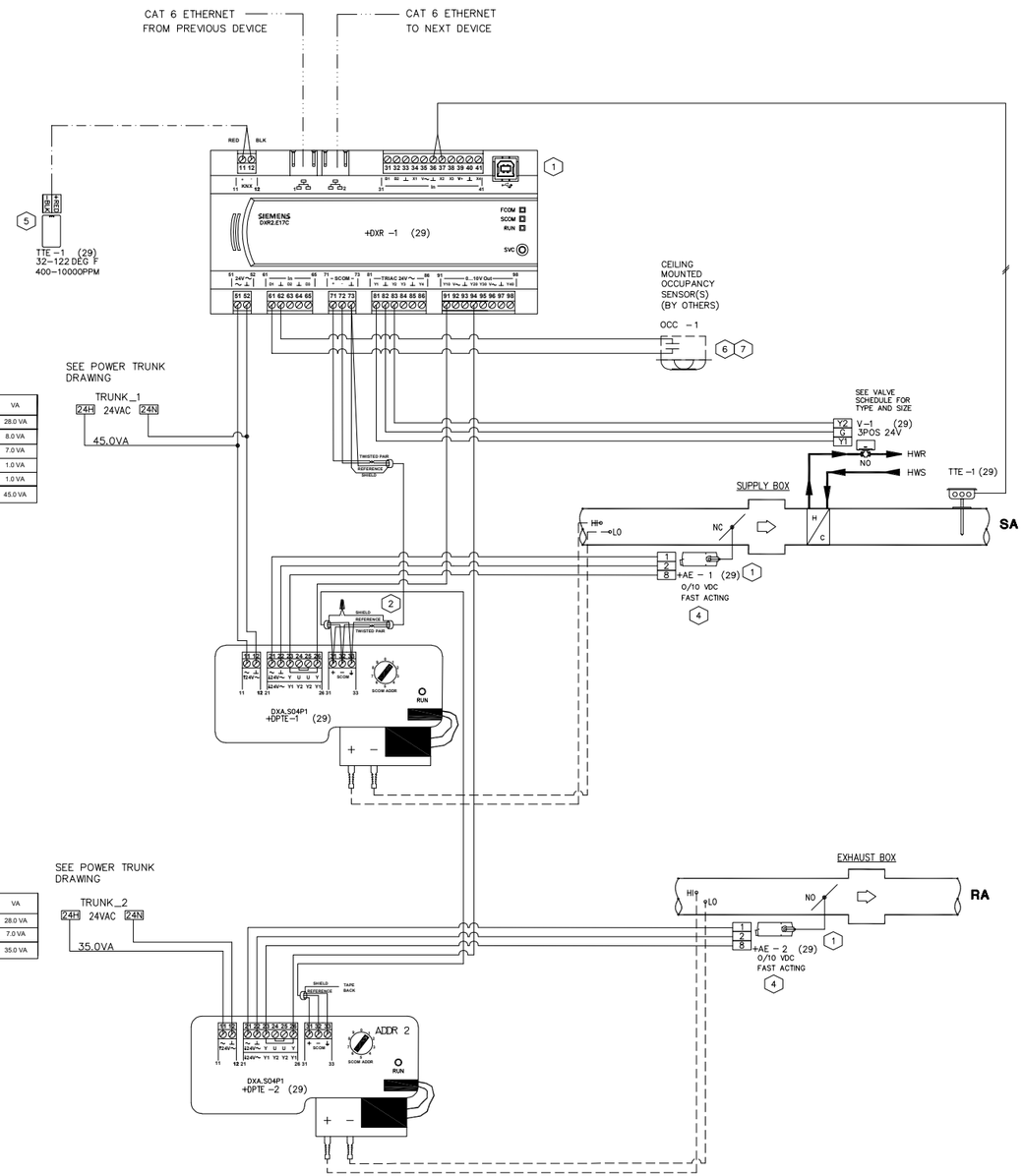

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
SUP AIR VALVE FAST ACTING ACTUATOR - GNP	1	28.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	1	7.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	45.0 VA

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE FAST ACTING ACTUATOR - GNP	1	28.0 VA
DPTE MODULE - DXA	1	7.0 VA
	TOTAL	35.0 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR-1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. TTC WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1 / 433 SUP AIR BOX AND RET AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (29)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16751

440P412785
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433

SIEMENS
3502 WOODVIEW TRACE
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UNITED STATES
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	29	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
TTE 2	29	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
PART OF TERM UNIT ASSBLY					
AE 1-2	58	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1-2	58	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	29	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-P70-OCC BOM

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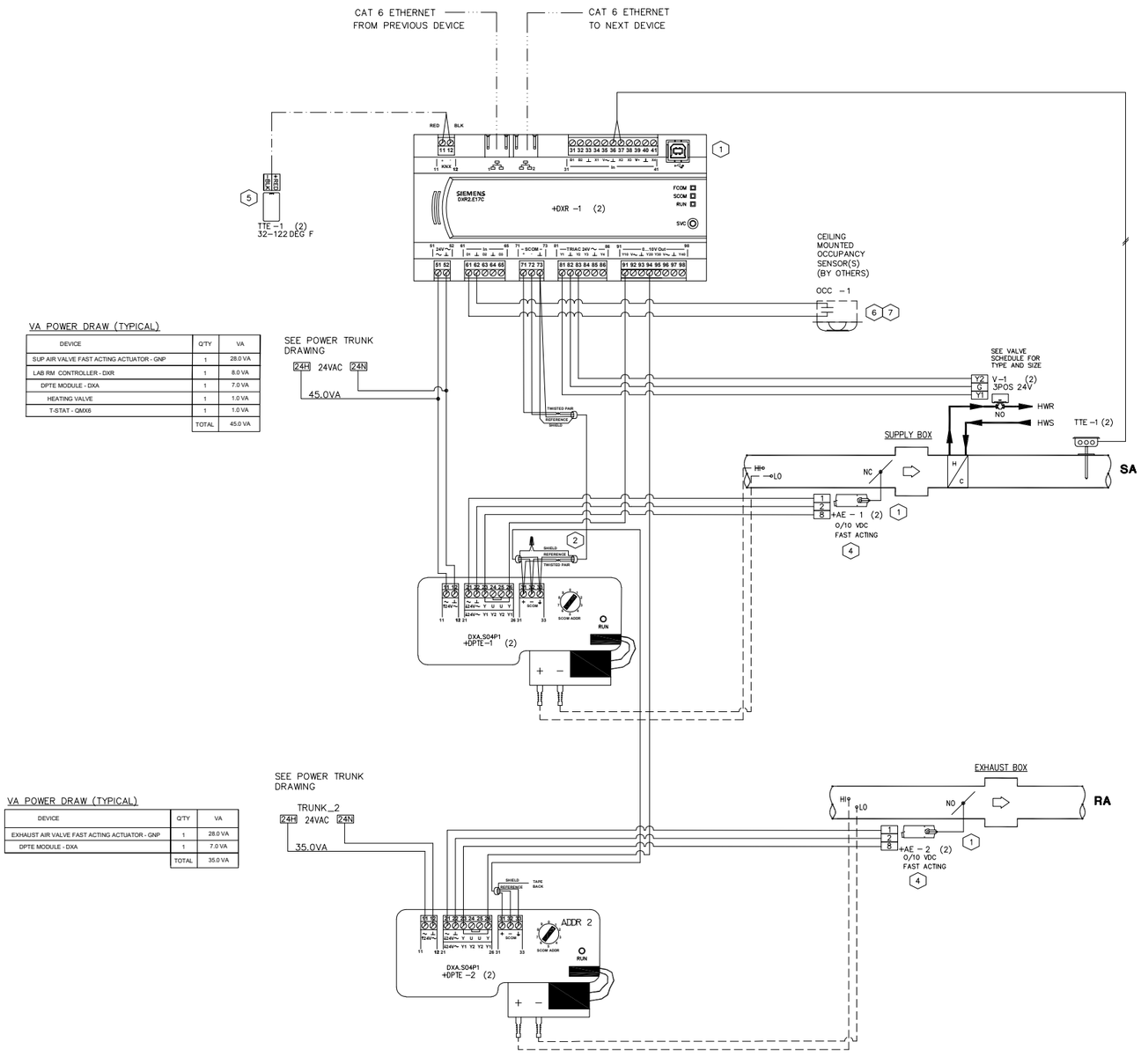

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. TTC WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/434 SUP AIR BOX AND RET AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (2)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16751

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LTB-LGEV-FAST-P30-OCC

ENGINEER: HB
DRAFTER: HB
CHECKED BY: KR
WORK RELEASE: 04/02/26
LAST EDIT DATE: 04/02/26

LTB LAUNCH ACCELERATOR FOR BIO
ILs 202500072, IN

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REVISION HISTORY

00	1/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	2	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
TTE 2	2	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
PART OF TERM UNIT ASSBLY					
AE 1-2	4	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1-2	4	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	2	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-FAST-P30-OCC BOM

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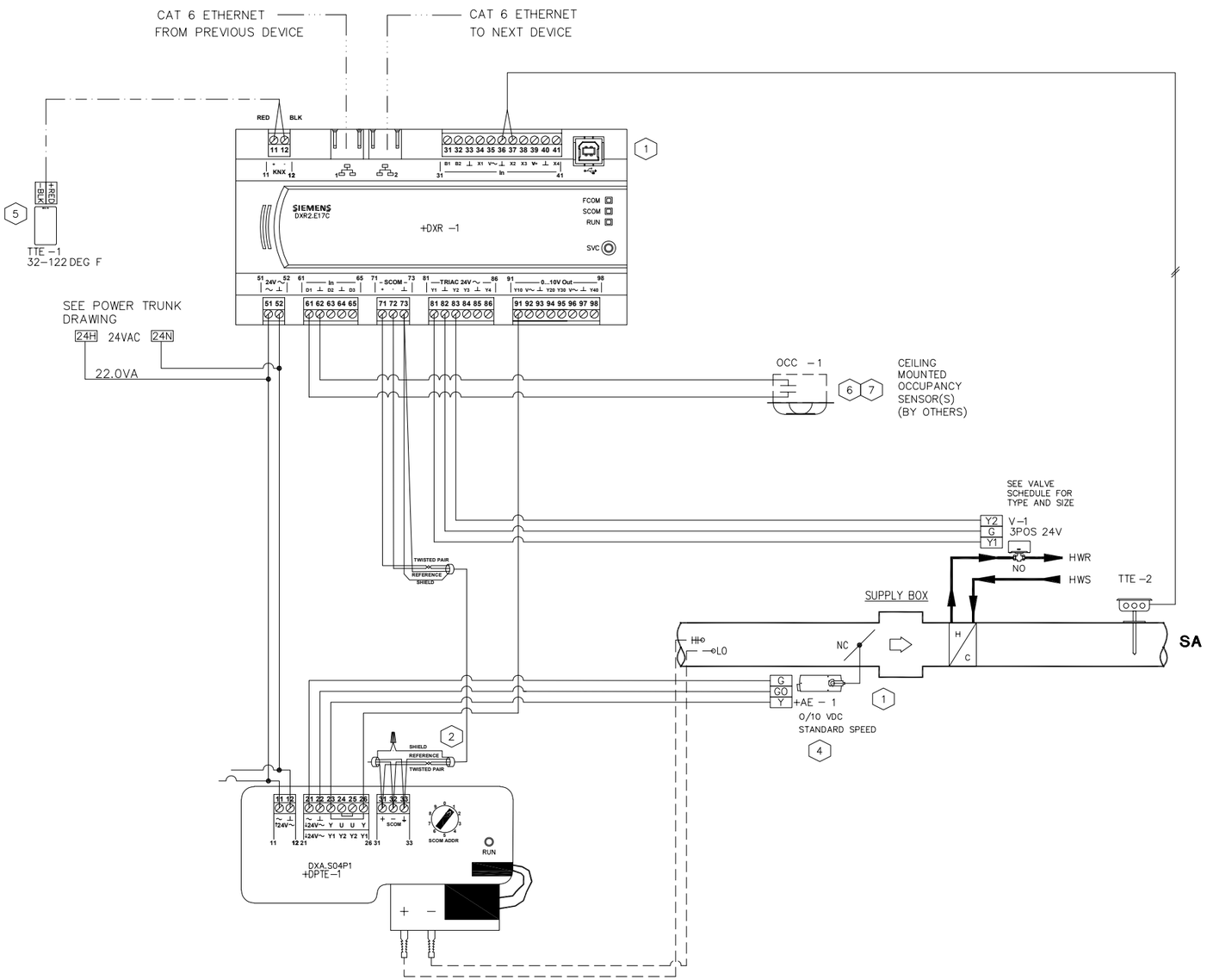

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY SIEMENS WITH AUXILIARY CONTACT. TTC WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	1	7.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	22.0 VA

1/435 SUP AIR BOX, FAST ACTING ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (1)
LOCATION: SEE THE LAB ROOM CONTROL SCHEDULE
SERVES: SEE THE LAB ROOM CONTROL SCHEDULE
BASE APPLICATION NUMBER: 16773

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IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-SLOW-P30-OCC

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SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	1	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1	1	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	1	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-SLOW-P30-OCC BOM

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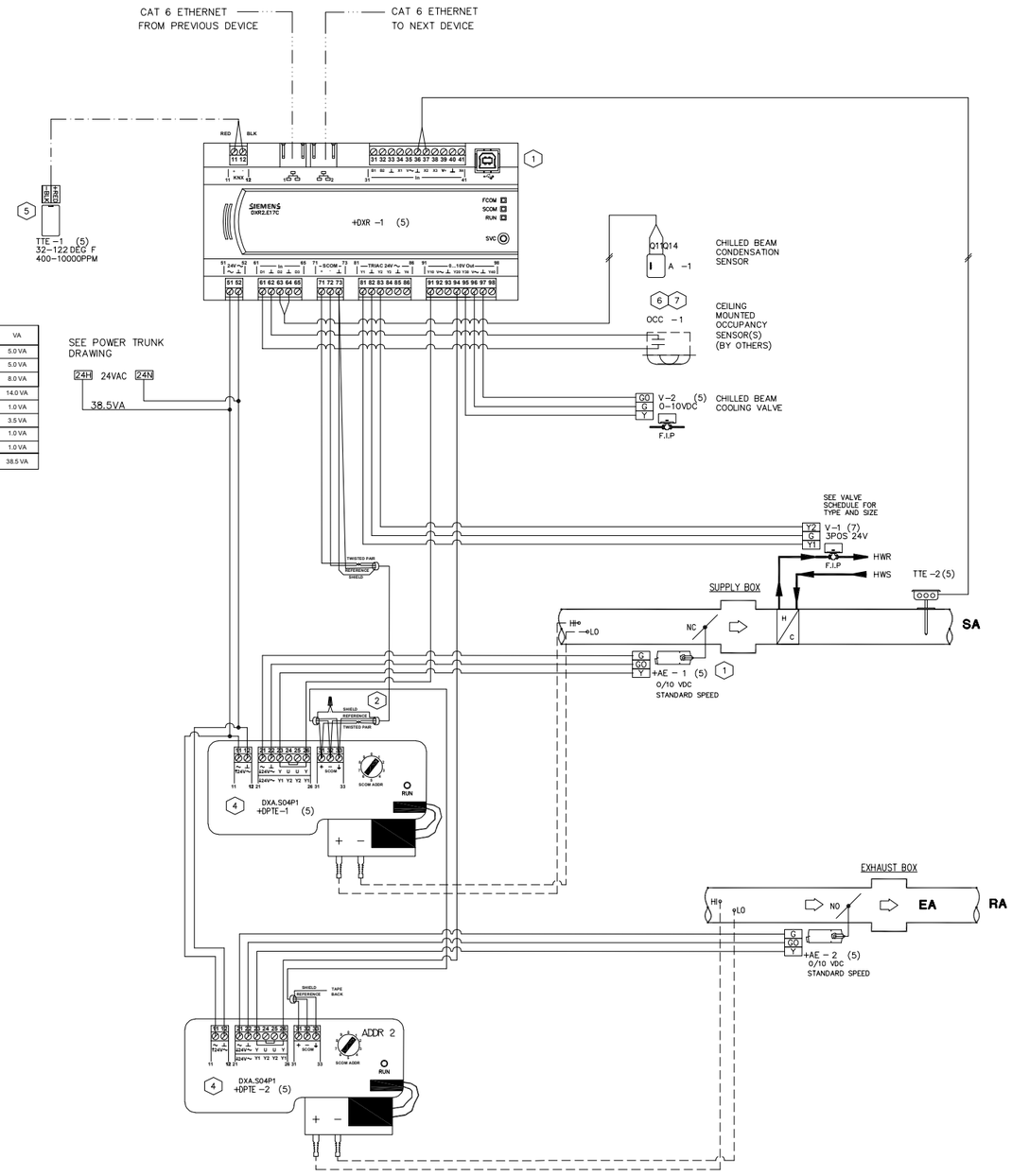


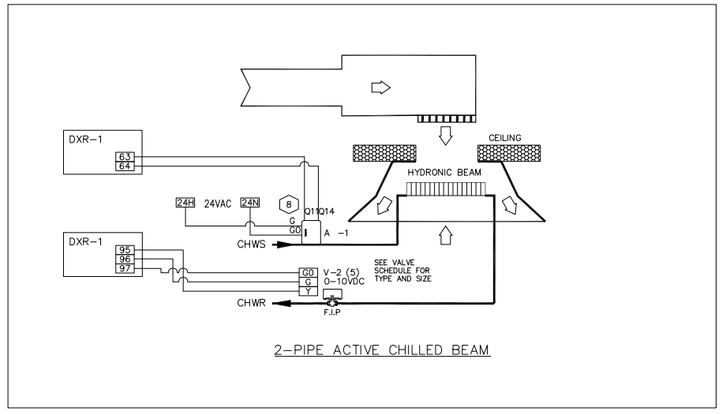
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	38.5 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
8. SEE SCHEDULE FOR WHICH CB NEEDS TO BE INSTALLED CONDENSATE SENSOR.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM

1/436 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (5)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

440P412785
0
436

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

BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-CB-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	1	QXA2101	SIEMENS		CONDENSATION MONITOR W/REMOTE SNSR (95%)
TTE 1	5	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	5	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	10	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	10	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	5	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-CB-P70-OCC BOM

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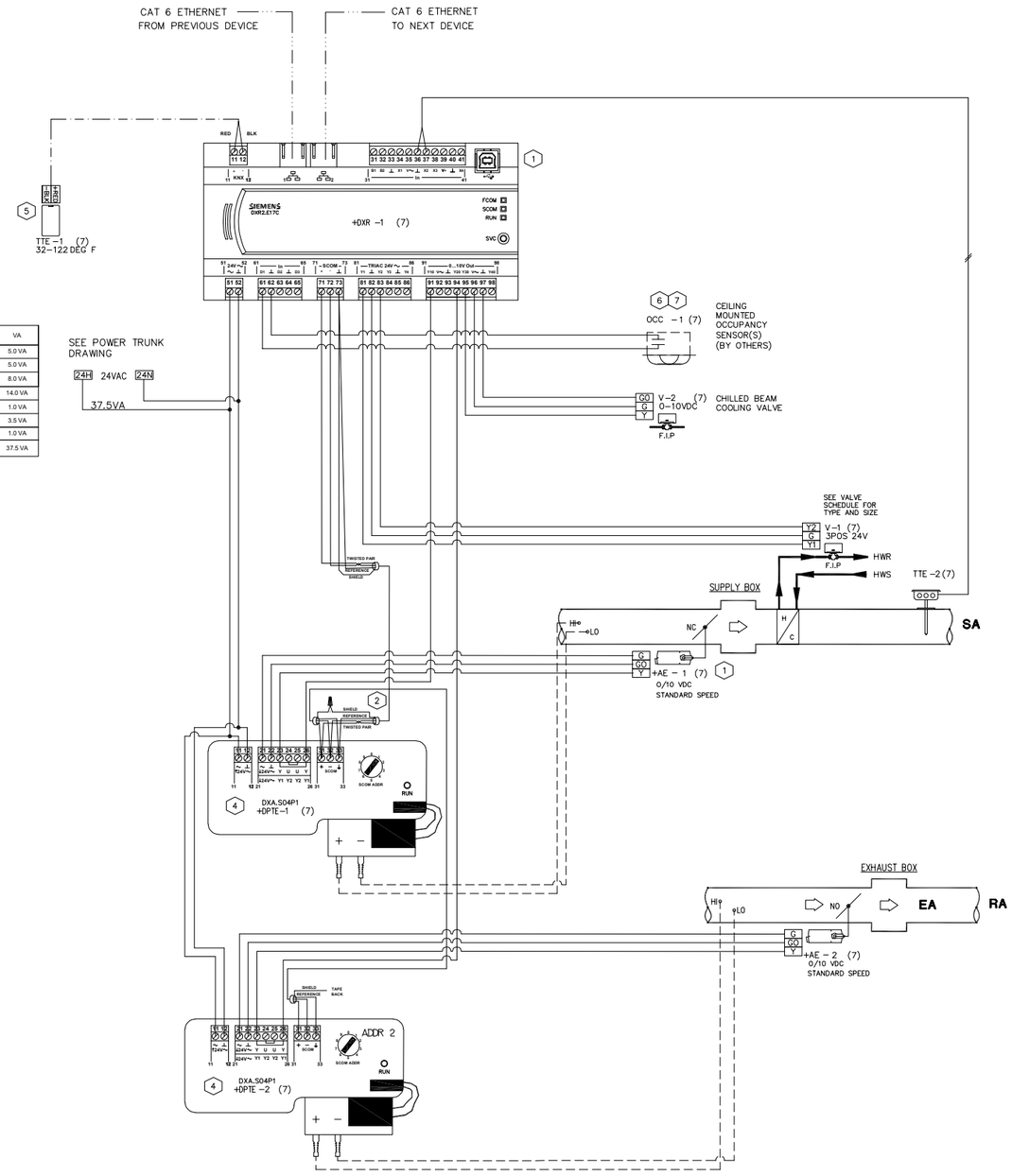


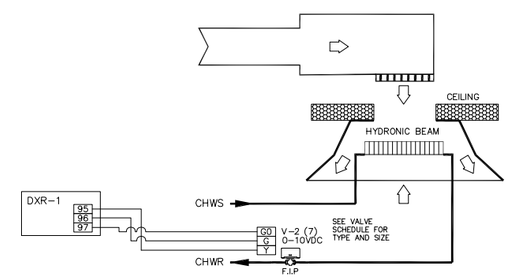
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	37.5 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM

1/437 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (7)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

440P412785
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

BU LAUNCH ACCELERATOR FOR BIO
IL# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-CB-P30-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	7	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	7	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	14	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	14	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	7	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SMART INFRASTRUCTURE DIVISION

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FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-CB-P30-OCC BOM

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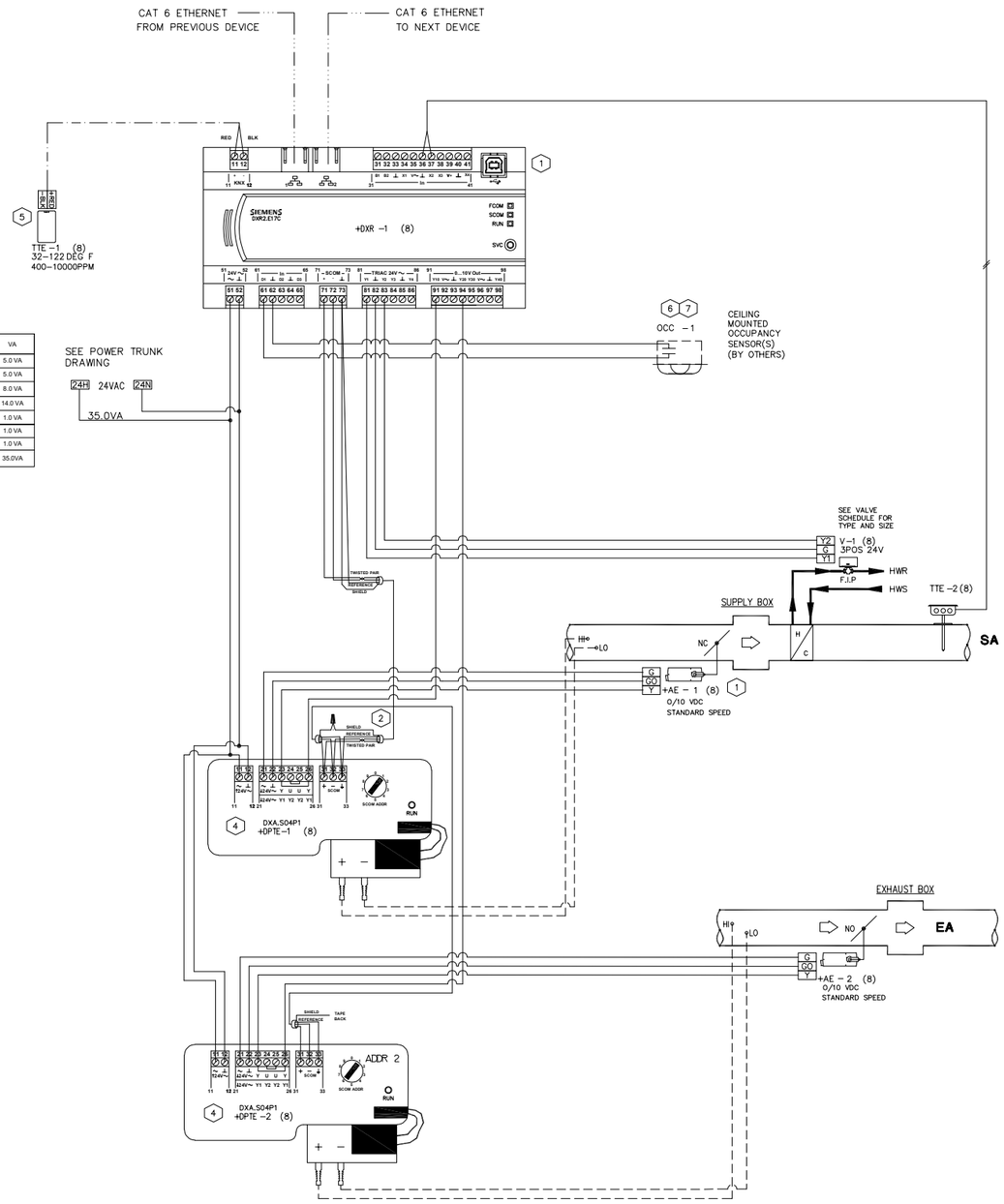

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	35.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/438 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (8)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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LU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	8	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	8	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	16	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	16	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	8	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LTB-LGEV-SLOW-P70-OCC BOM

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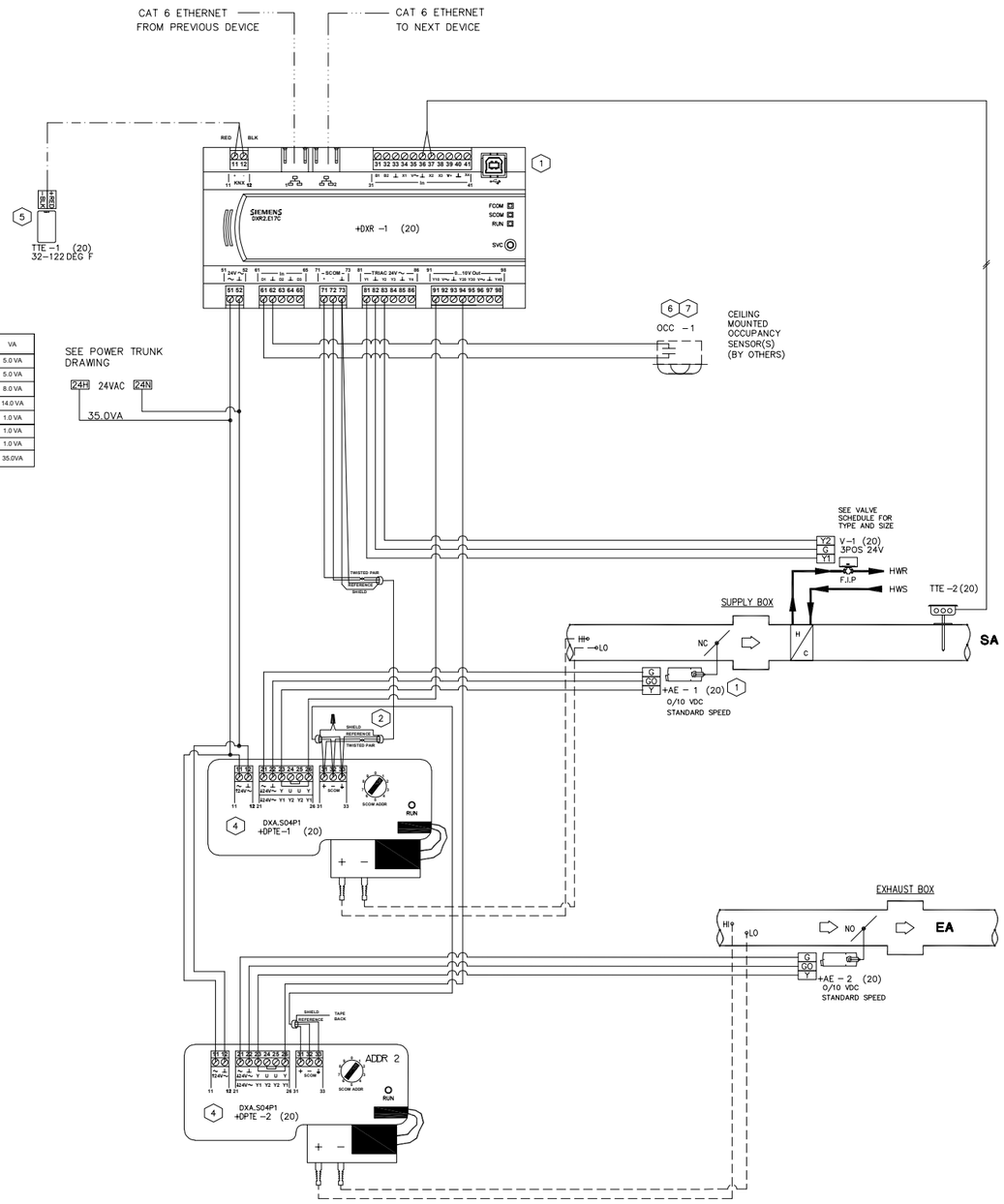

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	35.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/439 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (20)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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439

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BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-P30-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	20	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	20	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	40	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	40	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	20	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-P30-OCC BOM

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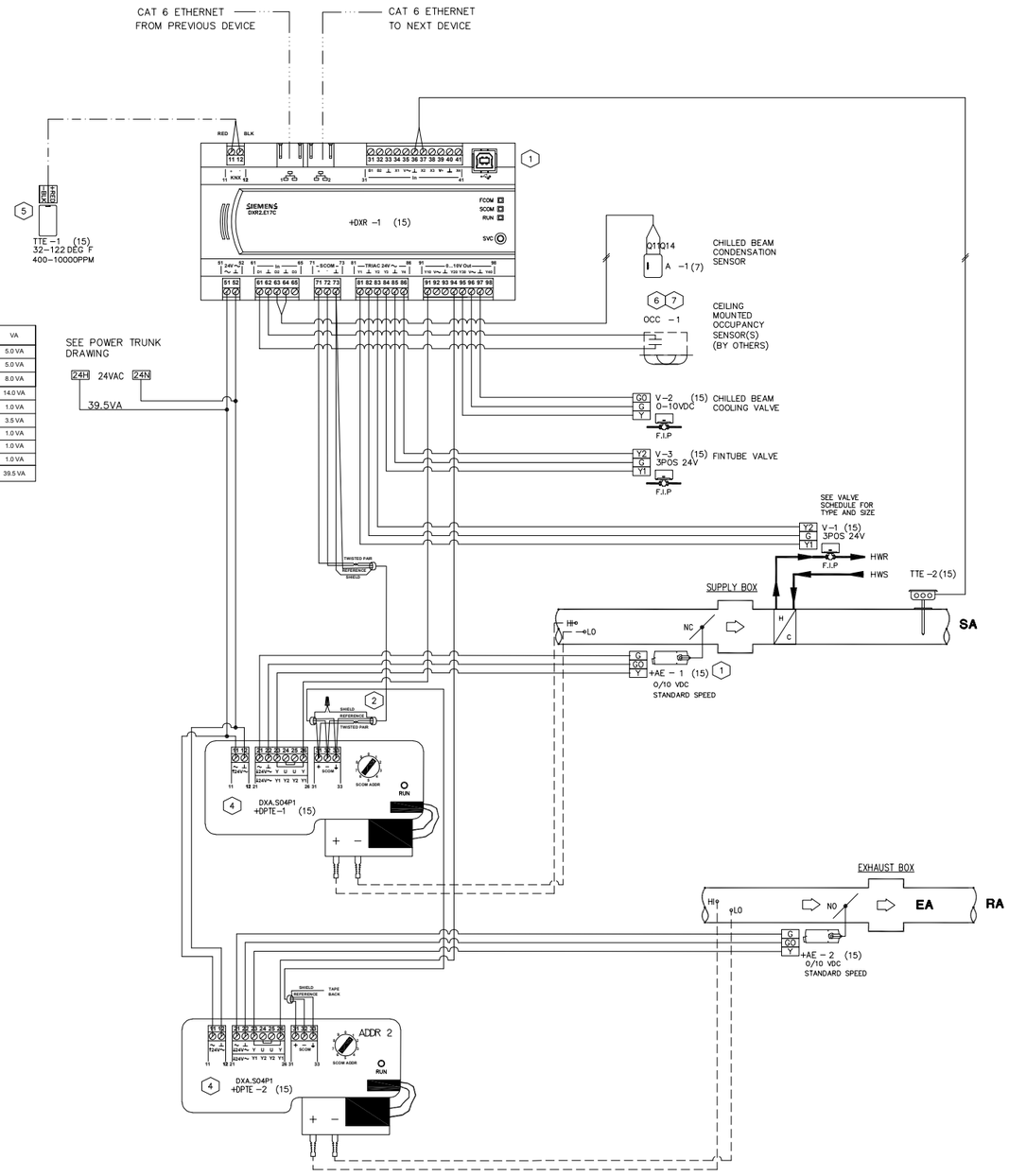


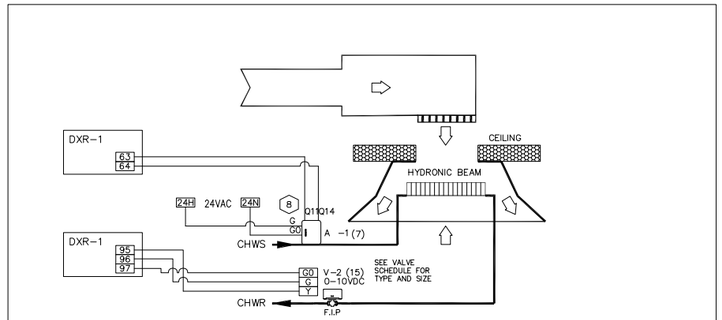
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
FINTUBE VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	39.5 VA

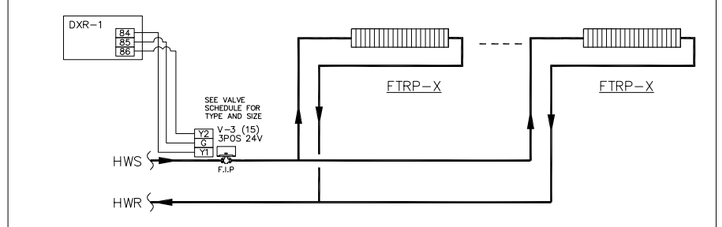
INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
8. SEE SCHEDULE FOR WHICH CB NEEDS TO BE INSTALLED CONDENSATE SENSOR.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM



NOTE:
Q'TY.(1) VALVE TO CONTROL MULTIPLE FTRPs.

FINTUBE RADIATION

1/440 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (15)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

440P412785
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SMART INFRASTRUCTURE DIVISION

EU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CB-RAD-P70-OCC

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	7	QXA2101	SIEMENS		CONDENSATION MONITOR W/REMOTE SNSR (95%)
TTE 1	15	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	15	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	30	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	30	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	15	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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TB-EV-SLOW-CB-RAD-P70-OCC BOM

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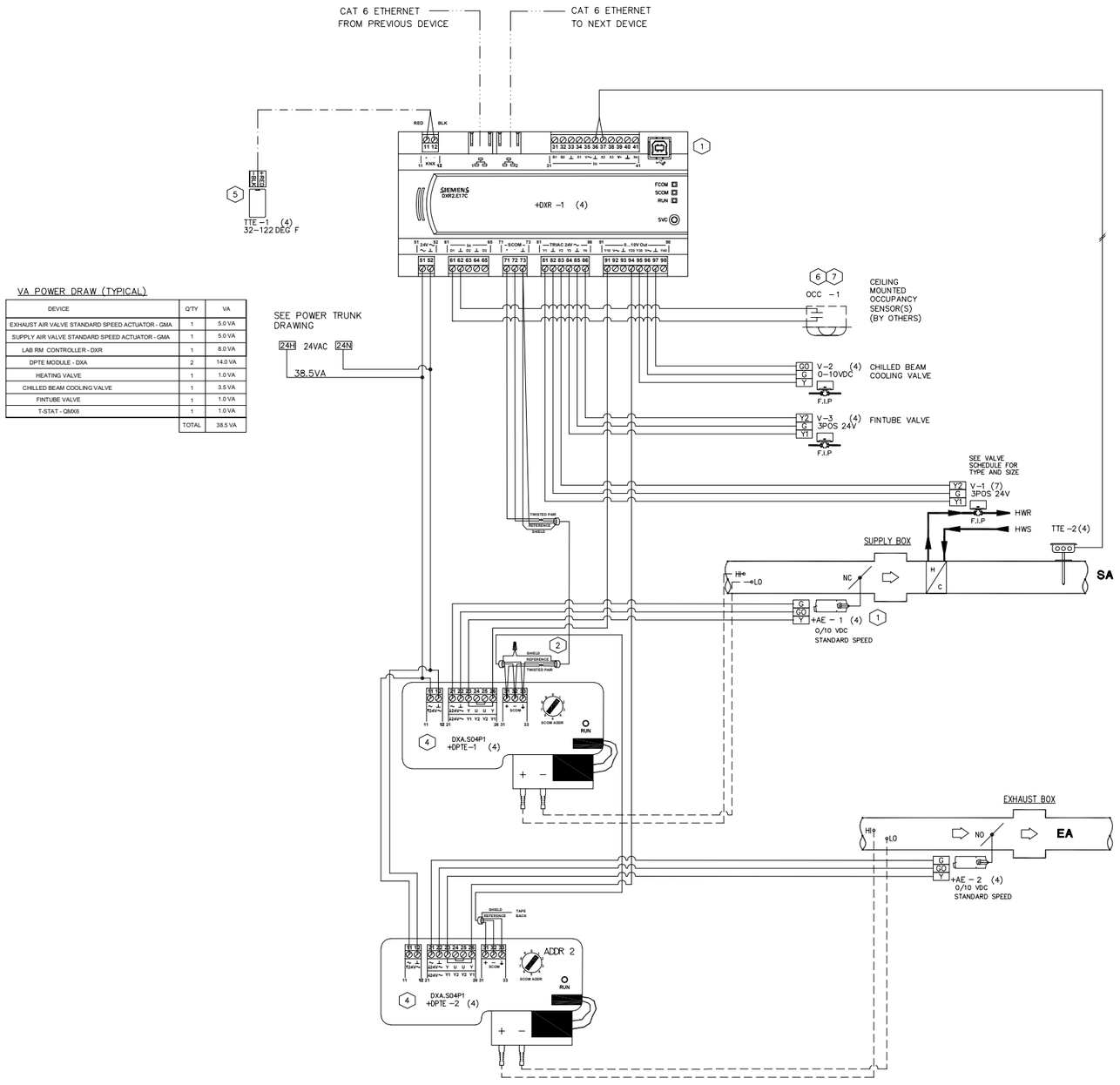


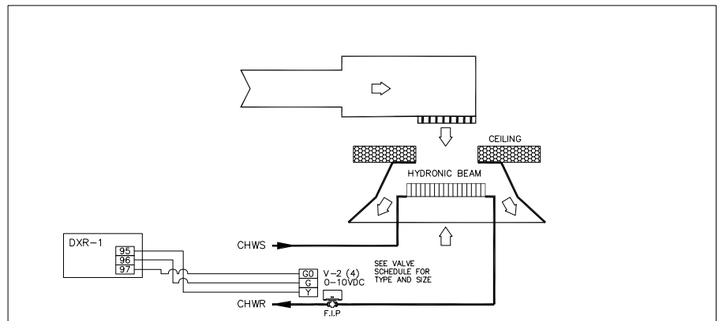
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
FINTUBE VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
TOTAL		38.5 VA

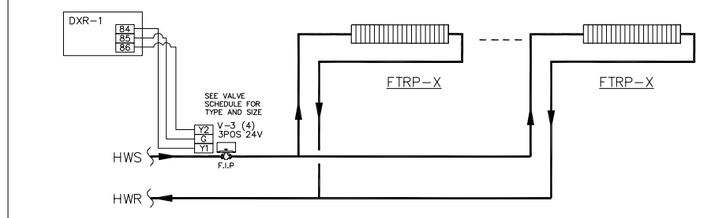
INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM



NOTE:
Q'TY.(1) VALVE TO CONTROL MULTIPLE FTRPs.

FINTUBE RADIATION

1
441
SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (4)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

440P412785
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PROJECT	LJU LAUNCH ACCELERATOR FOR BIO
ILN	202500072, IN
DRAWN BY	HB
CHECKED BY	KR
ISSUE DATE	04/02/26
LAST EDIT DATE	04/02/26
DRAWING NUMBER	TB-EV-SLOW-CB-RAD-P30-OCC

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	4	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	4	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	8	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	8	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	4	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CB-RAD-P30-OCC BOM

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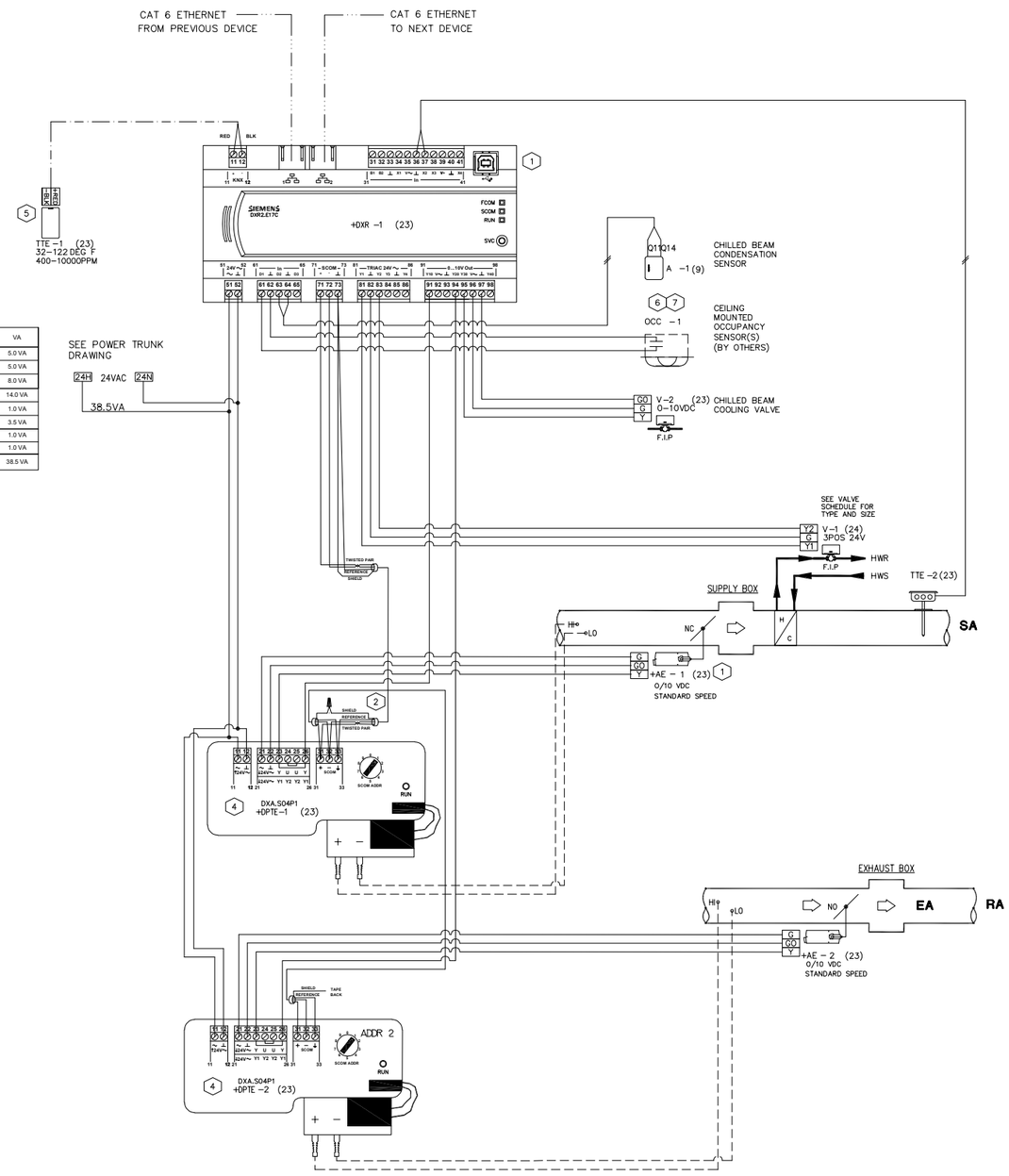


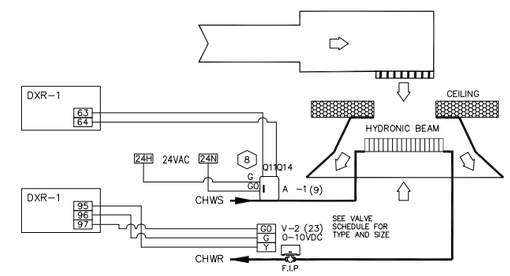
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	38.5 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
8. SEE SCHEDULE FOR WHICH CB NEEDS TO BE INSTALLED CONDENSATE SENSOR.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM

1/442 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (23)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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BU LAUNCH ACCELERATOR FOR BIO
IU# 20260072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CB-P70-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	9	QXA2101	SIEMENS		CONDENSATION MONITOR W/REMOTE SNSR (95%)
TTE 1	23	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	23	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	46	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	46	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	23	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CB-P70-OCC BOM

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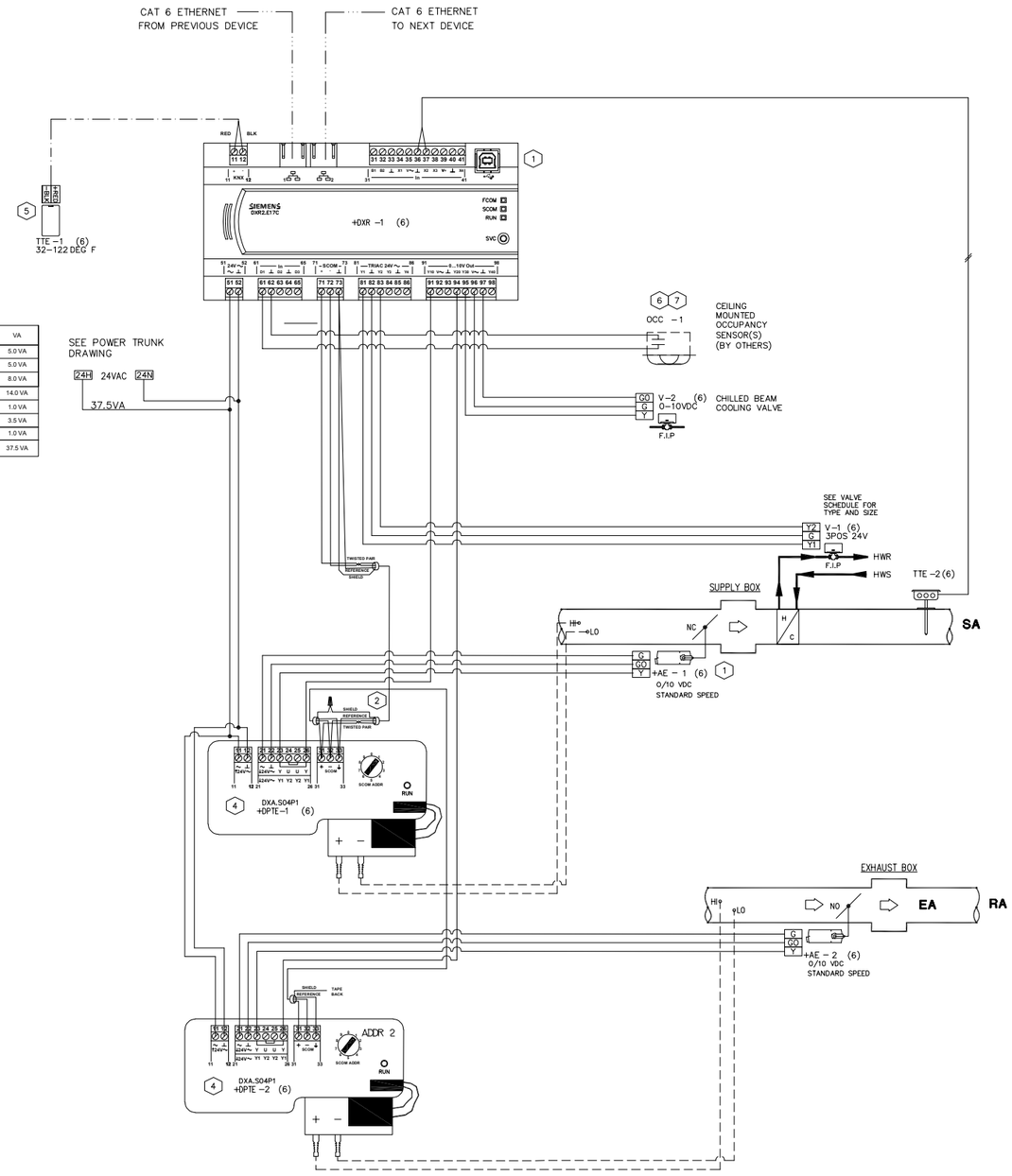


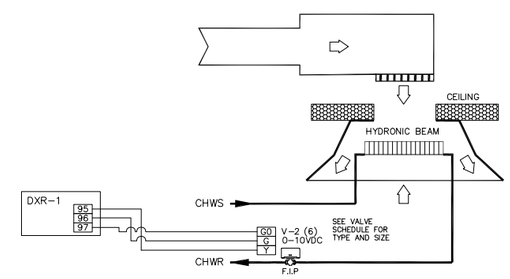
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	37.5 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
8. SEE SCHEDULE FOR WHICH CB NEEDS TO BE INSTALLED CONDENSATE SENSOR.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2-PIPE ACTIVE CHILLED BEAM

1/443 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (6)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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BU LAUNCH ACCELERATOR FOR BIO
ID# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CB-P30-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	6	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	6	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	12	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	12	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	6	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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TB-EV-SLOW-CB-P30-OCC BOM

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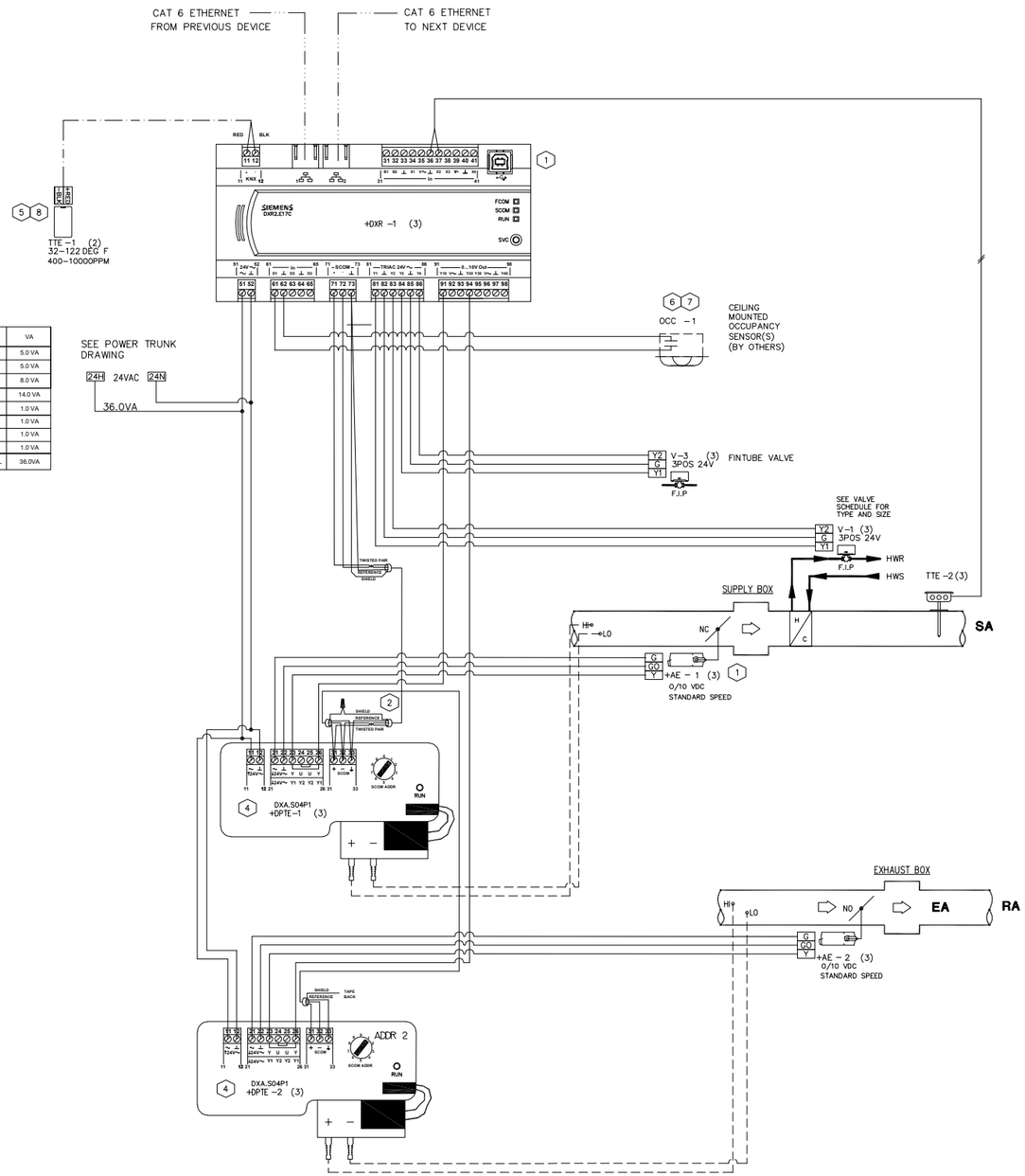


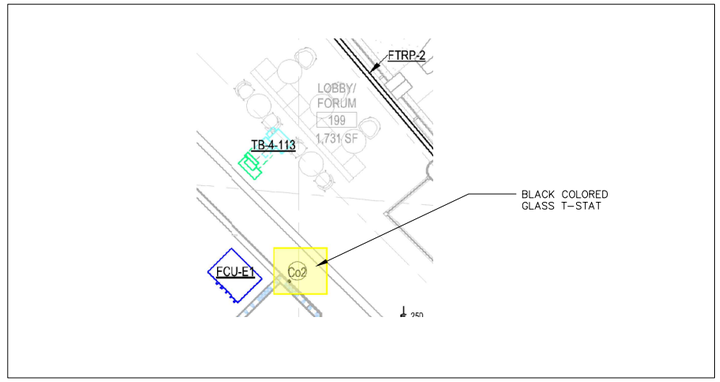
VA POWER DRAW (TYPICAL)

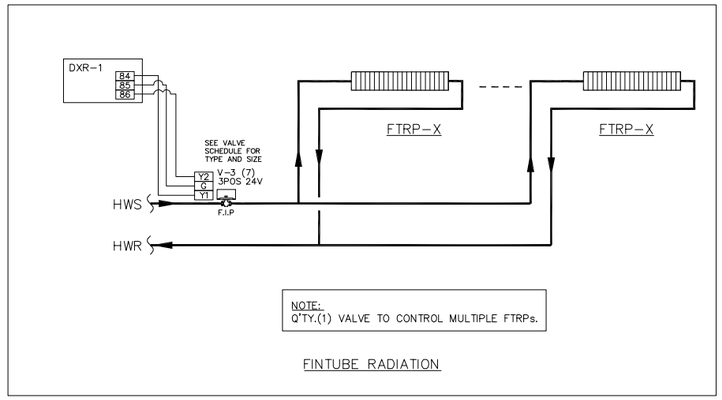
DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
FINTUBE VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	36.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.
8. BLACK COLORED GLASS T-STAT FOR TB-4-113.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.





NOTE:
Q'TY.(1) VALVE TO CONTROL MULTIPLE FTRPs.

FINTUBE RADIATION

1/444 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (3)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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BU LAUNCH ACCELERATOR FOR BIO
IU# 20260072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-RAD-P70-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	2	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	3	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
TTE 1.1	1	QMX6.P70-BK	SIEMENS		QMX6 ROOM TEMP, RH & CO2, BLACK
PART OF TERM UNIT ASSBLY					
AE 1-2	6	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	6	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	3	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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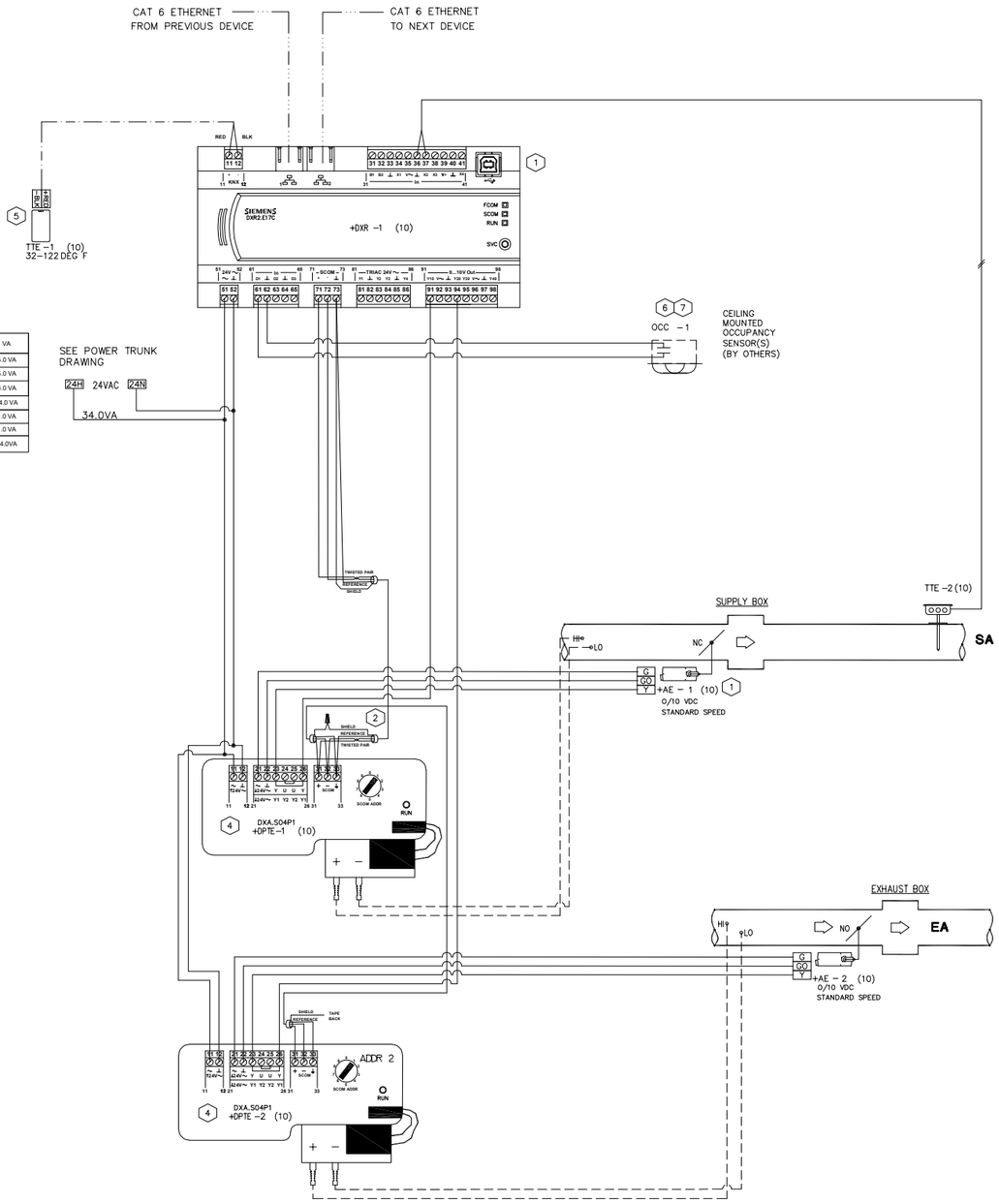

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	34.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1 / 445 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (10)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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BU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-CLG-P30-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	10	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	10	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	20	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	20	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	10	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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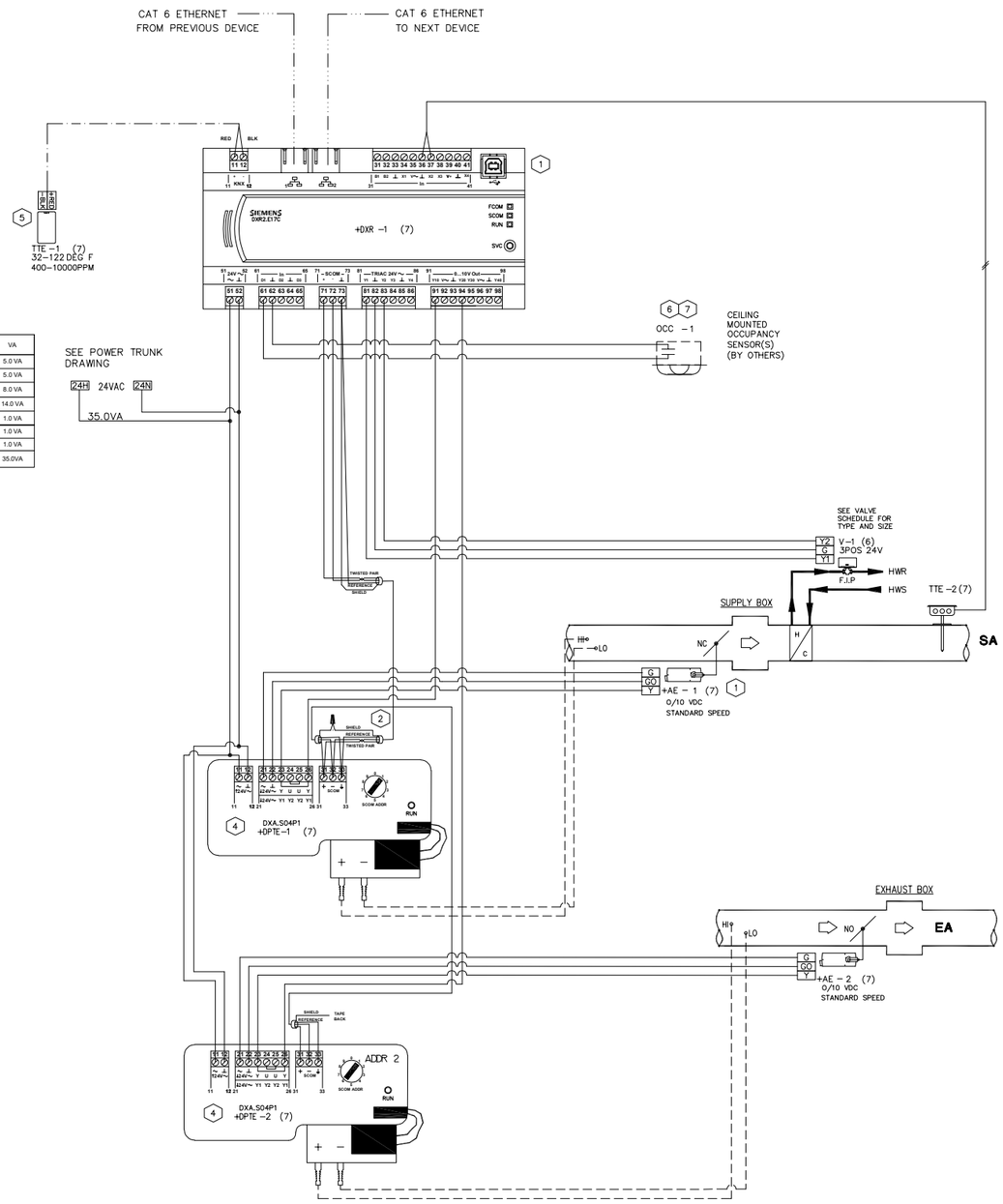

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	35.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR–1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/446 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (7)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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IU LAUNCH ACCELERATOR FOR BIO
IU# 202500072, IN

DRAWN BY	CHECKED BY	LAST ISSUE DATE
HB	KS	04/02/26

TB-EV-SLOW-P70-OCC

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	7	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	7	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	14	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	14	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	7	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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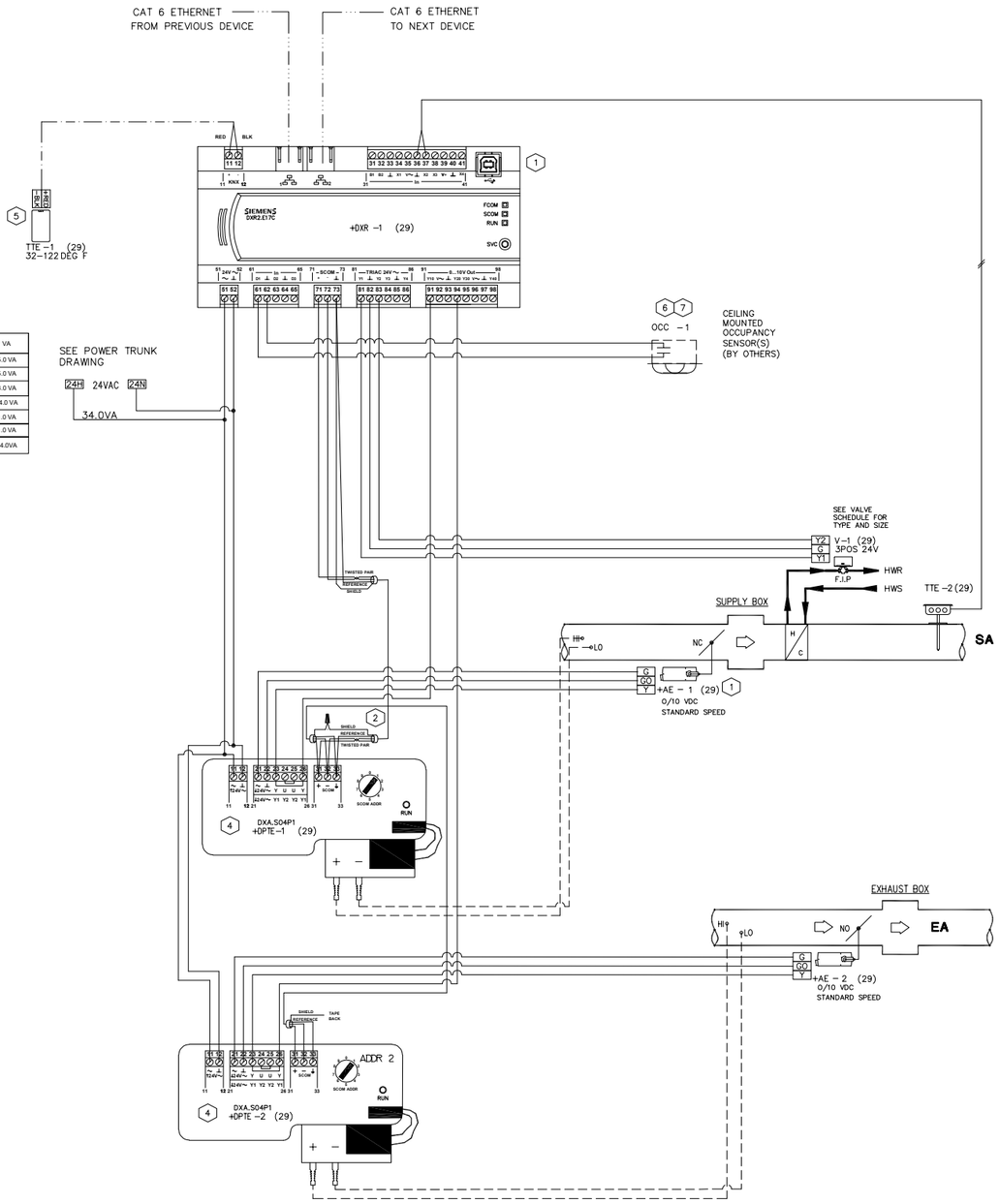

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	34.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. LOCATED BY DIV 26 AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
7. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/447 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (29)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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HB	HB	KR	04/02/26	04/02/26

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	29	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	29	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	58	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	58	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	29	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-P30-OCC BOM

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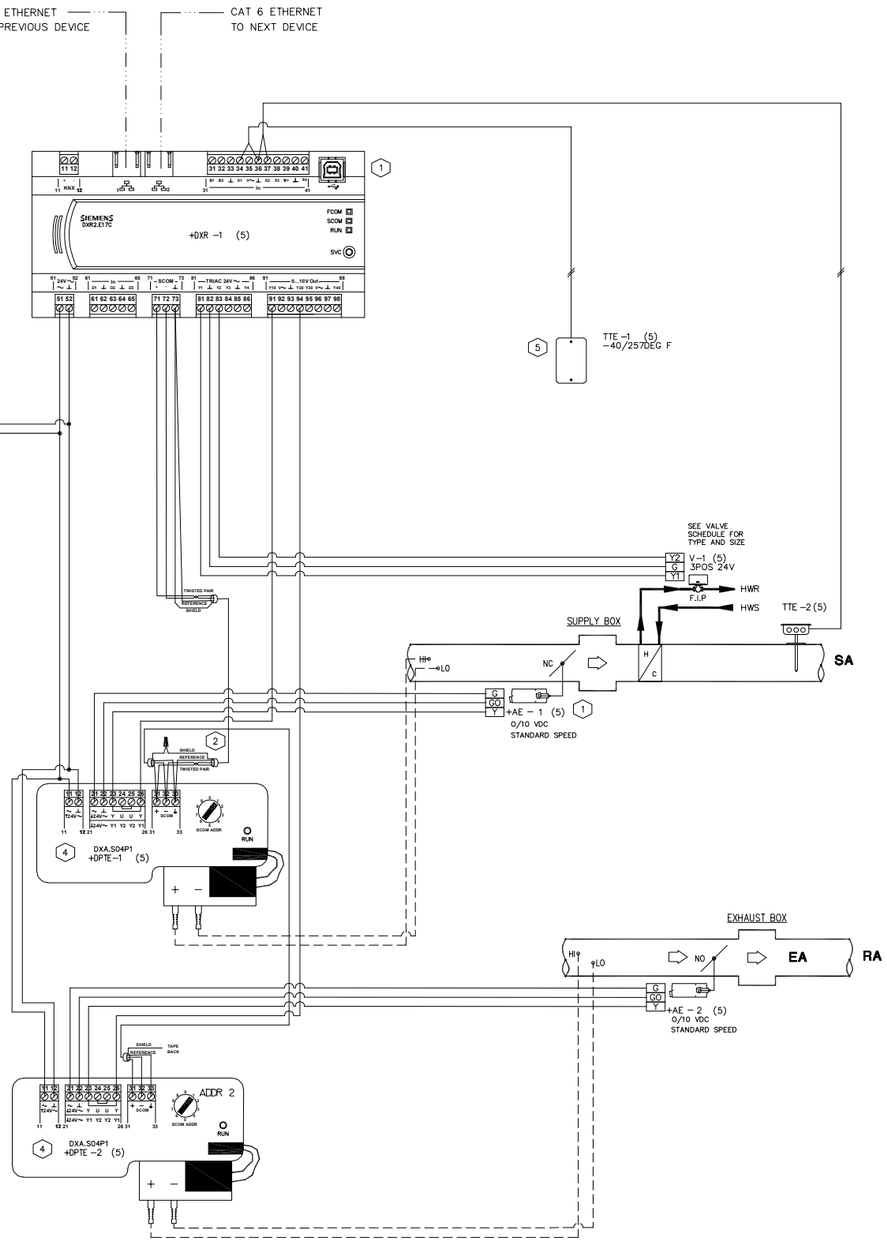

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
	TOTAL	33.0VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/448 SUP AIR BOX AND RET AIR BOX, STANDARD SPEED ACTUATOR CONTROL DIAGRAM

TYPICAL OF Q'TY: (5)
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16773

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	5	540-984	SIEMENS	149 971	FLUSH MNT TEMP SNSR, 10K OHM TYP2, METAL
TTE 2	5	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1-2	10	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DPTE 1-2	10	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	5	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

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SEQUENCE OF OPERATION - TERMINAL BOXES WITH AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE 90°F (ADJ.) MAXIMUM LEAVING AIR TEMPERATURE. UPON REACHING THE MAXIMUM LEAVING AIR TEMPERATURE THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN
A RANGE OF APPROXIMATELY 90°F +/- 5.0°F (ADJ) DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

2. PRESSURE-INDEPENDENT AIRFLOW CONTROL VALVE (AFCV) SHALL BE CONTROLLED IN SEQUENCE WITH SUPPLY AIR TERMINAL BOX FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN THE DESIGN AIRFLOW DIFFERENTIAL IN EACH ROOM. SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.

3. HEATING COIL CONTROL:
   A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
   B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
   C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WHERE FIN TUBE RADIATION IS USED:
   A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 50°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 52°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.
   B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
   C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

5. WHERE CO2 SENSING IS USED:
   A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS 950 PPM (ADJ), THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO 800 PPM (ADJ) WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING 800 PPM (ADJ), THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INTIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS 1,300 PPM (ADJ) FOR LONGER THAN 15 MINUTES (ADJ). CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).
   B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR THIRTY MINUTES (ADJ), THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
   - OCCUPIED MODE (ROOM OCCUPANCY SENSED)
     HEATING SET POINT = 70 DEGREES
     COOLING SET POINT = 75 DEGREES
     TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
   - STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR THIRTY MINUTES (ADJ))
     HEATING SET POINT = 67 DEGREES
     COOLING SET POINT = 78 DEGREES
     TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:

1. THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. THE FOURTH GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE THIRD GROUP. THE LAST GROUP OF SPACES CONSISTING OF THE REMAINDER OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FOURTH GROUP.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
   - SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE
     OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE THE SPACE UNOCCUPIED MODE OPERATION.
     UNOCCUPIED SPACE HEATING SETPOINT = 60°F (ADJ)
     UNOCCUPIED SPACE COOLING SETPOINT = 80°F (ADJ)

DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS 10% (ADJ) OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT). DURING UNOCCUPIED MODE, THE EXHAUST AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS 10% (ADJ) OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS EXHAUST AIR VALVE CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE EXHAUST FAN IS OPERATING OR NOT). **SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.**
HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE UNOCCUPIED SPACE HEATING SETPOINT AND THE UNOCCUPIED SPACE COOLING SETPOINT AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE
WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE UNOCCUPIED SPACE HEATING SETPOINT. THE
TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

4. EACH ASSOCIATED EV SHALL FULLY CLOSE WHEN IT'S ASSOCIATED TERMINAL BOX IS CLOSED IN UNOCCUPIED MODE. WHEN THE UNOCCUPIED MODE SETPOINT IS REACHED AND THE TERMINAL BOX OPENS BACK UP, THEN THE EV OPENS TO MINIMUM AIRFLOW AND CONTROLS IN SEQUENCE WITH THE SUPPLY AIR TERMINAL BOX FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN THE DESIGN AIR FLOW DIFFERENTIAL IN EACH ROOM. EACH EV SHALL FULLY CLOSE WHENEVER THE AHU WHICH SERVES THE SUPPLY AIR TERMINAL BOX IS OFF.

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):
1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE
DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

SEQUENCE OF OPERATION FOR 2-PIPE CHILLED BEAM.
ZONES WITH A CONDENSATE SENSOR: 103, 104, 131, 138, 139, 211, 212, 217, 218, 306, 314, 321, 402, 413, 416, 503, 506.

OCCUPIED MODE:
1. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE

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CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

2. THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT IS 70°F (ADJ) AND THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT IS 75°F (ADJ). THE CHILLED BEAM HEATING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS GREATER THAN THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE BOTH WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW. STANDARD TERMINAL BOX CONTROL MODIFICATION: WHILE ACTIVELY HEATING THE TERMINAL BOX DISCHARGE TEMPERATURE MAY PROVIDE A MAXIMUM OF 120 DEGF (ADJ) DISCHARGE AIR TEMPERATURE (CHILLED BEAM MIXED AIR DELIVERY TEMPERATURE WILL BE APPROX 85 DEGF WITH 120 DEGF PRIMARY AIR TEMPERATURE).

4. THE ZONE CONTROL SYSTEM SHALL BE INDEXED FROM UNOCCUPIED MODE TO OCCUPIED MODE BY THE VACANCY SENSOR AND REMAINS IN OCCUPIED MODE FOR TEN MINUTES AFTER OCCUPANCY WAS LAST SENSED.

5. AFTER EVERY CHANGE OF STATUS TO "ON" OF THE AHU SERVING THE SPACE, THE ZONE CONTROLLER SHALL BE FORCED INTO OCCUPIED MODE FOR ONE HOUR (ADJUSTABLE). AFTER THE END OF THE FORCED OCCUPIED TIME PERIOD, THE ZONE CONTROLLER SHALL BE IN UNOCCUPIED MODE UNLESS THE ZONE VACANCY SENSOR IS ACTIVATED.

6. FOR ALL SPACES WHICH HAVE CONDENSATE SENSORS:
A. THE TERMINAL BOX AIRFLOW REMAINS AT THE NORMAL SCHEDULED / NORMAL CONTROLLED COOLING / HEATING AIRFLOW UNLESS THE AIRFLOW WAS RAISED FOR HUMIDITY OVERRIDE.

B. AS SPACE HUMIDITY INCREASES ABOVE A LEVEL OF 58% RH (ADJ), HUMIDITY OVERRIDE IS ENABLED AND THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO THE SCHEDULED MAXIMUM AIRFLOW TO REDUCE THE RELATIVE HUMIDITY IN THE SPACE. BELOW 53% RH (ADJ) READING THE SUPPLY AIRFLOW IS RELEASED FOR NORMAL CONTROL. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE SPACE HUMIDITY SENSOR READING EXCEEDS 65% RH (ADJ).

C. WHILE IN HUMIDITY OVERRIDE IF THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT (e.g. 70 degF) THE TERMINAL BOX/DUCT–MOUNTED HEATING COIL VALVE MODULATES OPEN TO PROVIDE ADDITIONAL HEATING AND TO MAINTAIN THE OCCUPIED HEATING SETPOINT.

D. IF AT ANY TIME, THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM CHILLED WATER SUPPLY PIPING, THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO MAXIMUM OCCUPIED SCHEDULED AIRFLOW TO PROVIDE MORE DRY AIR AND REMAINS AT MAXIMUM OCCUPIED SCHEDULED AIRFLOW UNTIL THE CONDENSATE DETECTION IS CLEARED. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE CONDENSATE SENSOR DETECTOR INDICATION EXCEEDS 24 HOURS (ADJ) STRAIGHT.

E. HUMIDITY OVERRIDE CONTROL IS ACTIVE IN UNOCCUPIED MODE. IF SPACE HUMIDITY EXCEEDS 58% RH (ADJ) THEN THE TERMINAL BOX SUPPLY AIR DAMPER CONTROLS THE SUPPLY AIR VOLUME TO THE OCCUPIED AIRFLOW SETTINGS FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

F. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED DURING THE SCHEDULED UNOCCUPIED TIMES, THAT INDIVIDUAL CLASSROOM SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

UNOCCUPIED MODE:

THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

1. IN UNOCCUPIED MODE THE SPACE TEMPERATURE READING IS ALLOWED TO FLOAT BETWEEN THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT OF 65°F (ADJ) AND THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT OF 80°F (ADJ).

2. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

4. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED, THAT INDIVIDUAL SPACE SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR A MINIMUM OF TWENTY MINUTES (ADJ). AT THE END OF THE TWENTY MINUTE PERIOD, THE OCCUPIED ROOM SHALL RETURN TO NORMAL OPERATION AND THE VACANCY SENSOR MAY THEN RETURN THE ROOM TO OCCUPIED OR UNOCCUPIED AS SENSED AND AS SCHEDULED.

EITHER MODE:

1. IF THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM WATER SUPPLY PIPING, THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED. NOTE THAT ONLY THOSE ZONES SPECIFICALLY NOTED CONTAIN A CONDENSATE SENSOR.

2. IF POWER HAS BEEN TRANSFERRED TO THE GENERATOR, FULLY CLOSE THE CB COOLING VALVE. UPON RETURN TO NORMAL POWER, RETURN CB COOLING VALVE TO NORMAL CONTROL.

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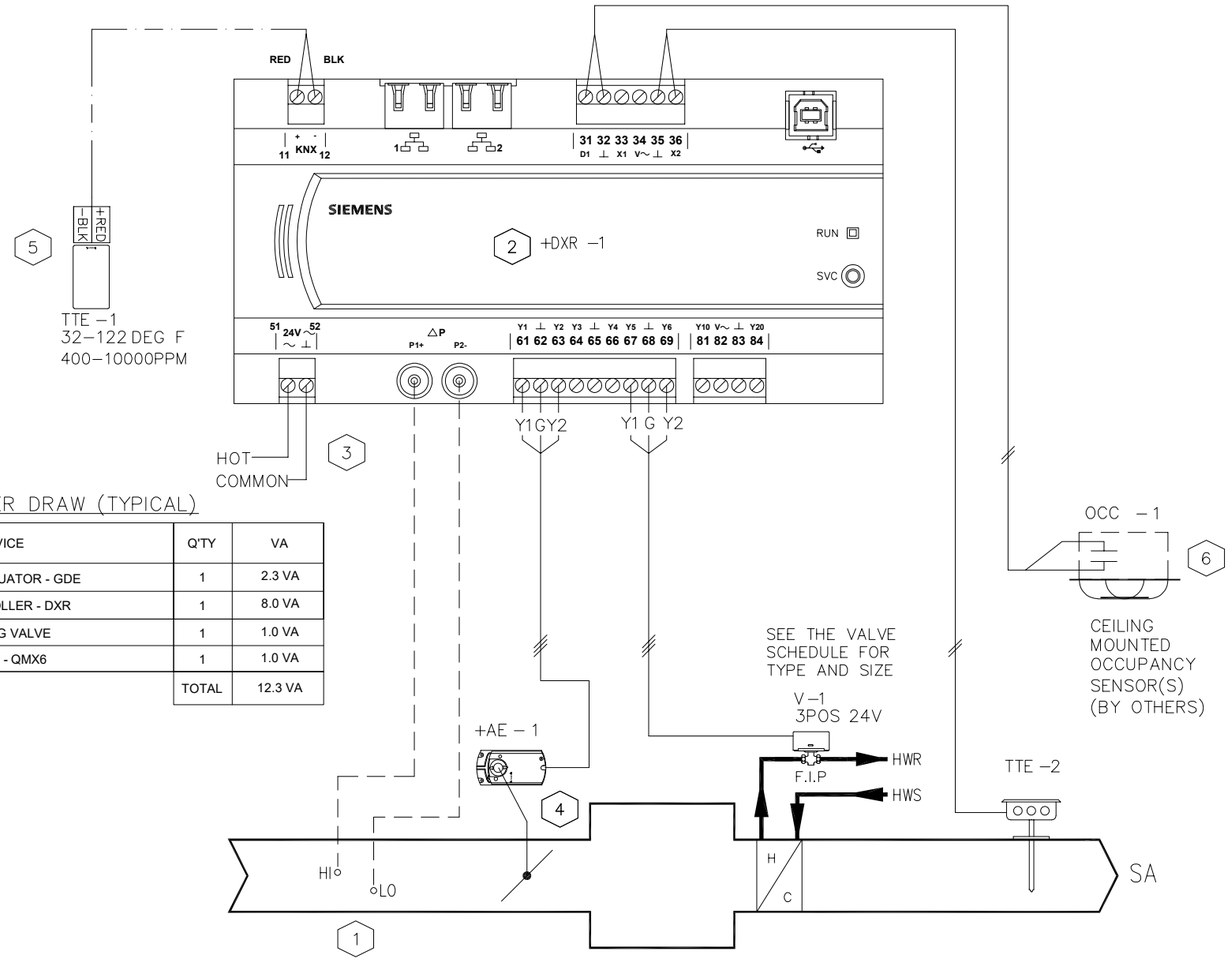

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	12.3 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/450 VAV BOX WITH HW REHEAT COIL

TYPICAL OF Q'TY : (1)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

VAV w/HW REHEAT-P70-IP DXR

440P412785
0
450

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	1	QMX6.P70	SIEMENS		QMX6 ROOM TEMP. RH & CO2
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	1	GDE131.1U	SIEMENS	154 011	ACT NSR 24/108L 5NM,NO PLENUM
DXR 1	1	DXR2.E12P-102B	SIEMENS	A6V10502844	DXR2.E12P Room Automation Station

SEQUENCE OF OPERATION - TERMINAL BOXES WITHOUT AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE 90°F (ADJ.) MAXIMUM LEAVING AIR TEMPERATURE. UPON REACHING THE MAXIMUM LEAVING AIR TEMPERATURE THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY 90°F +/- 5.0°F (ADJ) DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 50°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 52°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.

B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ)** FOR LONGER THAN **15 MINUTES (ADJ)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).

B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:
THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. THE FOURTH GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE THIRD GROUP. THE LAST GROUP OF SPACES CONSISTING OF THE REMAINDER OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FOURTH GROUP.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE
THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60F (ADJ)**
  UNOCCUPIED SPACE COOLING SETPOINT = **80F (ADJ)**
DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE UNOCCUPIED SPACE HEATING SETPOINT AND THE UNOCCUPIED SPACE COOLING SETPOINT AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE UNOCCUPIED SPACE HEATING SETPOINT. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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VAV w/HW REHEAT-P70-IP DXR BOM

440P412785

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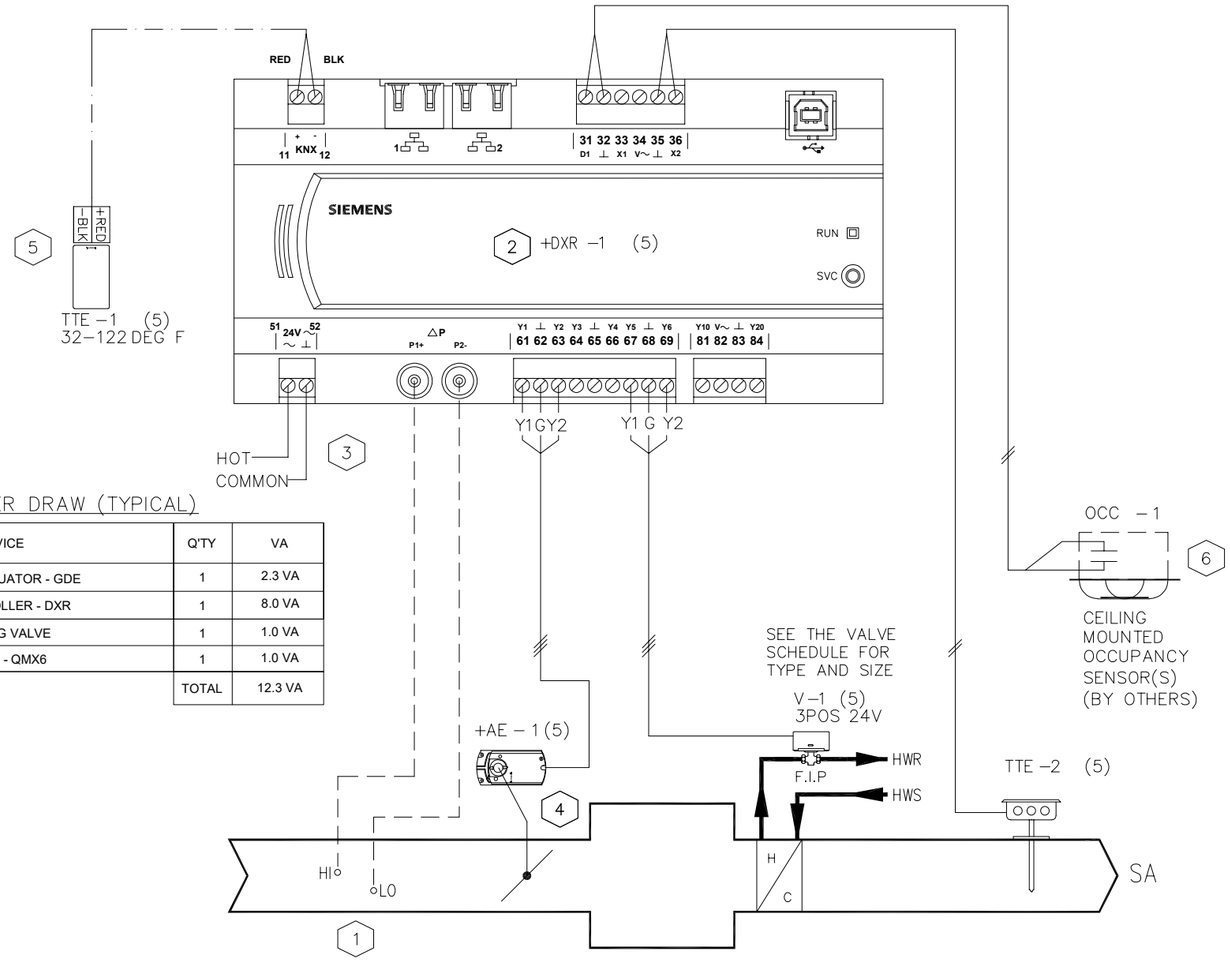

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	12.3 VA

1/451 VAV BOX WITH HW REHEAT COIL

TYPICAL OF Q'TY : (5)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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VAV w/HW REHEAT-P30-IP DXR

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451

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	5	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	5	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	5	GDE131.1U	SIEMENS	154 011	ACT NSR 24/108L 5NM,NO PLENUM
DXR 1	5	DXR2.E12P-102B	SIEMENS	A6V10502844	DXR2.E12P Room Automation Station

SEQUENCE OF OPERATION - TERMINAL BOXES WITHOUT AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE 90°F (ADJ.) MAXIMUM LEAVING AIR TEMPERATURE. UPON REACHING THE MAXIMUM LEAVING AIR TEMPERATURE THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY 90°F +/- 5.0°F (ADJ) DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 50°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 52°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.

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C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ)** FOR LONGER THAN **15 MINUTES (ADJ)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).

B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:
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2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE
THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60F (ADJ)**
  UNOCCUPIED SPACE COOLING SETPOINT = **80F (ADJ)**

DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE UNOCCUPIED SPACE HEATING SETPOINT AND THE UNOCCUPIED SPACE COOLING SETPOINT AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE UNOCCUPIED SPACE HEATING SETPOINT. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

REVISION HISTORY

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IU# 20250072, IN

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HB	HB	KR		04/14/26

VAV w/HW REHEAT-P30-IP DXR BOM

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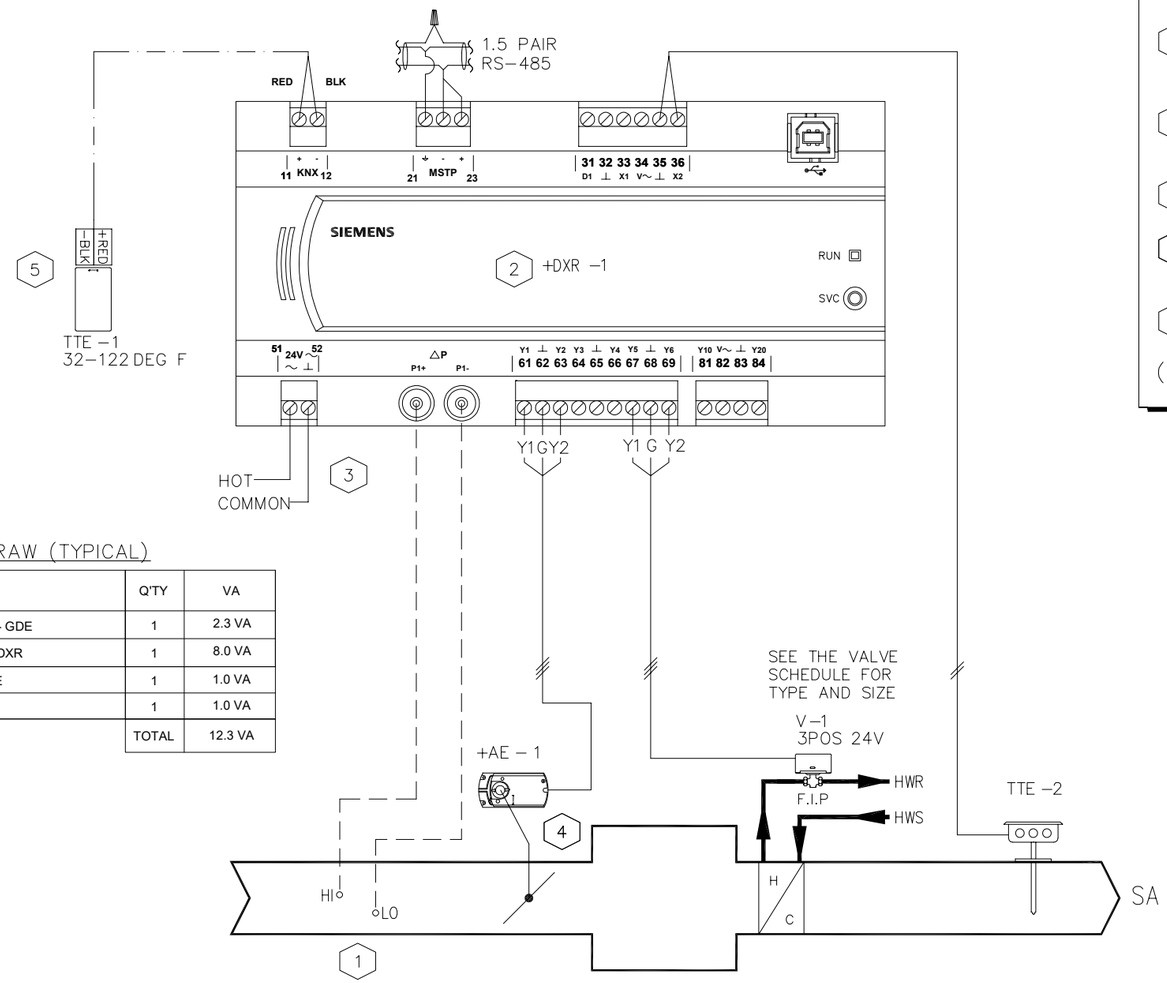

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	12.3 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR-1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR-1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/452 VAV BOX WITH HW REHEAT COIL

TYPICAL OF Q'TY : (1)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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VAV w/HW REHEAT MSTP DXR

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	1	GDE131.1U	SIEMENS	154 011	ACT NSR 24/108L 5NM,NO PLENUM
DXR 1	1	DXR2.M12P-102B	SIEMENS	A6V10502838	DXR2.M12P Room Automation Station

SEQUENCE OF OPERATION - TERMINAL BOXES WITHOUT AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE 90°F (ADJ.) MAXIMUM LEAVING AIR TEMPERATURE. UPON REACHING THE MAXIMUM LEAVING AIR TEMPERATURE THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY 90°F +/- 5.0°F (ADJ) DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 50°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 52°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.

B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ)** FOR LONGER THAN **15 MINUTES (ADJ)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).

B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:
THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. THE FOURTH GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE THIRD GROUP. THE LAST GROUP OF SPACES CONSISTING OF THE REMAINDER OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FOURTH GROUP.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE
THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60F (ADJ)**
  UNOCCUPIED SPACE COOLING SETPOINT = **80F (ADJ)**

DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE UNOCCUPIED SPACE HEATING SETPOINT AND THE UNOCCUPIED SPACE COOLING SETPOINT AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE UNOCCUPIED SPACE HEATING SETPOINT. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR		04/14/26

VAV w/HW REHEAT MSTP DXR BOM

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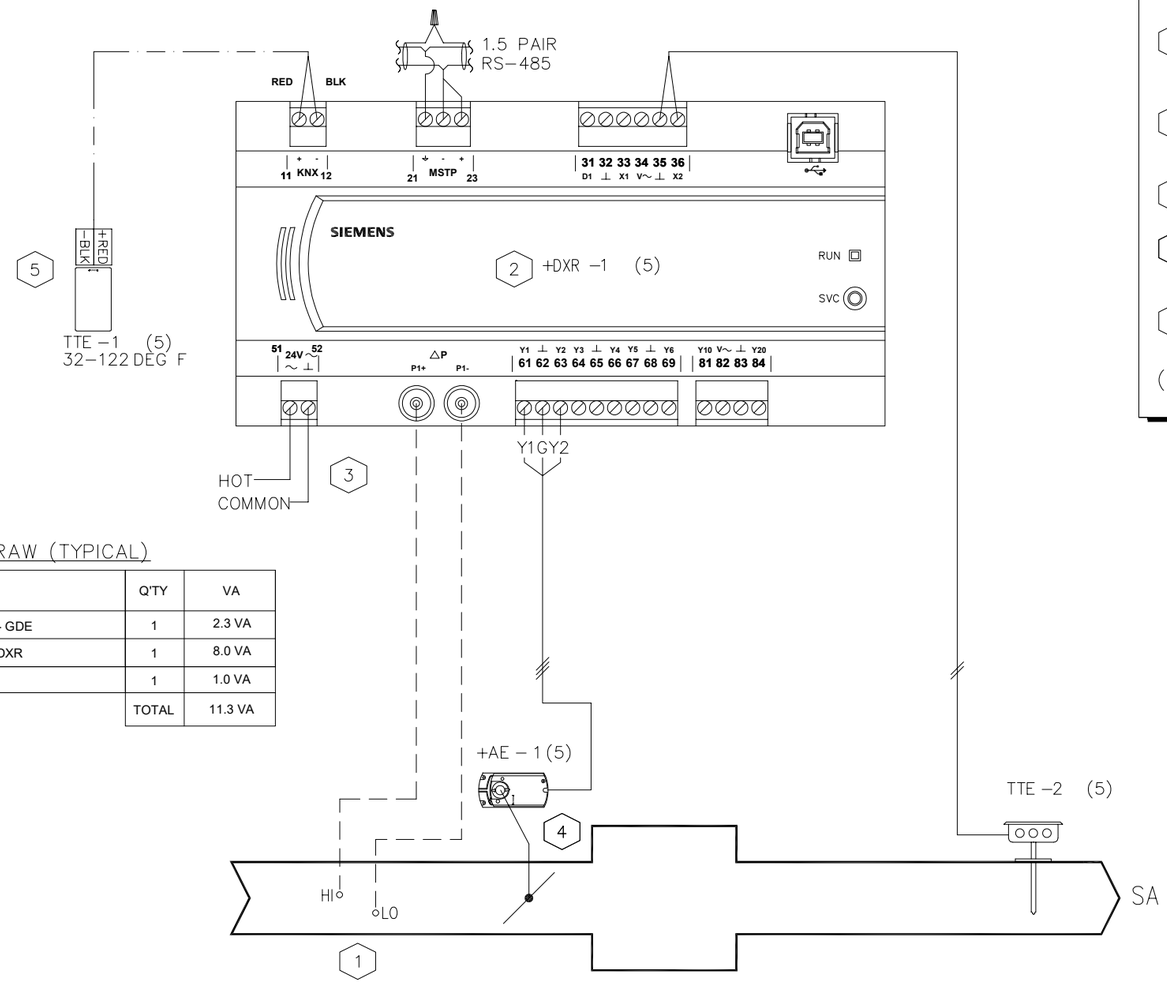

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR-1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR-1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	11.3 VA

1/453 VAV BOX COOLING ONLY

TYPICAL OF Q'TY : (5)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14020

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

VAV COOLING ONLY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	5	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	5	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	5	GDE131.1U	SIEMENS	154 011	ACT NSR 24/108L 5NM,NO PLENUM
DXR 1	5	DXR2.M12P-102B	SIEMENS	A6V10502838	DXR2.M12P Room Automation Station

SEQUENCE OF OPERATION - COOLING ONLY TERMINAL BOXES WITH MANUAL VOLUME DAMPER RETURN:

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VALVE FROM SCHEDULED COOLING MINIMUM AIRFLOW TO SCHEDULED MAXIMUM AIRFLOW. THROUGH LAN TO OPERATORS WORK STATION, IT SHALL BE POSSIBLE TO READ AND ADJUST SUPPLY AIR VOLUME (MAXIMUMS AND MINIMUMS). ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

2. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
   - OCCUPIED MODE (ROOM OCCUPANCY SENSED)
     SPACE HEATING SETPOINT = **70F**
     SPACE COOLING SETPOINT = **76F**
     TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

3. TERMINAL BOX SHALL MODULATE BETWEEN MAXIMUM AIRFLOW AND MINIMUM AIRFLOW TO MAINTAIN SPACE TEMPERATURE SETPOINTS. MINIMUM AIRFLOW WILL BE MAINTAINED FROM **1.0F BELOW** THE SPACE COOLING SETPOINT TO THE SPACE HEATING SETPOINT. AIR VALVE WILL BE FULLY CLOSED BELOW THE SPACE HEATING SETPOINT.

II. UNOCCUPIED MODE:

1. THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME SCHEDULE. INITIAL YEAR UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 5:00PM TO 5:30AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO COMMISSIONING OR TURNOVER.

THE SPACES SHALL BE INDEXED INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION WITH SPACES INDEXED **TEN MINUTES (ADJ)** AFTER THE LAST SPACE.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
   - SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE THE SPACE UNOCCUPIED MODE OPERATION.
     UNOCCUPIED SPACE HEATING SETPOINT = **60F (ADJ)**
     UNOCCUPIED SPACE COOLING SETPOINT = **81F (ADJ)**

3. TERMINAL BOX SHALL MODULATE BETWEEN MAXIMUM AIRFLOW AND UNOCCUPIED MINIMUM AIRFLOW TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINTS. MINIMUM AIRFLOW WILL BE MAINTAINED FROM **1.0F BELOW** THE UNOCCUPIED SPACE COOLING SETPOINT TO THE UNOCCUPIED SPACE HEATING SETPOINT. AIR VALVE WILL BE FULLY CLOSED BELOW THE UNOCCUPIED SPACE HEATING SETPOINT.

DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **50% (ADJ)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

3. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

TEMPERATURE SPACE SENSORS:

EACH TERMINAL UNIT SHALL UTILIZE A FLAT PLATE WALL-MOUNTED SPACE SENSOR.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

VAV COOLING ONLY BOM & SOO

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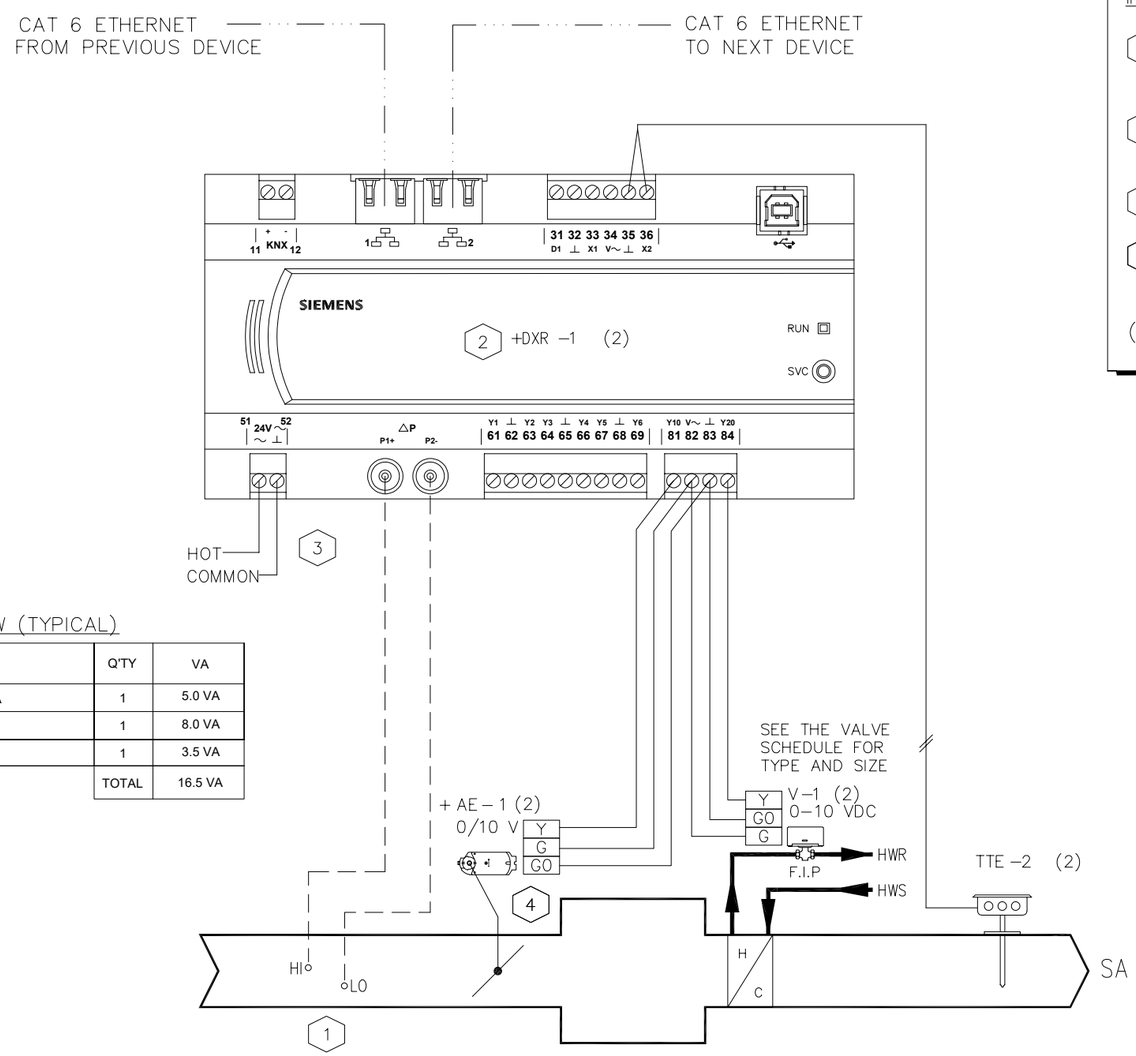

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GMA	1	5.0 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	3.5 VA
	TOTAL	16.5 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1/454 VAV BOX WITH HW REHEAT COIL

TYPICAL OF Q'TY : (2)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023 OR BLANKED OUT WITH NO APP.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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INJECTION VAV BOX

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 2	2	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	2	GMA161.1P	SIEMENS	154004	MOD SR 24V,62LBIN,PLM
DXR 1	2	DXR2.E12P-102B	SIEMENS	A6V10502844	DXR2.E12P Room Automation Station

REFER TO AHU-6A AND AHU-6B SEQUENCE OF OPERATIONS.

REVISION HISTORY

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INJECTION VAV BOX BOM

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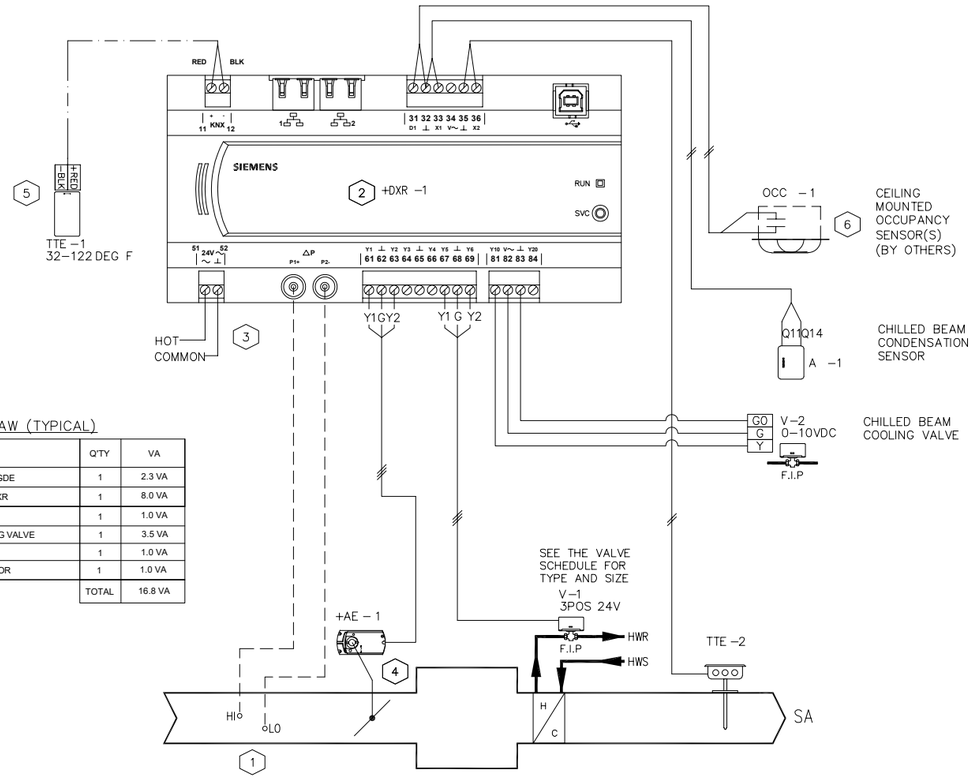


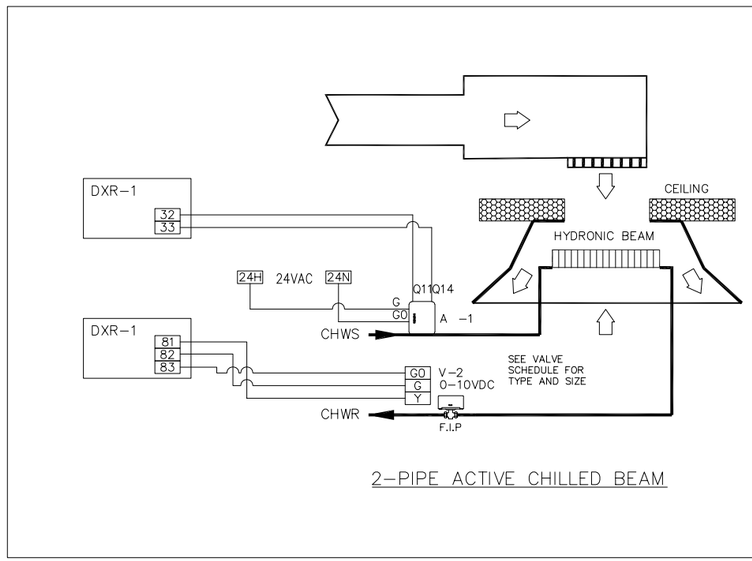
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	16.8 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
2. DXR−1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR−1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2−PIPE ACTIVE CHILLED BEAM

1 / 455 VAV BOX WITH HW REHEAT COIL AND CHILLED BEAM

TYPICAL OF Q'TY : (1)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023

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IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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VAV w/HW RH-CB-P30-IP DXR

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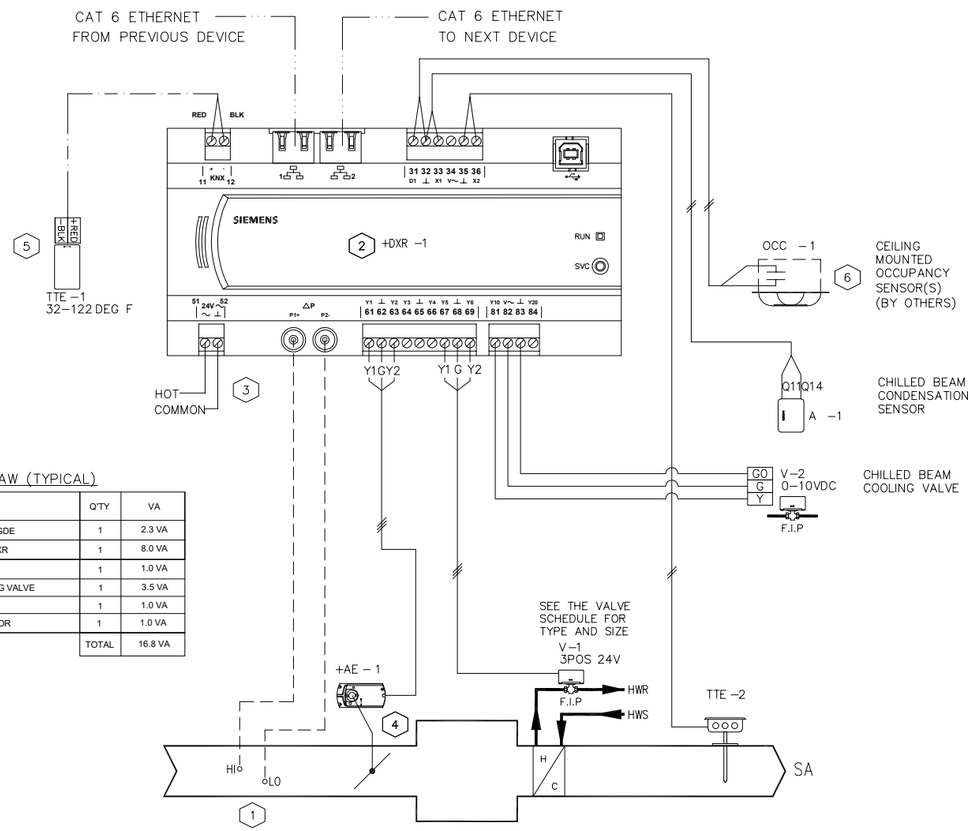


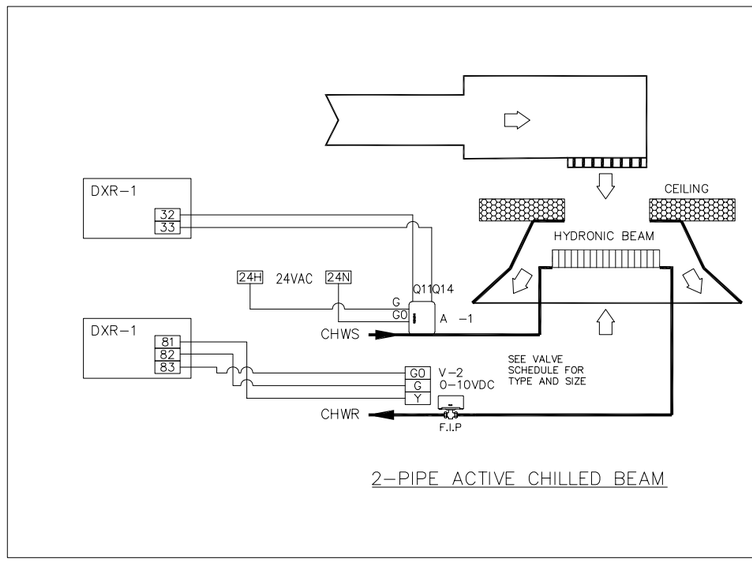
VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	1.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	16.8 VA

INSTALLATION NOTES:

1. VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING
2. DXR–1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR–1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
5. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
6. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. C.I.C WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL FOR CONTROL OF VAV. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



2–PIPE ACTIVE CHILLED BEAM

1/455 VAV BOX WITH HW REHEAT COIL AND CHILLED BEAM

TYPICAL OF Q'TY : (1)
LOCATION: SEE FLN DEVICES SCHEDULE
SERVES: SEE FLN DEVICES SCHEDULE
BASE APPLICATION : 14023

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IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

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HB	HB	KR	04/02/26	04/15/26

VAV w/HW RH-CB-P30-IP DXR

3502 WOODVIEW TRACE
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SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB SUBMITTAL SET

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	1	QXA2101	SIEMENS		CONDENSATION MONITOR W/REMOTE SNSR (95%)
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
PART OF TERM UNIT ASSBLY					
AE 1	1	GDE131.1U	SIEMENS	154 011	ACT NSR 24/108L 5NM,NO PLENUM
DXR 1	1	DXR2.E12P-102B	SIEMENS	A6V10502844	DXR2.E12P Room Automation Station

SEQUENCE OF OPERATION - TERMINAL BOXES WITHOUT AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE 90°F (ADJ.) MAXIMUM LEAVING AIR TEMPERATURE. UPON REACHING THE MAXIMUM LEAVING AIR TEMPERATURE THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY 90°F +/- 5.0°F (ADJ) DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW 50°F (ADJ) OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE 52°F (ADJ) OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.

B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.
C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE SPACE HEATING SETPOINT.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ)** FOR LONGER THAN **15 MINUTES (ADJ)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).

B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:
THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. THE FOURTH GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE THIRD GROUP. THE LAST GROUP OF SPACES CONSISTING OF THE REMAINDER OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FOURTH GROUP.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE
THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60F (ADJ)**
  UNOCCUPIED SPACE COOLING SETPOINT = **80F (ADJ)**
DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE UNOCCUPIED SPACE HEATING SETPOINT AND THE UNOCCUPIED SPACE COOLING SETPOINT AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE UNOCCUPIED SPACE HEATING SETPOINT. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR		04/14/26

VAV w/HW RH-CB-P30-IP DXR BOM

440P412785

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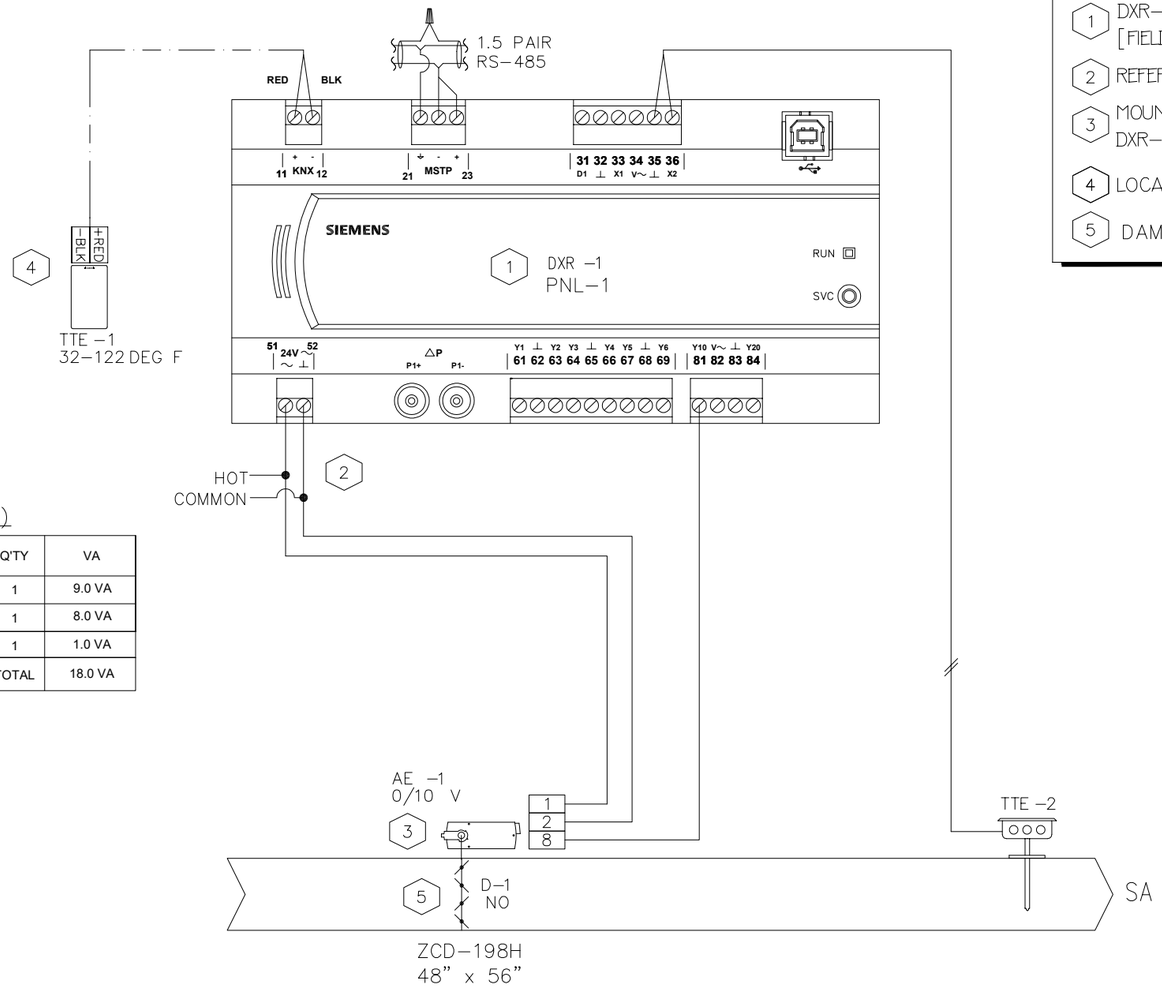

INSTALLATION NOTES:

1. DXR-1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS [FIELD INSTALLED]
2. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
3. MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY DXR-1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER
4. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.
5. DAMPER PROVIDED AND INSTALLED BY OTHERS.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GCA	1	9.0 VA
CONTROLLER - DXR	1	8.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	18.0 VA

1/456 PUMP ROOM DAMPER CONTROL

TYPICAL OF Q'TY : (1)
SERVES: PUMP ROOM 198H
BASE APPLICATION : 14020

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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PUMP RM DMP CONTROL

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	1	GCA161.1P	SIEMENS	154001	MOD(V) SR,24V, MED. PLNM
DXR 1	1	DXR2.M12P-102B	SIEMENS	A6V10502838	DXR2.M12P Room Automation Station
PNL 1	1	550-002	SIEMENS		ENCLOSURE ASSY,TEC
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"

SEQUENCE OF OPERATION.

BIG CONTROL DAMPER WITHOUT ANY AFMS SHALL HAVE MIN AIRFLOW SETTING OF 5% OPEN (ADJ.) AND MAX AIRFLOW SETTING OF 85% OPEN (ADJ.).

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
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PUMP RM DMP CONTROL

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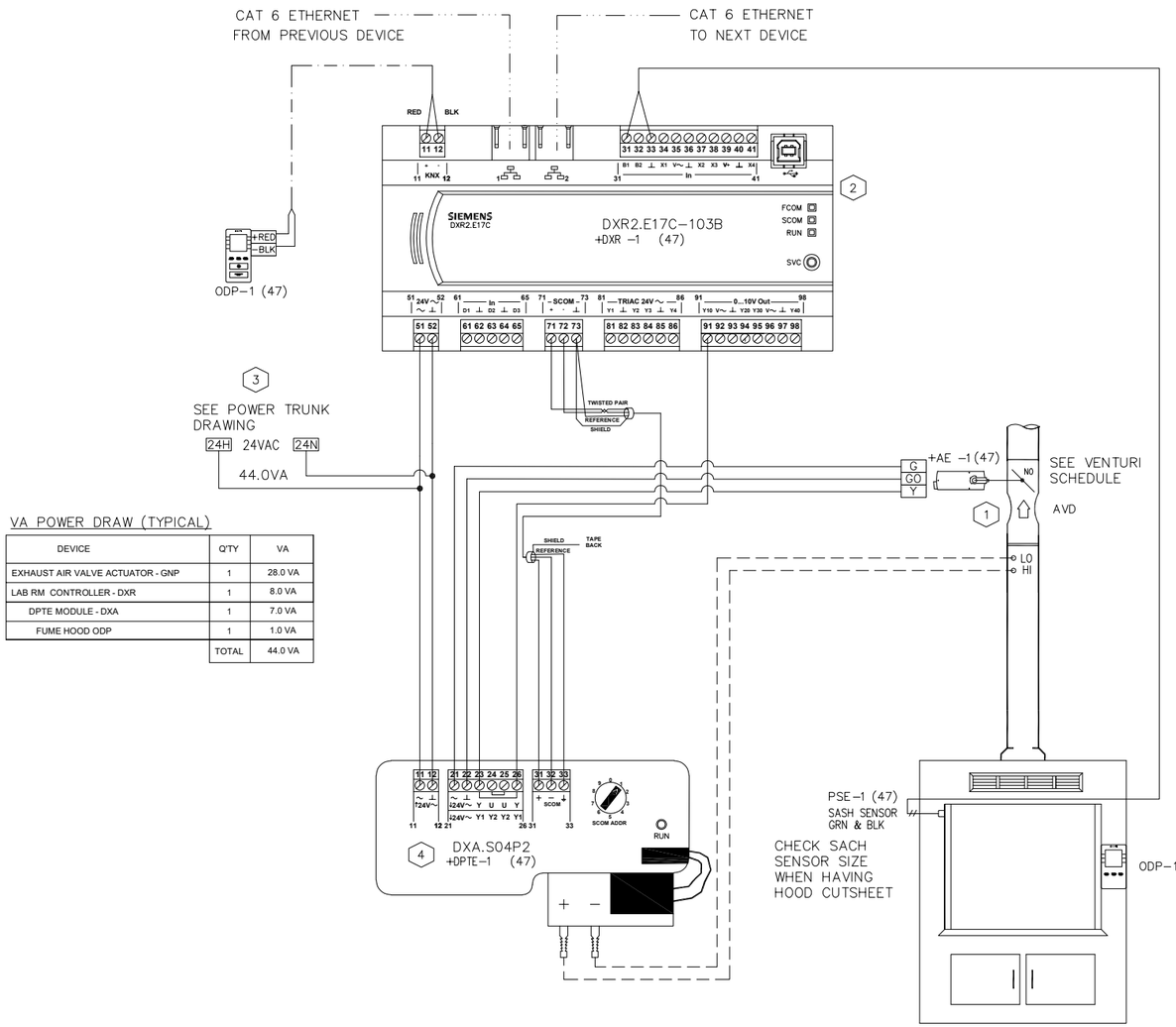
INSTALLATION NOTES:

1. LAB AIR TERMINAL INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF AIR TERMINAL TO PROVIDE PROPER FLOW SENSING
2. DXR-1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.



VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE ACTUATOR - GNP	1	28.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	1	7.0 VA
FUME HOOD ODP	1	1.0 VA
	TOTAL	44.0 VA

1/460 FUME HOOD CONTROL

TYPICAL OF Q'TY : (47), 23 OUT OF 47 FOR FUTURE
LOCATION: SEE THE LAB ROOM SCHEDULE
SERVES: SEE THE LAB ROOM SCHEDULE
BASE APPLICATION NUMBER: 16742

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IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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FUME HOOD CONTROL

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ODP 1	24	QMX3.P87-1WSC	SIEMENS		WALL MOUNT FUME HOOD ODP (PL-LINK)
PSE 1	24	DXA.B200	SIEMENS		80" RETRACTING CABLE SASH SENSOR
PART OF TERM UNIT ASSBLY					
AE 1	24	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1	24	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	24	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

BILL OF MATERIAL FOR FUTURE FUME HOODS

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ODP 1	23	QMX3.P87-1WSC	SIEMENS		WALL MOUNT FUME HOOD ODP (PL-LINK)
PSE 1	23	DXA.B200	SIEMENS		80" RETRACTING CABLE SASH SENSOR
PART OF TERM UNIT ASSBLY					
AE 1	23	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1	23	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	23	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

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FUME HOOD CONTROL BOM

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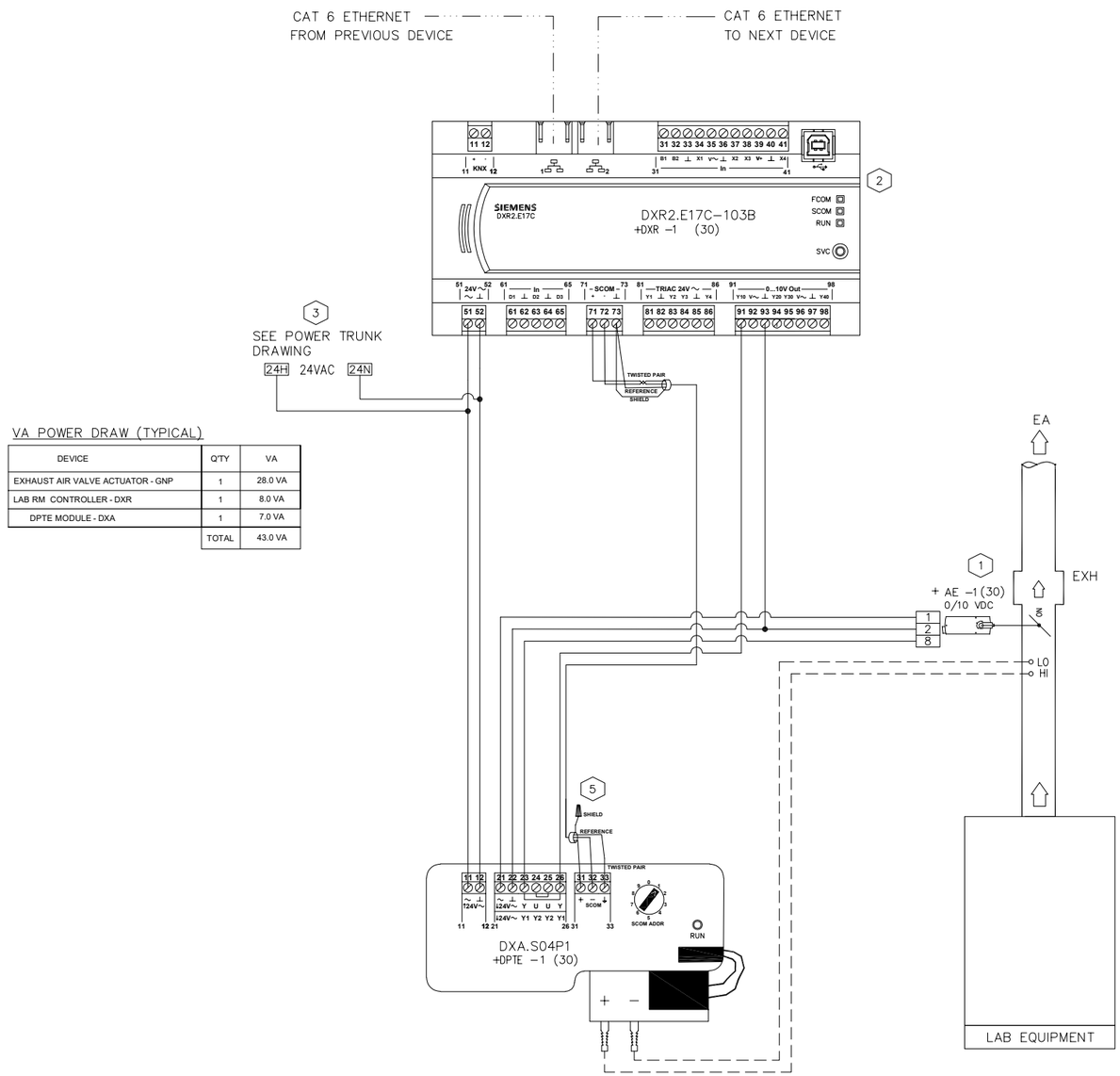

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
EXHAUST AIR VALVE ACTUATOR - GNP	1	28.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	1	7.0 VA
	TOTAL	43.0 VA

INSTALLATION NOTES:

1. LAB AIR TERMINAL INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETER'S UPSTREAM OF AIR TERMINAL TO PROVIDE PROPER FLOW SENSING.
2. DXR–1 IS FACTORY MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
3. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER
4. DXA.S04P1 IS FACTORY MOUNTED AT ASSOCIATED LAB AIR TERMINAL. SEE TAVS SCHEDULE FOR DETAILS.
5. PART# (H–A–1.5TSP24LC–CMP) 1.5 PAIR COMM CABLE.
6. CONSULT WITH THE ENGINEER FOR THE LOCATION.

(+) DENOTE: DEVICE IS A PART OF TAVS PACKAGE.

1 / 461 LAB EQUIPMENT VENTURI CONTROL

TYPICAL OF Q'TY : (30)
LOCATION: SEE THE LAB ROOM CONTROL SCHEDULE
SERVES: SEE THE LAB ROOM CONTROL SCHEDULE
BASE APPLICATION NUMBER: 16742

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LAB EQUIPMENT EXHAUST

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
PART OF TERM UNIT ASSBLY					
AE 1	30	GNP191.1P	SIEMENS	154083	FAIL SAFE, 50 LB-IN, 2 SEC. RUN
DPTE 1	30	DXA.S04P1	SIEMENS		AIR FLOW PRES SENSOR 1"
DXR 1	30	DXR2.E17C-103B	SIEMENS		DXR2.E17C-103B AUTOMATION STATION

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LAB EQUIPMENT EXHAUST BOM

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PULL WIRE TO AHU-1, AHU-2
AND AHU-3 CONTROLLER

LA18_H1-AHU1-STS
0018: 0.61.3
AHU-1 RUN STATUS
LA18_H1-AHU2-STS
0018: 0.61.4
AHU-2 RUN STATUS
LA18_H1-AHU3-STS
0018: 0.61.5
AHU-3 RUN STATUS

120 VAC
ELECTRICAL TROUGH
PNL-H.1
H-534 & H-540
CONTROL PANEL

PULL WIRE TO AHU-1, AHU-2
AND AHU-3 CONTROLLER

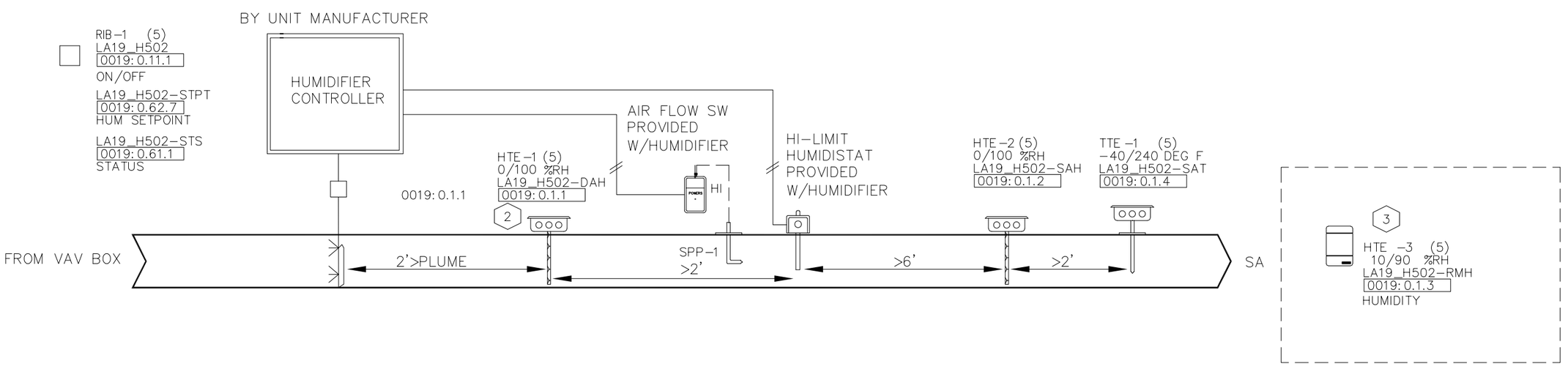
LA19_H2-AHU1-STS
0019: 0.61.4
AHU-1 RUN STATUS
LA19_H2-AHU2-STS
0019: 0.61.5
AHU-2 RUN STATUS
LA19_H2-AHU3-STS
0019: 0.61.6
AHU-3 RUN STATUS

120 VAC
ELECTRICAL TROUGH
PNL-H.2
H-502, 509, 536
CONTROL PANEL

INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. LOCATE ANALOG SENSOR MINIMUM 24" UPSTREAM OF THE HUMIDITY SWITCH AND MINIMUM 30" DOWNSTREAM OF THE HUMIDIFIER GRID.
3. REFER TO PLANS FOR LOCATIONS.

THE DRAWING SHOWS THE BAS POINT FOR H-502. TYPICAL FOR H-509, H-534, H-536, H-540.
SEE THE NEXT DRAWINGS FOR DETAIL WIRING AND POINT ADDRESSES FOR EACH HUMIDIFIER CONTROLS.



1/470 DUCT HUMIDIFIER CONTROL DIAGRAM
TYPICAL OF Q'TY : (5)

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0018	LA18.PXCA	
0019	LA19.PXCA	

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DUCT HUMIDIFIER CONTROL

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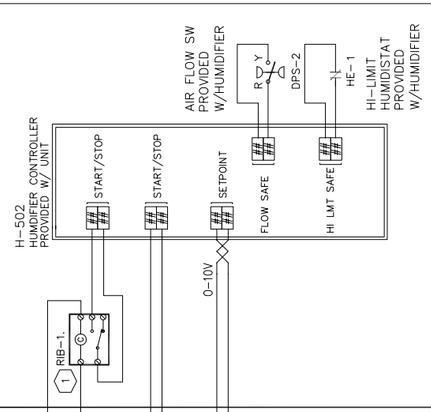
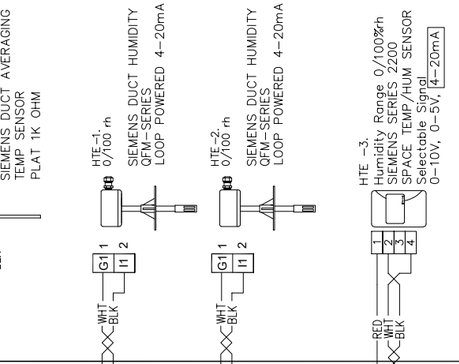
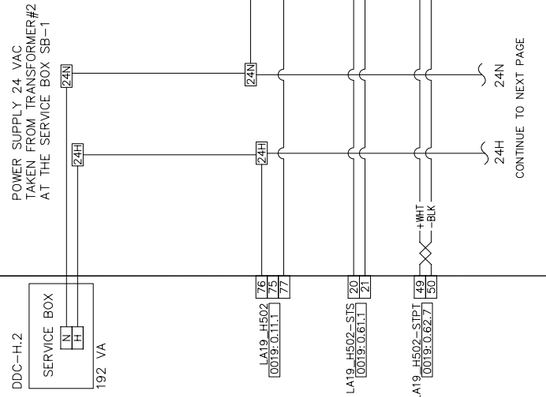
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

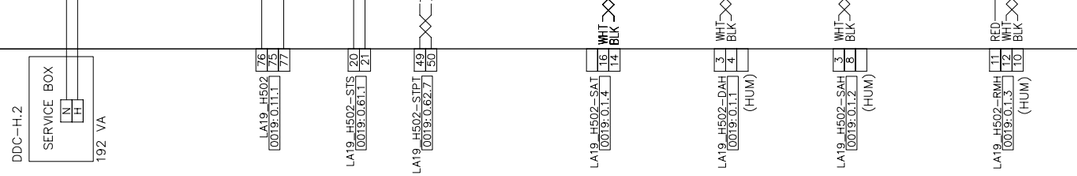




COMPONENT PANEL / POWER



FIELD PANEL



REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0019	LA19.PXCA	

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

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 IU/PU/SIEMENS.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

H-502 ELEC. WIRING

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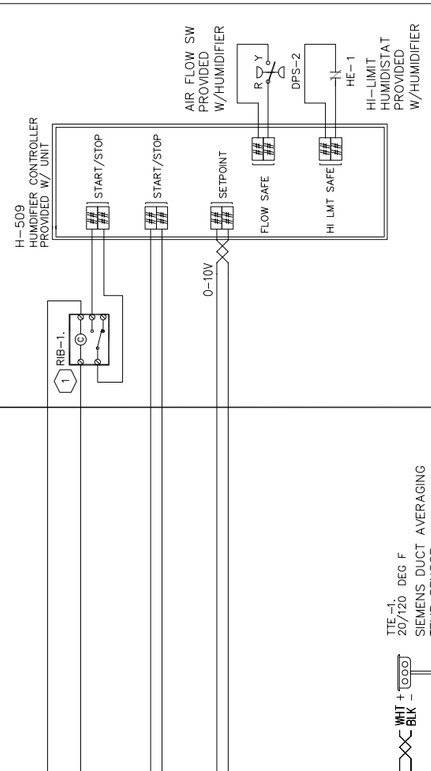
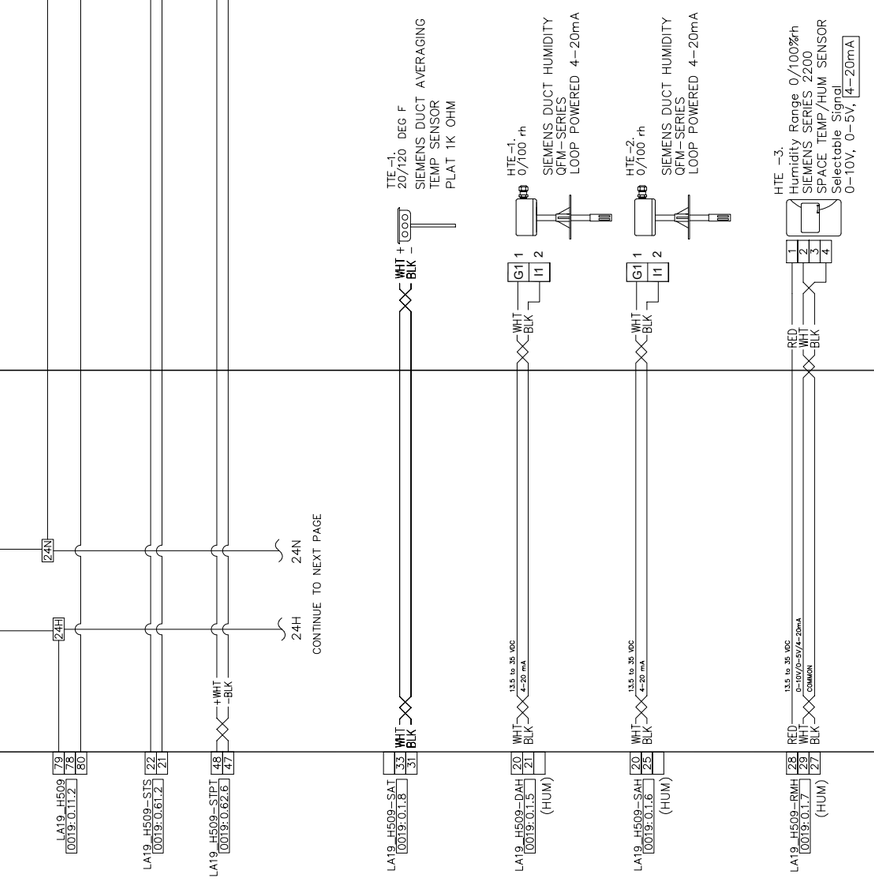
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING





COMPONENT PANEL / POWER

FIELD PANEL

DRAWING NOTES: (#)

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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FIELD WIRING

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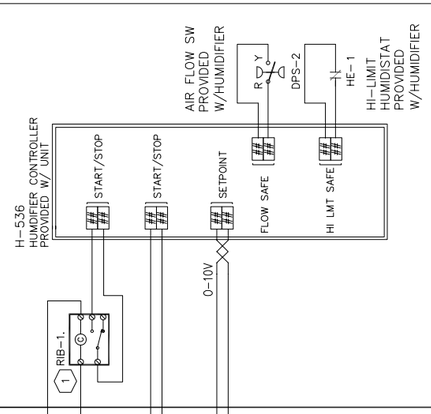
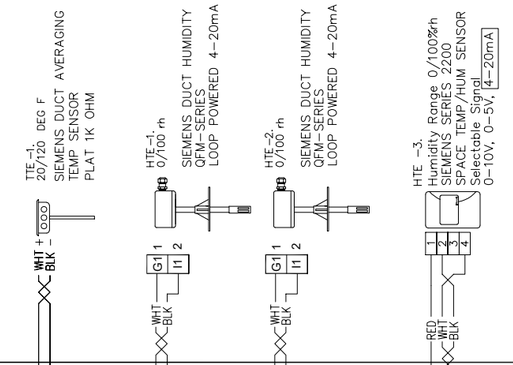
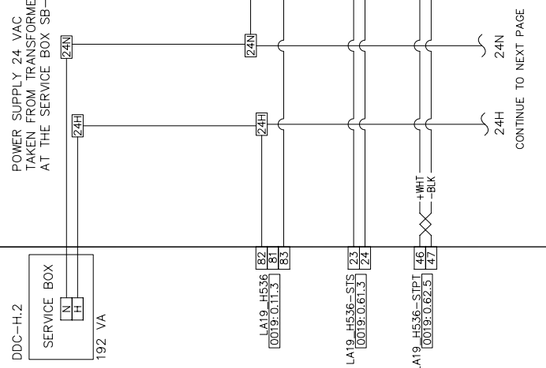
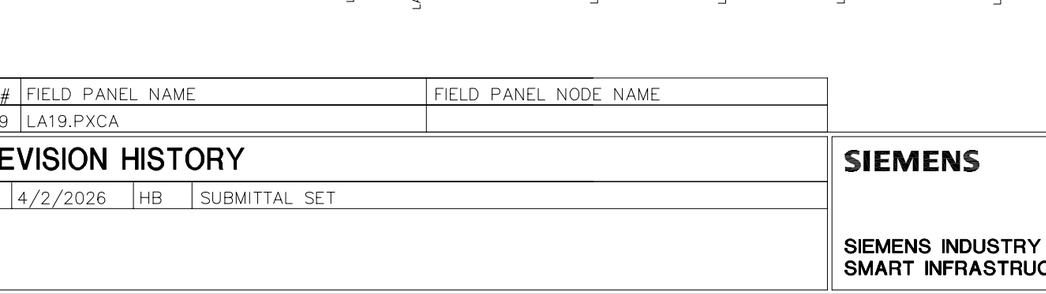




COMPONENT PANEL / POWER



FIELD PANEL



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0019	LA19.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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FIELD WIRING

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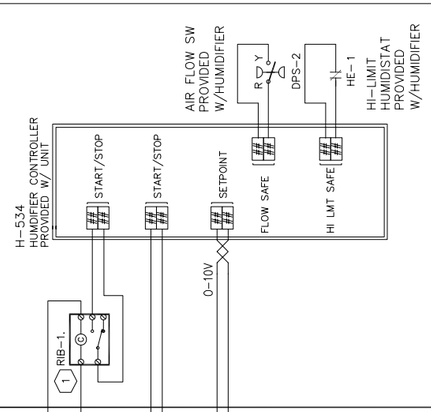

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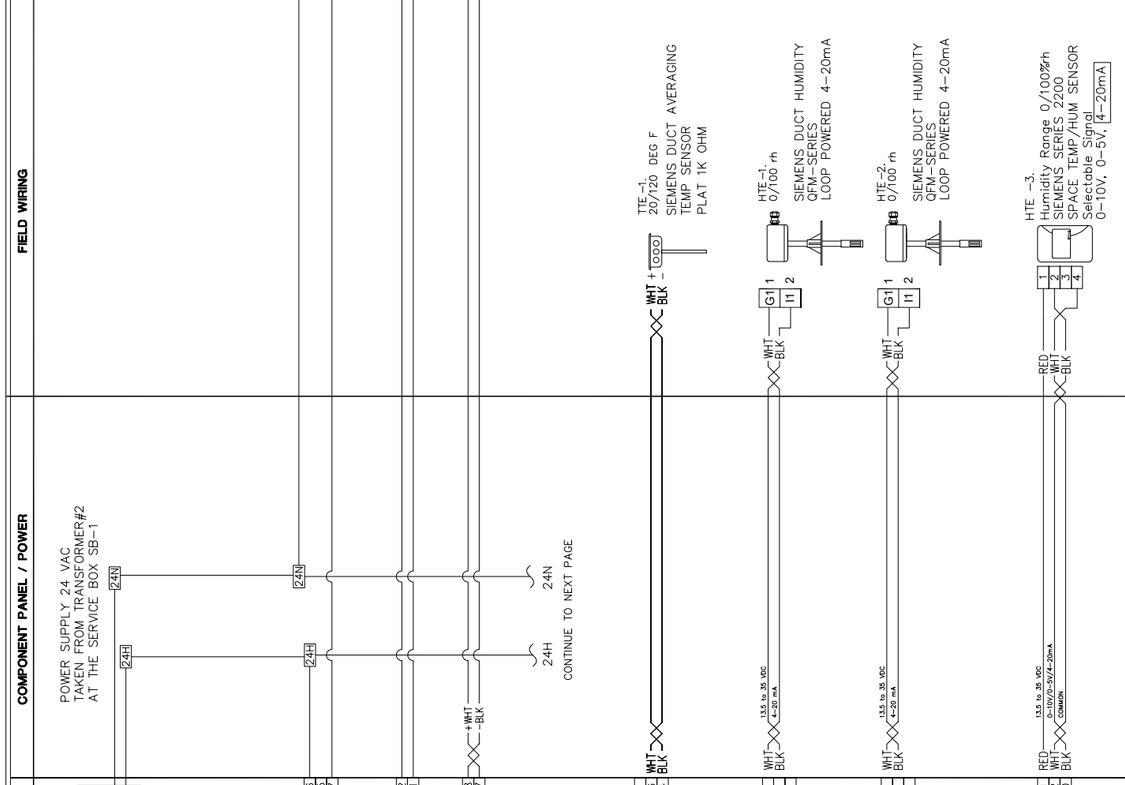
COMPONENT PANEL / POWER



FIELD PANEL

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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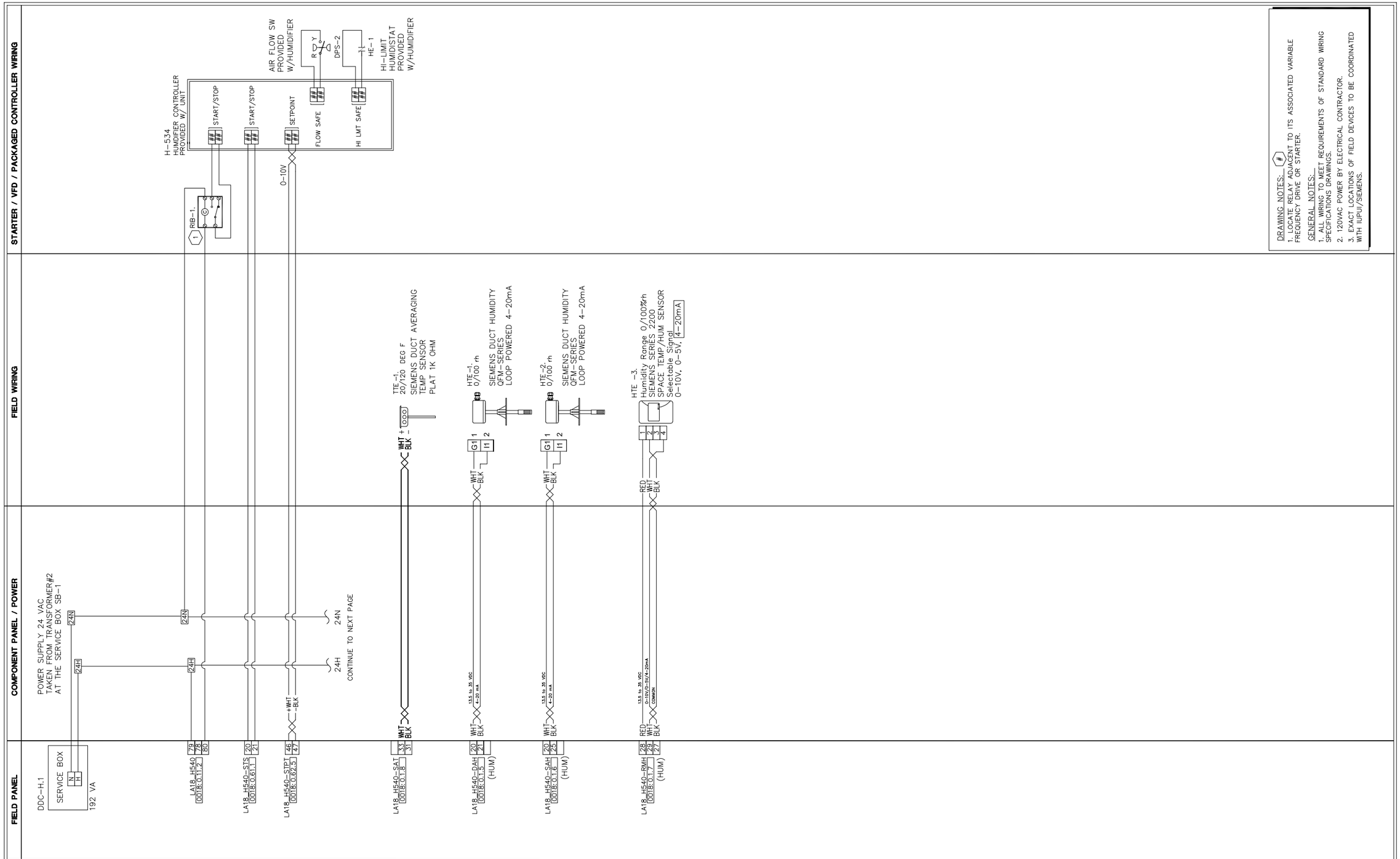

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0018	LA18.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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H-540 ELEC. WIRING

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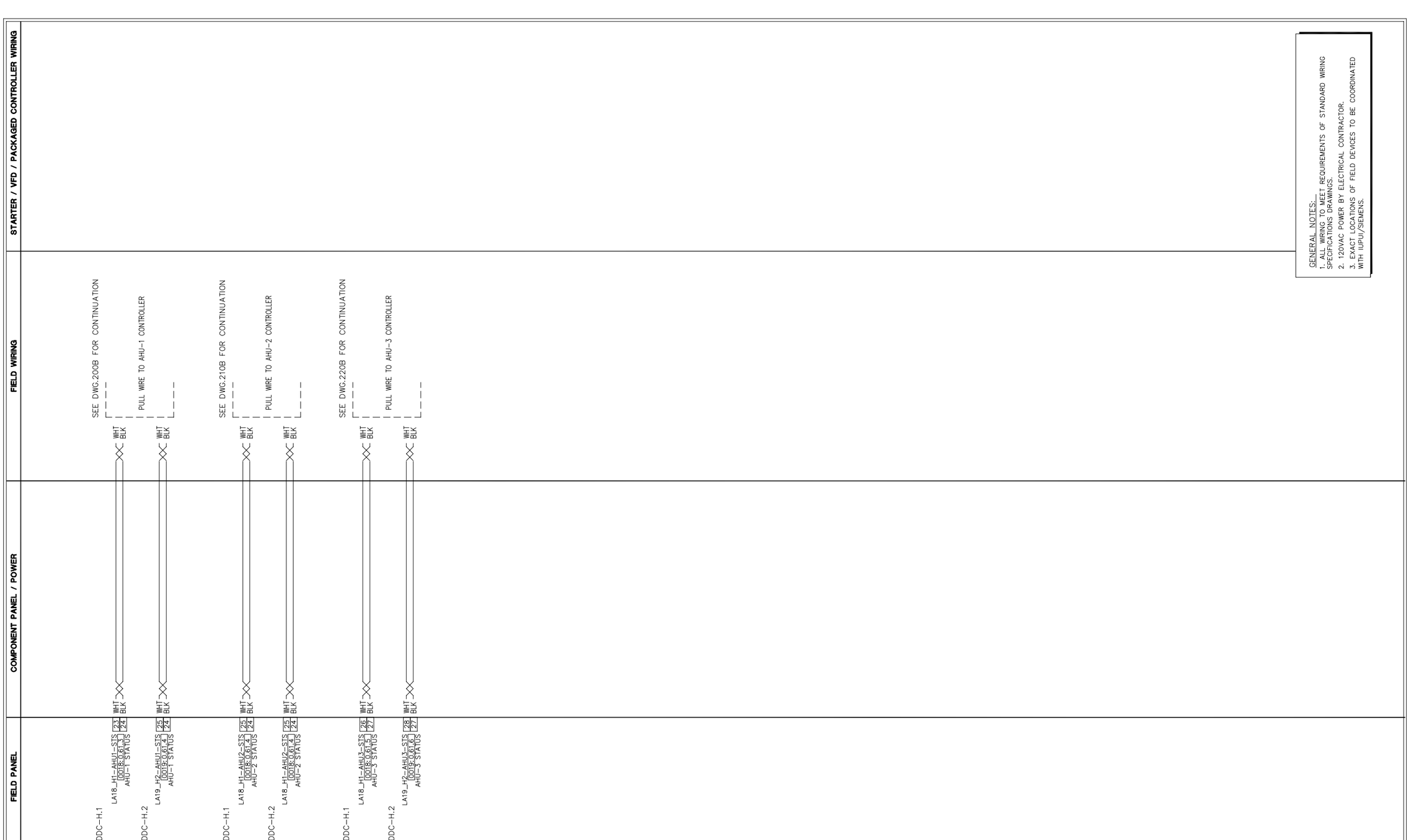

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU STATUS INTLK WIRING

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
HTE 1-2	10	QFM3101	SIEMENS	149991	DUCT RH SENSOR, 4-20mA, 2%
HTE 3	5	QFA32SS.EWSN	SIEMENS	129104	ROOM RH&T, ANALOG, BLANK FRONT
	5	AQA2200-2X4	SIEMENS		SERIES 2200/3200 3-1/2 x 5 TRIM PLATE
RIB 1	5	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1	5	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"

SEQUENCE OF OPERATION:

HUMIDIFIER

A. **ENABLE:** HUMIDIFIER IS ENABLED TO OPERATE **TWO MINUTES (ADJ)** AFTER **ANY ONE OF** AHU-1 **OR** AHU-2 **OR** AHU-3 HAS BEEN IN OPERATION (STATUS PROVED).
B. **DISABLE:** HUMIDIFIER IS DISABLED FROM OPERATION **IMMEDIATELY** AFTER **ANY TWO OF THE THREE AHUS** AHU-1 **OR** AHU-2 **OR** AHU-3 HAS BEEN TAKEN OUT OF OPERATION (STATUS LOST). IMMEDIATELY AFTER SUCH AN INCIDENT, THE HUMIDIFIER IS AUTOMATICALLY RE-ENABLED TO OPERATE **ONE MINUTE (ADJ)** AFTER **ANY TWO OF THE THREE AHUS** AHU-1 **OR** AHU-2 **OR** AHU-3 REGAINS STATUS. IMMEDIATELY AFTER SUCH AN INCIDENT, THE HUMIDIFIER IS RE-ENABLED TO OPERATE **SIXTY MINUTES (ADJ)** AFTER **ONLY ANY ONE OF THE THREE AHUS** AHU-1 **OR** AHU-2 **OR** AHU-3 REGAINS STATUS.
C. **DISABLE:** HUMIDIFIER IS DISABLED FROM OPERATION IF THE OUTDOOR AIR TEMPERATURE IS ABOVE **75F (adj)** FOR **10 MINUTES (ADJ)**.
D. **DISABLE:** HUMIDIFIER IS DISABLED FROM OPERATION IF ANY **TWO (ADJ)** OF THE AHU-1/2/3 DUCT STATIC PRESSURE READINGS IS BELOW **0.30" W.G. (adj)** FOR **20 SECONDS (ADJ)**.

1. OCCUPIED MODE ?HUMIDITY CONTROL LOOP TO EMPLOY SPACE HUMIDITY SENSORS, DUCT AIR SENSORS, AND SUPPLY DUCT HIGH LIMIT SENSORS TO MODULATE HUMIDIFIER SIGNAL TO MAINTAIN THE CONTROL POINT.

DDC-H.1 CONTROL POINT TO BE **44% (ADJ) +/- 4.0% (ADJ)** RH SPACE HUMIDITY WITH A **85% RH (ADJ)** ANALOG HIGH LIMIT IN THE HUMIDIFIER DISCHARGE AIR (AI-1).

DDC-H.2 CONTROL POINT TO BE **34% (ADJ) +/- 4.0% (ADJ)** RH SPACE HUMIDITY WITH A **80% RH (ADJ)** ANALOG HIGH LIMIT IN THE HUMIDIFIER DISCHARGE AIR (AI-1).

HUMIDIFIER SHALL HAVE INSTANTANEOUS DISABLE SIGNAL AT **90% (ADJ)** RH IN SUPPLY AIR (AI-2). HUMIDIFIER AIRFLOW SWITCH SHALL BE CALIBRATED TO ENABLE HUMIDIFIER OPERATION WHEN THE ZONE IS AT MINIMUM AIRFLOW AND TO DISABLE HUMIDIFIER OPERATION WHEN THE ZONE IS 100 CFM LESS THAN MINIMUM AIRFLOW SCHEDULED. HUMIDIFIER CONTROL LOOP SHALL BE TUNED/SLOWED DOWN TO AVOID WETTING OF DUCTWORK.

ZONE SPACE HUMIDITY SETPOINTS WITHIN THE GIVEN SPACE DO NOT NECESSARILY HAVE TO MATCH; ALLOW FOR EACH HUMIDIFIER TO BE FULLY ADJUSTABLE.

2. UNOCCUPIED MODE
UNOCCUPIED MODE TIME OF DAY/DAY OF WEEK SCHEDULING IS CONTROLLED AT THE SPACE ZONE LEVEL. PROVIDE GRAPHICAL UNOCCUPIED MODE SCHEDULING PAGE FOR ZONE MAINTENANCE USE WITH UNOCCUPIED MODE SET UP BUT WITH ZERO HOURS SCHEDULED TO BE UNOCCUPIED.

3. ALARMS:
A. ALARM AT THE OWS IF THE SUPPLY AIR TEMPERATURE (AI-3) (SUPPLY AIR TEMPERATURE GOING DOWN THE DUCT) EXCEEDS **85F (adj)** FOR A PERIOD OF **5 MINUTES (ADJ).**
B. ALARM AT THE OWS IF WHILE THE AHU IS OPERATING AND THE HUMIDIFIER IS ACTIVE IF THE SUPPLY AIR RELATIVE HUMIDITY (AI-2) IS LESS THAN **40% RH (adj)** FOR A PERIOD OF **60 SECONDS (ADJ).**

ZONE TEMPERATURE CONTROL

SEE LAB CONTROLS SCHEMATIC FOR ZONE LEVEL CONTROL REQUIREMENTS FOR EACH OF THE ZONES. EACH ZONE'S TEMPERATURE SETPOINTS SHALL GENERALLY MATCH WITHIN THE GIVEN SPACE.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS
SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION
3502 WOODVIEW TRACE
SUITE 240
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

DUCT HUMIDIFIER BOM & SOO

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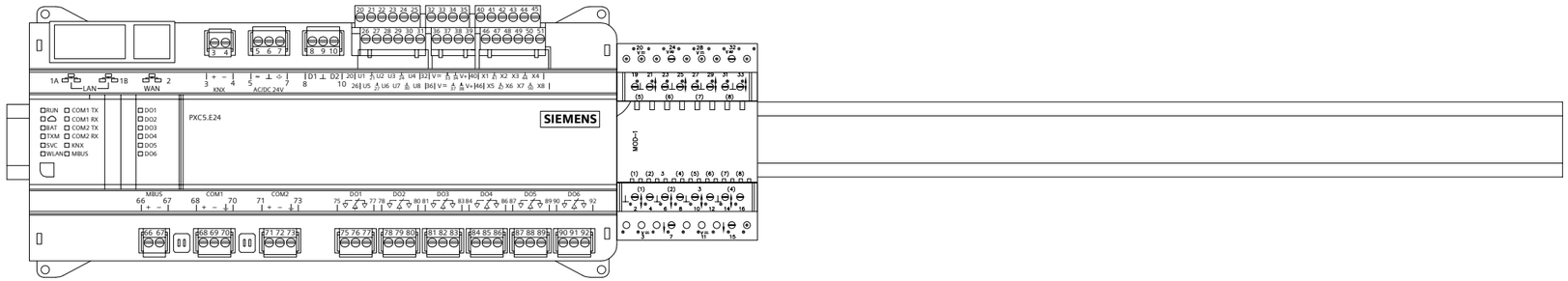
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.



REVISION HISTORY			
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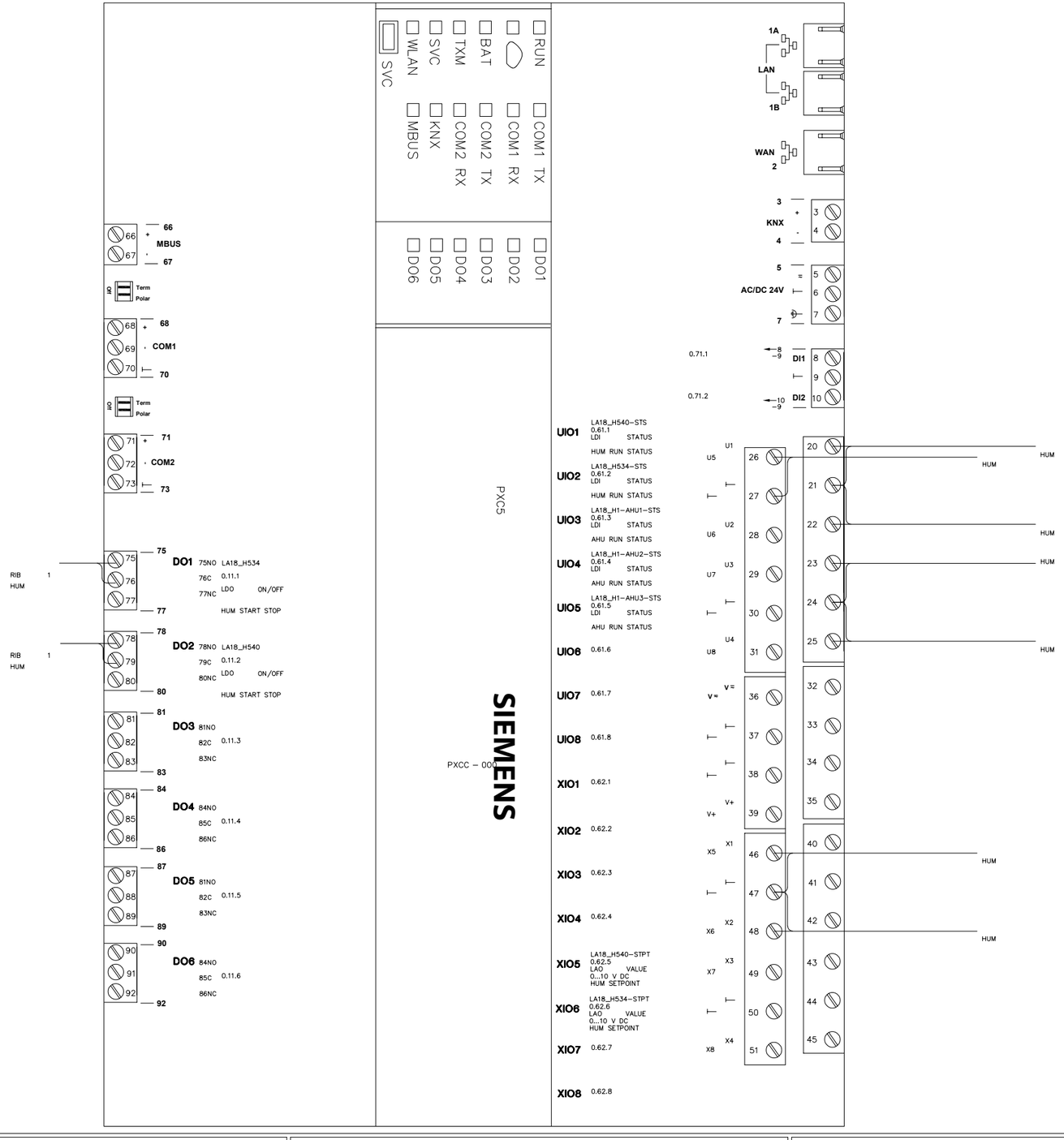

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HUMIDIFIERS 534 & 540

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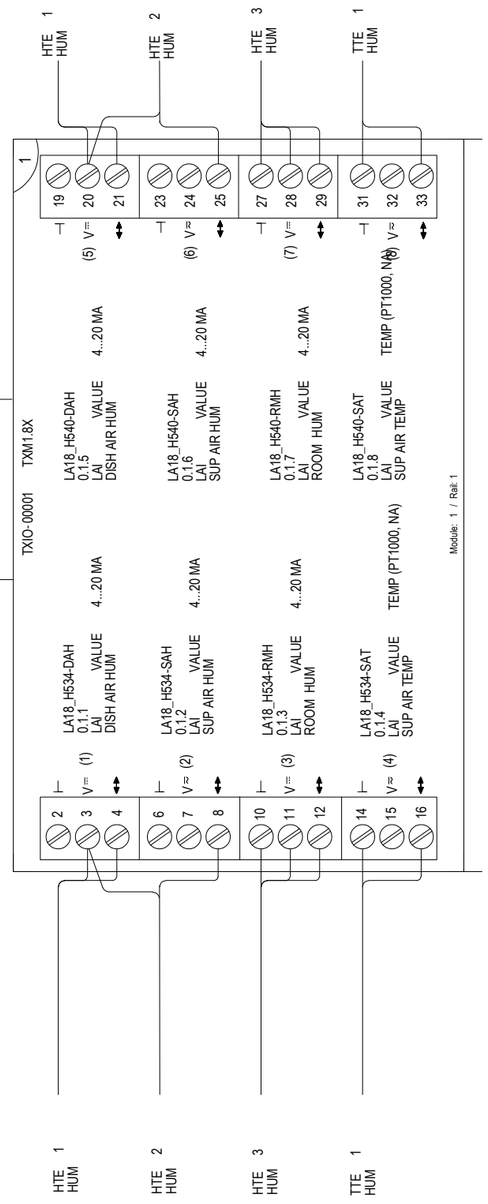

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC5 000	1	PXC5.E24.A	SIEMENS		PXC5.E24.A COMPACT 24PT, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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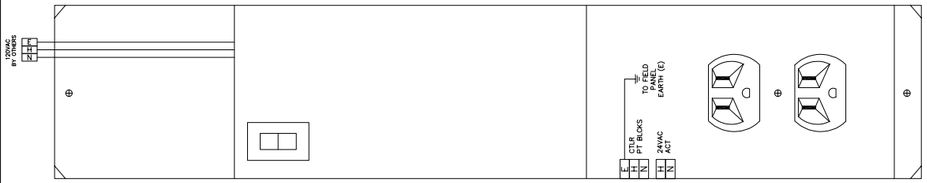

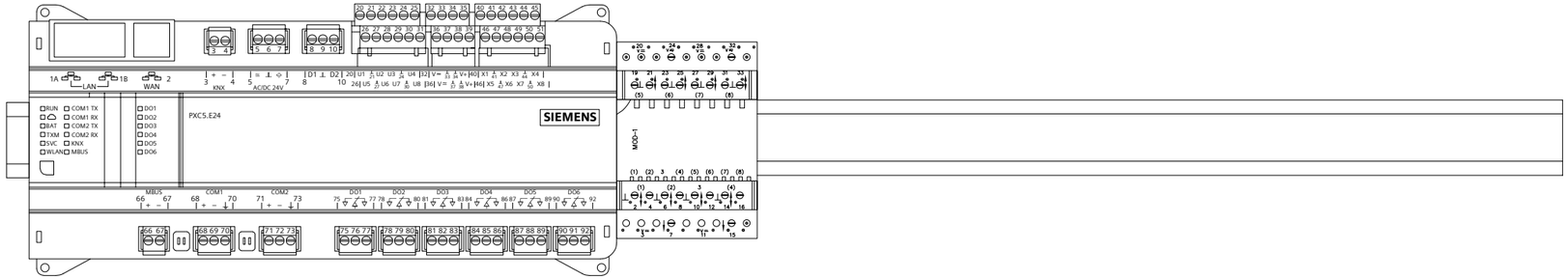

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LA19.PXCA INSTALLATION

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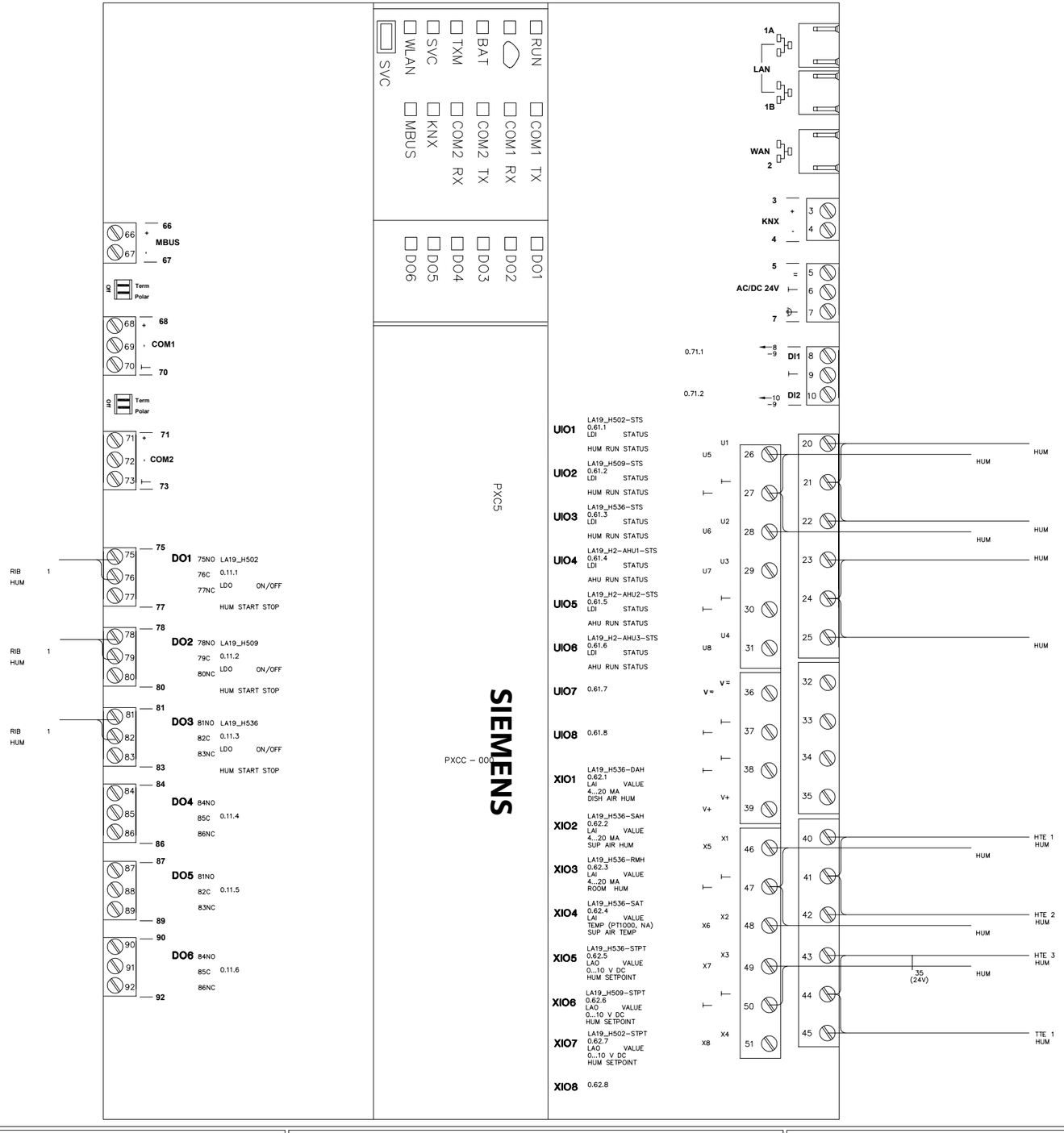

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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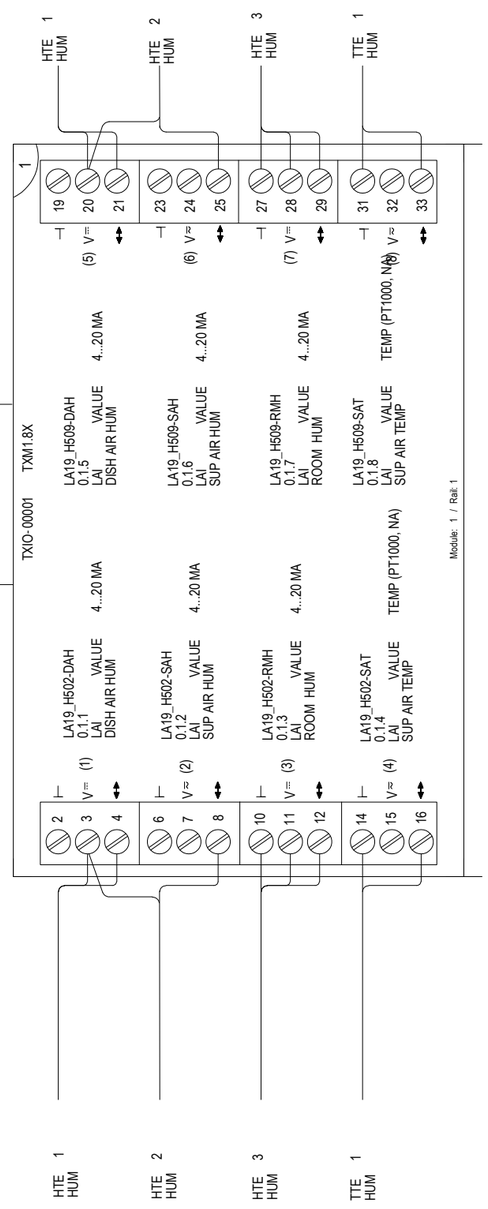

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
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FAX: 317-293-0374

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC5 000	1	PXC5.E24.A	SIEMENS		PXC5.E24.A COMPACT 24PT, BACNET, Desigo
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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IU# 20250072, IN

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LA19.PXCA BOM

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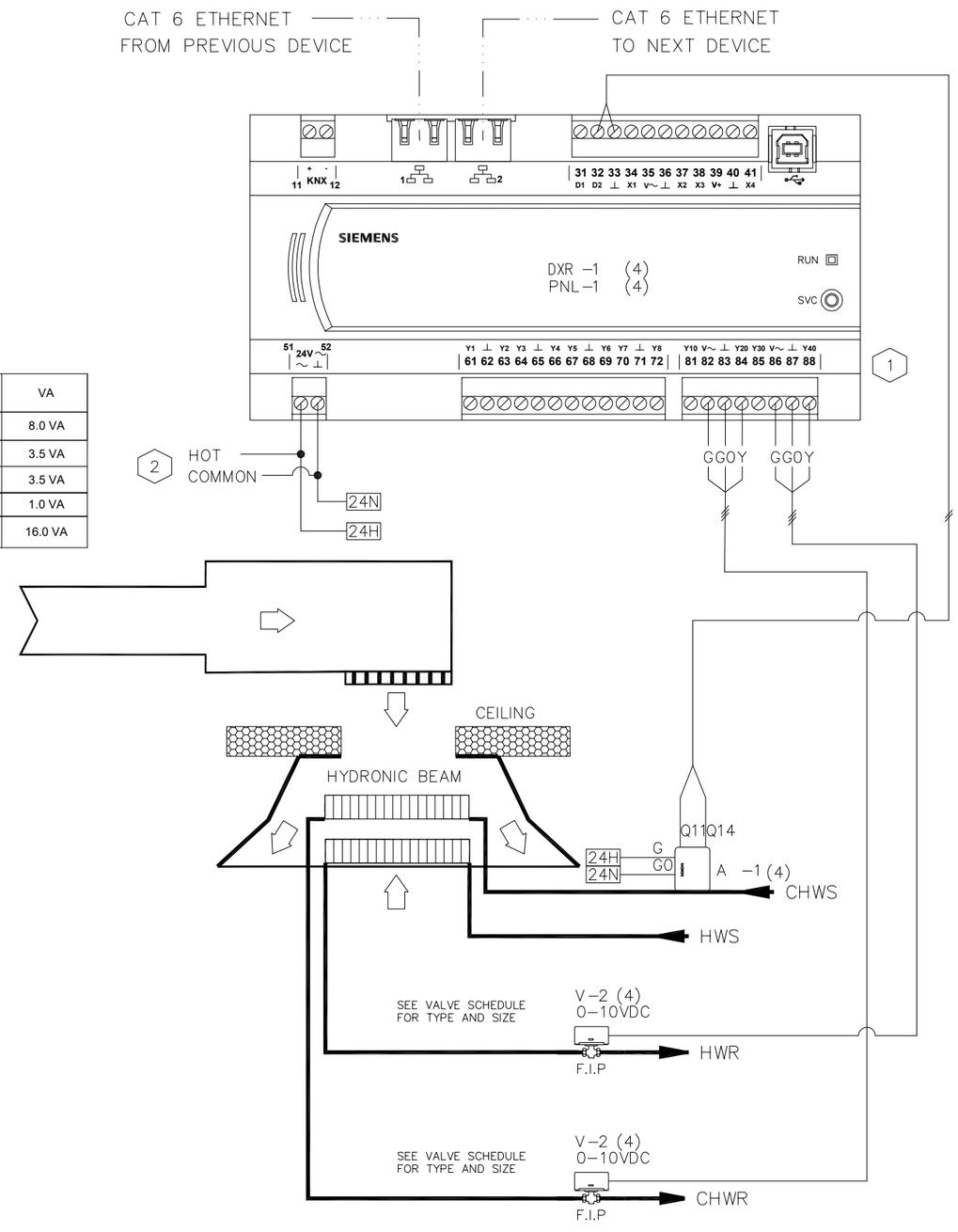

INSTALLATION NOTES:

1. DXR SERVES ACTIVE CHILLED BEAMS. MOUNT DXR IN SIEMENS SUPPLIED ENCLOSURE. MOUNT ENCLOSURE NEAR CHILLED BEAM VALVES.
2. REFER TO BUILDING RISER DRAWING FOR 24 VAC POWER
3. LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
CHILLED BEAM COOLING VALVE	1	3.5 VA
CHILLED BEAM HEATING VALVE	1	3.5 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	16.0 VA

1/471 4–PIPE HYDRONIC BEAM

TYPICAL OF Q'TY : (4)
LOCATION: SEE THECHILLED BEAM BY ROOM SCHEDULE
SERVES: SEE THECHILLED BEAM BY ROOM SCHEDULE
BASE APPLICATION : 14358

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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4-PIPE HYDRONIC BEAM

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	4	QXA2101	SIEMENS		CONDENSATION MONITOR W/REMOTE SNSR (95%)
PNL 1	4	540-155	SIEMENS		TEC ENCL CTLR ONLY
Panel Mounted Devices					
DXR 1	4	DXR2.E18-101B	SIEMENS	A6V10502848	DXR2.E18 Room Automation Station

SEQUENCE OF OPERATION FOR 4-PIPE CHILLED BEAM.
ZONES 102, 115, 199, AND 205

OCCUPIED MODE:

1. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

2. THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT IS 70°F (ADJ) AND THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT IS 75°F (ADJ). THE CHILLED BEAM HEATING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS GREATER THAN THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE BOTH WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW. STANDARD TERMINAL BOX CONTROL MODIFICATION: WHILE ACTIVELY HEATING THE TERMINAL BOX DISCHARGE TEMPERATURE MAY PROVIDE A MAXIMUM OF 120 DEGF (ADJ) DISCHARGE AIR TEMPERATURE (CHILLED BEAM MIXED AIR DELIVERY TEMPERATURE WILL BE APPROX 85 DEGF WITH 120 DEGF PRIMARY AIR TEMPERATURE).

4. THE ZONE CONTROL SYSTEM SHALL BE INDEXED FROM UNOCCUPIED MODE TO OCCUPIED MODE BY THE VACANCY SENSOR AND REMAINS IN OCCUPIED MODE FOR TEN MINUTES AFTER OCCUPANCY WAS LAST SENSED.

5. AFTER EVERY CHANGE OF STATUS TO "ON" OF THE AHU SERVING THE SPACE, THE ZONE CONTROLLER SHALL BE FORCED INTO OCCUPIED MODE FOR ONE HOUR (ADJUSTABLE). AFTER THE END OF THE FORCED OCCUPIED TIME PERIOD, THE ZONE CONTROLLER SHALL BE IN UNOCCUPIED MODE UNLESS THE ZONE VACANCY SENSOR IS ACTIVATED.

6. FOR ALL SPACES WHICH HAVE CONDENSATE SENSORS:
   A. THE TERMINAL BOX AIRFLOW REMAINS AT THE NORMAL SCHEDULED / NORMAL CONTROLLED COOLING / HEATING AIRFLOW UNLESS THE AIRFLOW WAS RAISED FOR HUMIDITY OVERRIDE.
   B. AS SPACE HUMIDITY INCREASES ABOVE A LEVEL OF 58% RH (ADJ), HUMIDITY OVERRIDE IS ENABLED AND THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO THE SCHEDULED MAXIMUM AIRFLOW TO REDUCE THE RELATIVE HUMIDITY IN THE SPACE. BELOW 53% RH (ADJ) READING THE SUPPLY AIRFLOW IS RELEASED FOR NORMAL CONTROL. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE SPACE HUMIDITY SENSOR READING EXCEEDS 65% RH (ADJ).
   C. WHILE IN HUMIDITY OVERRIDE IF THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT (e.g. 70 degF) THE TERMINAL BOX/DUCT-MOUNTED HEATING COIL VALVE MODULATES OPEN TO PROVIDE ADDITIONAL HEATING AND TO MAINTAIN THE OCCUPIED HEATING SETPOINT.
   D. IF AT ANY TIME, THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM CHILLED WATER SUPPLY PIPING, THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO MAXIMUM OCCUPIED SCHEDULED AIRFLOW TO PROVIDE MORE DRY AIR AND REMAINS AT MAXIMUM OCCUPIED SCHEDULED AIRFLOW UNTIL THE CONDENSATE DETECTION IS CLEARED. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE CONDENSATE SENSOR DETECTOR INDICATION EXCEEDS 24 HOURS (ADJ) STRAIGHT.
   E. HUMIDITY OVERRIDE CONTROL IS ACTIVE IN UNOCCUPIED MODE. IF SPACE HUMIDITY EXCEEDS 58% RH (ADJ) THEN THE TERMINAL BOX SUPPLY AIR DAMPER CONTROLS THE SUPPLY AIR VOLUME TO THE OCCUPIED AIRFLOW SETTINGS FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.
   F. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED DURING THE SCHEDULED UNOCCUPIED TIMES, THAT INDIVIDUAL CLASSROOM SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

UNOCCUPIED MODE:

THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

1. IN UNOCCUPIED MODE THE SPACE TEMPERATURE READING IS ALLOWED TO FLOAT BETWEEN THE SPACE TEMPERATURE UNOCCUPIED HEATING
SETPOINT OF 65°F (ADJ) AND THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT OF 80°F (ADJ).

2. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

4. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED, THAT INDIVIDUAL SPACE SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR A MINIMUM OF TWENTY MINUTES (ADJ). AT THE END OF THE TWENTY MINUTE PERIOD, THE OCCUPIED ROOM SHALL RETURN TO NORMAL OPERATION AND THE VACANCY SENSOR MAY THEN RETURN THE ROOM TO OCCUPIED OR UNOCCUPIED AS SENSED AND AS SCHEDULED.

EITHER MODE:

1. IF THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM WATER SUPPLY PIPING, THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED.

2. IF POWER HAS BEEN TRANSFERRED TO THE GENERATOR, FULLY CLOSE THE CB COOLING VALVE. UPON RETURN TO NORMAL POWER, RETURN CB COOLING VALVE TO NORMAL CONTROL.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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4-PIPE HYDRONIC BEAM BOM & SOO

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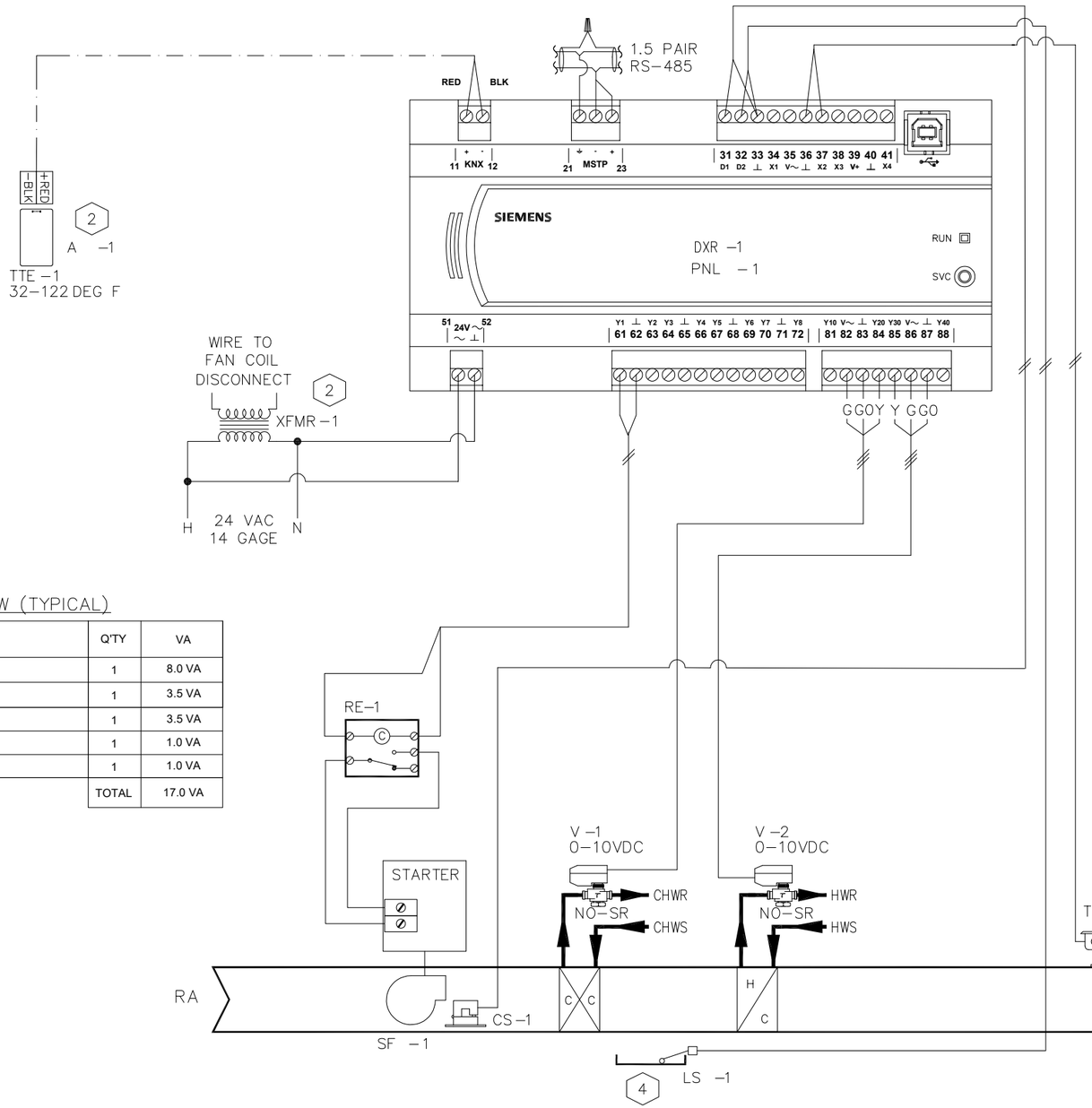

INSTALLATION NOTES:

1. DXR-1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS [FIELD INSTALLED]
2. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	3.5 VA
COOLING VALVE	1	3.5 VA
RELAY	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	17.0 VA

1/480 FCU 4-PIPE WITH CHW AND HW

TYPICAL OF Q'TY : (1)
LOCATION: SEE THE SHEET ON THIS PAGE
SERVES: SEE THE SHEET ON THIS PAGE
BASE APPLICATION : 14051

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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4-PIPE FCU CONTROL

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	1	F29-0193	KELE		THERMOSTAT GUARD, STEEL
CS 1	1	C-2320-L ECM	SENVA		ECM CURRENT SWITCH
LS 1	1	SS3	KELE INC		AUXILIARY CONDENSATE PAN OVERFLOW SWITCH
PNL 1	1	550-002	SIEMENS		ENCLOSURE ASSY,TEC
RIB 1	1	RIB2401B	FUNCTIONAL DEVICES	1208cut021	20A SPDT 24VAC/DC/120VAC
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
DXR 1	1	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
XFMR 1	1	TR40VA002	FUNCTIONAL	TR40VA002	Xfrmr 40VA,120-24V,dual hub,Class II UL

SEQUENCE OF OPERATION:

OCCUPIED CYCLE (6:00 A.M. TO 4:00 P.M., DAYTIME MONDAY THROUGH FRIDAY):

1. BELOW **66.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. ABOVE **75.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. EACH NEW CYCLING ON OF THE FAN REQUIRES A MINIMUM **TWENTY MINUTE (ADJ)** FAN RUNTIME BEFORE THE FAN CYCLES OFF. MINIMUM FAN OFF TIME PER CYCLE SHALL BE AT LEAST **FIVE MINUTES (ADJ)**.

2. ABOVE 60'F OUTDOOR AIR TEMPERATURE THE HEATING VALVE IS DISABLED AND FULLY CLOSED.

3. WITH THE FAN OPERATING, THE UNIT HEATING COIL VALVE (IF ENABLED) IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **65.0F (ADJ)**.

4. WITH THE FAN OPERATING, THE UNIT COOLING COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **76.0F (ADJ)**.

5. IF SPACE TEMPERATURE DROPS BELOW **50?F (ADJ)** FOR **5 MINUTES (ADJ.)** THEN SIGNAL AN ALARM AT THE OWS.

UNOCCUPIED CYCLE (4:00 P.M TO 6:00 A.M. MONDAY-FRIDAY WEEKDAY EVENINGS, ALL DAY&NIGHT SATURDAY, ALL DAY&NIGHT SUNDAY):

1. UNOCCUPIED CYCLE CAN BE OVERRIDDEN VIA THE GRAPHICS AT THE OPERATOR'S WORKSTATION FOR THE CASE OF OFF-SHIFT WORKERS OCCUPYING THE SPACES FOR EXTENDED PERIODS. UNOCCUPIED CYCLE OVERRIDE AUTOMATICALLY RESETS TO THE NORMAL UNOCCUPIED SCHEDULE AFTER TWELVE HOURS.

2. BELOW **58.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. ABOVE **80.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY.

3. ABOVE 56'F OUTDOOR AIR TEMPERATURE THE HEATING VALVE IS DISABLED AND FULLY CLOSED.

4. WITH THE FAN OPERATING, THE UNIT HEATING COIL VALVE (IF ENABLED) IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **57.0F (ADJ)**.

3. WITH THE FAN OPERATING, THE UNIT COOLING COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **81.0F (ADJ)**.

4. IF SPACE TEMPERATURE DROPS BELOW **50?F (ADJ)** FOR **5 MINUTES (ADJ.)** THEN SIGNAL AN ALARM AT THE OWS.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

4-PIPE FCU CTRL BOM & SOO

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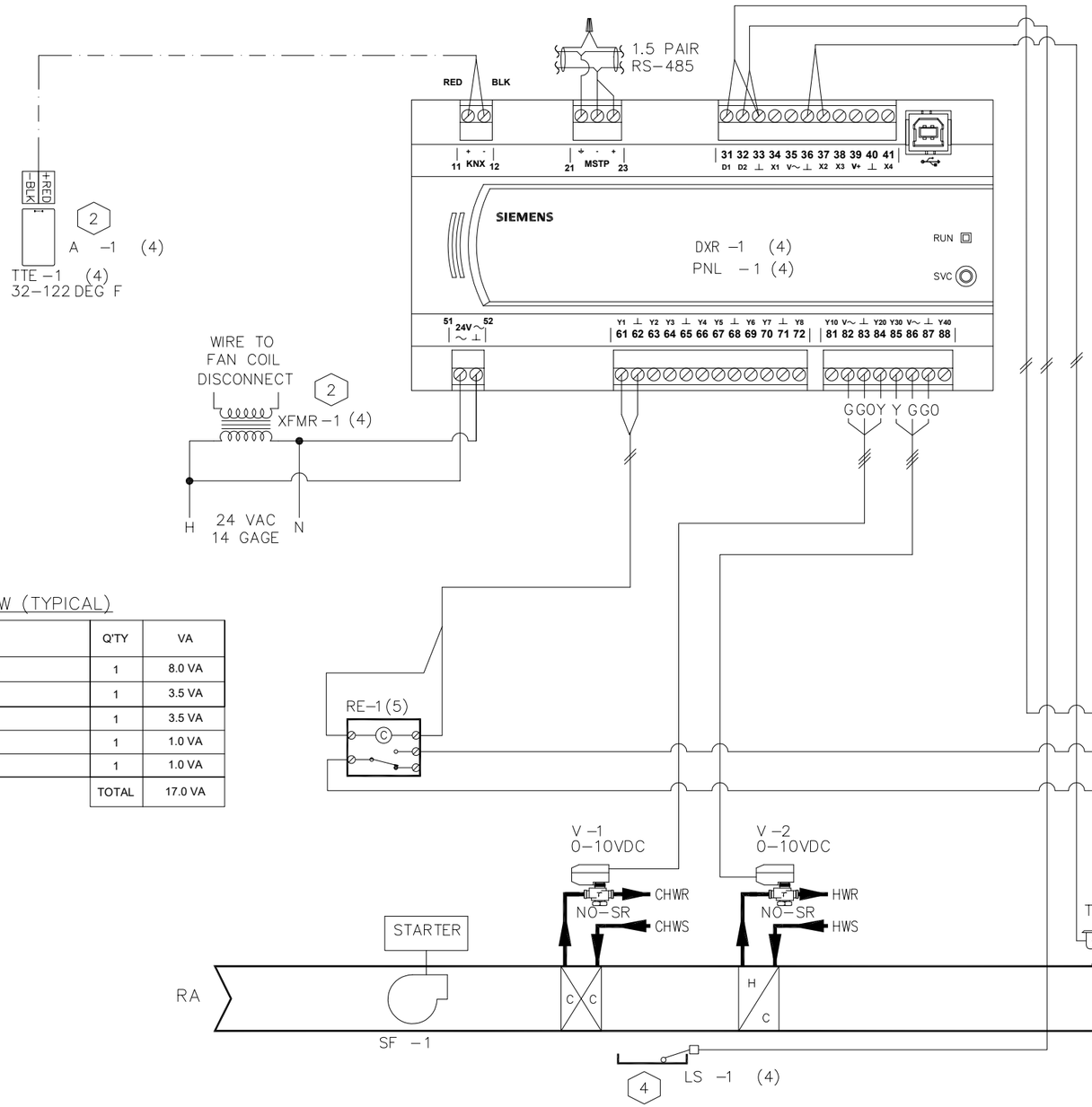
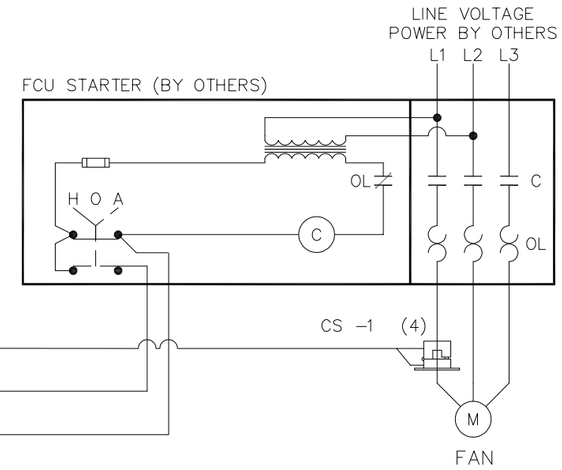
INSTALLATION NOTES:

1. DXR–1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS [FIELD INSTALLED]
2. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.





VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	3.5 VA
COOLING VALVE	1	3.5 VA
RELAY	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	17.0 VA

1 / 481 FCU 4–PIPE WITH CHW AND HW

TYPICAL OF Q'TY : (4)
LOCATION: SEE THE SHEET ON THIS PAGE
SERVES: SEE THE SHEET ON THIS PAGE
BASE APPLICATION : 14051

REVISION HISTORY

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4-PIPE FCU 3PH FAN CONTROL

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	4	F29-0193	KELE		THERMOSTAT GUARD, STEEL
CS 1	4	C-2320-L ECM	SENVA		ECM CURRENT SWITCH
LS 1	4	SS3	KELE INC		AUXILIARY CONDENSATE PAN OVERFLOW SWITCH
PNL 1	4	550-002	SIEMENS		ENCLOSURE ASSY,TEC
RIB 1	4	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1	4	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	4	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
DXR 1	4	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
XFMR 1	4	TR40VA004	FUNCTIONAL	TR40VA003	Xfrmr 40VA,277/240/208/120-24V,2 hub,Cla

SEQUENCE OF OPERATION:

OCCUPIED CYCLE (6:00 A.M. TO 4:00 P.M., DAYTIME MONDAY THROUGH FRIDAY):

1. BELOW **66.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. ABOVE **75.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. EACH NEW CYCLING ON OF THE FAN REQUIRES A MINIMUM **TWENTY MINUTE (ADJ)** FAN RUNTIME BEFORE THE FAN CYCLES OFF. MINIMUM FAN OFF TIME PER CYCLE SHALL BE AT LEAST **FIVE MINUTES (ADJ)**.

2. ABOVE 60'F OUTDOOR AIR TEMPERATURE THE HEATING VALVE IS DISABLED AND FULLY CLOSED.

3. WITH THE FAN OPERATING, THE UNIT HEATING COIL VALVE (IF ENABLED) IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **65.0F (ADJ)**.

4. WITH THE FAN OPERATING, THE UNIT COOLING COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **76.0F (ADJ)**.

5. IF SPACE TEMPERATURE DROPS BELOW **50?F (ADJ)** FOR **5 MINUTES (ADJ.)** THEN SIGNAL AN ALARM AT THE OWS.

UNOCCUPIED CYCLE (4:00 P.M TO 6:00 A.M. MONDAY-FRIDAY WEEKDAY EVENINGS, ALL DAY&NIGHT SATURDAY, ALL DAY&NIGHT SUNDAY):

1. UNOCCUPIED CYCLE CAN BE OVERRIDDEN VIA THE GRAPHICS AT THE OPERATOR'S WORKSTATION FOR THE CASE OF OFF-SHIFT WORKERS OCCUPYING THE SPACES FOR EXTENDED PERIODS. UNOCCUPIED CYCLE OVERRIDE AUTOMATICALLY RESETS TO THE NORMAL UNOCCUPIED SCHEDULE AFTER TWELVE HOURS.

2. BELOW **58.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY. ABOVE **80.0F (ADJ)** SPACE TEMPERATURE READING THE UNIT FAN OPERATES CONTINUOUSLY.

3. ABOVE 56'F OUTDOOR AIR TEMPERATURE THE HEATING VALVE IS DISABLED AND FULLY CLOSED.

4. WITH THE FAN OPERATING, THE UNIT HEATING COIL VALVE (IF ENABLED) IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **57.0F (ADJ)**.

3. WITH THE FAN OPERATING, THE UNIT COOLING COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **81.0F (ADJ)**.

4. IF SPACE TEMPERATURE DROPS BELOW **50?F (ADJ)** FOR **5 MINUTES (ADJ.)** THEN SIGNAL AN ALARM AT THE OWS.

REVISION HISTORY

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4-PIPE FCU 3PH FANBOM & SOO

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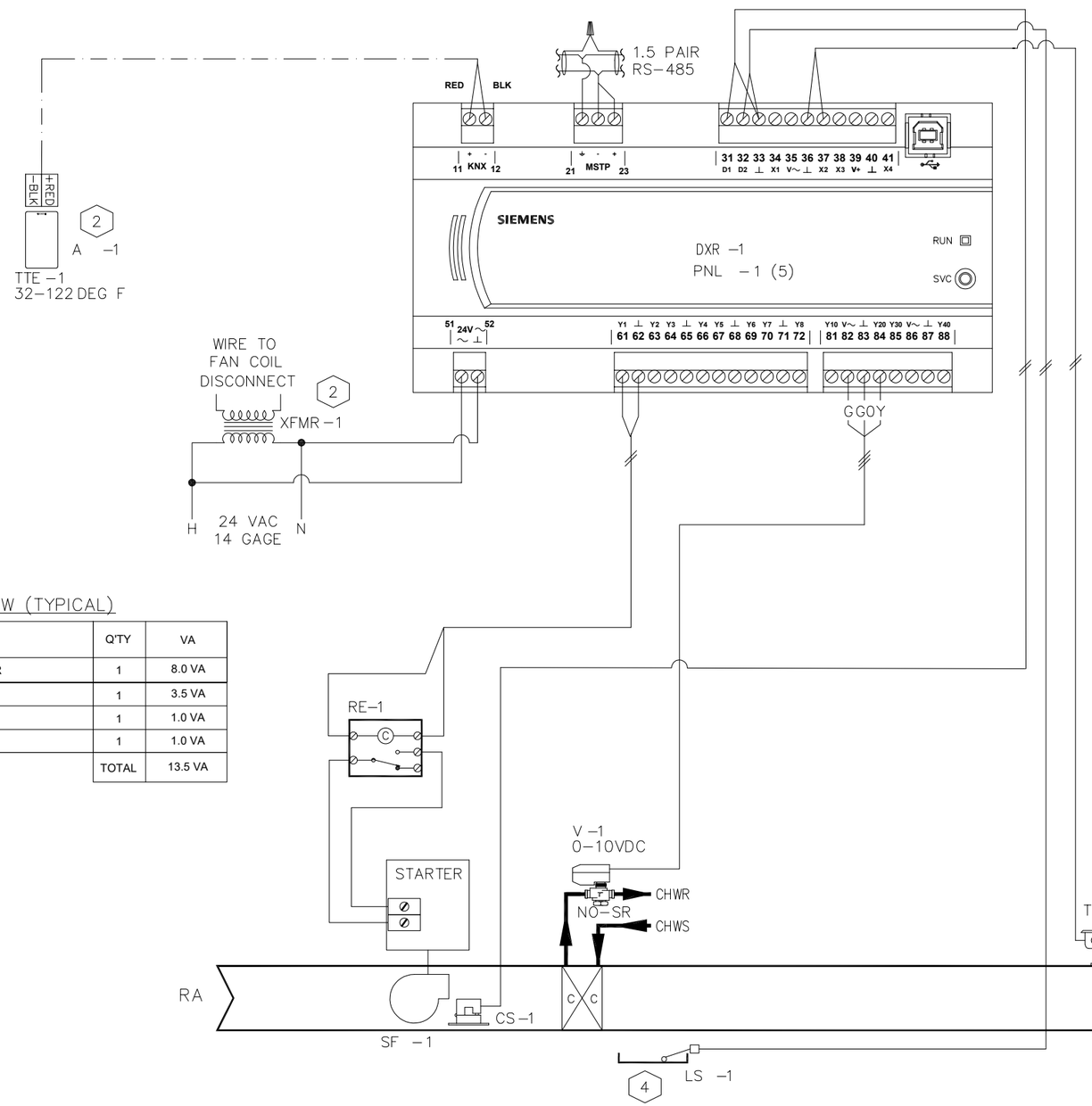

INSTALLATION NOTES:

1. DXR-1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS [FIELD INSTALLED]
2. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
COOLING VALVE	1	3.5 VA
RELAY	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	13.5 VA

1
482

FCU 2-PIPE WITH CHW

TYPICAL OF Q'TY : (1)
LOCATION: SEE THE SHEET ON THIS PAGE
SERVES: SEE THE SHEET ON THIS PAGE
BASE APPLICATION : 14051

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

2-PIPE FCU CONTROL

440P412785
0
482

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
A 1	1	F29-0193	KELE		THERMOSTAT GUARD, STEEL
CS 1	1	C-2320-L ECM	SENVA		ECM CURRENT SWITCH
LS 1	1	SS3	KELE INC		AUXILIARY CONDENSATE PAN OVERFLOW SWITCH
PNL 1	1	550-002	SIEMENS		ENCLOSURE ASSY,TEC
RIB 1	1	RIB2401B	FUNCTIONAL DEVICES	1208cut021	20A SPDT 24VAC/DC/120VAC
TTE 1	1	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
TTE 2	1	QAM2030.010	SIEMENS	149915	DUCT POINT TEMP, 10K OHM TYPE 2, 4"
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
DXR 1	1	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
XFMR 1	1	TR40VA002	FUNCTIONAL	TR40VA002	Xfrmr 40VA,120-24V,dual hub,Class II UL

SEQUENCE OF OPERATION:

1. BELOW 60°F (ADJ) OUTDOOR AIR TEMPERATURE (OAT) THE UNIT SHALL BE ENABLED TO OPERATE. ABOVE 65°F (ADJ) OAT THE UNIT SHALL BE DEENERGIZED.
2. IF SPACE TEMPERATURE DROPS BELOW 45?F (ADJ.) FOR 5 MINUTES (ADJ.) THEN SIGNAL AN ALARM AT THE OWS.

ENABLED OPERATION:

1. WHEN THE SPACE TEMPERATURE READING DROPS BELOW 72°F (ADJ) FOR 30 SECONDS (ADJ.) THE FAN IS CYCLED ON AND THE HEATING WATER COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF 65°F (ADJ). WHEN THE HEATING WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF ONE MINUTE (ADJ) THE FAN CYCLE IS CEASED.

2. EACH NEW CYCLING ON OF THE FAN REQUIRES A MINIMUM 10 MINUTES (ADJ) FAN RUNTIME BEFORE THE FAN CYCLES OFF. MINIMUM FAN OFF TIME PER CYCLE SHALL BE AT LEAST ONE MINUTE (ADJ).

3. WHILE THE SPACE TEMPERATURE READING IS ABOVE 80°F (ADJ) FOR ONE MINUTE (ADJ) THE FAN IS CYCLED OFF REGARDLESS OF MINIMUM FAN RUNTIME.

4. BELOW 30°F (ADJ) OUTDOOR AIR TEMPERATURE (OAT) THE FAN SHALL OPERATE CONTINUOUSLY.

UNOCCUPIED CYCLE:

1. THERE IS NO UNOCCUPIED CYCLE FOR THE VESTIBULE.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

2-PIPE FCU CTRL BOM & SOO

440P412785
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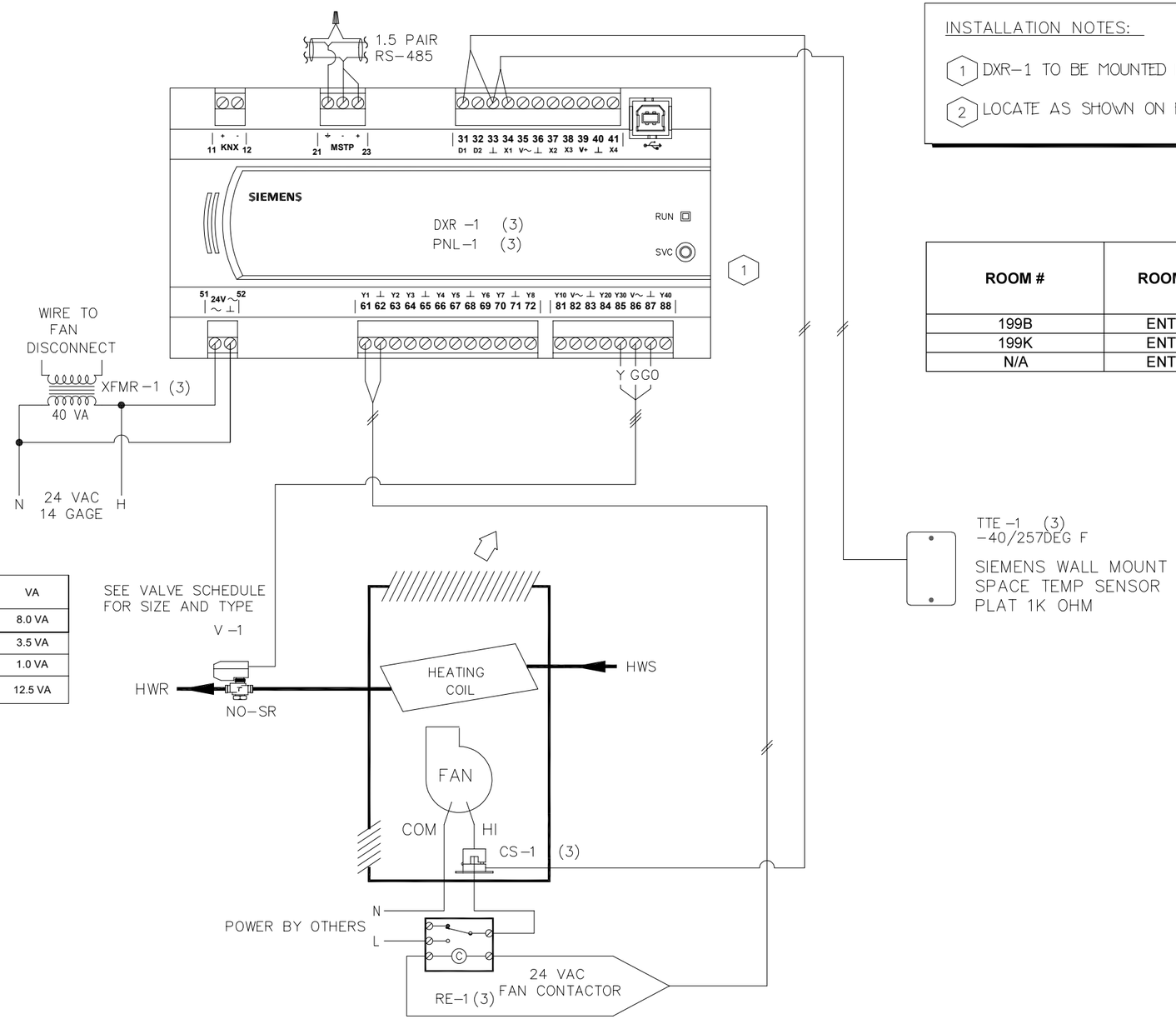
INSTALLATION NOTES:

1. DXR–1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS.
2. LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.

ROOM #	ROOM DESCRIPTION	TAG
199B	ENTRY VESTIBULE	CUH-1
199K	ENTRY VESTIBULE	CUH-2
N/A	ENTRY VESTIBULE	CUH-3



VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	3.5 VA
RELAY	1	1.0 VA
	TOTAL	12.5 VA

1/490 CABINET UNIT HEATER

TYPICAL OF Q'TY : (3)
LOCATION: SEE THE FLN DEVICE SCHEDULE
SERVES: SEE THE FLN DEVICE SCHEDULE
BASE APPLICATION : 14050

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CABINET UH CONTROL

440P412785
0
490

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1	3	C-2320-L ECM	SENVA		ECM CURRENT SWITCH
PNL 1	3	550-002	SIEMENS		ENCLOSURE ASSY,TEC
RIB 1	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1	3	540-984	SIEMENS	149 971	FLUSH MNT TEMP SNSR, 10K OHM TYP2, METAL
Panel Mounted Devices					
DXR 1	3	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
XFMR 1	3	TR40VA002	FUNCTIONAL	TR40VA002	Xfrmr 40VA,120-24V,dual hub,Class II UL

SEQUENCE OF OPERATION:

1. BELOW **60F (ADJ)** OUTDOOR AIR TEMPERATURE (OAT) THE UNIT SHALL BE ENABLED TO OPERATE. ABOVE **65F (ADJ)** OAT THE UNIT SHALL BE DEENERGIZED.

2. IF SPACE TEMPERATURE DROPS BELOW **45?F (ADJ.)** FOR **5 MINUTES (ADJ.**) THEN SIGNAL AN ALARM AT THE OWS.

ENABLED OPERATION:

1. WHEN THE SPACE TEMPERATURE READING DROPS BELOW **72F (ADJ)** FOR **30 SECONDS (ADJ.**) THE FAN IS CYCLED ON AND THE HEATING WATER COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **65F (ADJ)**. WHEN THE HEATING WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF **ONE MINUTE (ADJ**) THE FAN CYCLE IS CEASED.

2. EACH NEW CYCLING ON OF THE FAN REQUIRES A MINIMUM **10 MINUTES (ADJ)** FAN RUNTIME BEFORE THE FAN CYCLES OFF. MINIMUM FAN OFF TIME PER CYCLE SHALL BE AT LEAST **ONE MINUTE (ADJ)**.

3. WHILE THE SPACE TEMPERATURE READING IS ABOVE **80F (ADJ)** FOR **ONE MINUTE (ADJ**) THE FAN IS CYCLED OFF REGARDLESS OF MINIMUM FAN RUNTIME.

4. BELOW **30F (ADJ)** OUTDOOR AIR TEMPERATURE (OAT) THE FAN SHALL OPERATE CONTINUOUSLY.

UNOCCUPIED CYCLE:

1. THERE IS NO UNOCCUPIED CYCLE FOR THE VESTIBULE.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

CABINET UH CTROL BOM & SOO

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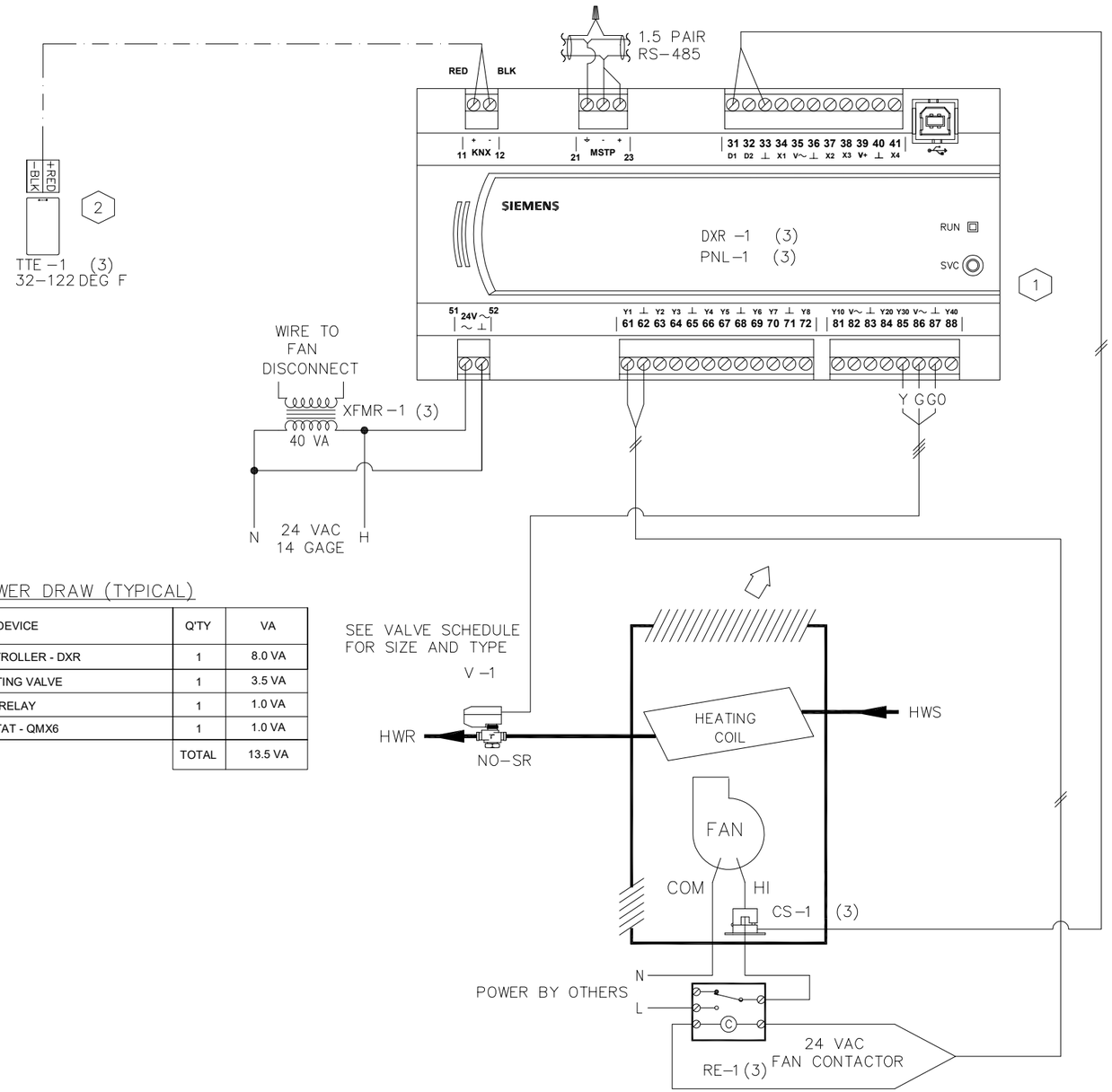

INSTALLATION NOTES:

1. DXR-1 TO BE MOUNTED IN ELECTRIC PANEL PROVIDED BY SIEMENS.
2. MOUNT THERMOSTAT SUSPENDED 12" BEHIND THE UH INLET, AT THE SAME HEIGHT AS THE UNIT.

ROOM #	ROOM DESCRIPTION	TAG
199H	RECEIVING	UH-1
199H	RECEIVING	UH-2
199H	RECEIVING	UH-3

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
CONTROLLER - DXR	1	8.0 VA
HEATING VALVE	1	3.5 VA
RELAY	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	13.5 VA

1 / 491 UNIT HEATER

TYPICAL OF Q'TY : (3)
LOCATION: SEE THE FLN DEVICE SCHEDULE
SERVES: SEE THE FLN DEVICE SCHEDULE
BASE APPLICATION : 14050

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

UNIT HEATER CONTROL

440P412785
0
491

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1	3	C-2320-L ECM	SENVA		ECM CURRENT SWITCH
PNL 1	3	550-002	SIEMENS		ENCLOSURE ASSY,TEC
RIB 1	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
TTE 1	3	QMX6.P30	SIEMENS		QMX6 ROOM TEMP ONLY
Panel Mounted Devices					
DXR 1	3	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
XFMR 1	3	TR40VA002	FUNCTIONAL	TR40VA002	Xfrmr 40VA,120-24V,dual hub,Class II UL

SEQUENCE OF OPERATION:

1. BELOW **60F (ADJ)** OUTDOOR AIR TEMPERATURE (OAT) THE UNIT SHALL BE ENABLED TO OPERATE. ABOVE **62F (ADJ)** OAT THE UNIT SHALL BE DEENERGIZED.

2. WHEN THE SPACE TEMPERATURE READING DROPS BELOW **65F (ADJ)** FOR **30 SECONDS (ADJ.**) THE FAN IS CYCLED ON AND THE HEATING WATER COIL VALVE IS MODULATED TO ACHIEVE A SPACE TEMPERATURE READING OF **68F (ADJ)**. WHEN THE HEATING WATER VALVE IS FULLY CLOSED FOR A MINIMUM OF **ONE MINUTE (ADJ.**) THE FAN CYCLE IS CEASED.

3. EACH NEW CYCLING ON OF THE FAN REQUIRES A MINIMUM **5 MINUTES (ADJ)** FAN RUNTIME BEFORE THE FAN CYCLES OFF. MINIMUM FAN OFF TIME PER CYCLE SHALL BE AT LEAST **ONE MINUTE (ADJ)**.

4. IF SPACE TEMPERATURE DROPS BELOW **50?F (ADJ.)** FOR **5 MINUTES (ADJ.**) THEN SIGNAL AN ALARM AT THE OWS.

UNOCCUPIED CYCLE:

1. THERE IS NO UNOCCUPIED CYCLE FOR THE UNIT HEATER SERVING AREAS WITH EXTERIOR DOORS.

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

UNIT HEATER CTRL BOM & SOO

440P412785
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491A

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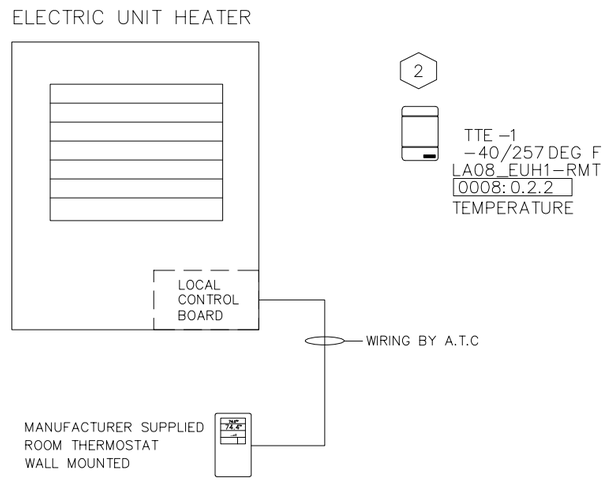
INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. REFER TO PLANS FOR LOCATIONS.

MARK	AREA SERVED
EUH-1	STAIR 199F HALL WAY



1/492 CABINET ELECTRIC UNIT HEATER

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0008	LA08.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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UNITED STATES
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

ELECTRIC UH CONTROL

440P412785
0
492

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL

1 / 492A ELEC. WIRING FOR EUH-1

DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0008	LA08.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

ELECTRIC UH CTRL WIRING

440P412785
0
492A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	1	QAA1011.AATU	SIEMENS	149471	BUTT TEMP SNSR, 1K PT(375), MTL WALL PLT

SEQUENCE OF OPERATION:

1. IF SPACE TEMPERATURE DROPS BELOW 55?F (ADJ.) FOR 5 MINUTES (ADJ.) THEN SIGNAL AN ALARM AT THE OWS.

UNOCCUPIED CYCLE:
1. THERE IS NO UNOCCUPIED CYCLE FOR THE EUH

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

ELECTRIC UH CTRL BOM & SOO

440P412785
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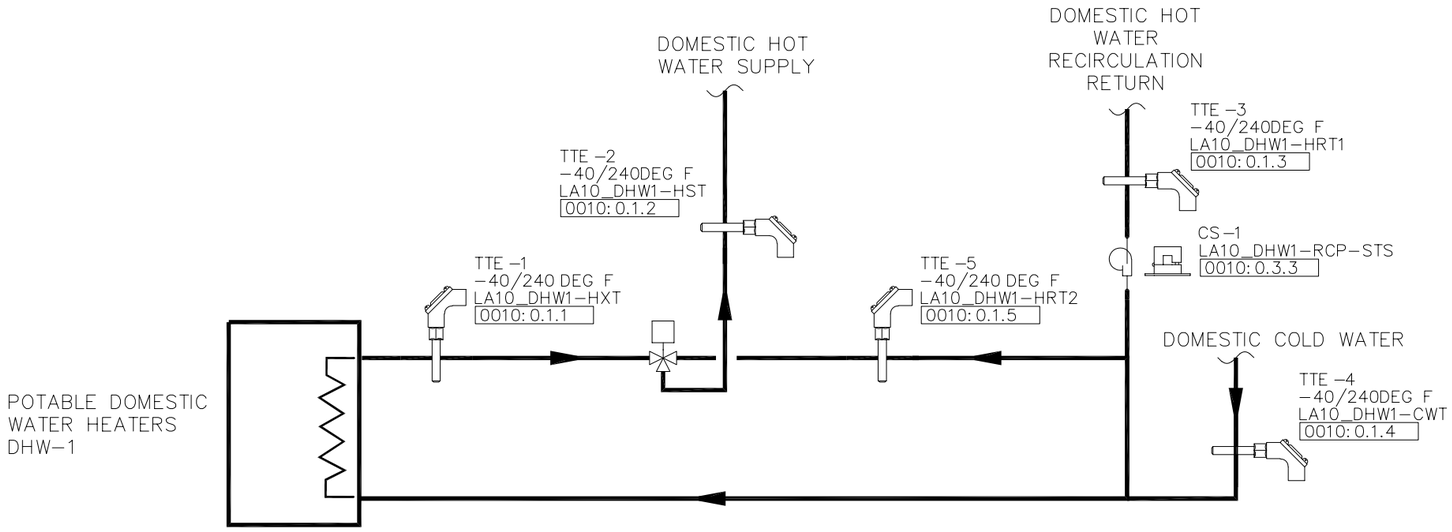
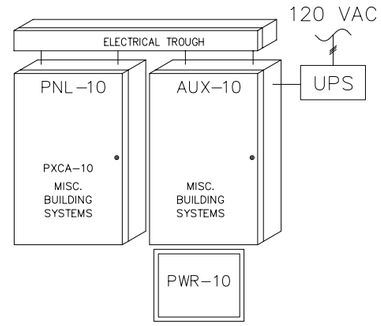
INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.



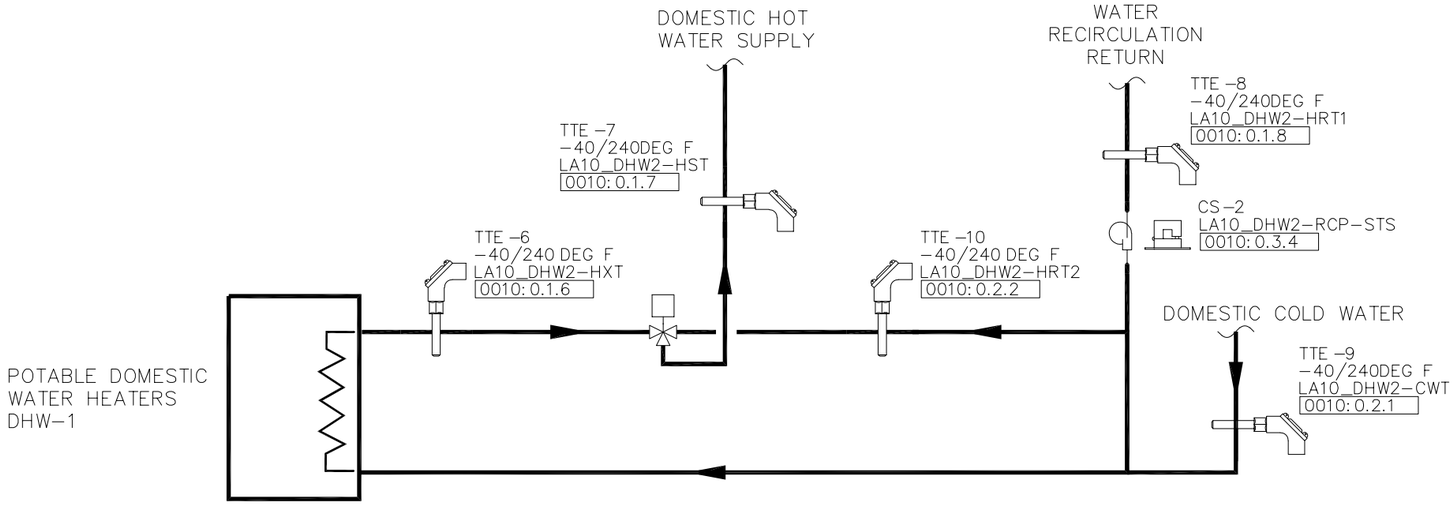
1 / 600 POTABLE DHW–1 MONITOR



PNL–10 / AUX–10

UPS–1
UPS LO BATT
LA10_UPS–LBT
0010: 0.3.1

POWER LOSS
LA10_UPS–PWL
0010: 0.3.2



2 / 600 NONPOTABLE DHW–2 MONITOR

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

DOMESTIC WATER HEATERS

440P412785
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600

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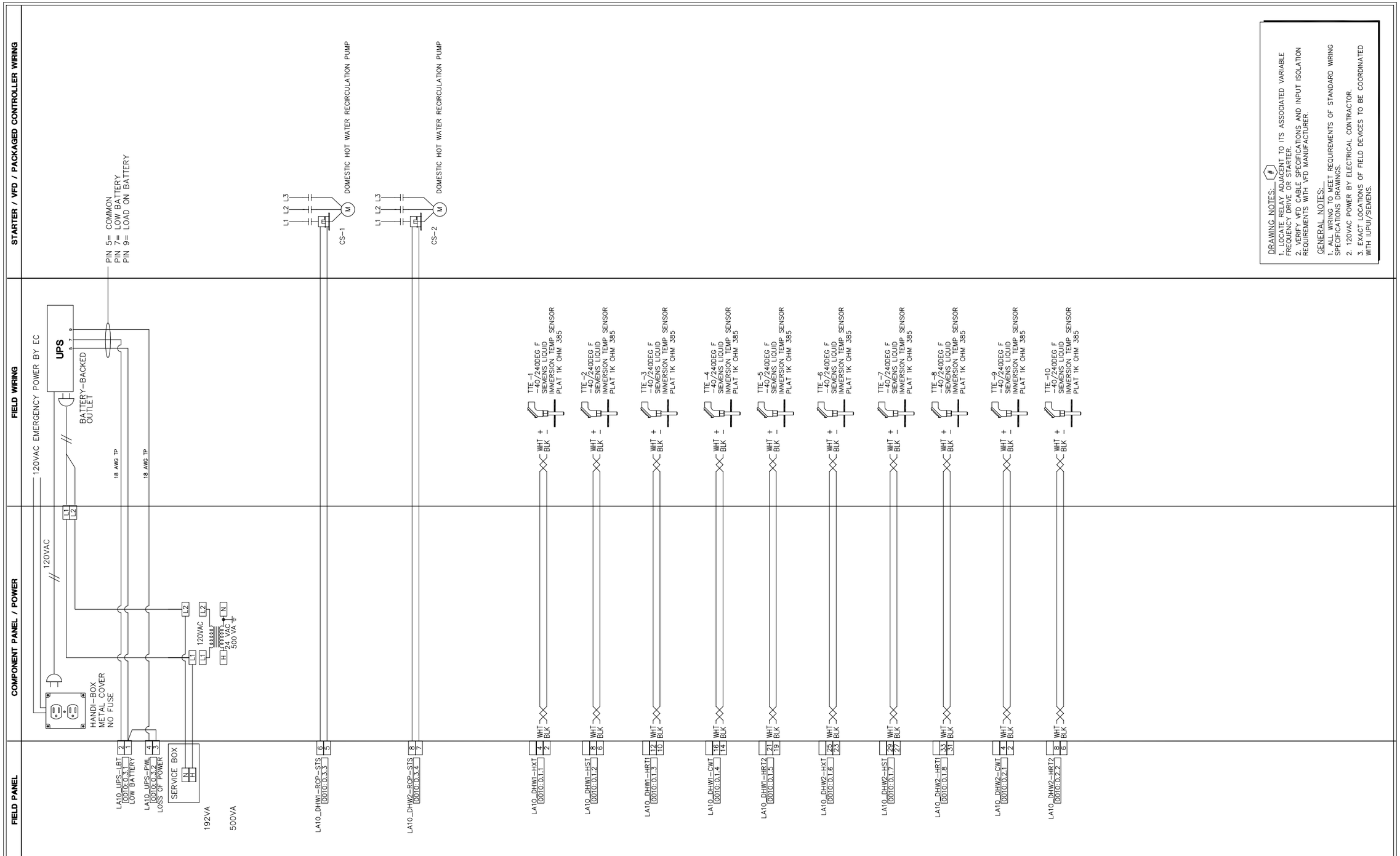

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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DHW-1 & 2 ELEC. WIRING

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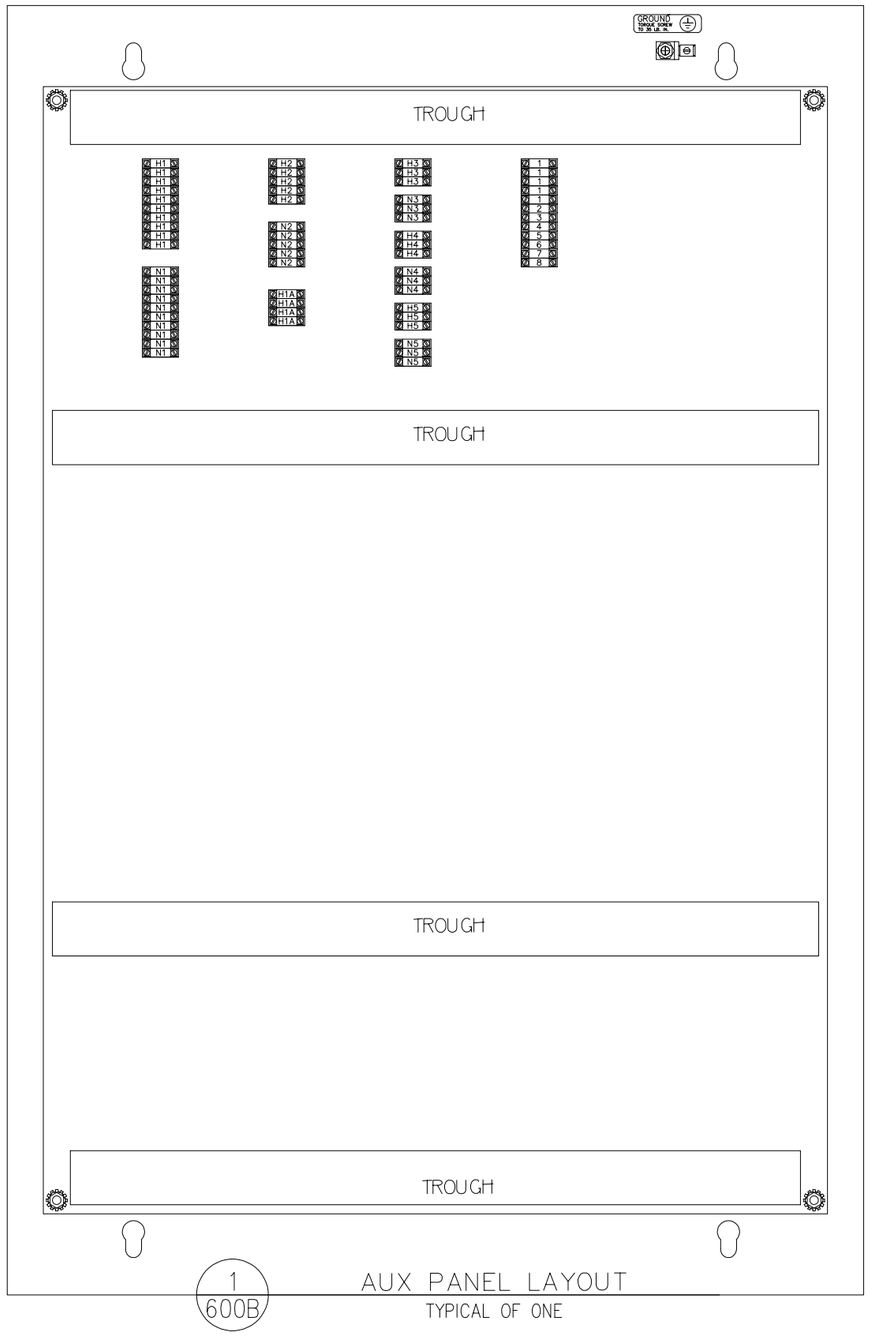
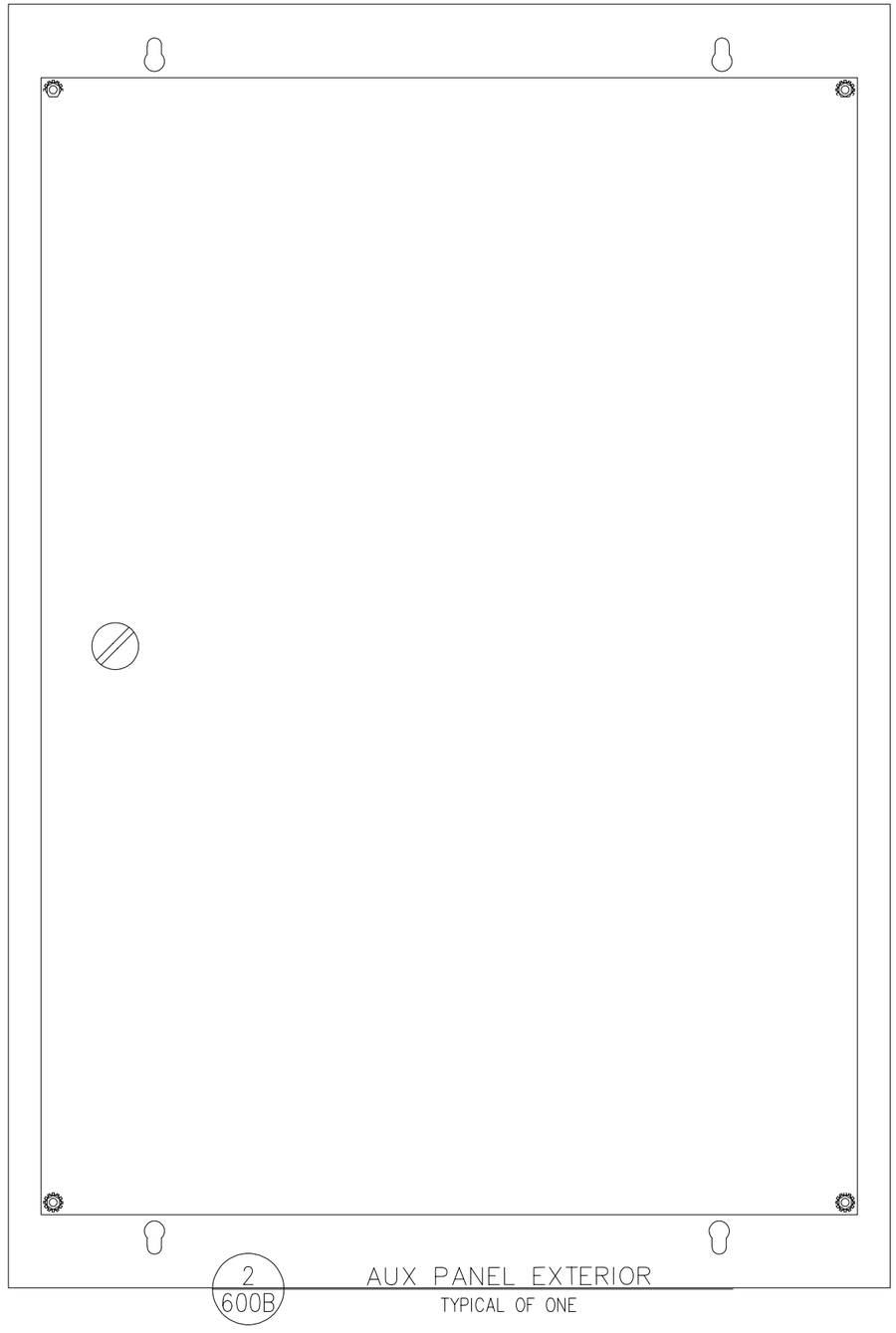


1 600B AUX PANEL LAYOUT
TYPICAL OF ONE



2 600B AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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DWH AUX LAYOUT PANEL

440P412785
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1-2	2	C-2320	SENVA INC	C(preset)	Current Sw,Split,Pre-Set Adj,1-100A
PNL AUX-10	1	567-353	SIEMENS	155 272	#4 PNEU PANEL 36X24X9
PWR 10	1	PSH500A-LVC	FUNCTIONAL		Power Supply HILO 100VAx5 multi-tap
TTE 1-10	10	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
UPS 1	1	5P1500R	EATON		1440 VA BATTERY BACKUP
	1	RELAY-MS	EATON		RELAY/SERIAL INTERFACE CARD
	1	CS-DSDMDB09MF-010	EATON		9-PIN DB9 DELUXE D-SUB CABLE

SEQUENCE OF OPERATION:

(POINTS NAMES LISTED ARE FOR DWH-1. SEQUENCE TEXT IS IDENTICAL FOR THE TWO DWH SUBSTITUTING APPROPRIATE POINT NAMES.)
1. WATER HEATER CONTROL VALVE IS MODULATED VIA THE INTEGRAL WATER HEATER CONTROL PANEL TO MAINTAIN HEAT EXCHANGER LEAVING DOMESTIC WATER TEMPERATURE AT 140° F (ADJUSTABLE LOCALLY AT THE INTEGRAL WATER HEATER CONTROL PANEL FURNISHED BY DIV. 22).
2. DOMESTIC HOT WATER RECIRCULATION PUMP RUNS CONTINUOUS BELOW 115° F (ADJ) DHW RECIRCULATION TEMPERATURE (AI-3).
3. DOMESTIC HOT WATER RECIRCULATION PUMP SHALL BE OFF ABOVE 120° F (ADJ) DHW RECIRCULATION TEMPERATURE (AI-3).
4. THERMOSTATIC MIXING VALVE SHALL MAINTAIN DHW SUPPLY TEMPERATURE (AI-2) OF 120° F (ADJ) THROUGH INTEGRAL CONTROLS.

WATER HEATERS: DWH-1 & DWH-2
ZONE MAINTENANCE MANUALLY ENABLES / DISABLES BOTH WATER HEATERS (VIA THE DIV. 22 INTEGRAL CONTROLLER) AND THEIR ASSOCIATED PUMPING SYSTEMS (VIA THE MOTOR STARTER) TO OPERATE 8,760 HOURS PER YEAR.

A. PROVIDE BINARY STATUS SIGNALS THAT ARE GENERATED FOR THE FOLLOWING EQUIPMENT.

DOMESTIC HOT WATER RECIRULATION PUMP:
DHWCP-1 AND DHCWP-2 CONTROLS SHALL MONITOR THE PUMP STATUS. LOSS OF STATUS WILL NOT SIGNAL AN ALARM AS PUMP AQUASTAT MAY BE CYCLING THE PUMP OFF.

B. PROVIDE SPECIFIC DEVICE CONTROLS:

DOMESTIC HOT WATER RECIRCULATION SYSTEM #1 : ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #1 IS ENABLED THAT A HOT WATER SUPPLY WATER TEMPERATURE (AI-2) OF A LEAST 100° F (ADJUSTABLE) IS NOT ACHIEVED. ALSO ALARM IF THE HOT WATER SUPPLY TEMPERATURE (AI-2) (GOING OUT TO THE BUILDING) EXCEEDS 130°F (ADJUSTABLE).

DOMESTIC HOT WATER RECIRCULATION SYSTEM #2 : ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #2 IS ENABLED THAT A HOT WATER SUPPLY WATER TEMPERATURE (AI-7) OF A LEAST 100° F (ADJUSTABLE) IS NOT ACHIEVED. ALSO ALARM IF THE HOT WATER SUPPLY TEMPERATURE (AI-7) (GOING OUT TO THE BUILDING) EXCEEDS 130° F (ADJUSTABLE).

DOMESTIC HOT WATER RECIRCULATION SYSTEM ZONE 1 : DHWCP-1 RETURN HOT WATER TEMPERATURE (AI-3) CONTROLS SHALL ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #1 IS ENABLED THAT A HOT WATER RETURN WATER TEMPERATURE EXCEEDING 125° F (ADJUSTABLE) IS ACHIEVED.

DOMESTIC HOT WATER RECIRCULATION SYSTEM ZONE 2 : DHWCP-2 RETURN HOT WATER TEMPERATURE (AI-8) CONTROLS SHALL ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #2 IS ENABLED THAT A HOT WATER RETURN WATER TEMPERATURE EXCEEDING 125° F (ADJUSTABLE) IS ACHIEVED.

DOMESTIC HOT WATER RECIRCULATION SYSTEM: ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #1 IS ENABLED THAT A COLD WATER SUPPLY WATER TEMPERATURE (AI-4) GREATER THAN 80 DEGREE F (ADJUSTABLE) IS ACHIEVED (INDICATING SYSTEM BLEED-THROUGH OR OTHER FAILURE).
DOMESTIC HOT WATER RECIRCULATION SYSTEM: ALARM OPERATOR'S WORK STATION IF FIVE MINUTES (ADJUSTABLE) AFTER THE PUMP #2 IS ENABLED THAT A COLD WATER SUPPLY WATER TEMPERATURE (AI-9) GREATER THAN 80 DEGREE F (ADJUSTABLE) IS ACHIEVED (INDICATING SYSTEM BLEED-THROUGH OR OTHER FAILURE).

DOMESTIC HOT WATER GENERATION SYSTEM DHW PIPE HEADER TEMPERATURE SENSOR (AI-1) AT THE DISCHARGE OF THE WATER HEATERS FOR DHTMV-1; CONTROLS SHALL ALARM OPERATORS WORK STATION IF THE HOT WATER TEMPERATURE EXCEEDS 150° F (ADJUSTABLE) FOR A PERIOD OF THIRTY SECONDS (ADJUSTABLE).

DOMESTIC HOT WATER GENERATION SYSTEM DHW PIPE HEADER TEMPERATURE SENSOR (AI-6) AT THE DISCHARGE OF THE WATER HEATERS FOR DHTMV-2; CONTROLS SHALL ALARM OPERATORS WORK STATION IF THE HOT WATER TEMPERATURE EXCEEDS 150° F (ADJUSTABLE) FOR A PERIOD OF THIRTY SECONDS (ADJUSTABLE).

REVISION HISTORY

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SMART INFRASTRUCTURE DIVISION

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/02/26

DW HEATERS BOM & SOO

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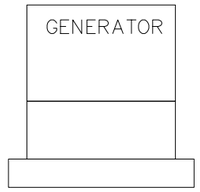
INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.

RIB-1 WATER HEATER DWH-1
LA10_DWH1-ALM
0010: 0.3.8
ALARM

RIB-2 WATER HEATER DWH-2
LA10_DWH2-ALM
0010: 0.3.9
ALARM

1/610 WATER HEATERS DWH-1 & 2 MONITOR



RIB-6 LA10_GEN-STS
0010: 0.3.13
RUNNING STATUS

RIB-7 LA10_GEN-ALM
0010: 0.3.14
ALARM

2/610 GENERATOR MONITOR

RIB-8 LA10_BLDG-PWL
0010: 0.3.15
POWER TRANSFERRED

3/610 ATS MONITOR

RIB-3 AIR COMPRESSOR AC-1
LA10_AC1-ALM
0010: 0.3.10
ALARM

RIB-4 AIR COMPRESSOR AC-2
LA10_AC2-ALM
0010: 0.3.11
ALARM

RIB-5 AIR COMPRESSOR AC-3
LA10_AC3-ALM
0010: 0.3.12
ALARM

4/610 AIR COMPRESSORS AC-1,2,3 MONITOR

WD -1
WATER DET
ELEVATOR PIT ELEV 1
LA10_ELEV1-WD
0010: 0.3.5
ALARM

WD -2
WATER DET
ELEVATOR PIT ELEV 2
LA10_ELEV2-WD
0010: 0.3.6
ALARM

WD -3
WATER DET
PLUMBING EQUIP. ROOM
LA10_ELEV3-WD
0010: 0.3.7
ALARM

5/610 WATER LEAK ALARM MONITOR

RIB-9 LA10_RO-ALM
0010: 0.4.1
ALARM

6/610 RO MACHINE ALARM MONITOR

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

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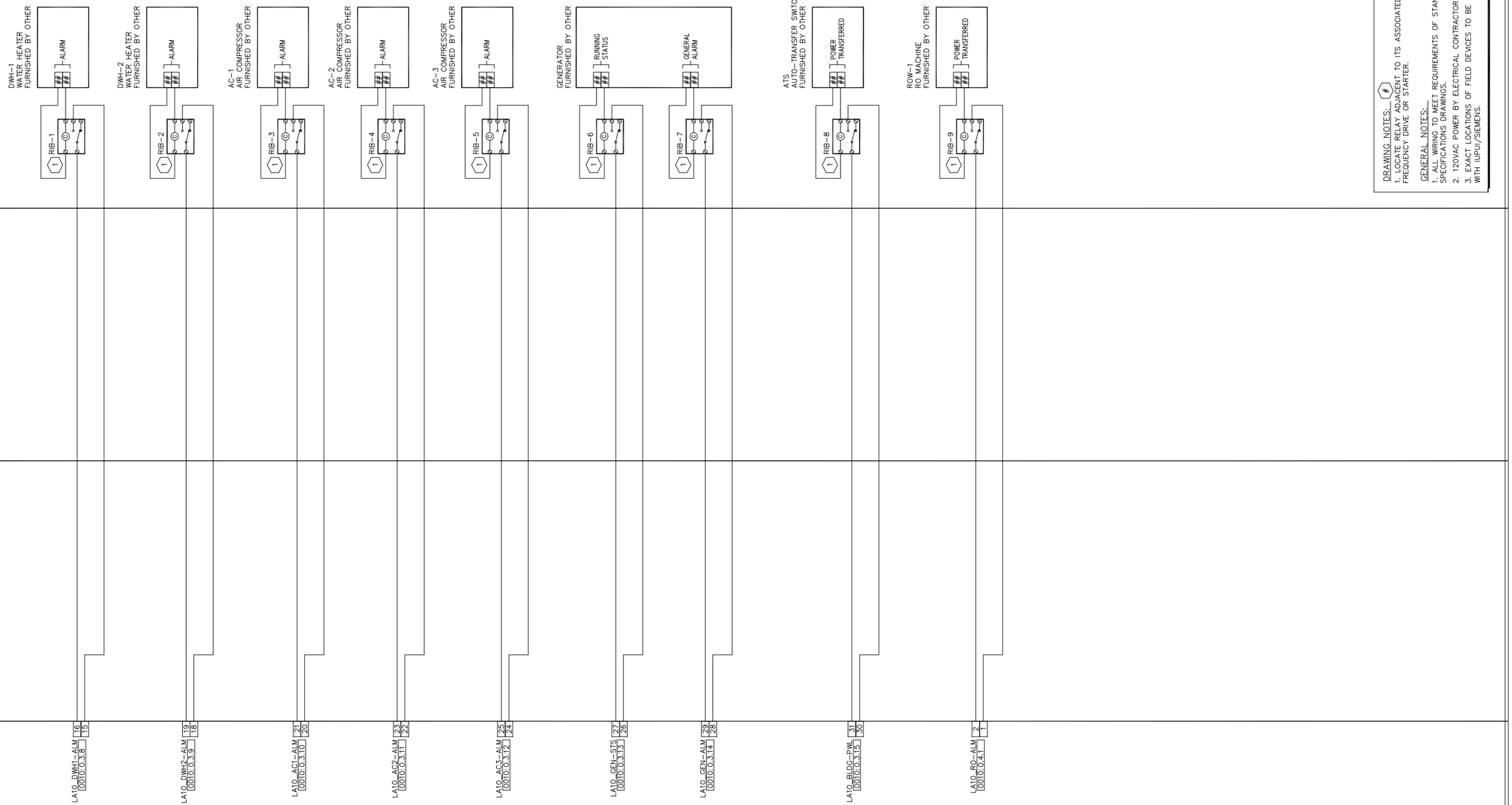
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING



DRAWING NOTES: (#)
1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

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MISC. ELEC. WIRING 1

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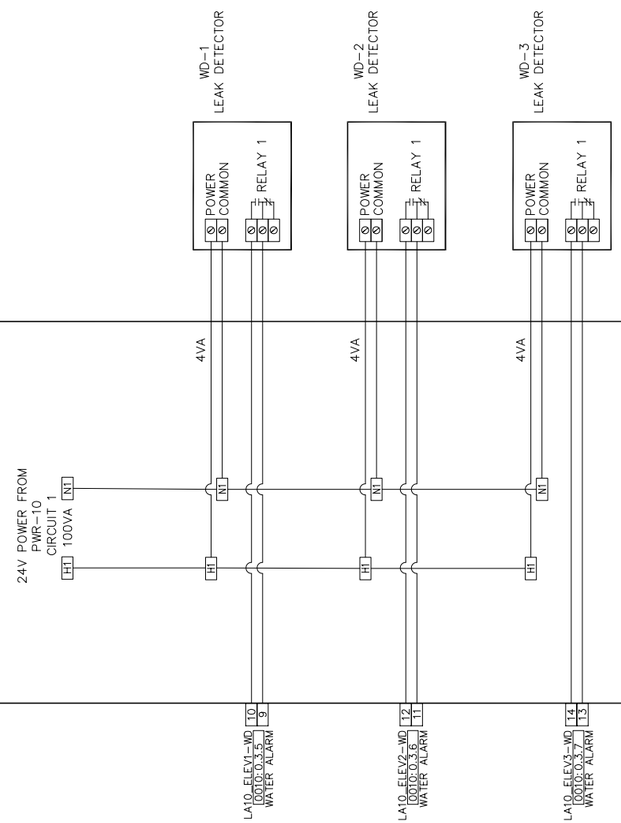
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.
2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

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MISC. ELEC. WIRING 2

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
RIB 1-9	9	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIBU1C FD 120VAC 24VAC/DC SPDT
WD 1-3	3	WD-2PR-10	KELE		WTR DETECTOR W 10' SENSING CABLE

BUILDING SYSTEMS ELECTRICAL EQUIPMENT ALARMS :

A. BINARY ALARMS ARE TO BE GENERATED ANYTIME THE GENERATOR INDICATES THESE LISTED CONDITIONS. ALARM POINTS SHALL BE HARD-WIRED TO THE CLOSEST DDC EQUIPMENT PANEL LOCATED IN THE SAME ROOM OR, IF NOT AVAILABLE, ON THE SAME FLOOR. PROVIDE UNDERGROUND CONDUIT TO ROUTE THE POINTS INTO THE BUILDING. INCLUDE ALARM POINTS AND NORMAL CONDITION ON OPERATOR'S WORK STATION GRAPHICS. ALARM POINTS FOR THE GENERATOR INCLUDE:

GENERATOR RUNNING.
GENERATOR GENERAL ALARM.

B. B. BINARY ALARMS ARE TO BE GENERATED ANYTIME THE OPTIONAL STANDBY ATS WHICH POWERS THE HVAC EQUIPMENT ACC-5 INDICATES THESE LISTED CONDITIONS. ALARM POINTS SHALL BE HARD-WIRED TO THE CLOSEST DDC EQUIPMENT PANEL LOCATED IN THE SAME ROOM OR, IF NOT AVAILABLE, ON THE SAME FLOOR. INCLUDE ALARM POINTS AND NORMAL CONDITION ON OPERATOR'S WORK STATION GRAPHICS. ALARM POINTS FOR THE ATS INCLUDE:

ATS POWER TRANSFERED.

BUILDING SYSTEM EQUIPMENT ALARM AND LEAK ALARMS :

A. BINARY ALARMS ARE TO BE GENERATED ANYTIME ANY OF THE FOLLOWING EQUIPMENT INDICATES AN ALARM CONDITION. ALARM POINTS SHALL BE HARD-WIRED TO THE CLOSEST DDC EQUIPMENT PANEL LOCATED IN THE SAME ROOM OR, IF NOT AVAILABLE, ON THE SAME FLOOR. INCLUDE ALARM POINTS ON OPERATOR'S WORK STATION GRAPHICS. ALARM POINTS INCLUDE:

WATER HEATERS: DWH-1, DWH-2
AIR COMPRESSORS: AC-1, AC-2, AC-3
RO MACHINE: ROW-1

B. BINARY ALARMS ARE TO BE GENERATED ANYTIME ANY OF THESE LIQUID SENSORS INDICATES THERE IS LIQUID DETECTED (OTHER WATER SENSORS ARE INCLUDED ON SPECIFIC TEMPERATURE CONTROL SCHEMATICS). ALARM POINTS SHALL BE HARD-WIRED TO THE CLOSEST DDC EQUIPMENT PANEL LOCATED IN THE SAME ROOM OR, IF NOT AVAILABLE, ON THE SAME FLOOR. INCLUDE ALARM POINTS ON OPERATOR'S WORK STATION GRAPHICS. ALARM POINTS INCLUDE:

ELEVATOR PIT WATER SENSORS: ELEVATOR PIT ELEV 1 AND ELEVATOR PIT ELEV 2. ELEVATOR PIT WATER SENSORS SHALL BE LOCATED WITHIN THE PIT AS DIRECTED IN WRITING BY THE ELEVATOR MANUFACTURER. LIQUID SENSORS SHALL BE INTRINSICALLY SAFE TWO CONDUCTOR SHIELDED CABLE FOR DETECTING WATER. ECC TO PROVIDE 120V POWER TO SENSORS AS REQUIRED.

PLUMBING EQUIPMENT ROOM: WATER SENSOR, SET TO INDICATE WITH 1/4" OF WATER DEPTH, LOCATION AS INDICATED ON THE PLANS.

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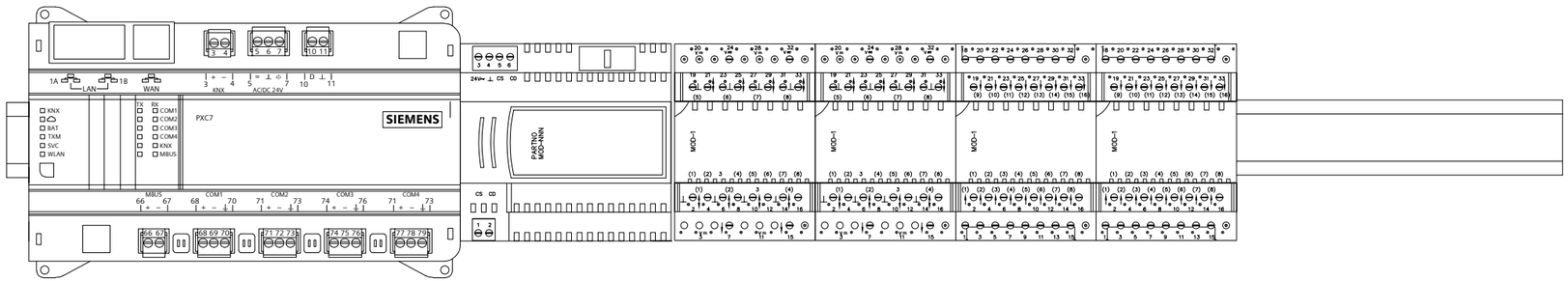
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.



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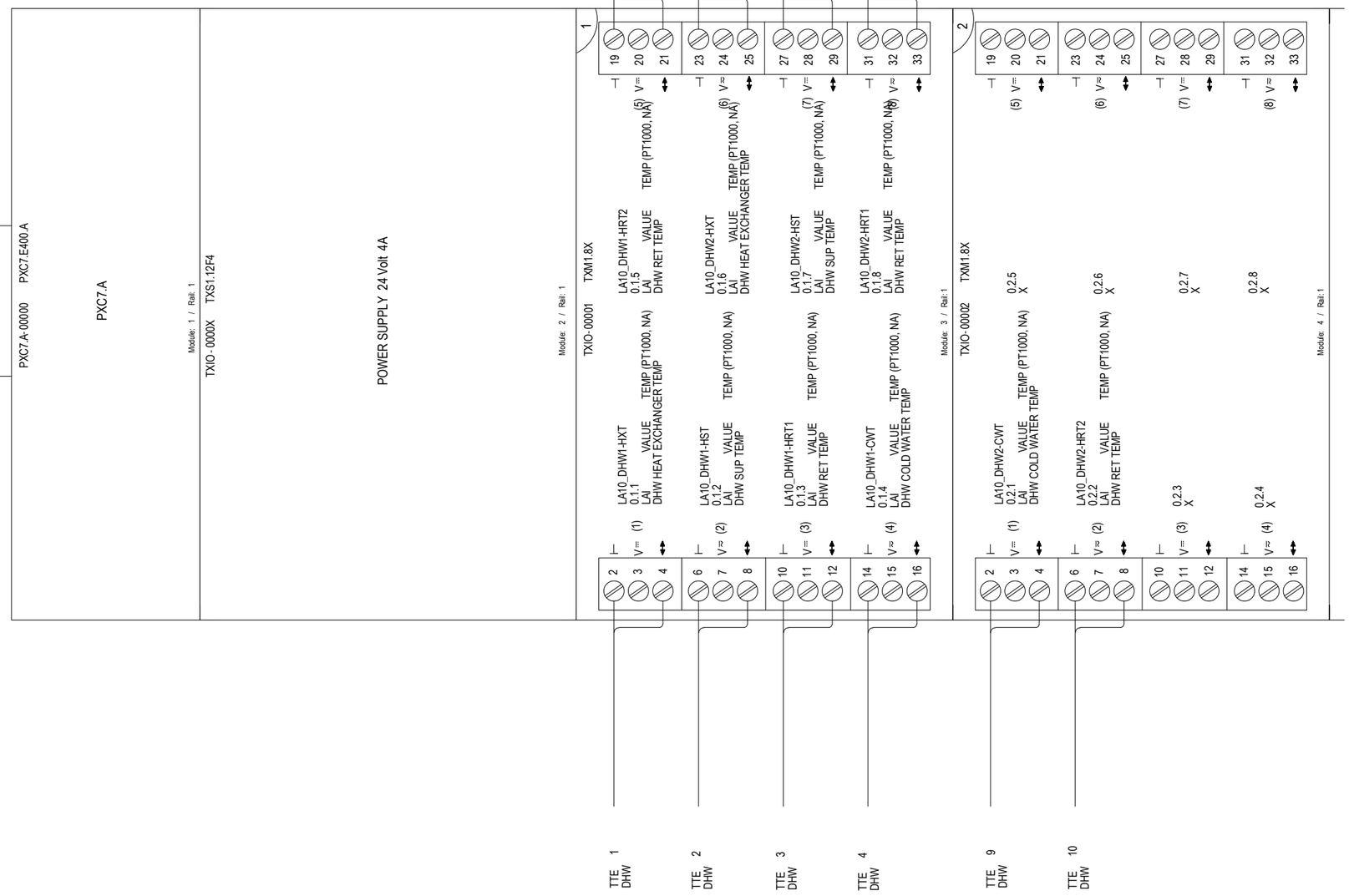
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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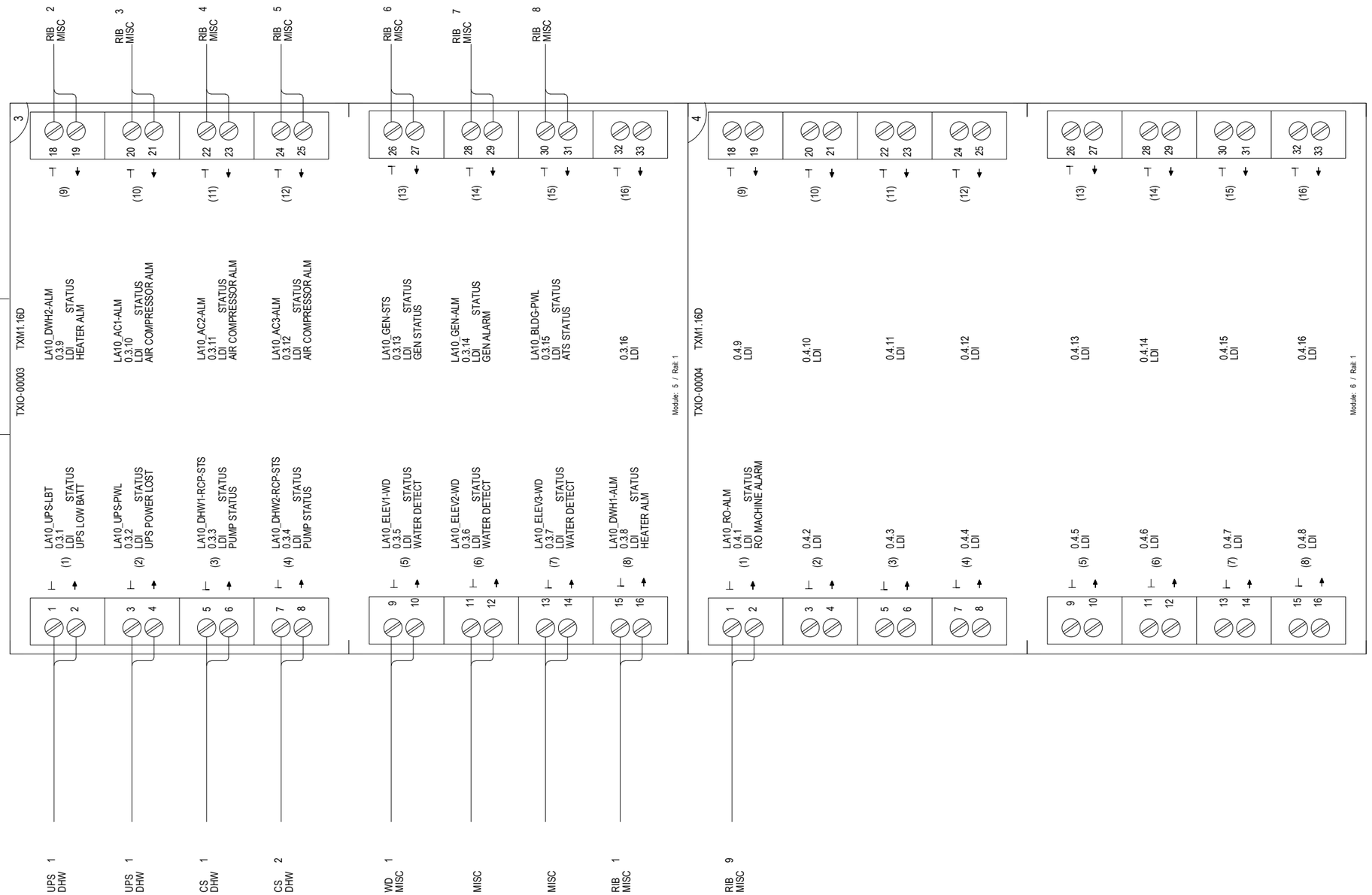

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	2	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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SECTION 23 8241
WATER-TO-WATER HEAT PUMPS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

D. UL 1995 - Heating and Cooling Equipment.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.03 QUALITY ASSURANCE

1.04 DELIVERY, STORAGE, AND HANDLING

A. Verify upon delivery that equipment nameplate data, including electrical data, matches specified and ordered equipment. Verify that refrigerant charge has been retained during shipping.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store products under cover and elevated above grade.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer's Warranty: Provide minimum five year warranty to include coverage for materials and labor for compressor, evaporator, and complete assembly.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier.

B. MultiStack.

C. ClimaCool.

D. **Trane.**

2.02 GENERAL WATER-TO-WATER HEAT PUMP FABRICATION REQUIREMENTS

A. Energy Efficiency: ASHRAE Std 90.1 I-P EER and COP ratings, minimum.

B. Factory assemble internal components, safety-controls, accessories, filters, piping, cable, and wires, then charge with refrigerant prior to testing. WWHP shall be a packaged, skid mounted assembly with factory controls capable of simultaneously producing 52 deg. F chilled water and 130 deg. F heating water.

C. Condenser-Fluid Temperature Performance:

1. Startup condenser field temperature: WWHP shall be capable of starting with an entering condenser-fluid temperature of 80-125 deg F and providing stable operation for at least thirty minutes.

2. Minimum operating condenser fluid temperature: WWHP shall be capable of continuous operation over the entire capacity range indicated with an entering condenser-fluid temperature of 100-125 deg. F.

D. Include marked terminal strip to interface field mounted components and accessories.

E. Comply with UL 1995, place service and caution labels on unit in appropriate locations.

F. Cabinet Assembly:
1. Construct of zinc-coated, heavy-gauge, galvanized steel with exposed edges rounded.
2. Finish: Factory apply electrostatic powder paint or baked enamel finish. Coordinate with Architect for specific color finish requirements of console units or other units installed within occupied spaces.
3. Provide access panels for inspection, cleaning, and servicing of refrigerant, controls, and heat exchangers.
4. Interior Insulation: Minimum 1/2 inch thick, dual density, bonded glass fiber.
5. Provide flame spread of less than 25, and smoke developed classification of less than 50 when tested in accordance with ASTM E84 and UL 723.
6. Sound and Noise Suppression:
   a. Furnish removable and reusable sound-barrier covers over the compressor housing, hermetic motor, compressor suction and discharge piping, and condenser shell. Furnish material, thickness and arrangement as required to meet noise requirements such that the total A-weighted airborne sound pressure at a horizontal distance of 3’-0” to the receiver per ARI Standard 575 is no greater than 69 DBA at 100% load.
   b. Panel Thickness: 16 gauge, 0.06 inch, minimum.
   c. Compressor enclosure lined with 1/2 inch thick insulation.
   d. Include vibration isolation between compressor and heat exchanger.
   e. Include length-wise unit base stiffeners.
   f. Foam gasket sealant around compressor and end panel perimeter.
7. Manufacturer selected and furnished restrained spring isolators with 2" deflection.

G. Compressor Section:
1. Provide rubber mounting vibration isolation devices underneath mounting base.
2. Safety Interlocked Devices:
   a. Thermal overload protection.
   b. High pressure switch for protection against excessive discharge pressure.
   c. Low pressure safety for protection against loss of refrigerant charge.
3. Minimum capacity reduction to **25%** of the total WWHP scheduled capacity.

H. Refrigerant Tubing Lines:
1. Tubing made of copper with service pressure ports on high and low pressure sides.
2. Free from contaminants and conditions such as drilling fragments, dirt, and oil.
3. Include drier, thermal expansion valve, and other related components. Each circuit shall include a thermal- or electronic-expansion valve, refrigerant charging connections, compressor suction and discharge shutoff valves, a liquid-line shutoff valve, a replaceable-core filter-dryer, a sight glass with moisture indicator, a liquid-line solenoid valve, and an insulated suction line.
4. Freeze Protection: 30 degrees F, thermistor based.

I. Water-to-Refrigerant Heat Exchanger:
1. Coaxial Type: Provide aluminum or copper tube and fins.
2. Brazed-Plate Type: Stainless steel, with bidirectional liquid line filter drier.

3. Insulate heat exchanger, water lines, and refrigerant suction lines for prevention of condensation at temperatures below 60 degrees F.
4. Provide rubber isolation to the heat exchanging device for enhanced sound attenuation.
5. Freeze Protection: 35 degrees F by thermistor sensing.
6. Minimum Working Pressure: 400 psi water side, 600 psi DX side.
7. End Connections: Copper NPT. Provide flow shut-off ball valves.
8. Accessories:
   a. Strainer, PT test plug, and flow regulator.
   b. Unit-controlled, return-water-side solenoid valve.
   c. Pressure relief device: Comply with requirements in ASHRAE 15 and in applicable portions of ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

J. Electrical:
1. Provide factory-installed phase loss safety device for 3-phase units. Provide each motor with overcurrent protection.
2. Configure unit for single point connection, include terminal for field-installed components. NEMA KS 1, heavy-duty, non-fused disconnect switch.
3. Provide branch power circuit to each motor and to controls with one of the following disconnecting means:
   a. NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 60947-4-1.
   b. NEMA AB 1, motor-circuit protector (circuit breaker) with field-adjustable, short-circuit-trip set point.

K. Unit Controls: DDC.
1. Application Specific Controller; see Section 25 1400 unless factory-provided.
2. Tested to monitor and handle sequencing functions and other operational modes using supplied field mounted sensors and switches.
3. Controller Interface:
   a. Unit mounted device with monitoring display.
   b. Pushbutton or key operated for local control and configuration.
      1) Date and time.
      2) Operating or alarm status.
      3) Fault history with not less than last 20 faults displayed.
      4) Set points of controllable parameters.
      5) Operating hours.
      6) Temperature and pressure of operating set points.
      7) Entering- and leaving-fluid temperatures of evaporator and condenser.
      8) Difference in fluid temperatures of evaporator and condenser.
      9) Refrigerant pressures in evaporator and condenser.
      10) Refrigerant saturation temperature in evaporator and condenser.
      11) No cooling load condition.
      12) Elapsed time meter (compressor run status).
      13) Percent of maximum motor amperage.
      14) Current-limit set point.
      15) Compressor refrigerant suction and discharge temperature.
      16) Phase current.
      17) Percent of motor rated load amperes.
      18) Phase voltage.

19) Manual or automatic startup and shutdown time schedule.
20) Entering and leaving chilled-water temperatures, control set points, and motor load limits. Chilled-water leaving temperature shall be constant.
21) Current limit and demand limit.
22) Condenser-fluid discharge temperature control.
23) External HRC emergency stop.
24) Anti-recycling timer.
25) Automatic lead-lag switching.

c. BAS interface: Factory-installed hardware and software to enable the BAS to enable/disable, monitor and display WWHP status and alarms. Provide dry contacts for binary signals for Enable/Disable and Status.
d. Flow switches and differential pressure sensors as required for internal safeties.

4. Coordination and Sequencing:
   a. Internal Devices: Include compressors, sensors, switches, valves, safeties, other components.
   b. Field-Installed Devices: Solenoid valves, EWT sensors, LWT sensors, load-pump contact, source pump contact, and other devices required for operation.
   c. Safeties: At minimum include anti-short-cycle compressor protection, condensate overflow, refrigerant high-pressure, refrigerant low-pressure, loss-of-charge, and refrigerant freeze protection.
5. Power:
   a. Factory-mounted and internally-wired into nonfused electrical disconnect.
   b. Configure safety-lockout circuits to be reset either using reset switch or power cycling.
   c. Control transformer: 24 VAC/VDC, include minimum of 10 VA spare load capacity for potential field use.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that available power supply complies with equipment specifications.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Ensure electric utility connections are achieved in an orderly and expeditious manner.

C. Verify that equipment is undamaged, including refrigerant components and shipped loose items.

3.03 INSTALLATION

A. Install equipment in accordance with manufacturer's written installation instructions.

B. Unit Mounting:
   1. Ground or Surface-Mount: Include vibration-isolated support base; see Section 23 0548.
   2. Do not obstruct maintenance access to equipment by any type of piping, electrical conduit, or any other utility.

C. Evaporator Fluid Connections: Connect to evaporator inlet with shutoff valve, strainer, flexible connector, thermometer, and plugged tee with pressure gage. Connect to evaporator outlet with shutoff valve, balancing valve, flexible connector, flow switch, thermometer, plugged tee with shutoff valve and pressure gage, and drain connection with valve. Make connections to unit with a flange or mechanical coupling.

D. Condenser Fluid Connections: Connect to condenser inlet with shutoff valve, strainer, flexible connector, thermometer, and plugged tee with pressure gage. Connect to condenser outlet with shutoff valve, balancing valve, flexible connector, flow switch, thermometer, plugged tee with shutoff valve and pressure gage, and drain connection with valve. Make connections to unit with a flange or mechanical coupling.

E. Refrigerant Pressure Relief Device Connections: For units installed indoors, extend vent piping to the outdoors without valves or restrictions. Comply with ASHRAE 15. Connect vent to unit pressure relief device with flexible connector and dirt leg with drain valve.

F. Electrical: Provide equipment raceway, wiring, and cables; see Section 26 0583.

G. Install and wire complete in EMT any loose shipped sensors.

H. Charge with refrigerant and fill with oil if not factory installed.

I. Start system and adjust controls and equipment for satisfactory operation.

J. Adjust water temperature control system and place in operation so that water quantities circulated are as required.

3.04 FIELD QUALITY CONTROL

A. Engage a factory-authorized service representative to provide startup service. Startup personnel shall not be employees of the installing contractor nor tradesmen temporarily employed by the installing contractor. Startup personnel shall have completed the most current factory training and certifications for the specific model of the WWHP being installed. Startup service shall be included in the Project by the WWHP manufacturer via the WWHP manufacturer’s authorized representative.

B. Upon completion and before final acceptance of work, test each system to demonstrate compliance with the contract requirements.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Verify that refrigerant charge is sufficient and the unit has been leak tested. Check bearing lubrication and oil levels.
   3. Operate unit for a short run-in period.
   4. Verify and record performance of fluid flow and low-temperature interlocks for evaporator and condenser.
   5. Adjust controls and balance systems prior to final acceptance of completed systems.
   6. Test controls through every cycle of operation.
   7. Test safety controls to demonstrate performance of required function.
   8. Furnish water, electricity, instruments, connecting devices, and personnel for tests.
   9. Clean equipment, piping, strainers, ducts, and filters.
   10. Coordinate testing with testing of related piping, specified elsewhere.
   11. Correct defects in work and repeat tests.

C. Operational Testing: After demonstration of satisfactory operation perform operational testing:
   1. Test each item of equipment in operation for continuous period of not less than 24 hours under every condition of operation in accordance with equipment manufacturer's recommendations.

2. Verify that each item of equipment operating parameters are within limits recommended by the manufacturer.
3. Manufacturer's Recommended Test: Conduct the manufacturer's recommended field testing; provide a factory trained field representative authorized by and to represent the equipment manufacturer during the complete execution of the field testing.

D. Startup and Operational Testing service shall not be less than 16 hours total time on job site, spread over at least five calendar days, for each unit installed and shall continue until such time as the Engineer of Record determines that the equipment operation and startup is satisfactory.

E. See Section 23 0593 for additional testing, adjusting, and balancing (TAB) requirements of piping, equipment, and controls.

F. Startup Report: Identify in writing every single setting that is adjustable (controller settings and physical settings such as knobs and dipswitches). Identify measured water temperatures, outdoor air temperature, quantity of boilers operating, water flow rates, water temperature in and out, refrigerant pressures and temperatures, oil pressures and temperatures on the written documentation.
1. Report all results in writing directly to the Engineer of Record within 12 hours of the each measurement being taken. Telephone and fax the written results directly to the Engineer of Record.
2. The startup technician shall directly telephone the Engineer of Record 24 hours prior to arrival at the Project Site and once every day while on the Project Site to verbally report on the status and issues.
3. Failure to contact the Engineer of Record as required shall negate any startup work performed. Repeat of negated work shall be included at no additional cost nor schedule delay.

G. Within 30 calendar days after acceptable completion of testing, submit each test report for review and approval; include:
1. Unit nameplate data and actual voltage and ampere consumption.
2. Load-side supply and return water flow and temperatures and measurement equipment.
3. Source-side supply and return water flow and temperatures and measurement equipment.
4. Ambient air temperature at heat pump unit.
5. Date, name, and signature of person testing and reporting.

3.05 CLOSEOUT ACTIVITIES

A. Training: Upon completion of work and at time designated by Architect, provide services of water source heat pump manufacturer's technical representative for period of not less than one 8-hour working day for instruction of Owner's operating personnel in proper operation and maintenance of equipment.

3.06 OCCUPANCY ADJUSTMENTS

A. When requested by the Owner or the Engineer of Record, within 18 months of Substantial Completion, provide on-site assistance adjusting the system to suit actual occupied conditions. Provide up to six visits to the project site for this purpose. Project site visits for occupancy adjustment shall commence within 72 hours of when requested and shall be staffed appropriately such that they are fully completed within 48 hours of arrival on the Project site.

B. The above on-site occupancy adjustment assistance shall be performed by direct factory employees of the unit manufacturer unless otherwise requested in writing by the Engineer of Record. The unit shall be “restarted up” at the end of each of the visits with all new complete written documentation of setpoints, operability, and capacity characteristics provided prior to the technician leaving the project site.

C. The factory technician shall directly telephone the Engineer of Record 24 hours prior to arrival at the Project Site and once every day while on the Project Site to verbally report on the status and issues. Failure to contact the Engineer of Record as required shall negate any startup work performed. Repeat of negated work shall be included at no additional cost nor schedule delay.

END OF SECTION 23 8241

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CONSTRUCTION DOCUMENT CODE AND LIFE SAFETY SUMMARY
12.15.25

Applicable Codes	2014 Indiana Building Code • 2012 IBC w Indiana Amendments 2014 Indiana Mechanical Code • 2012 IMC w Indiana Amendments 2014 Indiana Fire Code • 2012 IFC w Indiana Amendments 2012 Indiana Plumbing Code • 2006 IPC w Indiana Amendments 2009 Indiana Electrical Code • 2008 NFPA 70 2010 Indiana Energy Conservation Code • ASHRAE 90.1 2007 w Indiana Amendments • *2010 Required for LEED Baseline Purposes* 2011 Indiana Elevator Safety Code • Updated 6/10/24 2009 ICC A-117.1 Accessibility Code NFPA 13, 2010 Edition NFPA 72, 2010 Edition
Project Scope	The preliminary project scope includes construction of a new, freestanding 5-story + mechanical penthouse building, with approximately 150,000 sq ft of total floor area (incl penthouse). The building will be comprised of a combination of research and teaching labs, classrooms, administrative space, and ancillary support functions.
Occupancy Classifications	Educational use areas for students beyond the 12th grade, classrooms and labs with an occupancy load of less than 50 each. • B Occupancy [304.1] Office and administrative space, assembly functions with an occupant load of less than 50 each, including conference rooms • B Occupancy [304.1, 303.1.2] Classrooms or other assembly functions with an occupancy load of 50 or more. • A-3 Occupancy; nonseparated [303.4, 508.3]
Occupant Load Factors	• Conference/Collaboration/Lounge 15 sf/occ • Classrooms/Seminar Rooms 20 sf/occ • Vocational/Studio/Instructional Labs 50 sf/occ • Office/Research Labs 100 sf/occ • Storage/Mechanical 300 sf/occ
Code Strategy	Type IB • IB allows nonseparated occupancies • Automatic sprinkler systems throughout.
Construction Type	Type IB (noncombustible, fire-resistive) Construction [Table 601]

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Allowable Area for Type IB Construction	Unlimited area permitted for Type IB Construction, non-separated occupancies [Table 503]
Allowable Height for Type IB Construction	12 stories above grade maximum height permitted [503, 504.2]
Building Elements for Type IB Construction	[Table 601] Structural Frame **2** hours Structural Frame Supporting Roof **1** hours Floor Assemblies **2** hours Roof Assemblies >20' above floor **0** hours <20' above floor **1** hour Interior Partitions **0** hours Exterior Walls [Table 602] **0** hours / 1 if <30 feet Unlimited exterior openings permitted based upon a fire separation distance of at least 20 feet – UP/S [Table 705.8] Penthouse walls and roofs are not required to have a fire-resistance rating based on a fire separation distance of 20 feet or greater. Penthouse structural columns supporting a non-rated roof assembly are also not required to have a fire-resistance rating. [1509.2.5, exception 1]
Approved Variance Requests	• Permit penthouse to exceed 1/3 roof area of supporting story. • 90-minute egress fire curtain (UL 10B) at 2nd and 3rd levels openings in 2-hour fire rated shaft wall at multi-story lobby space. • Two-way elevator lobby communication. • Design to 2018 IBC for Higher Education Laboratories (a more modern code). • Remove the fire-rated door and wall separation between Stair A and the exit passageway based upon the passageway not having any other openings from other building areas. • Permit the rated shaft at the multi-story lobby space to include the volume of the 1st floor level.
Higher Education Laboratory Suites *(approved variance to design to 2018 IBC, Section 428)*	• Higher education laboratories will be provided on each floor as necessary to maintain quantities of hazardous materials within maximum permitted quantities per IBC/IFC • Each laboratory suite will be separated from other portions of the building with a 1-hour fire barrier on the First through Fifth Levels. Floors supporting laboratory suites are to be 2-hour per Construction Type. [428.3.1, 428.3.3 Table 428.3] • The total amount of hazardous materials on each floor of the building are as follows: [Table 428.3] o 1st-2nd Level – 100% permitted in each lab suite. o 3rd Level – 100% permitted in each lab suite. o 4th-6th Level – 75% permitted in each lab suite. • The permitted number of lab suites per floor are as follows:

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	o First Level – 6 o Second Level – 6 o Third Level – 4 o Fourth Level – 4 o Fifth Level – 4
Shaft Enclosures/Floor Penetrations	• Exit stairways are required to be enclosed with a 2-hour fire barrier [1022.2] • Vertical shafts through floors are required to be enclosed in 2-hour construction based upon a 2-hour floor rating. [712, 713.4] • Shafts are required to terminate at the bottom and top as specified in Sec. 713.11 and 713.12 – shafts are permitted to terminate within a complying penthouse without protection at the point of penetration. • Utility penetrations of floors by other than ducts are required to be provided with a listed firestop assembly unless meeting exceptions noted [714.4.1.1] • Ducts penetrating a single floor are permitted to be equipped with a fire damper at the floor level – ducts penetrating more than a single floor are required to be enclosed in a 2-hour enclosure. [717.6.1]
Mixed Use Occupancies	Mixed-use separations are not required based upon compliance with non-separated occupancies. [508.3]
Vertical Openings Open to First Floor *(multi-story lobby space)*	• Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted. • Shafts connecting 4 or more stories shall be protected from adjacent spaces with 2-hour fire barriers, with openings permitted for fire barriers in accordance with Section 707 and 716. • Shafts that do not extend to the bottom of the building or structure shall be enclosed at the lowest level with construction of the same fire-resistance rating as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure. Variance approved to permit the rated shaft to include the volume of the 1st floor level [713.11, exception 1] • Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall but shall not be limited to 156 square feet where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. [707.6, exception 1] • Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 716.5.1, 716.5.2 or 716.5.3. Fire door frames with transom lights, sidelights or both shall be permitted in accordance with Section 716.5.6. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

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	passageway. Variance approved to eliminate due to no other openings from other areas of the building into the exit passageway. [1022.3.1] • Minimum width shall be determined as specified in Section 1005.1 but such width shall not be less than 44 inches. The required width of exit passageways shall be unobstructed. [1023.2] • Walls, floors and ceilings shall have a 2-hour fire rating to match the connecting interior exit stairway. [1023.3]
Exit Travel Distance	Exit access travel distance is permitted to be a maximum of 250 feet for A Occupancy areas and 300 feet for B Occupancy areas [Table 1016.2]
Common Path of Travel	The common path of travel is permitted to be a maximum of 75 feet for A Occupancies and 100 feet for B Occupancies [1014.3]
Panic Hardware	• Panic hardware is required for locking/latching doors serving A Occupancy spaces. • Panic hardware required for electrical rooms with equipment rated 1,200 amps or more and over 6 feet in width that contains over-current devices. • Panic hardware not required for B occupancies. [1008.1.10]
Sprinkler System	NFPA 13 sprinkler system to be provided throughout the building [903.3]
Standpipes	• Class I standpipe system required based upon a floor elevation located more than 30 feet above lowest level of fire department access. [905.3.1] • The system is permitted to be a manual wet system with pressure provided by fire department pumper. • Standpipe outlets are required at the intermediate floor level landing within stair enclosures, with additional outlets required as necessary to limit hose distance from any point to the exit door into the stair to a maximum of 200 feet. [905.4]
Fire Alarm System	Fire alarm system is required throughout – manual pull stations are not required based upon automatic sprinkler initiation of the system. [907.2.1, 907.2.2, exception]
Smoke Detectors	• Required for automatic shutdown of HVAC systems delivering in excess of 2000 cfm, smoke detecrors shall be installed in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances. [606, IMC] • Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to the fire alarm system in accordance with the International Fire Code. The area smoke detection system shall comply with Section 606.4. • Required for elevator recall [3003.2]
Elevator Emergency Power	At least one elevator accessing all floors above the 4th level shall be required to be on emergency power as an accessible means of egress.

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	[1007.2.1]
Elevator Venting	The elevator is not required to be provided with venting, based upon automatic sprinkler protection throughout the building [3004.1, exception 1]
Elevator Lobby Vestibules	Elevator Lobby Vestibules are not required [713.14.1]
Elevator Size	At least one elevator accessing all floors is required to be sized to accommodate an ambulance stretcher [3002.4]
Plumbing Fixtures	The number of plumbing fixtures provided in the building is allowed to be based upon an actual maximum occupant load in lieu of a calculated occupant load. [2902.1.1, exception 2, IBC]

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	• Minimum fire door and fire shutter assembly ratings for 2-hour required wall assemblies: o 1 1/2 hours (90 minutes) o 100 sq. in. maximum door vision panel size o 2-hour (W-120) minimum sidelight/transom assembly (fire protection not permitted) [Table 716.5] • Windows to be protected using a U.L. listed 2-hour window sprinkler system (sprinklers on interior and exterior face of glass) based on ICC Evaluation Service (ESR-2397) per approval by Authorities Having Jurisdiction.
Elevator Hoistways	Elevator shafts and machine rooms will be enclosed with 2-hour construction to omit sprinkler protection. [903.3.1.1.1]
Incidental Uses	• Boiler/Mechanical rooms with boilers over 15 psi are required to be separated with a nonrated separation consisting of wall construction to the deck, and self-closing doors [Table 509] • Incidental uses shall not occupy more than 10% of the building area of the story in which it is located. [509.3]
Electrical Rooms	• Electrical vault (greater than 600 volts) is required to be provided with a 3-hour separation (non-sprinklered) [110.31(a), IEC] • Transformer rooms (greater than 112.5 kVA) are required to be separated with a 1-hour rating, unless insulation with a Class 155 rating or better is provided and the transformer is enclosed [450.41, IEC] • Switchgear over 35,000 volts – see 230.212, IEC • Electrical rooms without sprinkler protection are required to be separated with 2-hour construction per NFPA 13.
Fire Pump Room	1-hour fire barrier required to separate the fire pump room from adjacent space. [913.2.1, exception 1]
Fire Command Center	Not required, as the building is not high-rise per IBC definition.
Fire and Smoke Dampers	• Fire dampers are required for duct penetrations of rated shafts and 2-hour fire barriers, or at the floor level where a duct penetrates a single floor. [717.5] • Exception for subducts in an exhaust shaft [717.5.3, exception 1.1] • Smoke Dampers not required [717]
Egress Corridors	Corridors are permitted to be of nonrated construction throughout, based upon sprinkler protection [Table 1018.1]
Exit Passageways	• Interior exit stairway shall be permitted to terminate at an exit passageway complying with Section 1023, provided the exit passageway terminates at an exit discharge or a public way. [1022.3, exception] • Interior exit stairway shall be separated from the exit passageway by a fire barrier. The fire-resistance rating shall be 2-hour to match the interior exit stairway. A 1 1/2 hour (90 minute) fire door assembly shall be installed in the fire barrier to provide a means of egress from the interior exit stairway to the exit

BUILDING CODE SUMMARY

PROJECT INFORMATION

NAME OF PROJECT: LAUNCH ACCELERATOR FOR BIOSCIENCES
ADDRESS: INDIANAPOLIS, IN

PROJECT DESCRIPTION: 5 STORY ACADEMIC RESEARCH BUILDING
+ MECHANICAL PENTHOUSE; 150,000 SF

OWNER: INDIANA UNIVERISTY, RICH THOMPSON
PHONE / EMAIL: 812.855.0108 / rithomps@iu.edu

DESIGN PROFESSIONAL:

ARCHITECT: BSA
ADDRESS: 175 S. RANGELINE RD, SUITE 200
CARMEL, IN 46032

CONTACT: ANDREW LOUGH
317.695.3331 / alough@bsadesign.com

4

Gross Square Footage (GSF)	
LEVEL	AREA
LEVEL 1	45,036 SF
LEVEL 2	24,548 SF
LEVEL 3	24,330 SF
LEVEL 4	24,104 SF
LEVEL 5	24,105 SF
PENTHOUSE	8,906 SF
	151,031 SF

BUILDING AREA AND OCCUPANCY LOAD SCHEDULE

FUNCTION OF SPACE (TABLE 1004.5)	AREA	OCCUPANT LOAD FACTOR	NET/GROSS	# OF OCCUPANTS
PENTHOUSE				
Accessory storage areas, mechanical equipment room	7,878 SF	300 SF	GROSS	28
Business areas	376 SF	100 SF	GROSS	5
	8,254 SF			33
LEVEL 5				
Accessory storage areas, mechanical equipment room	883 SF	300 SF	GROSS	7
Business areas	22,360 SF	100 SF	GROSS	222
	23,244 SF			229
LEVEL 4				
Accessory storage areas, mechanical equipment room	882 SF	300 SF	GROSS	7
Business areas	19,859 SF	100 SF	GROSS	200
Educational: Shops and vocational room areas	2,566 SF	50 SF	NET	52
	23,307 SF			259
LEVEL 3				
Accessory storage areas, mechanical equipment room	882 SF	300 SF	GROSS	7
Assembly without fixed seats: Unconcentrated (tables and chairs)	2,512 SF	15 SF	NET	168
Business areas	18,233 SF	100 SF	GROSS	183
Educational: Shops and vocational room areas	1,898 SF	50 SF	NET	38
	23,525 SF			396
LEVEL 2				
Accessory storage areas, mechanical equipment room	632 SF	300 SF	GROSS	6
Assembly without fixed seats: Unconcentrated (tables and chairs)	5,363 SF	15 SF	NET	337
Business areas	20,135 SF	100 SF	GROSS	174
	26,130 SF			517
LEVEL 1				
Accessory storage areas, mechanical equipment room	9,799 SF	300 SF	GROSS	37
Assembly without fixed seats: Unconcentrated (tables and chairs)	8,471 SF	15 SF	NET	566
Business areas	20,299 SF	100 SF	GROSS	208
Educational: Shops and vocational room areas	4,788 SF	50 SF	NET	97
	43,367 SF			888
TOTAL BUILDING AREA	147,818 SF			2332

			FLOOR	01		02		03		04		05	
			ACTUAL OCCUPANT LOAD	844		568		390		268		242	
				REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED
B OCCUPANCY[1]	WATER CLOSETS*	1 PER 25 FOR THE FIRST 50 AND 1 PER 50 OVER 50		10	13	11	9***	9	9	8	9	8	9
	LAVATORIES	1 PER 40 FOR THE FIRST 80 AND 1 PER 80 OVER 80		6	10	8	9	6	9	6	9	6	9
	DRINKING FOUNTAINS[2]	1 PER 100		4	1	6	1	4	1	3	1	3	1
	SERVICE SINK			1	1	1	1	1	1	1	1	1	1
A-3 OCCUPANCY[1]	WATER CLOSETS**	MEN: 1 PER 125 WOMEN: 1 PER 65		-	-	6	8	-	-	-	-	-	-
	LAVATORIES	1 PER 200		-	-	4	7	-	-	-	-	-	-
	DRINKING FOUNTAINS[2]	1 PER 500		-	-	1	-	-	-	-	-	-	-
	SERVICE SINK												

1. RATIO : 50% MALE ; 50% FEMALE
2. BOTTLE FILLING STATIONS PROVIDED ON EACH FLOOR FREE TO OCCUPANTS. DRINKING FOUNTAINS NOT REQUIRED [TABLE 2902.1, FOOTNOTE H].
* URINALS SHALL NOT BE SUBSTITUTED FOR MORE THAN 50% OF THE REQUIRED MALE WATER CLOSETS.
** URINALS SHALL NOT BE SUBSTITUTED FOR MORE THAN 67% OF THE REQUIRED MALE WATER CLOSETS.
*** SECOND FLOOR WATER CLOSET COUNT UTILIZES (2) WATER CLOSETS FROM FIRST FLOOR WATER CLOSET COUNT [2902.3.2].

RESTROOM FIXTURE SCHEDULE

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
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SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP3-CD: CORE AND SHELL PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP3-CD: CORE AND SHELL PACKAGE
1	09/29/2025	BP1-CD: SITE AND FOUNDATION PACKAGE

TABLE 414.2.2 DESIGN AND NUMBER OF LABORATORY SUITES

PER IBC 2018 TABLE 428.3 (MODIFIED FROM TABLE 414.2.2)

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER HELS	NUMBER OF HELS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIER IN HOURS
ABOVE GRADE PLANE	21+	NOT ALLOWED	NOT PERMITTED	NOT PERMITTED
	16 - 20	25	1	2[a]
	11 - 15	50	1	2[a]
	7 - 10	50	2	2[a]
	4 - 6	**75**	**4**	**1**
	3	**100**	**4**	**1**
	1 - 2	**100**	**6**	**1**
BELOW GRADE PLANE	1	75	3	1
	2	50	2	1
	LOWER THAN 2	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED

NOTE: PERCENTAGES SHALL BE THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA SHOWN IN TABLE 307.1(1) AND 307.1(2).

a. VERTICAL FIRE BARRIERS SEPARATING LABORATORY SUITES FROM OTHER SPACES ON THE SAME FLOOR SHALL BE PERMITTED TO BE 1-HOUR FIRE-RESISTANCE RATED.

HIGHER EDUCATION LABORATORY SUITES - MAQs

HIGHER EDUCATION LABORATORY SUITES (HELS)						
FLOOR		01	02	03	04	05
NUMBER OF HELS / CONTROL AREAS		4	3	2	2	2
FIRE RESISTANCE BARRIER IN HOURS		1	1	1	1	1
PERCENTAGE OF MAXIMUM ALLOWABLE QUANTITIES		100%	100%	100%	75%	75%
MAXIMUM ALLOWABLE QUANTITIES OF HAZARDOUS MATERIALS PER CONTROL AREA*						
COMBUSTIBLE LIQUIDS (gallons)						
CLASS II	480 gallons	480	480	480	360	360
CLASS IIIA	1,320 gallons	1,320	1,320	1,3020	990	990
CLASS IIIB	unlimited	unlimited				
FLAMMABLE LIQUIDS (gallons)						
CLASS IA	120 gallons	120	120	120	90	90
CLASS IB AND IC	480 gallons	480	480	480	360	360
COMBINATION 1A/1B/1C	480 gallons	480	480	480	360	360
FLAMMABLE GASES (NTP) (cubic feet)	4,000 cubic feet	4,000	4,000	4,000	3,000	3,000
INERT GAS (NTP)	unlimited	unlimited				
OXIDIZING GASES	6,000 cubic feet	6,000	6,000	6,000	4,500	4,500
* BUILDING EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM AND HAZARDOUS MATERIALS STORED IN APPROVED STORAGE...						

HIGHER EDUCATION LABORATORY SUITES

EGRESS CALCULATIONS - PRELIMINARY

Floor	Occupancy Use	Area	Occ Load (SF/Person)	Total Occ Load	Inches of Exit Width Required				Inches of Exit Width Provided		
					In/Pers	Stairs	In/Pers	Doors	Stairs	Horiz	Doors
PH level	Mech/Stg	**7,878**	300	26							
	Business	**376**	100	4							
		8,254		**30**	0.2	6.00	0.15	4.50	114	0	66
5th level	Mech/Stg	**883**	300	3							
	Conference/Collab	**222**	15	15							
	Business	**22,138**	100	221							
		23,243		**239**	0.2	47.82	0.15	35.87	114	0	66
4th level	Mech/Stg	**882**	300	3							
	Business	**19,859**	100	199							
	Lab - Instructional	**2,566**	50	51							
		23,307		**253**	0.2	50.57	0.15	37.93	114	0	66
3rd level	Mech/Stg	**882**	300	3							
	Conference/Collab	**2,512**	15	167							
	Business	**18,233**	100	182							
	Lab - Instructional	**1,898**	50	38							
		23,525		**391**	0.2	78.14	0.15	58.60	114	0	66
2nd level	Mech/Stg	**632**	300	6							
	Conference/Collab	**3,825**	15	255							
	Business	**20,178**	100	204							
	Terrace	**1,419**	15	95							
		26,054		**560**	0.2	111.92	0.15	83.94	114	0	144
1st level	Mech/Stg	**9,730**	300	37							
	Conference/Collab	**7,603**	15	507							
	Restaurant	**597**	15	40							
	Business	**20,639**	100	208							
	Lab - Instructional	**4,788**	50	97							
		43,357		**889**			0.15	133.32	0	0	489

JOHN ANDREW LOUGH
REGISTERED
No. AR10400213
STATE OF
INDIANA
ARCHITECT

CODE SUMMARY

DATE
BSA PROJECT NO. 00360481

G100

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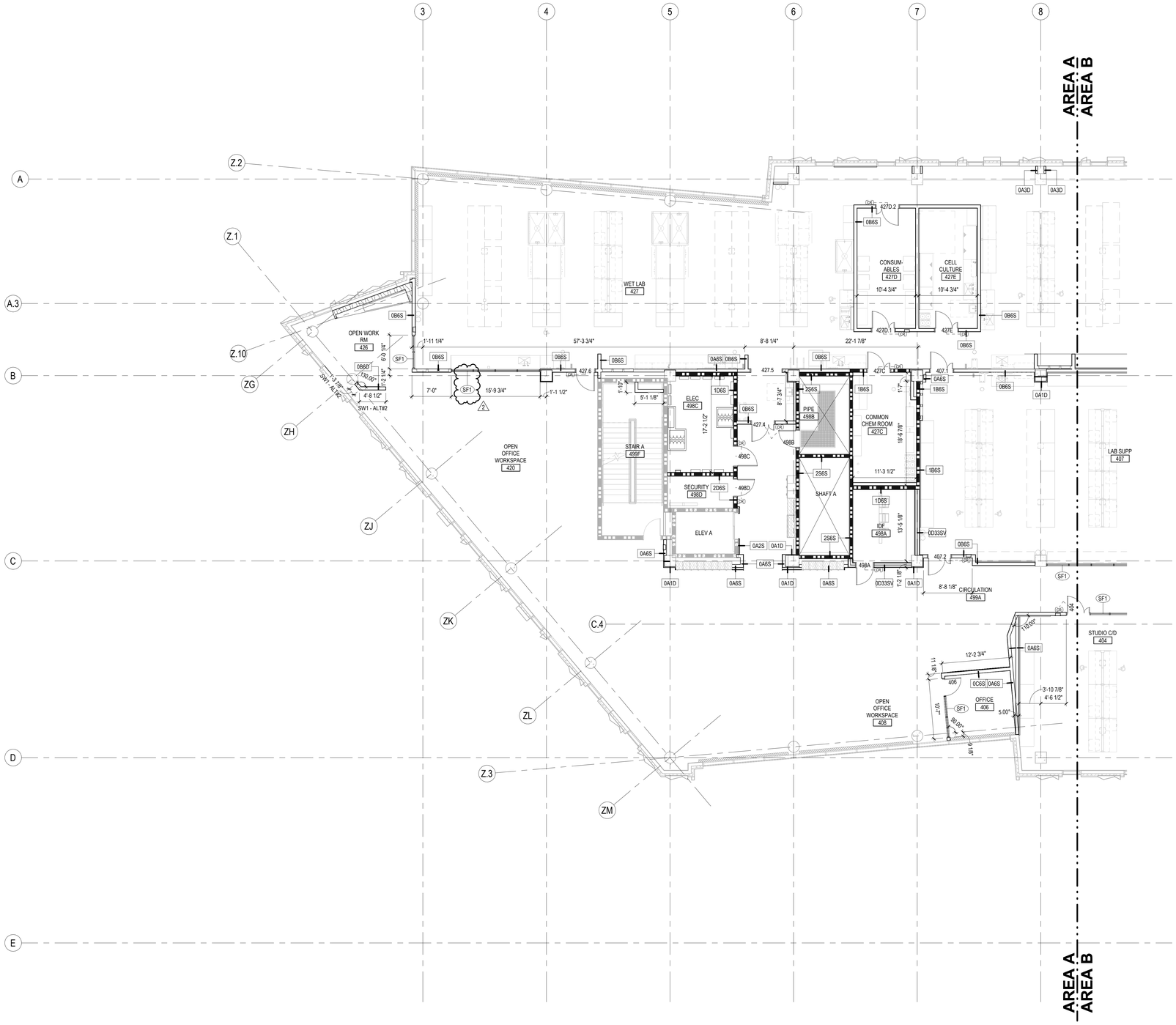

2 A114A DIMENSION FLOOR PLAN - LEVEL 4 - AREA A
1/8" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

1. DIMENSIONS ARE TO FACE OF PARTITION, UNLESS NOTED OTHERWISE.
2. FOR ASYMETRICAL PARTITIONS, INSTALL HIGHER NUMBER OF GYPSUM WALLBOARD LAYERS ON FACE WHERE PARTITION TAG IS LOCATED.
3. INTERIOR PARTITIONS TO BE TYPE **0B6S,** UNLESS NOTED OTHERWISE.
4. GYPSUM WALLBOARD COLUMN SURROUNDS TO BE PARTITION TYPE **0A3D,** UNLESS NOTED OTHERWISE.
5. WHERE GYPSUM WALLBOARD COLUMN SURROUNDS ARE ADJACENT TO CASEWORK, THE DEPTH OF THE COLUMN SURROUND SHALL EXTEND 1" BEYOND FACE OF CABINETS OR EDGE OF COUNTERTOP.
6. STANDARD WALL FURRING AT STAIRWAYS AND ELEVATORS TO BE PARTITION TYPE (___), UNLESS NOTED OTHERWISE.
7. LOCATE DOOR FRAMES 4" FROM ADJACENT PARTITION, UNLESS DIMENSIONED OTHERWISE.
8. INSTALL TWO 33 MIL STUDS TO STRUCTURE ABOVE AT DOOR, BORROWED LITE JAMBS, AND PARTITION CORNER LOCATIONS.
9. SMOKE RESISTANT AND FIRE RESISTANCE RATED ASSEMBLIES TO BE CONTINUOUS ABOVE DOOR AND WINDOW OPENINGS.
10. PROVIDE JOINT FIRESTOPPING WHERE GYPSUM WALLBOARD MEETS APPLIED FIRE PROTECTION ON COLUMNS, BEAMS, AND METAL DECK FOR FIRE RESISTANCE RATED PARTITIONS.

HATCH INDICATES LAB SPACE; REFER TO LAB FURNISHING DRAWINGS FOR ADDITIONAL INFORMATION

WALL RATING LEGEND

- 0B3S — INTERIOR PARTITION TAG - REFER TO PARTITION SCHEDULE
- UNRATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- 1-HOUR FIRE BARRIER
- 1-HOUR FIRE/SMOKE BARRIER
- 2-HOUR FIRE BARRIER
- 2-HOUR FIRE/SMOKE BARRIER
- 3-HOUR FIRE BARRIER

_KEYNOTE SCHEDULE

NUMBER	TEXT

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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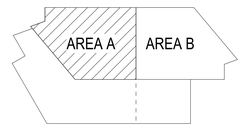
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

DIMENSION PLAN - LEVEL 4 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A114A

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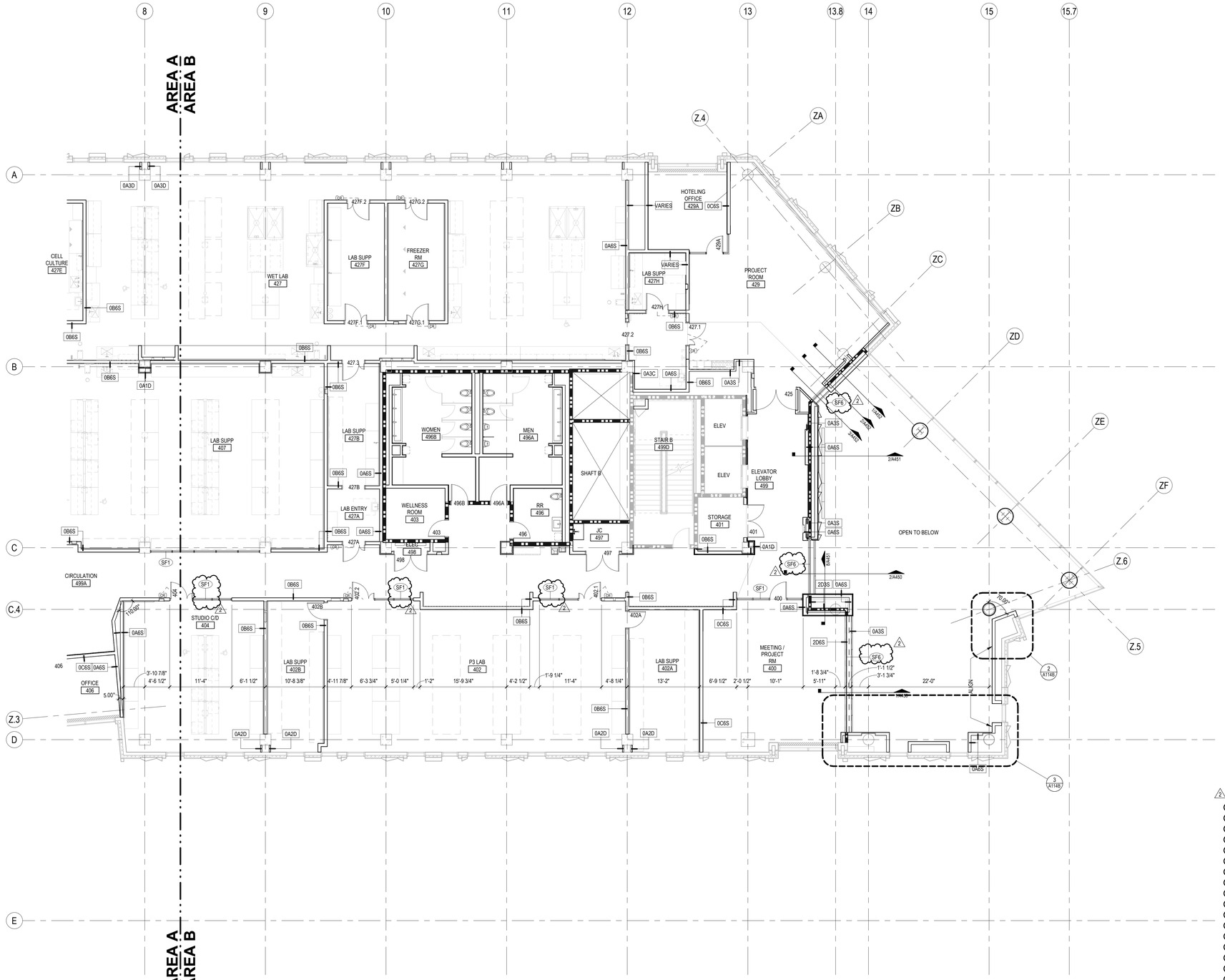
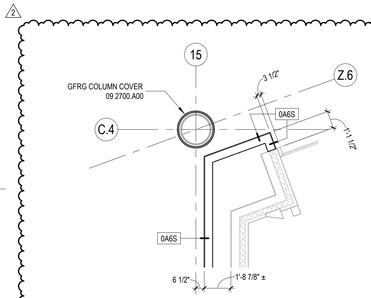
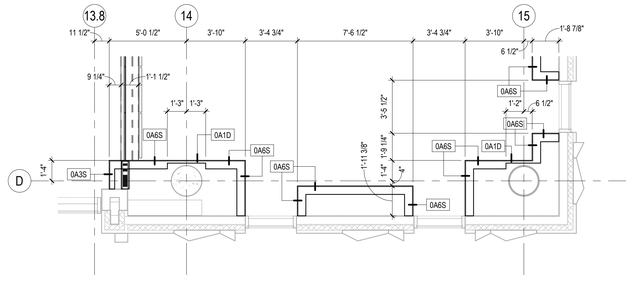


1 A114B DIMENSION FLOOR PLAN - LEVEL 4 - AREA B
1/8" = 1'-0"



2 A114B ENLARGED PLAN - SECOND FLOOR THRU FIFTH FLOOR
1/4" = 1'-0"



3 A114B ENLARGED PLAN - SECOND FLOOR THRU FIFTH FLOOR
1/4" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

1. DIMENSIONS ARE TO FACE OF PARTITION, UNLESS NOTED OTHERWISE.
2. FOR ASYMETRICAL PARTITIONS, INSTALL HIGHER NUMBER OF GYPSUM WALLBOARD LAYERS ON FACE WHERE PARTITION TAG IS LOCATED.
3. INTERIOR PARTITIONS TO BE TYPE **0B6S,** UNLESS NOTED OTHERWISE.
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9. SMOKE RESISTANT AND FIRE RESISTANCE RATED ASSEMBLIES TO BE CONTINUOUS ABOVE DOOR AND WINDOW OPENINGS.
10. PROVIDE JOINT FIRESTOPPING WHERE GYPSUM WALLBOARD MEETS APPLIED FIRE PROTECTION ON COLUMNS, BEAMS, AND METAL DECK FOR FIRE RESISTANCE RATED PARTITIONS.

HATCH INDICATES LAB SPACE; REFER TO LAB FURNISHING DRAWINGS FOR ADDITIONAL INFORMATION

WALL RATING LEGEND

- 0B3S — INTERIOR PARTITION TAG - REFER TO PARTITION SCHEDULE
- UNRATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- 1-HOUR FIRE BARRIER
- 1-HOUR FIRE/SMOKE BARRIER
- 2-HOUR FIRE BARRIER
- 2-HOUR FIRE/SMOKE BARRIER
- 3-HOUR FIRE BARRIER

_KEYNOTE SCHEDULE

NUMBER	TEXT
09 2700.A00	GFRG COLUMN COVER

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Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

JOHN JOSEPH JOHNSON
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

DIMENSION PLAN - LEVEL 4 - AREA B

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

A114B

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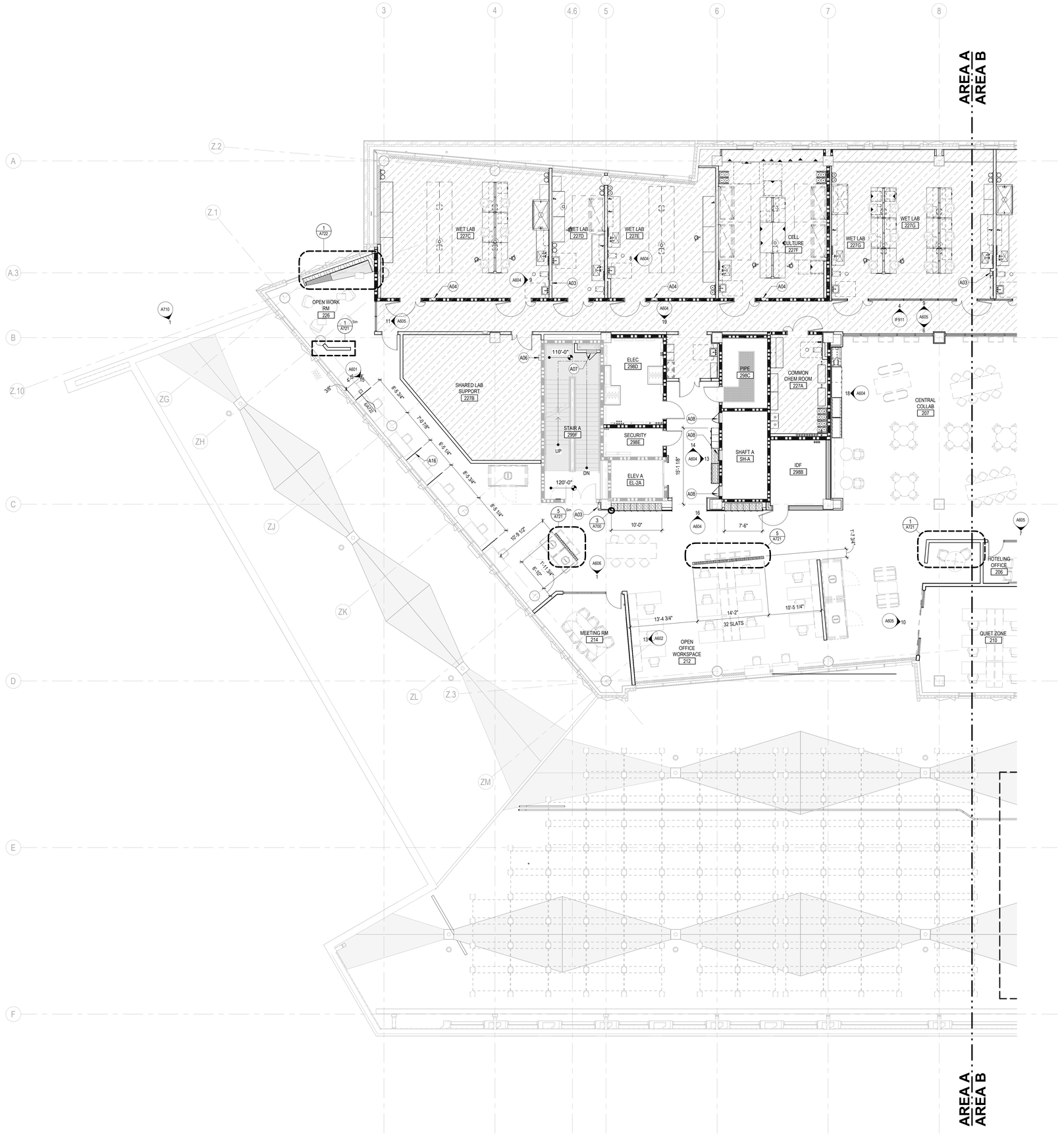

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

1. DIMENSIONS ARE TO FACE OF PARTITION, UNLESS NOTED OTHERWISE.
2. FOR ASYMETRICAL PARTITIONS, INSTALL HIGHER NUMBER OF GYPSUM WALLBOARD LAYERS ON FACE WHERE PARTITION TAG IS LOCATED.
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HATCH INDICATES LAB SPACE; REFER TO LAB FURNISHING DRAWINGS FOR ADDITIONAL INFORMATION

WALL RATING LEGEND

0B3S — INTERIOR PARTITION TAG - REFER TO PARTITION SCHEDULE

- UNRATED PARTITION
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- 1-HOUR FIRE/SMOKE BARRIER
- 2-HOUR FIRE BARRIER
- 2-HOUR FIRE/SMOKE BARRIER
- 3-HOUR FIRE BARRIER

SHEET NOTE SCHEDULE

NUMBER	TEXT
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A04	FIRE-RATED RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A06	SURFACE-MOUNTED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04
A08	24"x36" RATED PANEL. SEE 08 3100.A04
A16	LAWF2. REFER TO 6/A722

2

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LAUNCH ACCELERATOR FOR BIOSCIENCES

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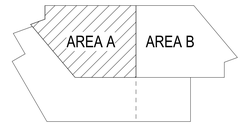
CLIENT PROJECT NO. - 20250072



KEYPLAN

TRUE NORTH

PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN JOHNSON REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

ARCHITECTURAL PLAN - LEVEL 2 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A122A

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1 A122A ARCHITECTURAL FLOOR PLAN - LEVEL 2 - AREA A
1/8" = 1'-0"

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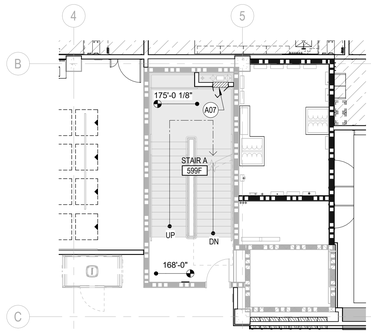
1 A125A ARCHITECTURAL FLOOR PLAN - LEVEL 5 - AREA A
1/8" = 1'-0"



2 A125A PARTIAL FLOOR PLAN - LEVEL 5 - AREA A - CUT ABOVE LANDING
1/8" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

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4. GYPSUM WALLBOARD COLUMN SURROUNDS TO BE PARTITION TYPE **0A3D,** UNLESS NOTED OTHERWISE.
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10. PROVIDE JOINT FIRESTOPPING WHERE GYPSUM WALLBOARD MEETS APPLIED FIRE PROTECTION ON COLUMNS, BEAMS, AND METAL DECK FOR FIRE RESISTANCE RATED PARTITIONS.

HATCH INDICATES LAB SPACE; REFER TO LAB FURNISHING DRAWINGS FOR ADDITIONAL INFORMATION

WALL RATING LEGEND

- 0B3S — INTERIOR PARTITION TAG - REFER TO PARTITION SCHEDULE
- UNRATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- 1-HOUR FIRE BARRIER
- 1-HOUR FIRE/SMOKE BARRIER
- 2-HOUR FIRE BARRIER
- 2-HOUR FIRE/SMOKE BARRIER
- 3-HOUR FIRE BARRIER

SHEET NOTE SCHEDULE

NUMBER	TEXT
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04
A16	

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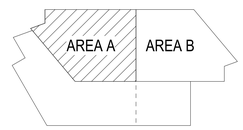
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN [illegible] REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

ARCHITECTURAL PLAN - LEVEL 5 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A125A

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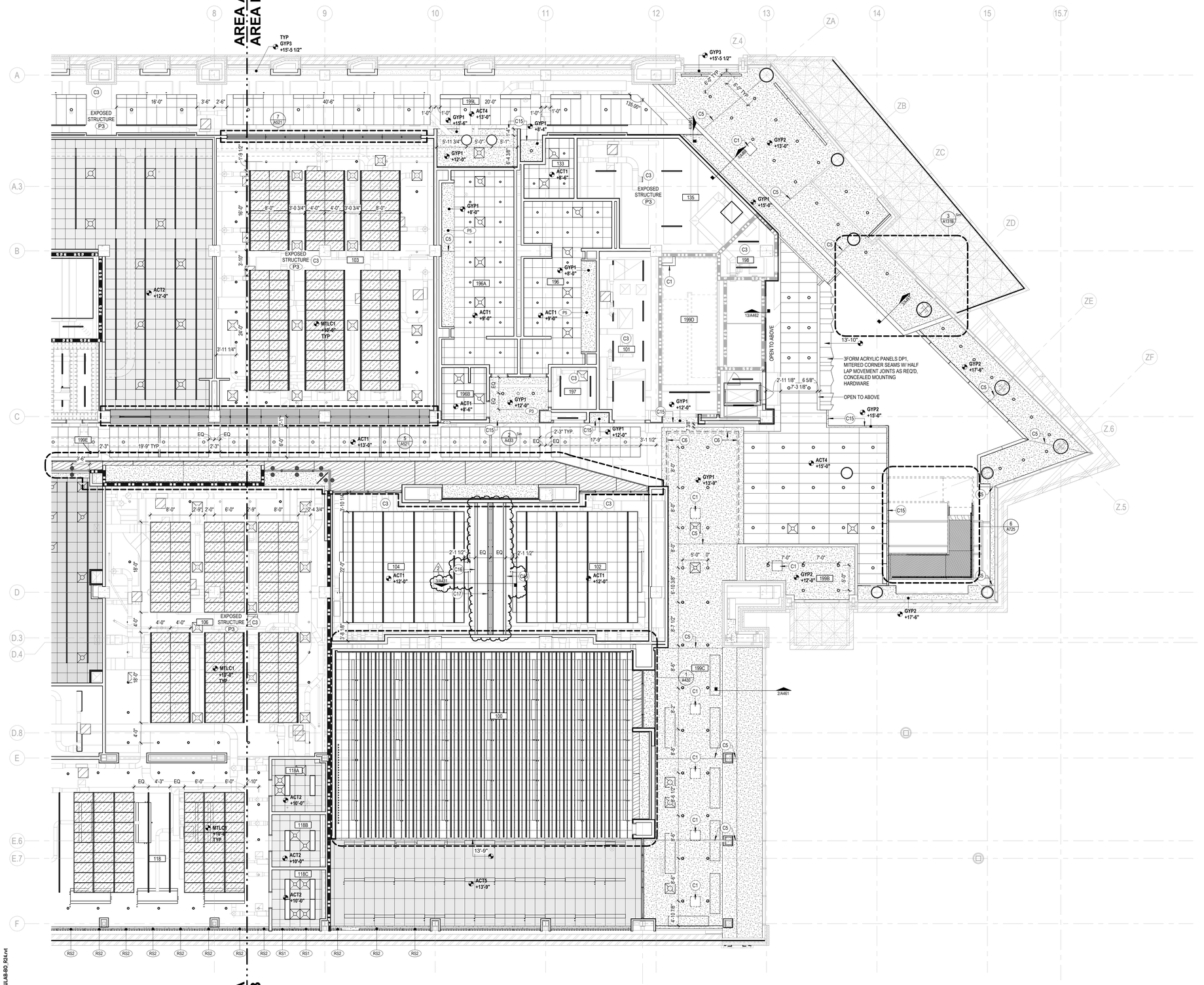
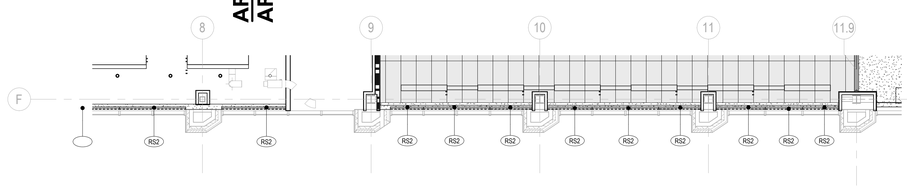
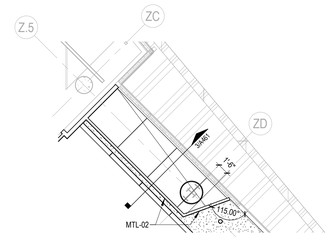


1 RCP - LEVEL 1 - AREA B
A131B 1/8" = 1'-0"



2 RCP - LEVEL 1 - CLERESTORY WINDOW SHADES - AREA B
A131B 1/8" = 1'-0"



3 RCP - LEVEL 1 - AREA B - LOBBY CEILING
A131B 1/8" = 1'-0"

REFLECTED CEILING PLAN LEGEND

REFLECTED CEILING PLAN NOTES

A. GYPSUM BOARD BULKHEADS TO BE INSTALLED AT ____ ABOVE ASSOCIATED LEVEL, UNLESS NOTED OTHERWISE. REFER TO **#/A450** FOR TYPICAL BULKHEAD DETAIL.
B. LOCATE ITEMS IN CENTER OF ACOUSTICAL CEILING TILE, UNLESS INDICATED OTHERWISE.
C. EXPOSED VERTICAL FACES OF SOFFITS/BULKHEADS TO RECEIVE 5/8 INCH GYPSUM WALLBOARD UNLESS INDICATED OTHERWISE.
D. INSTALL CONTROL JOINTS IN GYPSUM WALLBOARD ASSEMBLIES AS INDICATED ON THE FLOOR PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS AND AS REQUIRED IN THE SPECIFICATIONS.
E. LOCATE ALL DEVICES, EQUIPMENT, AND/OR JUNCTION BOXES REQUIRING ACCESS IN ACCESSIBLE CEILING LOCATIONS. AVOID LOCATING ITEMS REQUIRING ACCESS IN INACCESSIBLE CEILINGS OR SHARE ACCESS POINTS. COORDINATE ACCESS PANELS WHERE REQUIRED WITH ARCHITECT PRIOR TO INSTALLATION.
F. FIRE PROTECTION EQUIPMENT SHOWN FOR COORDINATION PURPOSES ONLY. SEE FIRE SUPRESSION DRAWINGS FOR SPRINKLER SYSTEM.
G. MECHANICAL, ELECTRICAL AND PLUMBING ITEMS, INCLUDING LIGHT FIXTURES, MECHANICAL DIFFUSERS AND GRILLES, INDICATED ON REFLECTED CEILING PLANS ARE FOR REFERENCE ONLY.
H. SEAL PENETRATIONS ABOVE AND BELOW ACOUSTICAL TILE CEILINGS IN ISOLATION AND PROCEDURE ROOMS.
I. ALL EXPOSED CEILING ELEMENTS INCLUDING BUT NOT LIMITED TO STRUCTURE, STRUCTURAL DECK, DUCTWORK, CONDUIT, PIPING, AND EQUIPMENT SHALL BE PAINTED P3 ABOVE A 12'-0" DATUM ON LEVEL 1 AND 10'-0" DATUM ON LEVELS 2 AND ABOVE, UNO. INCLUDE PAINTING OF WALL ABOVE THE DATUM NOTED ABOVE, UNO.
J. ALL GYP BD CEILINGS TO BE PAINTED P1 FLAT FINISH, UNO.

CEILING TAG

ACT1 +10'-0" — CEILING TYPE, REFERENCE CEILING SCHEDULE; HEIGHT ABOVE ASSOCIATE LEVEL

OTHER CEILING SYMBOLS

+9'-0" — SPOT ELEVATION SYMBOL & HEIGHT ABOVE ASSOCIATE LEVEL
EXPOSED STRUCTURE P1 — EXPOSED STRUCTURE FINISH
CJ — CONTROL JOINT
RS1 — SINGLE MANUAL ROLLER SHADE 3%
RS2 — SINGLE MOTORIZED ROLLER SHADE 1%
RS3 — SINGLE MOTORIZED ROLLER SHADE 3%
TROUGH STYLE CABLE TRAY WITH LOUVERED BOTTOM. REFER TO SPECIFICATION SECTION 270536

GRAPHIC LEGEND

ACT1		GYP	
ACT2		GYP (2 HOUR RATED)	
ACT3		MTLC1	
ACT4		MTLC2	
ACT5		MTLC3	
ACT6		PERFORATED MTL PNL	

SHEET NOTE SCHEDULE

NUMBER	TEXT
C1	24"x24" ACCESS PANEL. SEE 08 3100.A04
C3	NO CEILING, EXPOSED STRUCTURE AND UTILITIES. PAINT P3. SEE 09 9123
C5	GYP CONTROL JOINT.
C6	GYP BULKHEAD ABV UP TO B/ STRUCT
C15	BULKHEAD PARTITION TO DECK. REF A460.
C16	24"x24" ACCESS PANEL. COORDINATE W/ OPERABLE PARTITION MANUFACTURER'S REQUIREMENTS.
C17	FOLDING PANEL PARTITION. REF SPEC SECTION 10 2239.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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AARON JOHN JOHNSON REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

REFLECTED CEILING PLAN - LEVEL 1 - AREA B

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

A131B

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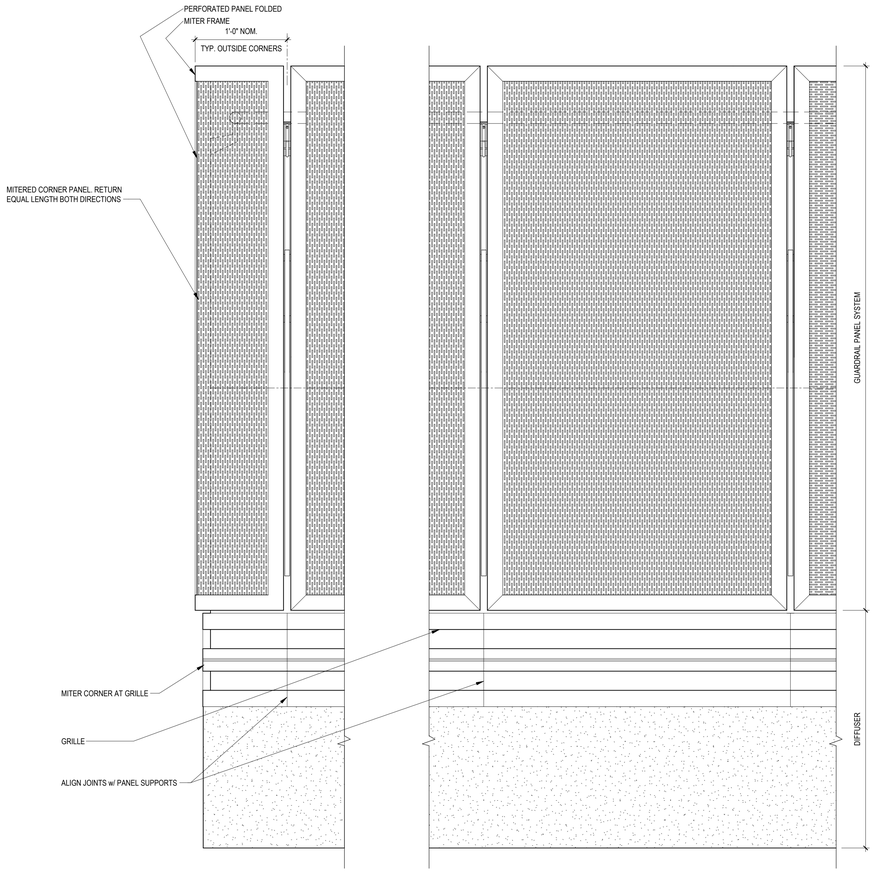
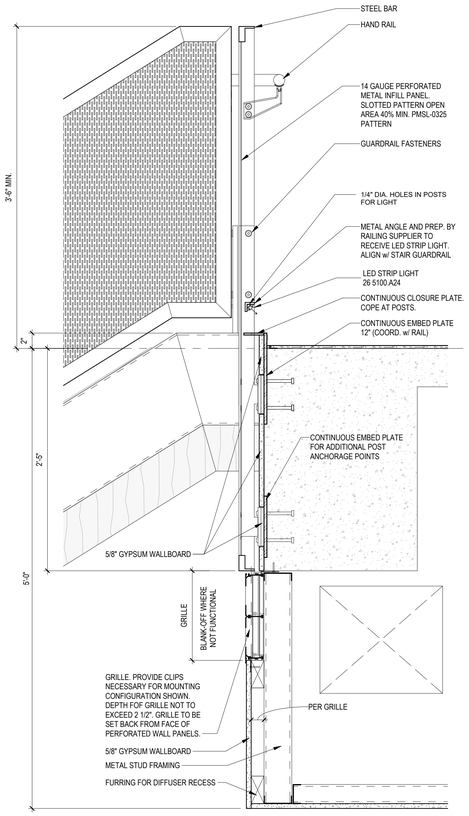
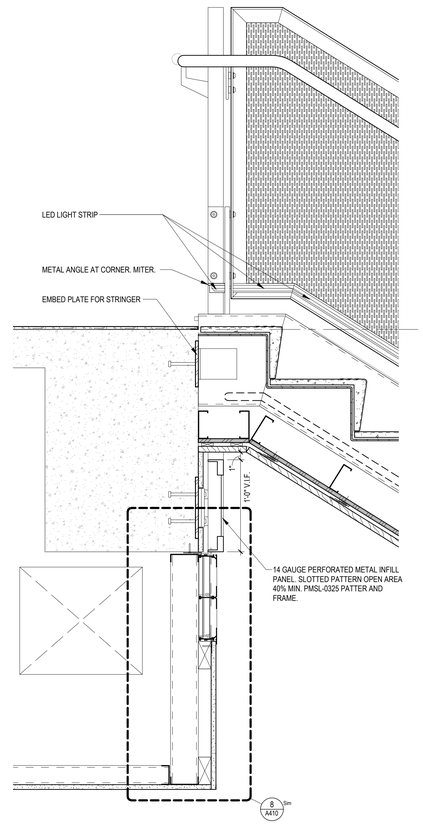


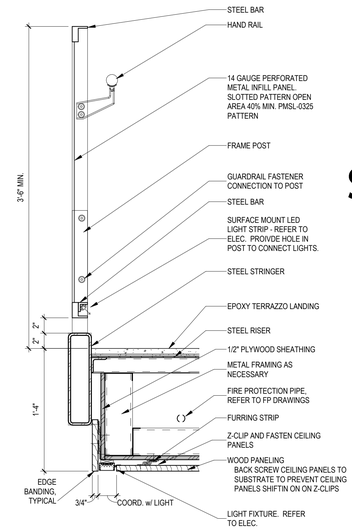
9 A410 RAILING OUTSIDE CORNER AND TYPICAL ELEVATION
1 1/2" = 1'-0"



8 A410 TYPICAL GUARDRAIL DETAIL AT SLAB EDGE
1 1/2" = 1'-0"



7 A410 TYPICAL DETAIL AT SLAB EDGE / STAIR
1 1/2" = 1'-0"



6 A410 TYPICAL RAILING DETAIL AT STAIR LANDING
1 1/2" = 1'-0"

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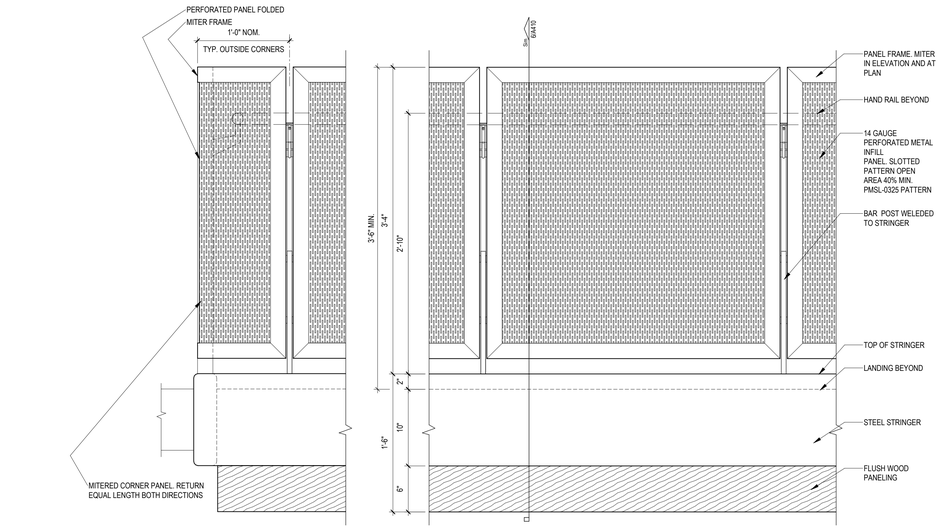
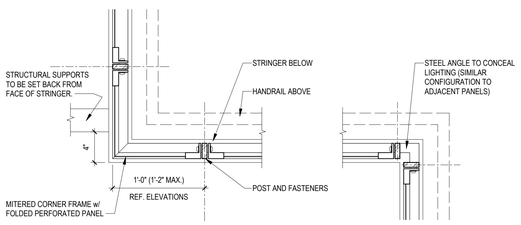
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

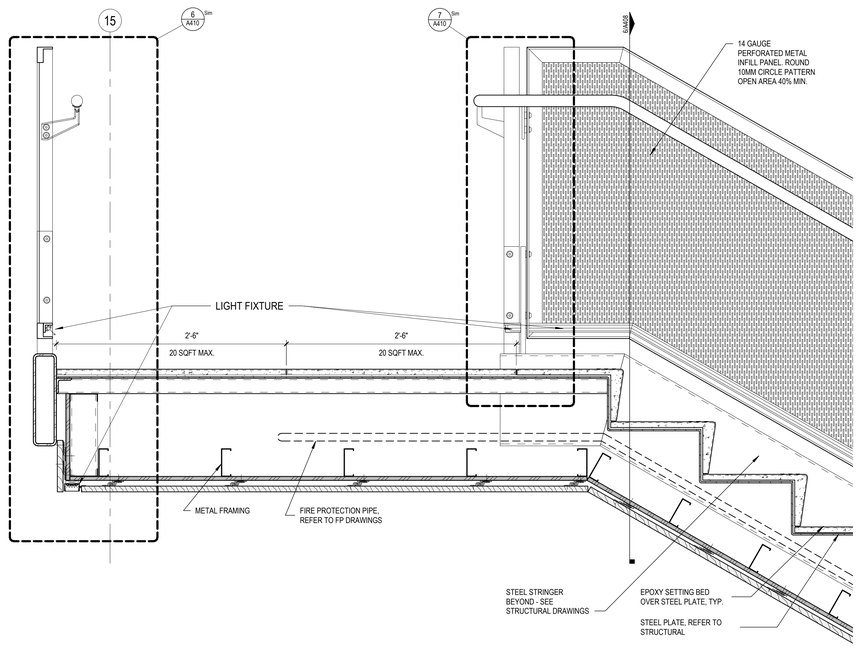


5 A410 RAILING OUTSIDE CORNER
1 1/2" = 1'-0"

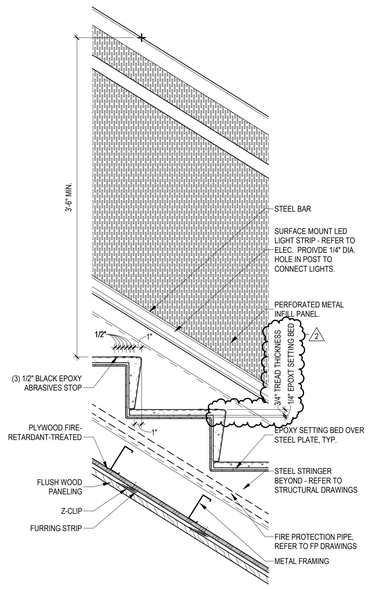
4 A410 TYPICAL ELEVATION OF METAL PANEL RAILING SYSTEMS
1 1/2" = 1'-0"



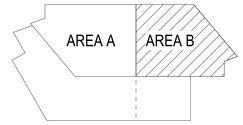
3 A410 RAILING PLAN DETAIL
1 1/2" = 1'-0"



2 A410 DETAIL AT MID LANDING
1 1/2" = 1'-0"



1 A410 TREAD DETAIL
1 1/2" = 1'-0"

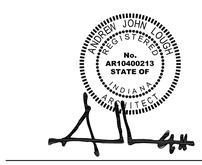


KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



COMMUNICATING STAIR DETAILS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A410

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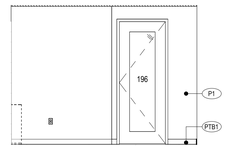
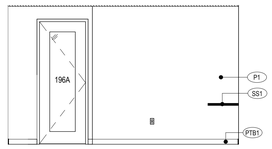
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250072-IULAB-BD_R24.rvt

TOILET ACCESSORY SCHEDULE			
NUMBER	DESCRIPTION	CONTRACT SCOPE	COMMENTS
	MOP HOLDER	CFCI	
TCD1	SEAT COVER DISPENSOR (SM)	CFCI	
TCH1	ROBE/COAT HOOK	CFCI	
TCH2	ROBE/COAT HOOK	CFCI	
TDC2	DIAPER CHANGING STATION (RE)	CFCI	
TGB18	18" GRAB BAR	CFCI	
TGB36	36" GRAB BAR	CFCI	
TGB42	42" GRAB BAR	CFCI	
TGB1830	18" X 30" GRAB BAR	CFCI	
TM1	MIRROR - FRAMED	CFCI	
TM2	MIRROR - FRAMED	CFCI	
TPT3	PAPER TOWEL DISPENSER (SM)	VARIES	
TS	PERFORATED STAINLESS STEEL SHELF	CFCI	
TSC	SHOWER CURTAIN	OFCI	
TSCR	SHOWER CURTAIN ROD	CFCI	
TSD	SOAP DISPENSER	VARIES	
TSN1	SANITARY NAPKIN DISPOSAL (SM)	OFCI	
TSS	ADA SHOWER SEAT	CFCI	
TTD2	TOILET PAPER DISPENSER - DOUBLE	OFCI	

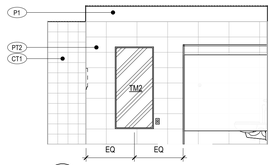
SHEET NOTE SCHEDULE	
NUMBER	TEXT
A15	24" DEEP SOLID SURFACE COUNTERTOP



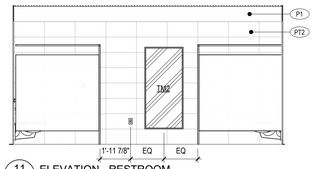
14 A420 ELEVATION - RESTOOM
1/4" = 1'-0"



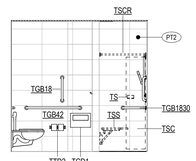
13 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



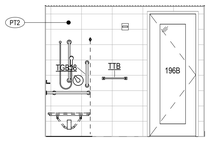
12 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



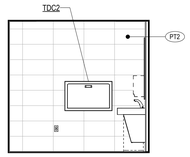
11 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



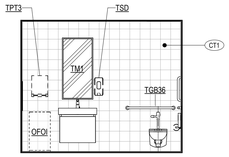
10 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



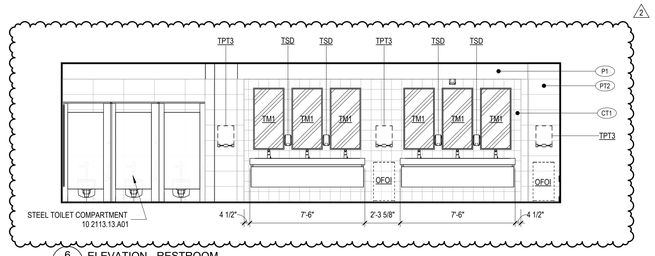
9 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



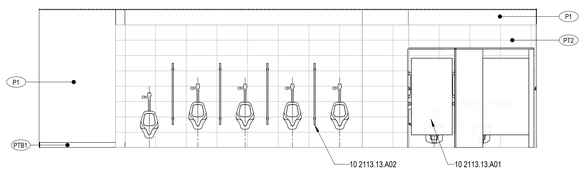
8 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



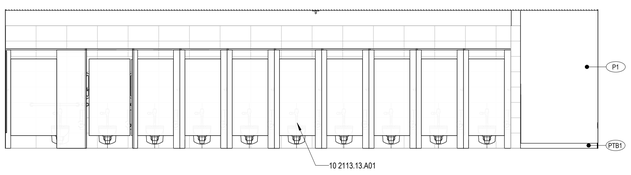
7 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



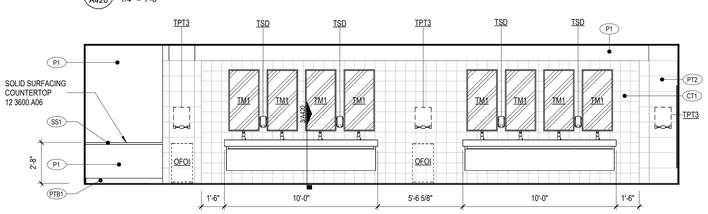
6 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



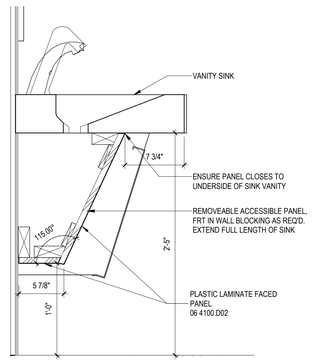
5 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



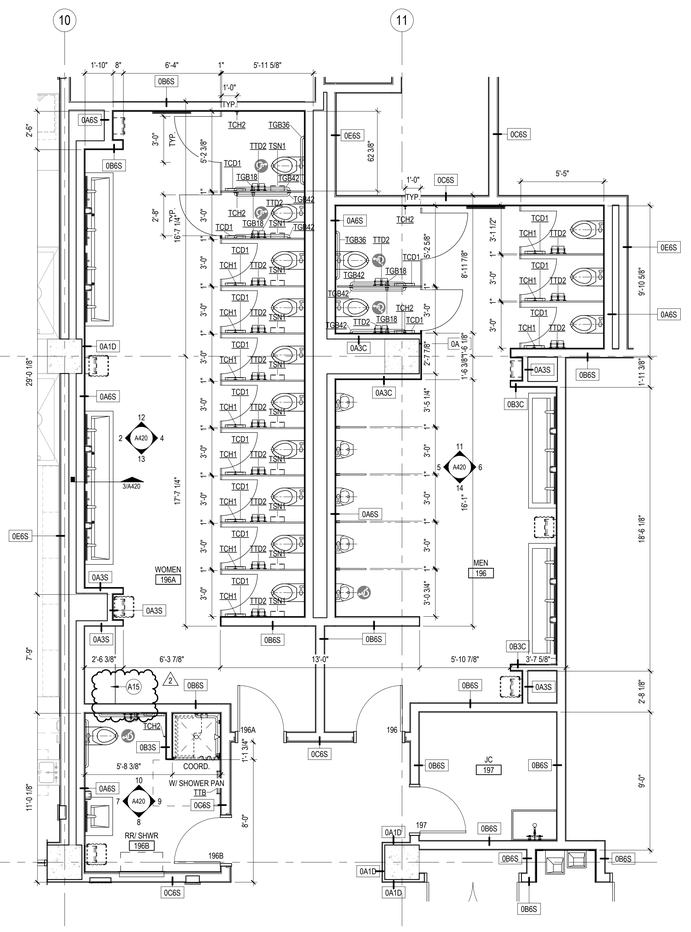
4 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



2 A420 ELEVATION - RESTROOM
1/4" = 1'-0"



3 A420 SECTION @ VANITY SINK SHROUD
1 1/2" = 1'-0"



1 A420 PLAN - LEVEL 1 RESTROOM
1/4" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN HUNTER
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

ENLARGED FLOOR PLANS AND ELEVATIONS

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

A420

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SHEET NOTE SCHEDULE	
NUMBER	TEXT
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04

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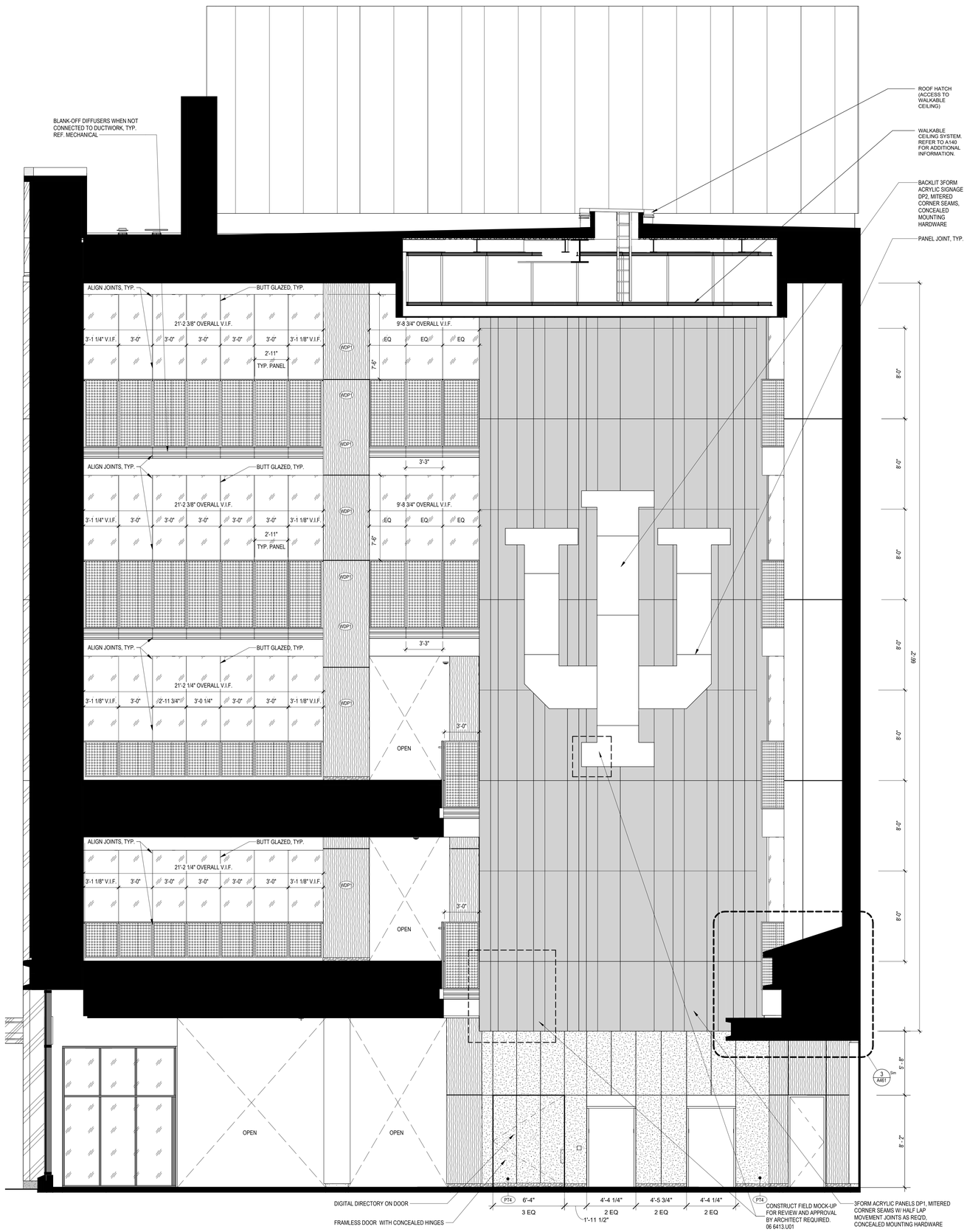
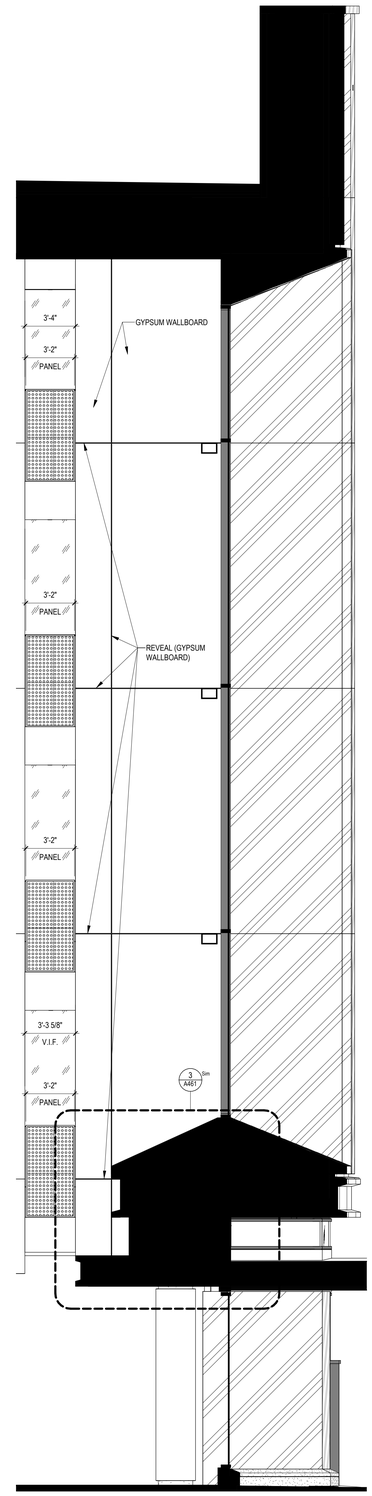
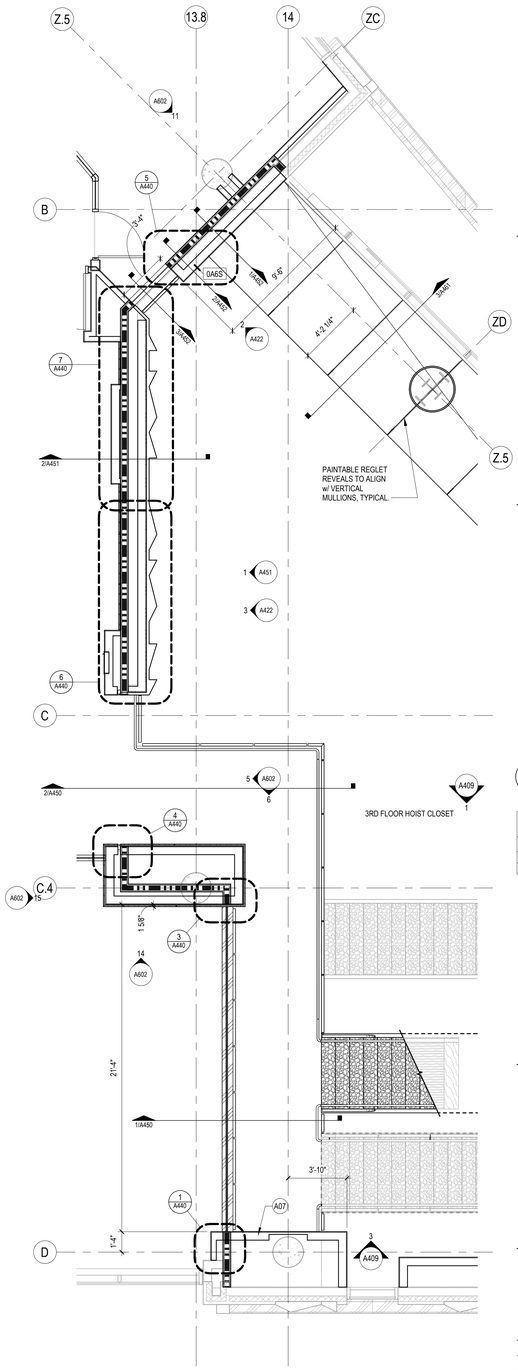


3 ELEVATION - MULTI-HEIGHT SPACE, WEST WALL
A422 1/4" = 1'-0"



2 ELEVATION - MULTI HEIGHT SPACE, NW WALL
A422 1/4" = 1'-0"



1 PLAN - MULTI-HEIGHT SPACE SHAFT WALL
A422 1/4" = 1'-0"

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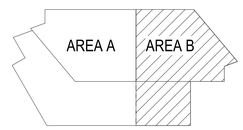
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

ENLARGED FLOOR PLANS AND ELEVATIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A422

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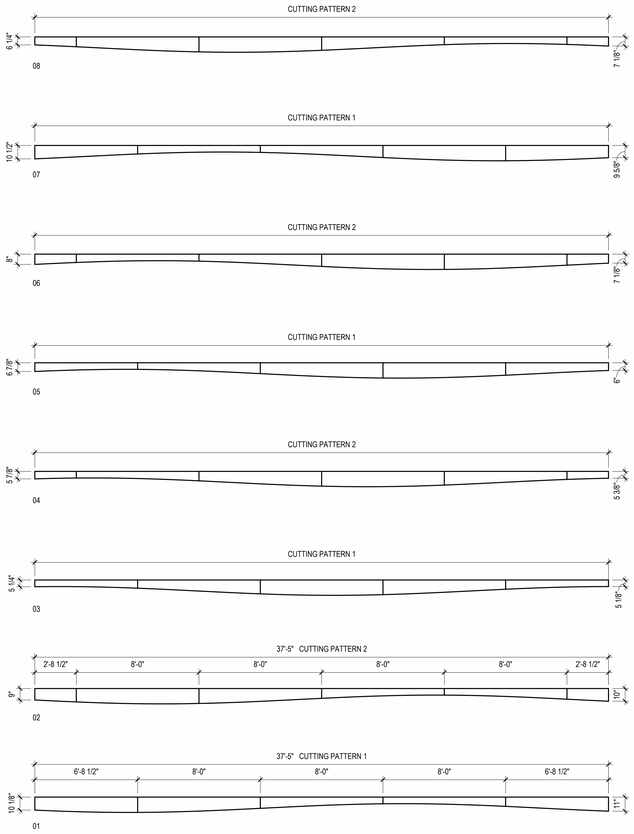
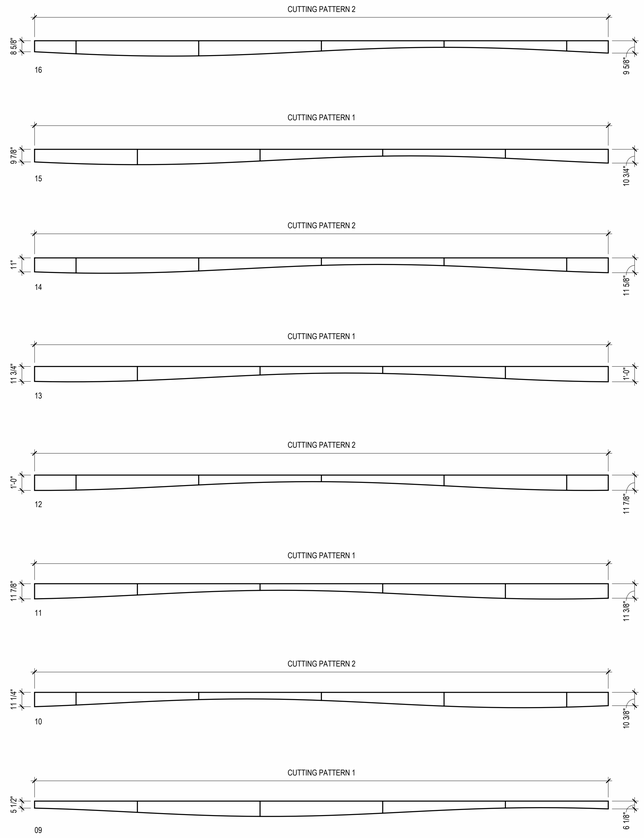




REFLECTED CEILING PLAN LEGEND

REFLECTED CEILING PLAN NOTES

A. GYPSUM BOARD BULKHEADS TO BE INSTALLED AT ____ ABOVE ASSOCIATED LEVEL, UNLESS NOTED OTHERWISE. REFER TO **#/A450** FOR TYPICAL BULKHEAD DETAIL.
B. LOCATE ITEMS IN CENTER OF ACOUSTICAL CEILING TILE, UNLESS INDICATED OTHERWISE.
C. EXPOSED VERTICAL FACES OF SOFFITS/BULKHEADS TO RECEIVE 5/8 INCH GYPSUM WALLBOARD UNLESS INDICATED OTHERWISE.
D. INSTALL CONTROL JOINTS IN GYPSUM WALLBOARD ASSEMBLIES AS INDICATED ON THE FLOOR PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS AND AS REQUIRED IN THE SPECIFICATIONS.
E. LOCATE ALL DEVICES, EQUIPMENT, AND/OR JUNCTION BOXES REQUIRING ACCESS IN ACCESSIBLE CEILING LOCATIONS. AVOID LOCATING ITEMS REQUIRING ACCESS IN INACCESSIBLE CEILINGS OR SHARE ACCESS POINTS. COORDINATE ACCESS PANELS WHERE REQUIRED WITH ARCHITECT PRIOR TO INSTALLATION.
F. FIRE PROTECTION EQUIPMENT SHOWN FOR COORDINATION PURPOSES ONLY. SEE FIRE SUPPRESSION DRAWINGS FOR SPRINKLER SYSTEM.
G. MECHANICAL, ELECTRICAL AND PLUMBING ITEMS, INCLUDING LIGHT FIXTURES, MECHANICAL DIFFUSERS AND GRILLES, INDICATED ON REFLECTED CEILING PLANS ARE FOR REFERENCE ONLY.
H. SEAL PENETRATIONS ABOVE AND BELOW ACOUSTICAL TILE CEILINGS IN ISOLATION AND PROCEDURE ROOMS.
I. ALL EXPOSED CEILING ELEMENTS INCLUDING BUT NOT LIMITED TO STRUCTURE, STRUCTURAL DECK, DUCTWORK, CONDUIT, PIPING, AND EQUIPMENT SHALL BE PAINTED P3 ABOVE A 12'-0" DATUM ON LEVEL 1 AND 10'-0" DATUM ON LEVELS 2 AND ABOVE, UNO. INCLUDE PAINTING OF WALL ABOVE THE DATUM NOTED ABOVE, UNO.
J. ALL GYP BD CEILINGS TO BE PAINTED P1 FLAT FINISH, UNO.

CEILING TAG

ACT1 +10'-0" — CEILING TYPE, REFERENCE CEILING SCHEDULE; HEIGHT ABOVE ASSOCIATE LEVEL

OTHER CEILING SYMBOLS

+9'-0" — SPOT ELEVATION SYMBOL & HEIGHT ABOVE ASSOCIATE LEVEL

EXPOSED STRUCTURE (P1) — EXPOSED STRUCTURE FINISH

CONTROL JOINT

RS1 — SINGLE MANUAL ROLLER SHADE 3%
RS2 — SINGLE MOTORIZED ROLLER SHADE 1%
RS3 — SINGLE MOTORIZED ROLLER SHADE 3%

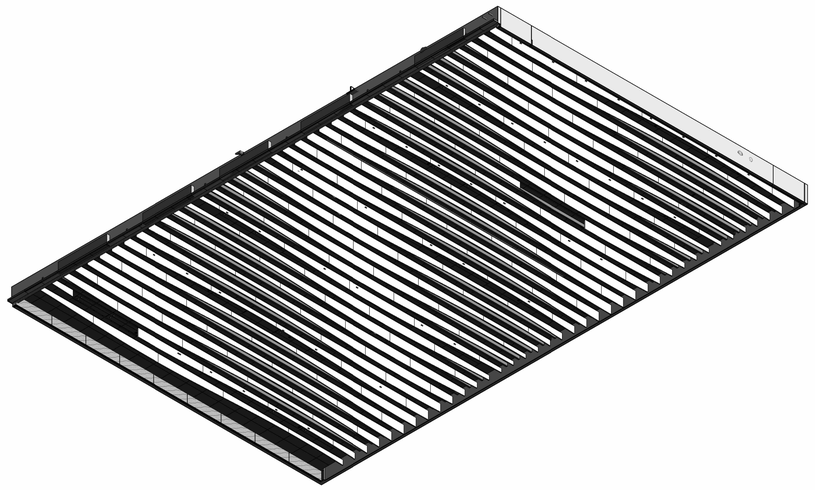
TROUGH STYLE CABLE TRAY WITH LOUVERED BOTTOM. REFER TO SPECIFICATION SECTION 270536

GRAPHIC LEGEND

ACT1		GYP	
ACT2		GYP (2 HOUR RATED)	
ACT3		MTLC1	
ACT4		MTLC2	
ACT5		MTLC3	
ACT6		PERFORATED MTL PNL	

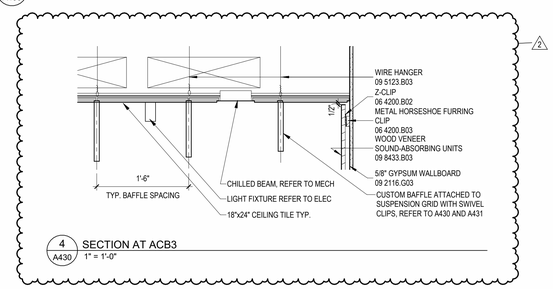
SHEET NOTE SCHEDULE

NUMBER	TEXT

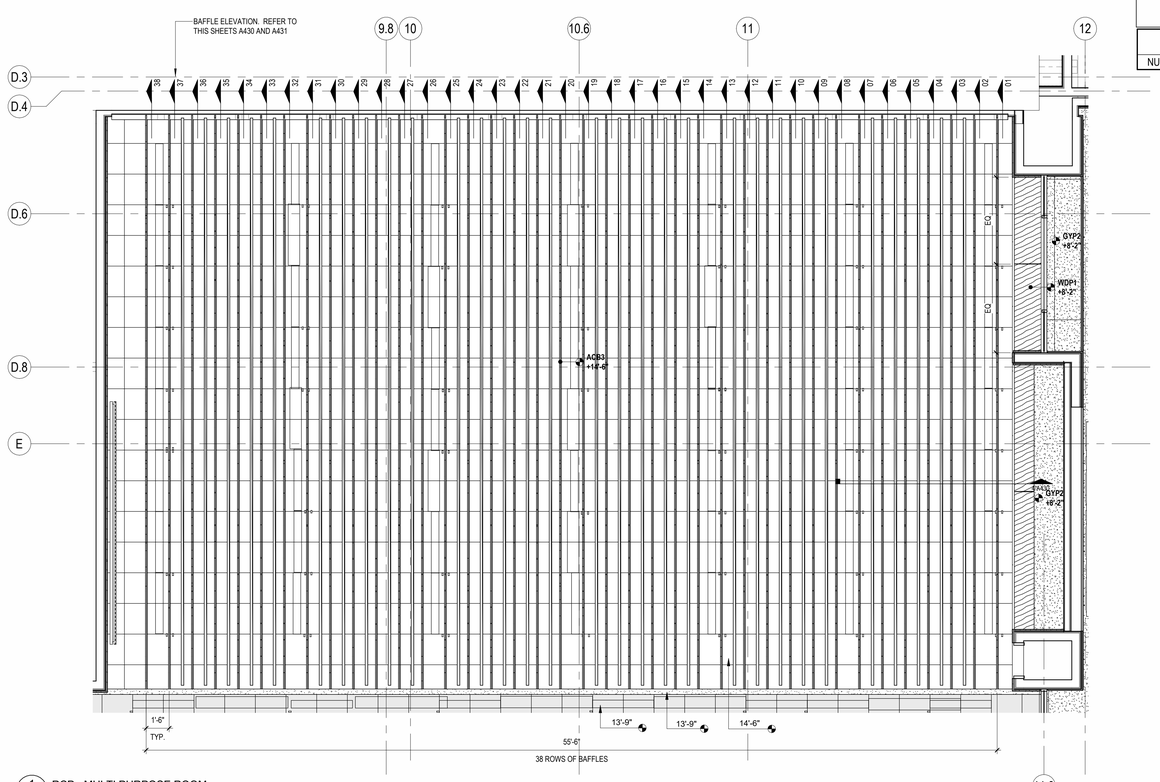


3 A430 WAVE CEILING PROFILE 01
1/4" = 1'-0"

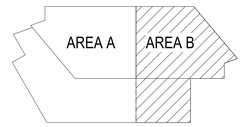
2 A430 AXON - MULTI PURPOSE ROOM



4 A430 SECTION AT ACB3
1" = 1'-0"



1 A430 RCP - MULTI PURPOSE ROOM
1/4" = 1'-0"



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP1-CD: SITE AND FOUNDATION PACKAGE

ANDREW JOHN MEISTERHEIM
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

ENLARGED CEILING PLANS

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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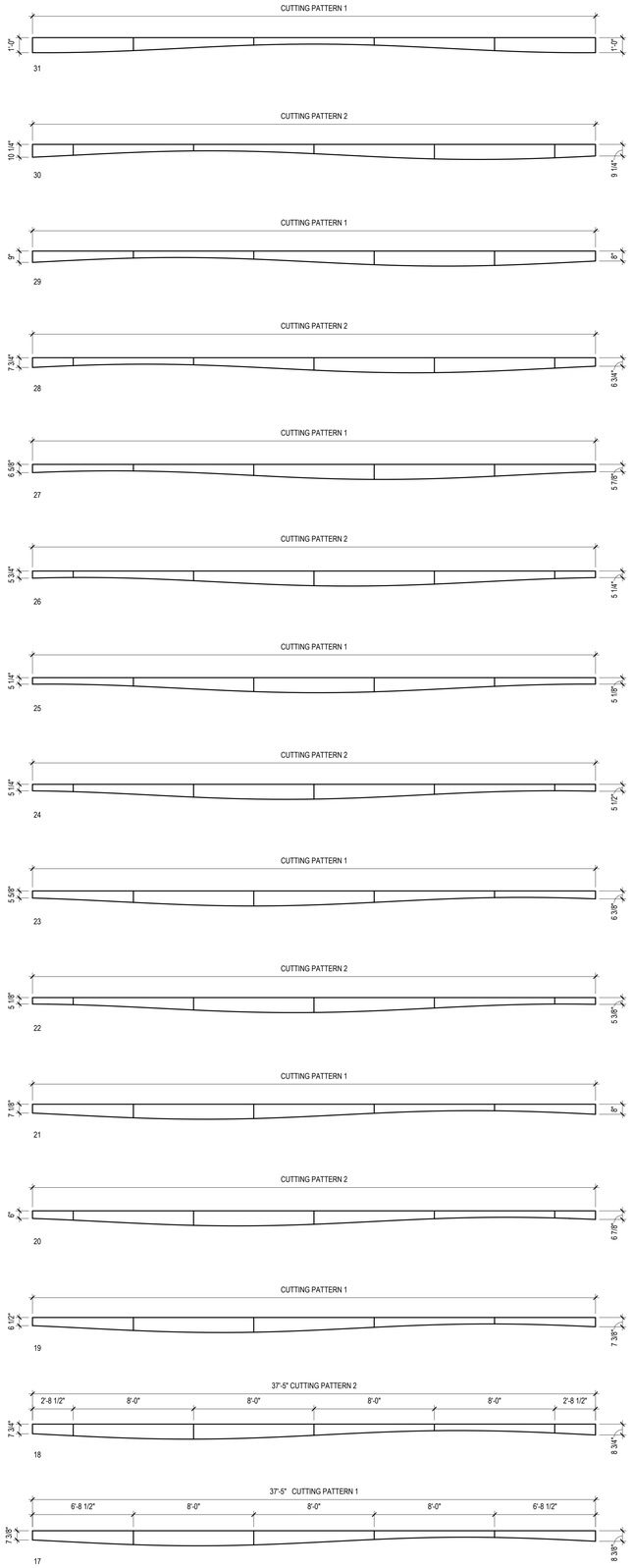
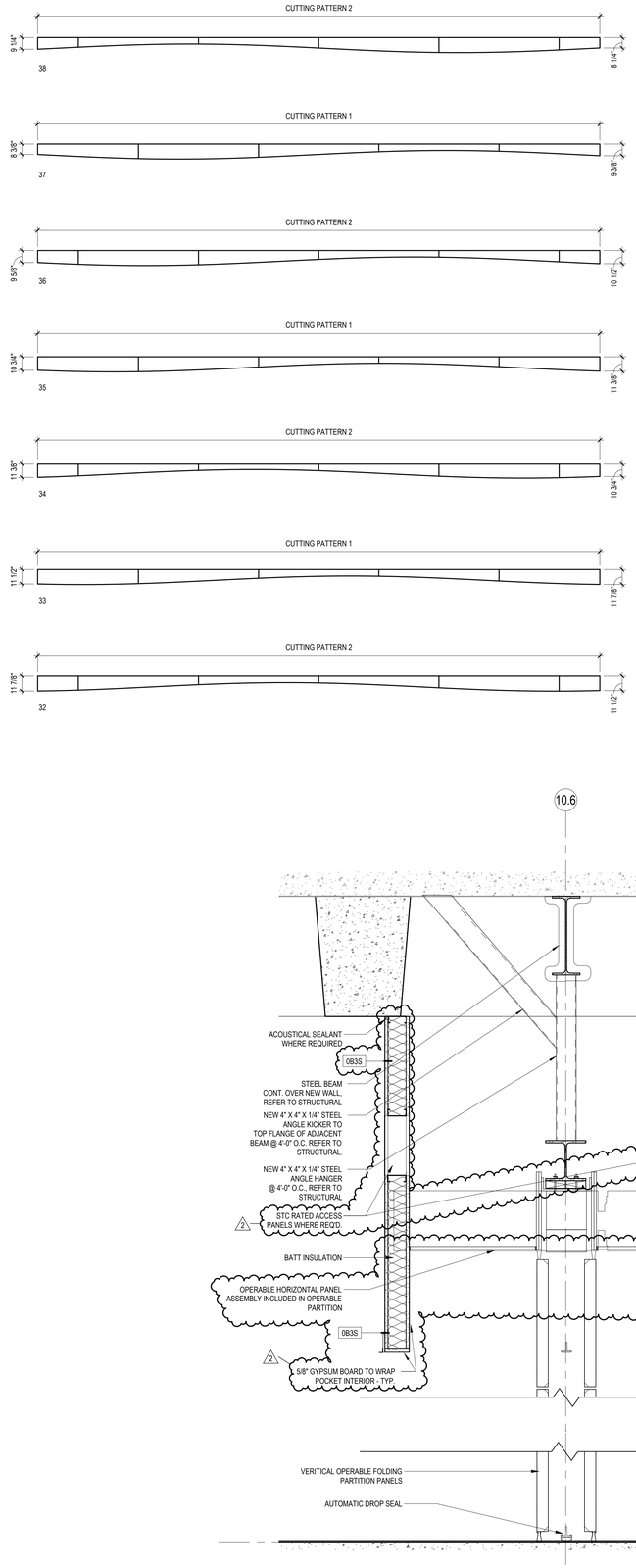


1 A431 WAVE CEILING PROFILE 02
1/4" = 1'-0"



3 A431 SECTION - VERTICAL OPERABLE PANEL PARTITION
1" = 1'-0"

REFLECTED CEILING PLAN LEGEND

REFLECTED CEILING PLAN NOTES

A. GYPSUM BOARD BULKHEADS TO BE INSTALLED AT ___ ABOVE ASSOCIATED LEVEL, UNLESS NOTED OTHERWISE. REFER TO **#/A450** FOR TYPICAL BULKHEAD DETAIL.
B. LOCATE ITEMS IN CENTER OF ACOUSTICAL CEILING TILE, UNLESS INDICATED OTHERWISE.
C. EXPOSED VERTICAL FACES OF SOFFITS/BULKHEADS TO RECEIVE 5/8 INCH GYPSUM WALLBOARD UNLESS INDICATED OTHERWISE.
D. INSTALL CONTROL JOINTS IN GYPSUM WALLBOARD ASSEMBLIES AS INDICATED ON THE FLOOR PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS AND AS REQUIRED IN THE SPECIFICATIONS.
E. LOCATE ALL DEVICES, EQUIPMENT, AND/OR JUNCTION BOXES REQUIRING ACCESS IN ACCESSIBLE CEILING LOCATIONS. AVOID LOCATING ITEMS REQUIRING ACCESS IN INACCESSIBLE CEILINGS OR SHARE ACCESS POINTS. COORDINATE ACCESS PANELS WHERE REQUIRED WITH ARCHITECT PRIOR TO INSTALLATION.
F. FIRE PROTECTION EQUIPMENT SHOWN FOR COORDINATION PURPOSES ONLY. SEE FIRE SUPRESSION DRAWINGS FOR SPRINKLER SYSTEM.
G. MECHANICAL, ELECTRICAL AND PLUMBING ITEMS, INCLUDING LIGHT FIXTURES, MECHANICAL DIFFUSERS AND GRILLES, INDICATED ON REFLECTED CEILING PLANS ARE FOR REFERENCE ONLY.
H. SEAL PENETRATIONS ABOVE AND BELOW ACOUSTICAL TILE CEILINGS IN ISOLATION AND PROCEDURE ROOMS.
I. ALL EXPOSED CEILING ELEMENTS INCLUDING BUT NOT LIMITED TO STRUCTURE, STRUCTURAL DECK, DUCTWORK, CONDUIT, PIPING, AND EQUIPMENT SHALL BE PAINTED P3 ABOVE A 12'-0" DATUM ON LEVEL 1 AND 10'-0" DATUM ON LEVELS 2 AND ABOVE, UNO. INCLUDE PAINTING OF WALL ABOVE THE DATUM NOTED ABOVE, UNO.
J. ALL GYP BD CEILINGS TO BE PAINTED P1 FLAT FINISH, UNO.

CEILING TAG

ACT1 +10'-0" — CEILING TYPE, REFERENCE CEILING SCHEDULE; HEIGHT ABOVE ASSOCIATE LEVEL

OTHER CEILING SYMBOLS

+9'-0" — SPOT ELEVATION SYMBOL & HEIGHT ABOVE ASSOCIATE LEVEL
EXPOSED STRUCTURE (P1) — EXPOSED STRUCTURE FINISH
CONTROL JOINT
RS1 — SINGLE MANUAL ROLLER SHADE 3%
RS2 — SINGLE MOTORIZED ROLLER SHADE 1%
RS3 — SINGLE MOTORIZED ROLLER SHADE 3%
TROUGH STYLE CABLE TRAY WITH LOUVERED BOTTOM. REFER TO SPECIFICATION SECTION 270536

GRAPHIC LEGEND

ACT1	GYP
ACT2	GYP (2 HOUR RATED)
ACT3	MTLC1
ACT4	MTLC2
ACT5	MTLC3
ACT6	PERFORATED MTL PNL

SHEET NOTE SCHEDULE

NUMBER	TEXT

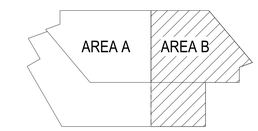
BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

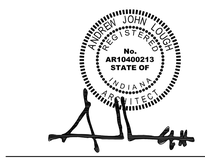
CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



ENLARGED CEILING PLANS AND DETAILS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A431

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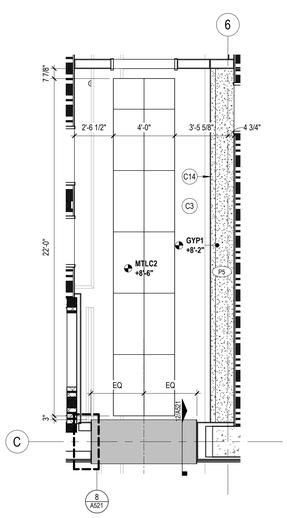
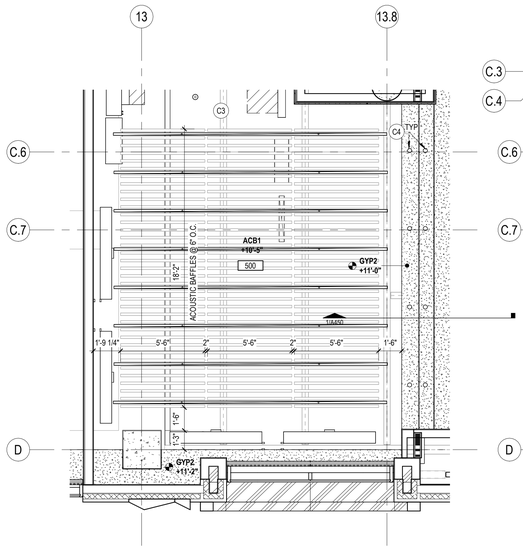
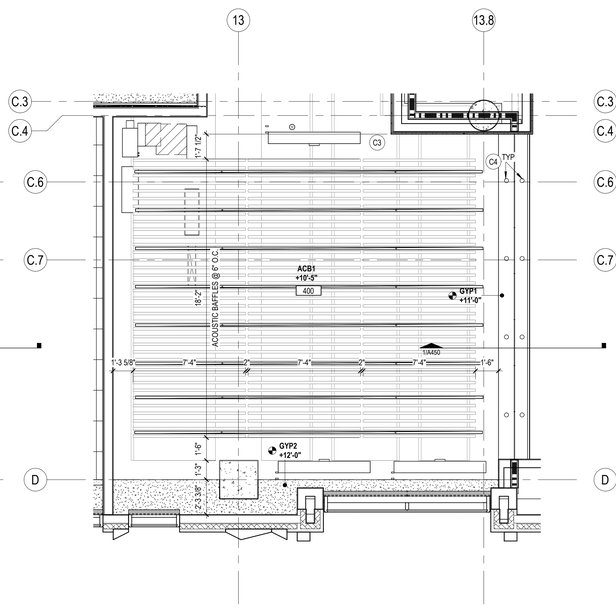


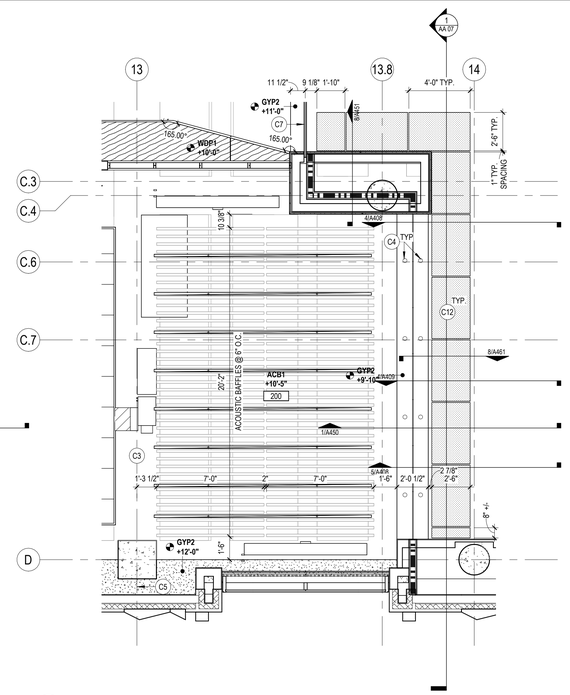
6 A432 RCP - WEST LAB ENTRY (TYPICAL)
1/4" = 1'-0"



4 A432 RCP - LEVEL 5 - AREA B - Callout 2
1/4" = 1'-0"

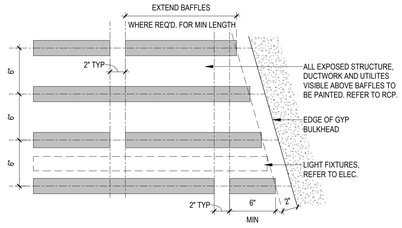


5 A432 RCP - LEVEL 4 - AREA B - Callout 3
1/4" = 1'-0"

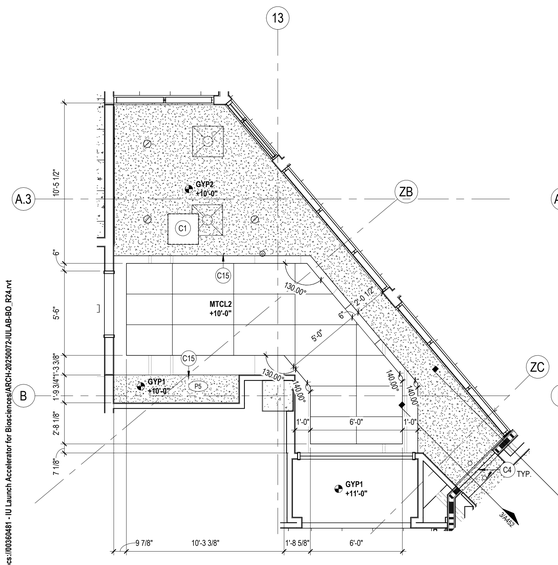


1 A432 RCP - LEVEL 2 - AREA B - Callout 2
1/4" = 1'-0"

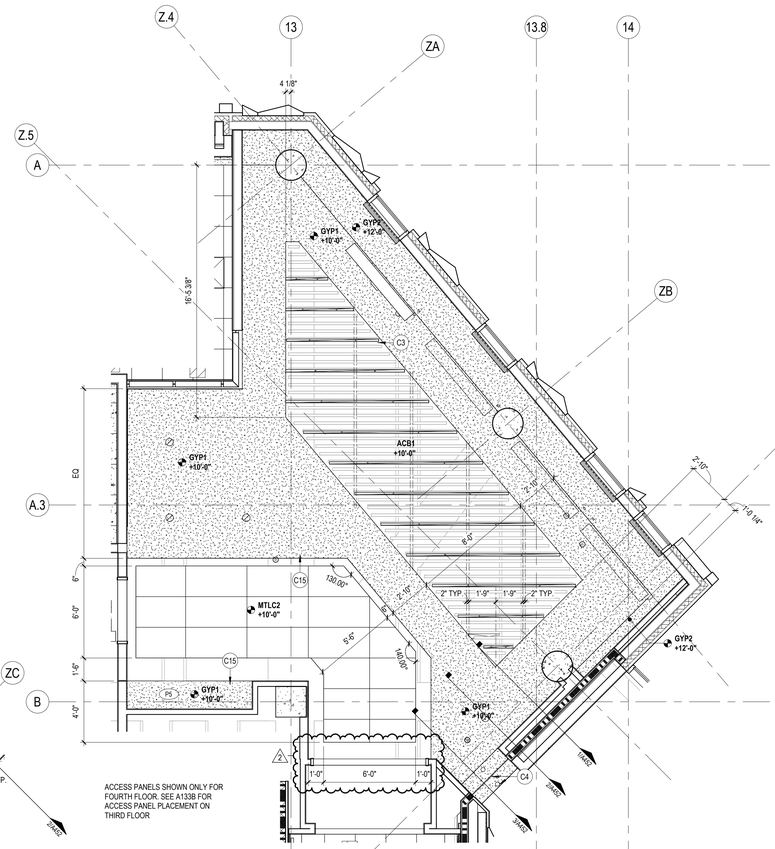
IN NON RECTANGULAR ACB1 BAFFLE AREAS, PROVIDE STAGGED BREAKS BETWEEN INDIVIDUAL BAFFLES. LAYOUT BAFFLES TO AVOID SECTIONS SHORTER THAN 6'. WHERE A STAGGERED JOINT CONDITION WOULD RESULT IN A BAFFLE SECTION SHORTER THAN 6", EXTEND THE ADJACENT BAFFLE TO MAINTAIN MIN. LENGTH



8 A432 GENERAL - ACB1 LAYOUT
1 1/2" = 1'-0"

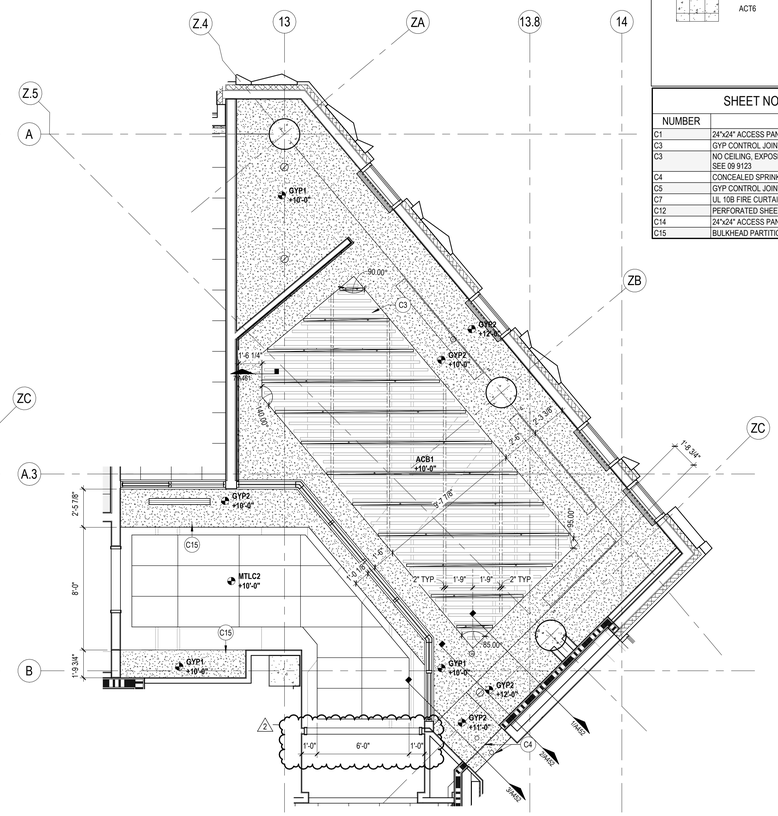


7 A432 RCP - LEVEL 5 - AREA B - Callout 1
1/4" = 1'-0"



ACCESS PANELS SHOWN ONLY FOR FOURTH FLOOR. SEE A133B FOR ACCESS PANEL PLACEMENT ON THIRD FLOOR

3 A432 RCP - LEVEL 3 & 4 - Callout 1
1/4" = 1'-0"



2 A432 RCP - LEVEL 2 - AREA B - Callout 3
1/4" = 1'-0"

REFLECTED CEILING PLAN LEGEND

REFLECTED CEILING PLAN NOTES

A. GYPSUM BOARD BULKHEADS TO BE INSTALLED AT ____ ABOVE ASSOCIATED LEVEL, UNLESS NOTED OTHERWISE. REFER TO **#/A450** FOR TYPICAL BULKHEAD DETAIL.
B. LOCATE ITEMS IN CENTER OF ACOUSTICAL CEILING TILE, UNLESS INDICATED OTHERWISE.
C. EXPOSED VERTICAL FACES OF SOFFITS/BULKHEADS TO RECEIVE 5/8 INCH GYPSUM WALLBOARD UNLESS INDICATED OTHERWISE.
D. INSTALL CONTROL JOINTS IN GYPSUM WALLBOARD ASSEMBLIES AS INDICATED ON THE FLOOR PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS AND AS REQUIRED IN THE SPECIFICATIONS.
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J. ALL GYP BD CEILINGS TO BE PAINTED P1 FLAT FINISH, UNO.

CEILING TAG

ACT1 +10'-0" — CEILING TYPE, REFERENCE CEILING SCHEDULE; HEIGHT ABOVE ASSOCIATE LEVEL

OTHER CEILING SYMBOLS

+9'-0" — SPOT ELEVATION SYMBOL & HEIGHT ABOVE ASSOCIATE LEVEL
EXPOSED STRUCTURE P1 — EXPOSED STRUCTURE FINISH
C.J. — CONTROL JOINT
RS1 — SINGLE MANUAL ROLLER SHADE 3%
RS2 — SINGLE MOTORIZED ROLLER SHADE 1%
RS3 — SINGLE MOTORIZED ROLLER SHADE 3%
TROUGH STYLE CABLE TRAY WITH LOUVERED BOTTOM. REFER TO SPECIFICATION SECTION 270536

GRAPHIC LEGEND

ACT1		GYP	
ACT2		GYP (2 HOUR RATED)	
ACT3		MTLC1	
ACT4		MTLC2	
ACT5		MTLC3	
ACT6		PERFORATED MTL PNL	

SHEET NOTE SCHEDULE

NUMBER	TEXT
C1	24"x24" ACCESS PANEL. SEE 08 3100.A04
C3	GYP CONTROL JOINT.
C3	NO CEILING, EXPOSED STRUCTURE AND UTILITIES. PAINT P3. SEE 09 9123
C4	CONCEALED SPRINKLER HEADS. REFER TO FP.
C5	GYP CONTROL JOINT.
C7	UL 10B FIRE CURTAIN
C12	PERFORATED SHEET METAL FABRICATION. 057500.A00
C14	24"x24" ACCESS PANEL IN BULKHEAD ABV. SEE 08 3100.A04
C15	BULKHEAD PARTITION TO DECK. REF A460.

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313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN DOWD
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

ENLARGED CEILING PLANS

DATE
BSA PROJECT NO. 00360481
REF: SHEET INDEX

A432

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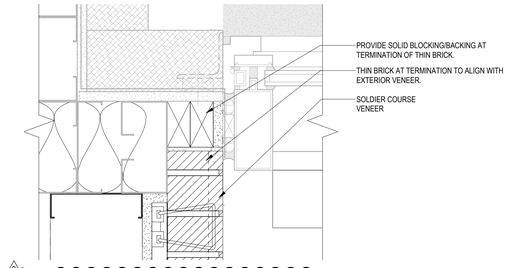
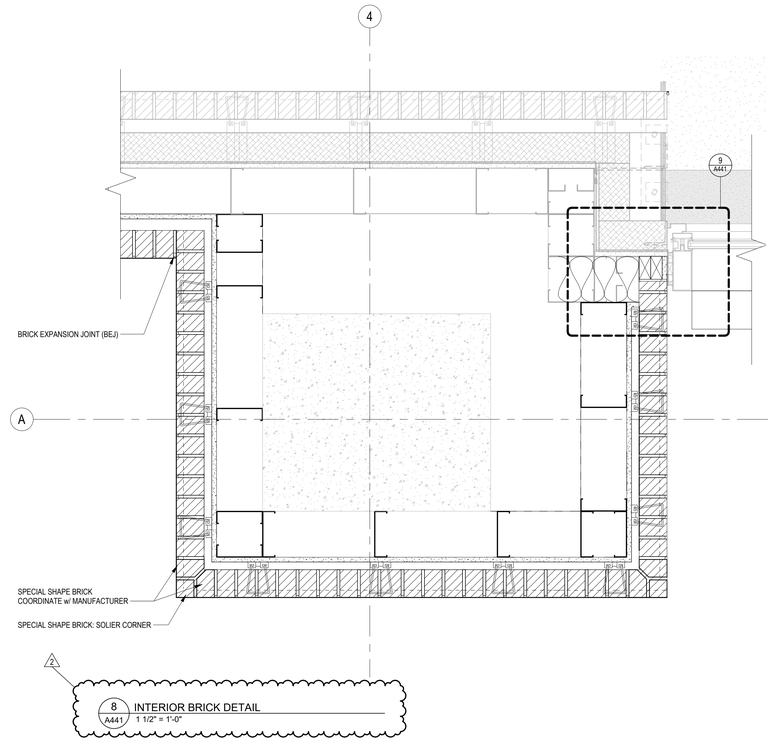
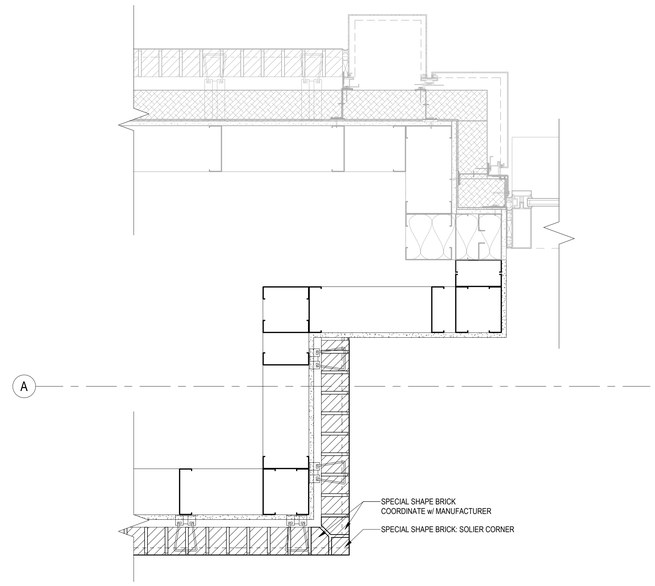


9 A441 INTERIOR BRICK TRANSITION DETAIL
3" = 1'-0"

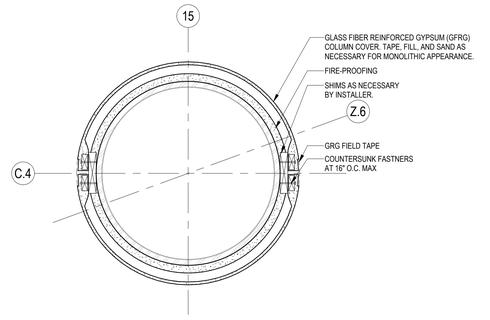


8 A441 INTERIOR BRICK DETAIL
1 1/2" = 1'-0"

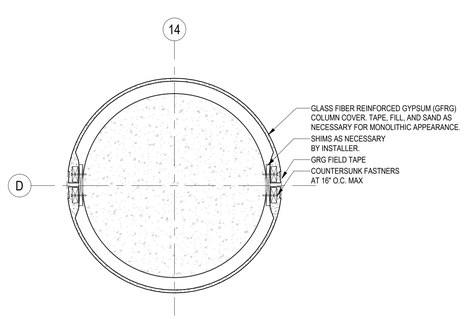


7 A441 INTERIOR BRICK DETAIL
1 1/2" = 1'-0"

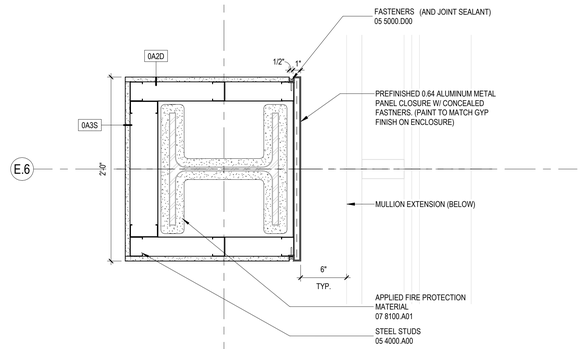
12.6



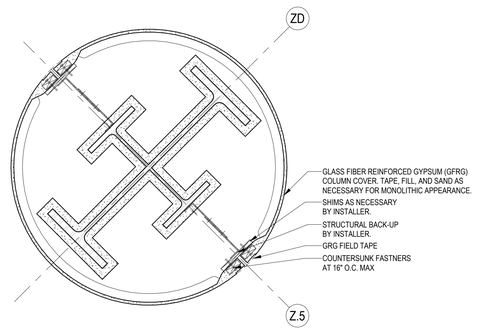
6 A441 PLAN DETAIL - COLUMN COVER
1 1/2" = 1'-0"



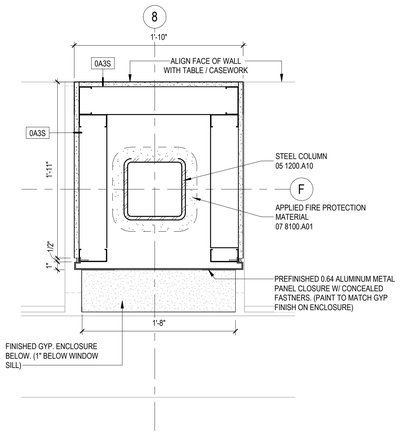
5 A441 PLAN DETAIL - COLUMN COVER 1
1 1/2" = 1'-0"



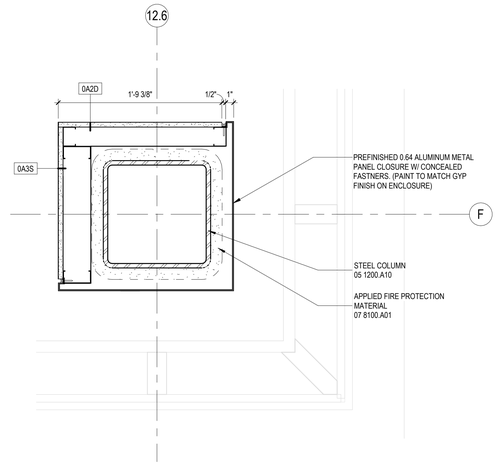
4 A441 PLAN DETAIL - METAL CLOSURE COLUMN ENCLOSURE 1
1 1/2" = 1'-0"



3 A441 PLAN DETAIL - GFRG COLUMN COVER
1 1/2" = 1'-0"



2 A441 PLAN DETAIL - COLUMN ENCLOSURE ON GRID F
1 1/2" = 1'-0"



1 A441 PLAN DETAIL - METAL ENCLOSURE COLUMN AT CORNER
1 1/2" = 1'-0"

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175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANGUS JOHN JOHNSON REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR PLAN DETAILS

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

A441

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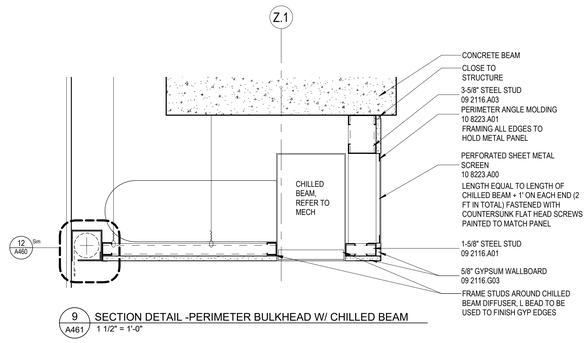
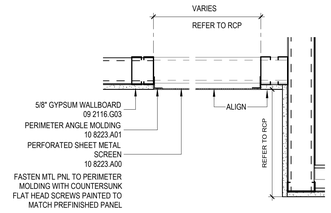
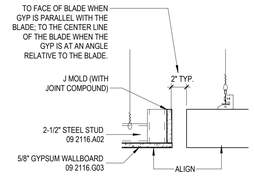


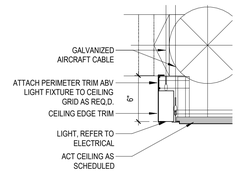
9 A461 SECTION DETAIL -PERIMETER BULKHEAD W/ CHILLED BEAM
1 1/2" = 1'-0"



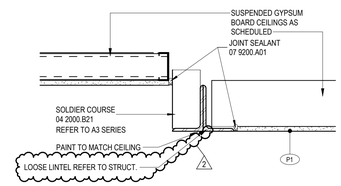
8 A461 SECTION DETAIL - PERFORATED METAL PANEL GRILLE
1 1/2" = 1'-0"



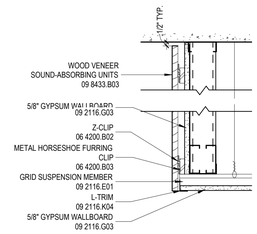
7 A461 SECTION DETAIL - MEETING ROOM
1 1/2" = 1'-0"



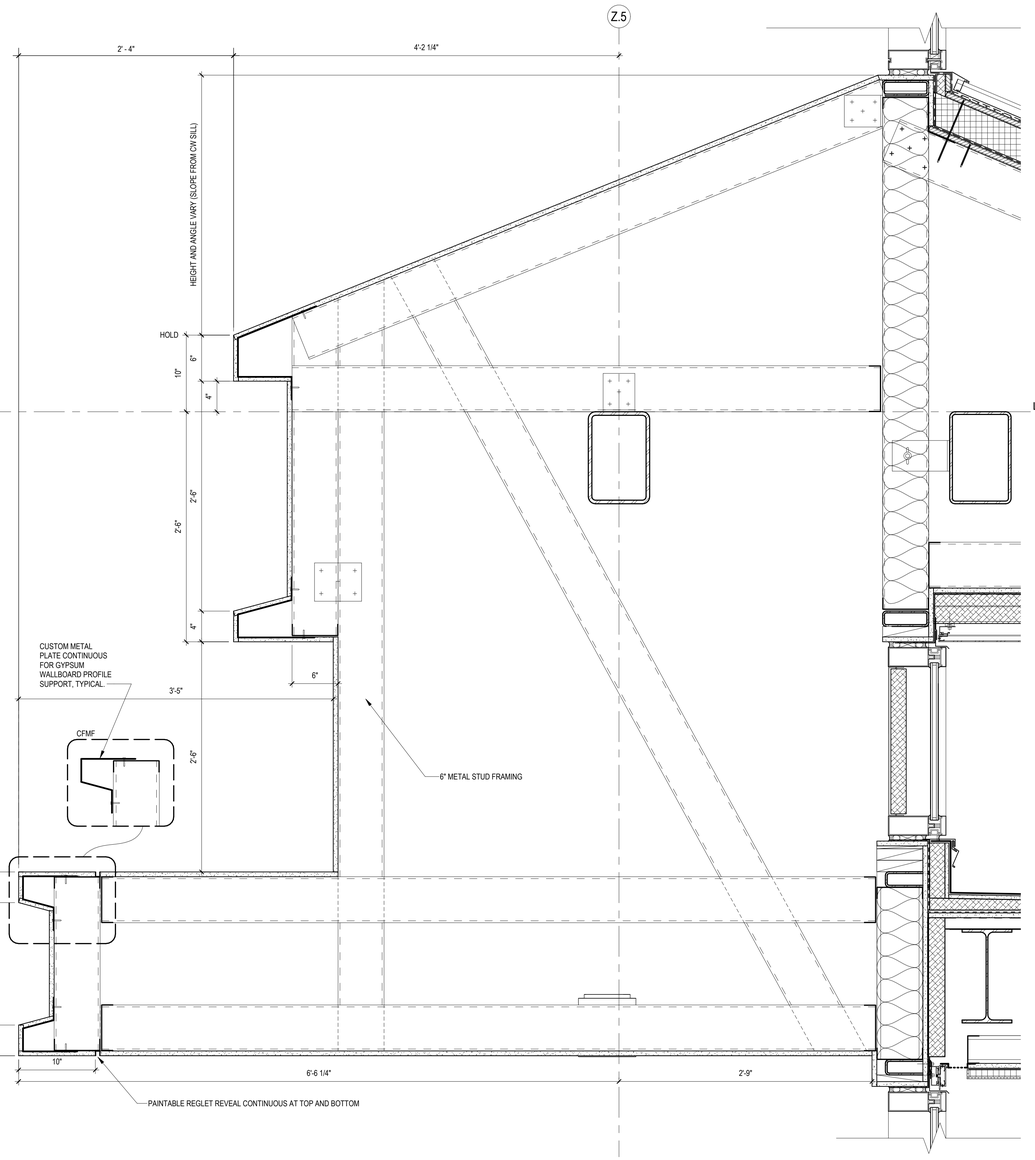
6 A461 SECTION DETAIL - TYPICAL LAB CEILING (ACT-2)
1 1/2" = 1'-0"



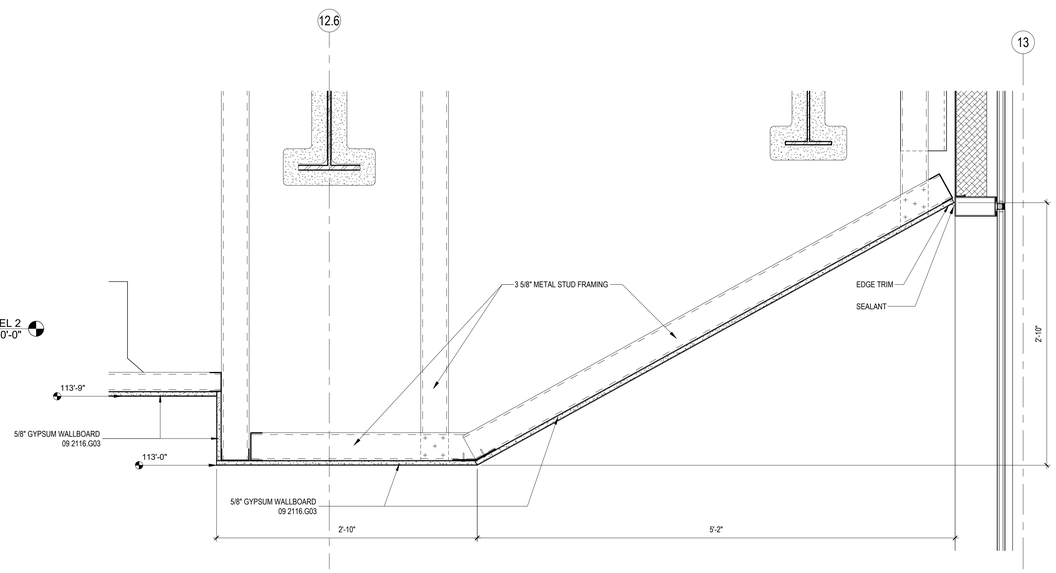
5 A461 SECTION DETAIL - NORTH WEST ENTRY
1 1/2" = 1'-0"



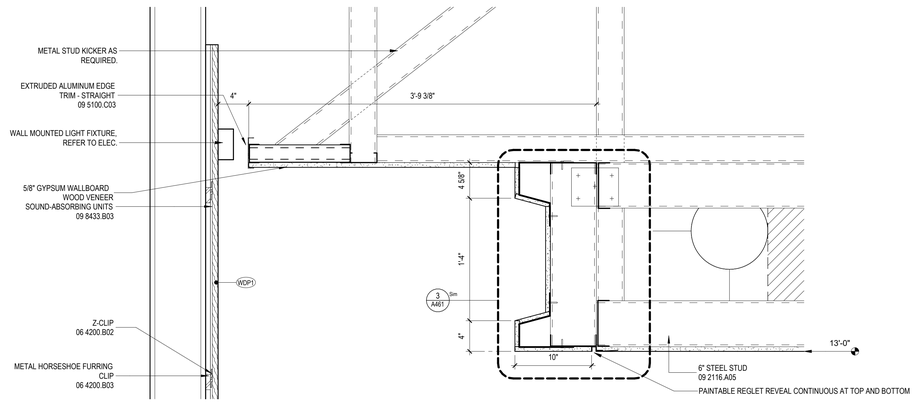
4 A461 SECTION DETAIL - LOBBY BULKHEAD
1 1/2" = 1'-0"



3 A461 SECTION DETAIL - NORTH EAST ENTRY SOFFIT - 1
1 1/2" = 1'-0"



2 A461 SECTION DETAIL - SOUTH EAST SOFFIT
1 1/2" = 1'-0"



1 A461 SECTION DETAIL - NORTH EAST ENTRY SOFFIT - 2
1 1/2" = 1'-0"

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175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN MILLER REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

INTERIOR CEILING DETAILS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A461

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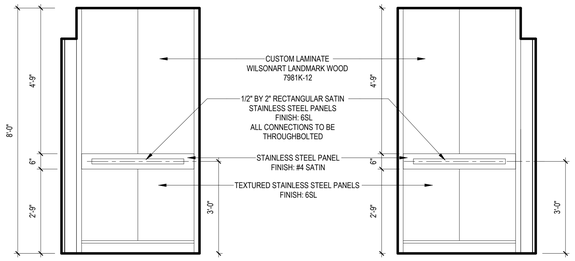
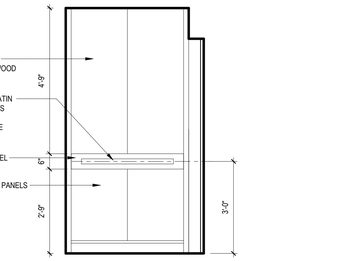
4/20/2026 4:39:09 PM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250072-IULAB-BO_R24.rvt



12 A462 PASSENGER ELEVATOR ELEVATION - SIDE WALL
1/2" = 1'-0"



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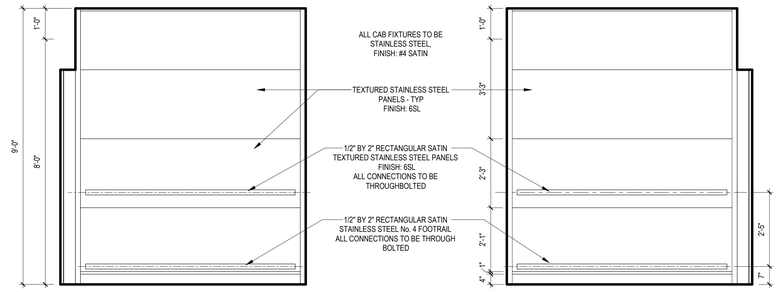
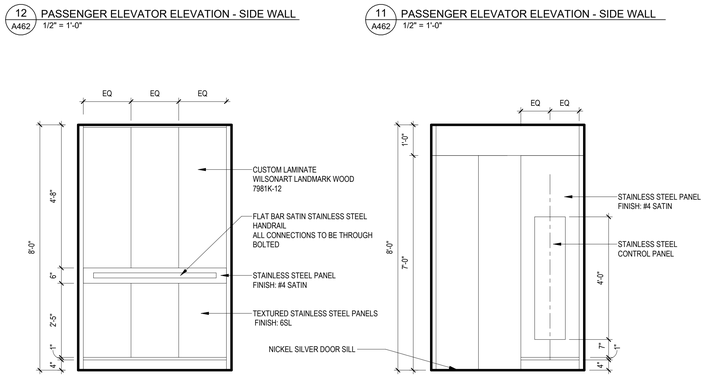
1/2" = 1'-0"



6 A462 SERVICE ELEVATOR ELEVATION - SIDE WALL
1/2" = 1'-0"

5 A462 SERVICE ELEVATOR ELEVATION - SIDE WALL
1/2" = 1'-0"



10 A462 PASSENGER ELEVATOR - REAR WALL
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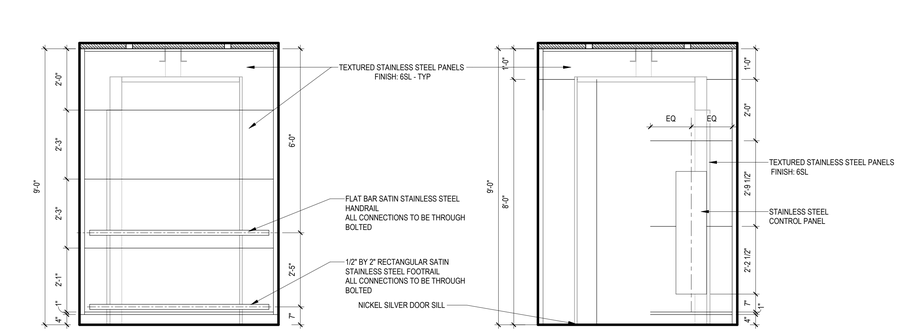
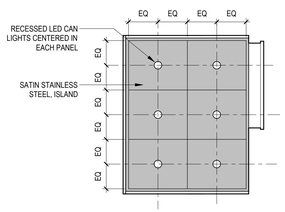
9 A462 PASSENGER ELEVATOR - FRONT WALL
1/2" = 1'-0"



4 A462 SERVICE ELEVATOR - REAR WALL
1/2" = 1'-0"

3 A462 SERVICE ELEVATOR - FRONT
1/2" = 1'-0"



8 A462 PASSENGER ELEVATOR CEILING PLAN (TYP)
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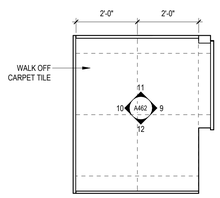

7 A462 ENLARGED PASSENGER ELEVATOR PLAN (TYP)
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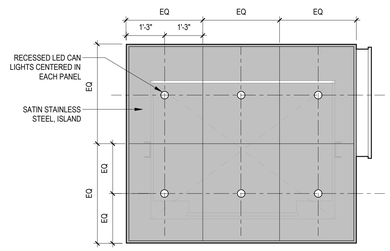

2 A462 SERVICE ELEVATOR CEILING PLAN
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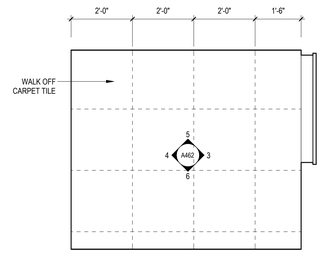
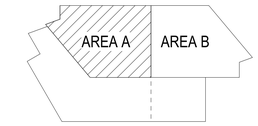


1 A462 ENLARGED SERVICE ELEVATOR PLAN
1/2" = 1'-0"



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
1	04/20/2026	BP4-CD: ADDENDUM 01

ELEVATOR REQUIREMENTS

GENERAL NOTES

1. COORDINATE LOCATION OF CONTROL OPERATING PANEL HINGE SUCH THAT SWING DOES NOT CONFLICT WITH CAB FINISHES.
2. PROVIDE A HALL LANTERN WITH POSITION INDICATOR AT EACH FLOOR LANDING.

LANDING OPERATING PANEL

FACEPLATE:
FINISH: 11 GAUGE STAINLESS STEEL W/ #4 BRUSH FINISH
HARDWARE: CONCEALED FASTENERS

METAL BUTTONS:
VANDAL RESISTANT STAINLESS STEEL FLAT PUSHBUTTON
BASIS OF DESIGN: MAD; BS MOON
1 1/4" DIA. HALO, 1/16" DIA. CLEAR RING, 1" DIA. BUTTON
ILLUMINATION COLOR: WHITE
TACTILE: SURFACE MOUNTED FISHTAIL, BLACK ON SATIN NICKEL.

KEY SWITCH:
SIZE: 1 3/8" DIAMETER
COLOR: RED BEZEL WITH WHITE LETTERING,
FINISH: CHROME.

INDICATOR JEWELS:
SIZE: 1 1/4" DIA. HALO, 1" DIA.
COLOR: BLACK
BASIS OF DESIGN: MAD; BW SERIES VANISHING INDICATOR
ILLUMINATION COLOR: RED

TEXT ENGRAVING:
TITLES: 1/4" HIGH HELVETICA MEDIUM, COLOR: RED
INSTRUCTIONS: 3/16" HIGH HELVETICA REGULAR, COLOR: BLACK

PICTOGRAPH ENGRAVING:
FIRE FLAME - RED PERIMETER
CIRCLES, SLASHES & SYMBOLS COLOR: BLACK
TEXT COLOR: BLACK

FIREMAN PHONE JACK:
FINISH: CHROME
LOCATION: INTEGRATED INTO OPERATING PANEL.
TEXT COLOR: BLACK

FIRE SERVICE ACCESS ELEVATOR

1. PROTECT WIRES OR CABLES THAT PROVIDE NORMAL AND STANDBY POWER, CONTROL SIGNALS, COMMUNICATION WITH THE CAR, LIGHTING, HEATING, AIR CONDITIONING, VENTILATION AND FIRE-DETECTING SYSTEMS TO FIRE SERVICE ACCESS ELEVATORS WITH 2-HR FIRE RESISTANCE RATING OR AS REQUIRED BY CODE.
2. PROVIDE 2-HR RATED ACCESS PANELS WHERE INDICATED AND AT ALL PULL BOX LOCATIONS.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ANDREW JOHN JOHNSON
REGISTERED
No. AR10400213
STATE OF
INDIANA
LICENSED
ARCHITECT

ELEVATOR CAB PLAN, AND ELEVATION DETAILS

DATE	REF: SHEET INDEX
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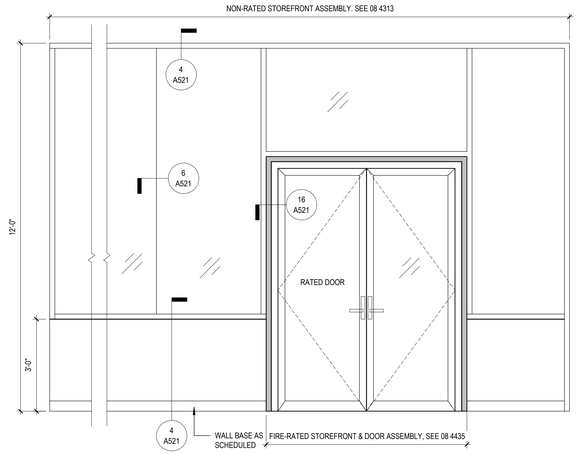
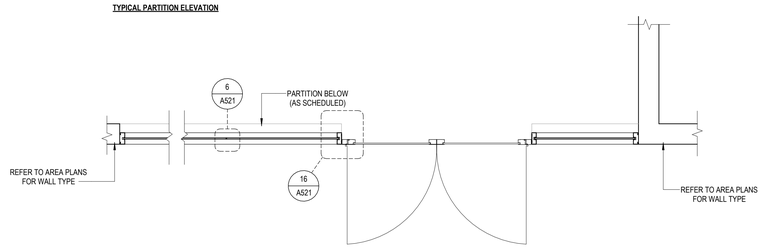


TYPICAL PARTITION ELEVATION



TYPICAL PARTITION PLAN

4 A520 INTERIOR STOREFRONT SYSTEM SF4 - 12 FT ON LEVEL 1 - W/ SPRINKLERS
1/2" = 1'-0"

INTERIOR STOREFRONT SCHEDULE						
TYPE	GRAPHIC	DESCRIPTION	SPECIFICATION SECTION	FIRE RATING	STC RATING	COMMENTS
SF1		2" x 4 1/2" INTERIOR STOREFRONT, CENTER GLAZED	08 4313	N/A		GL-03
SF2		2" x 4 1/2" INTERIOR STOREFRONT, CENTER GLAZED	08 4313	N/A		GL-03
SF3		2" x 4 1/2" INTERIOR STOREFRONT, CENTER GLAZED	08 4313	N/A		GL-03
SF4		2" x 4 1/2" INTERIOR STOREFRONT, CENTER GLAZED	08 4313	N/A		GL-03
SF5		2" x 4 1/2" INTERIOR STOREFRONT, CENTER GLAZED	08 4313	N/A		GL-01
SF6		LAMINATED GLASS WITH RECESSED GLAZING U-CHANNELS AND SEALED BUTT JOINTS.	08 4313	NA	39	GL-03

2

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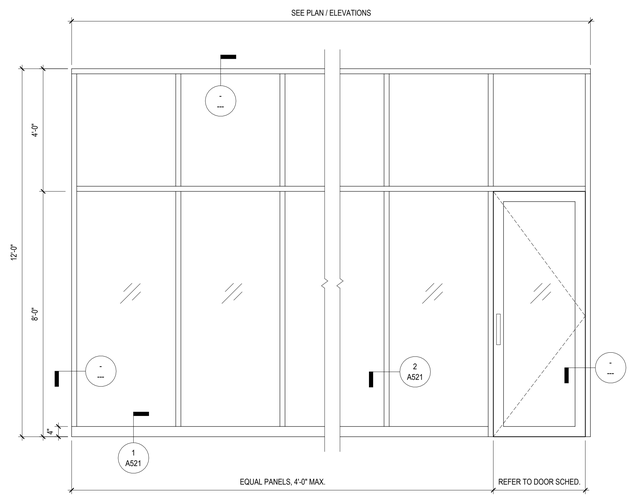
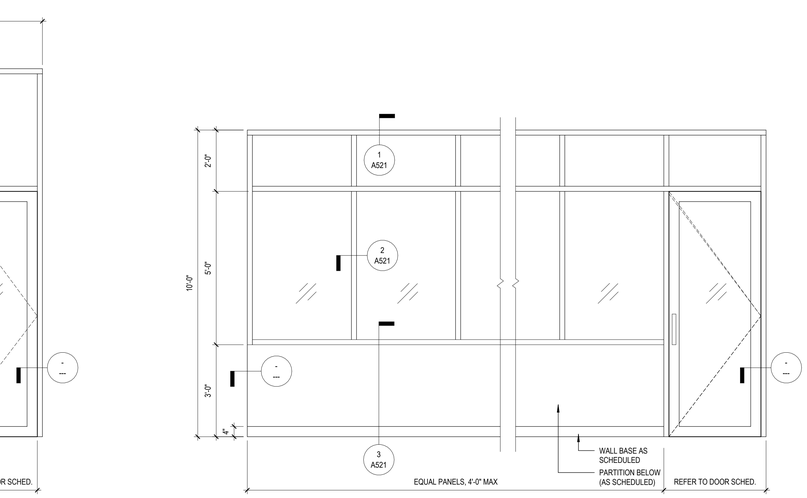
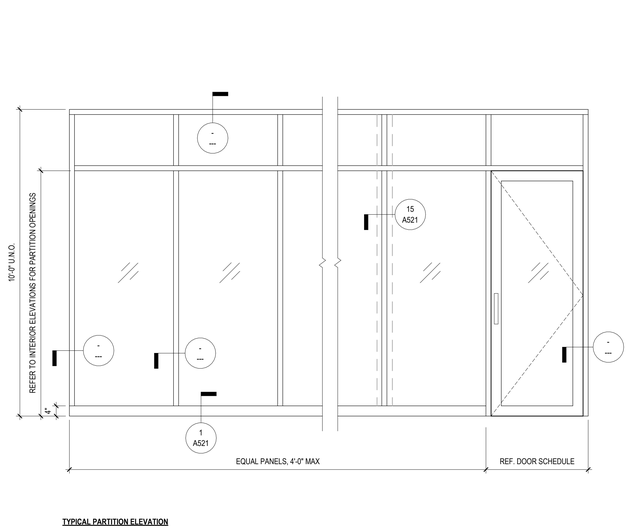


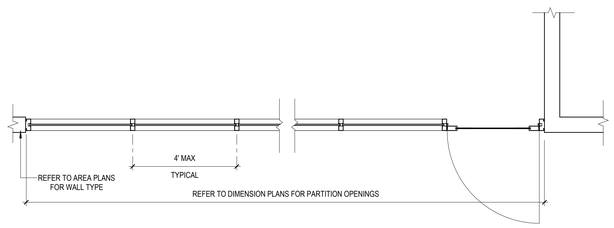
TYPICAL PARTITION ELEVATION



TYPICAL PARTITION ELEVATION

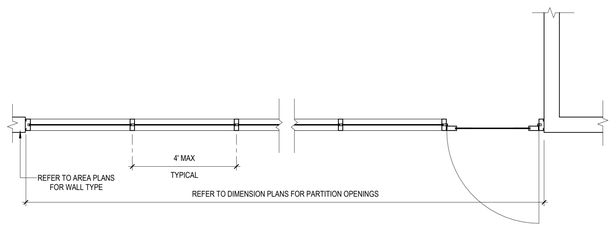


TYPICAL PARTITION ELEVATION



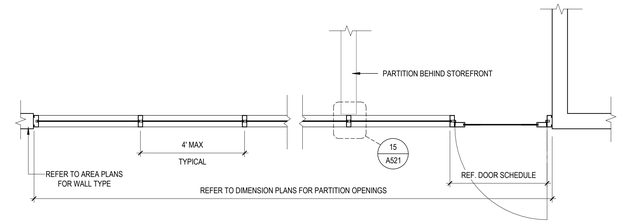
TYPICAL PARTITION PLAN

3 A520 INTERIOR STOREFRONT SYSTEM SF3 - 12 FT ON LEVEL 1
1/2" = 1'-0"



TYPICAL PARTITION PLAN

2 A520 INTERIOR STOREFRONT SYSTEM SF2
1/2" = 1'-0"



TYPICAL PARTITION PLAN

1 A520 INTERIOR STOREFRONT SYSTEM SF1
1/2" = 1'-0"

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN JOHNSON
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

INTERIOR GLAZING SCHEDULE & ELEVATIONS

DATE
BSA PROJECT NO. 00360481

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A520

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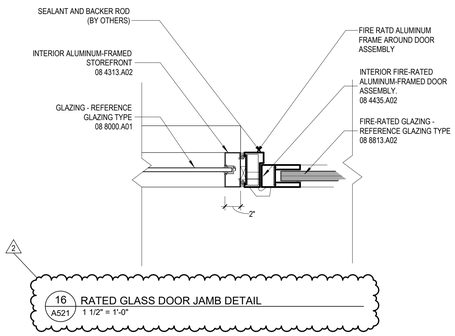
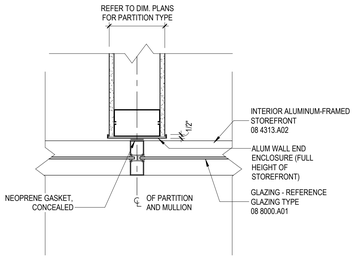
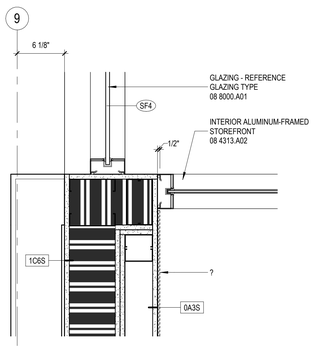


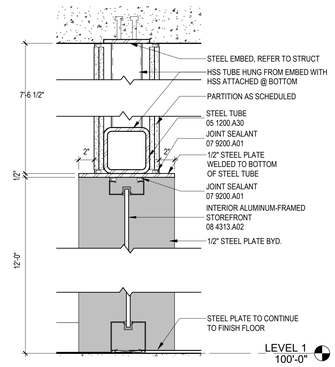
16 A521 RATED GLASS DOOR JAMB DETAIL
1 1/2" = 1'-0"



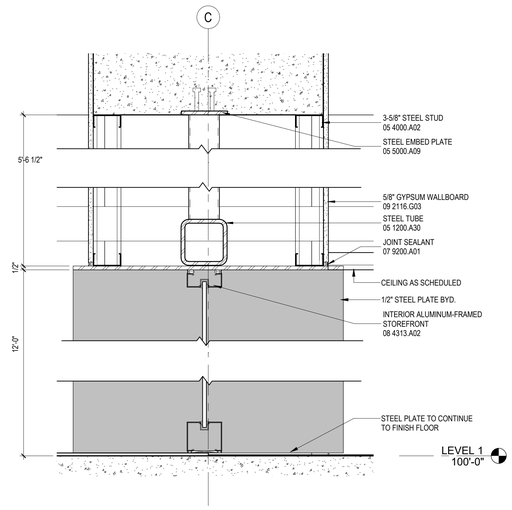
15 A521 TYP STOREFRONT PLAN DETAIL AT PARTITIONS
1 1/2" = 1'-0"



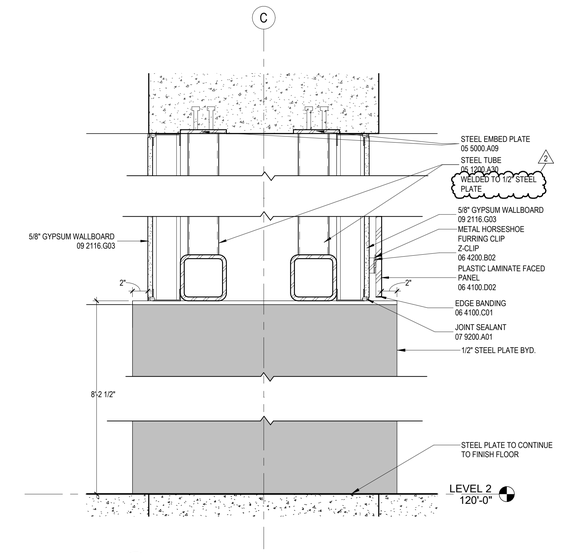
11 A521 LEVEL 1 CORNER PLAN DETAIL
1 1/2" = 1'-0"



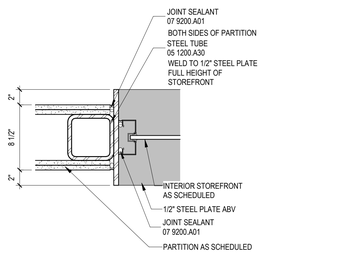
14 A521 SECTION @ NORTH PORTAL SHROUD DETAIL
1 1/2" = 1'-0"



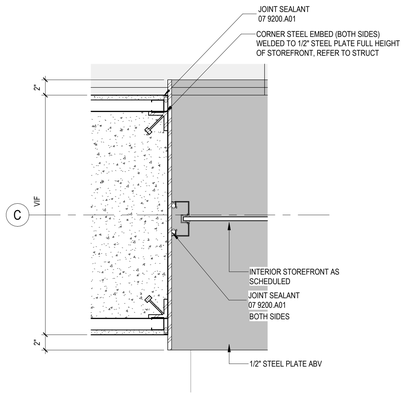
13 A521 SECTION @ SOUTH PORTAL SHROUD DETAIL
1 1/2" = 1'-0"



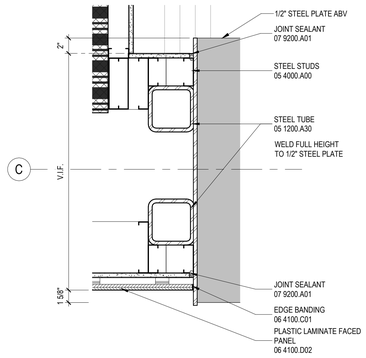
12 A521 SECTION @ CORRIDOR PORTAL SHROUD, TYP (LEVELS 2-5)
1 1/2" = 1'-0"



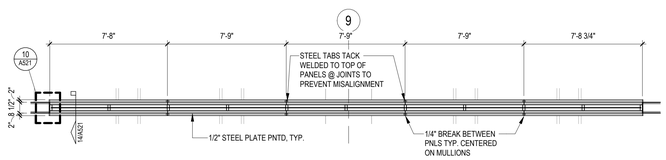
10 A521 ENLARGED RCP - NORTH STEEL PORTAL SHROUD - JAMB CONDITION
1 1/2" = 1'-0"



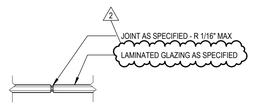
9 A521 ENLARGED RCP - SOUTH STEEL PORTAL SHROUD - Callout 1
1 1/2" = 1'-0"



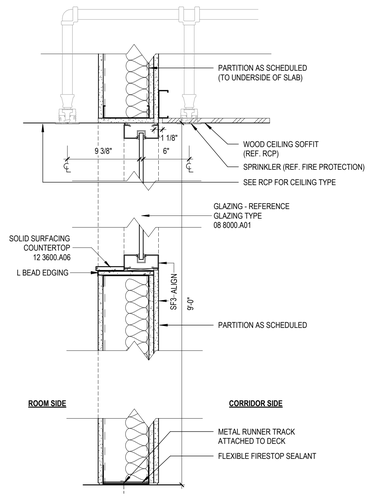
8 A521 ENLARGED RCP - CORRIDOR PORTAL SHROUD, TYP. (LEVELS 2-5)
1 1/2" = 1'-0"



7 A521 ENLARGED RCP - NORTH STEEL PORTAL SHROUD
1/4" = 1'-0"



6 A521 INTERIOR GLAZING - BUTT JOINT
3" = 1'-0"



4 A521 SF3 - TYPICAL STOREFRONT SECTION DETAIL
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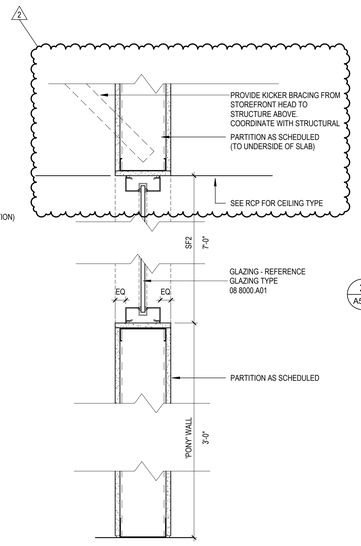

3 A521 SF2 - TYPICAL STOREFRONT SECTION DETAIL
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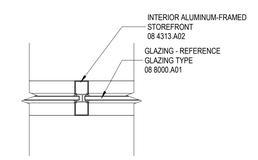

2 A521 TYPICAL STOREFRONT CENTER MULLION DETAIL
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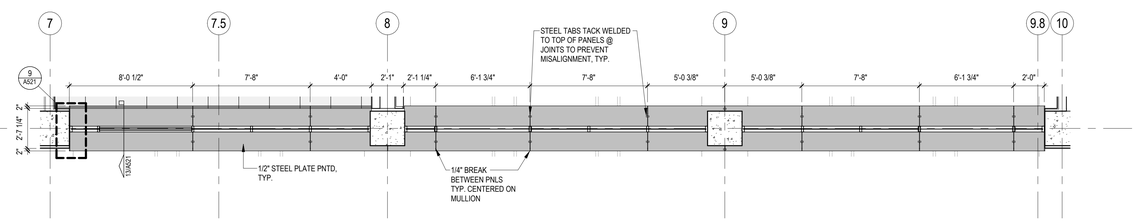

5 A521 ENLARGED RCP - SOUTH STEEL PORTAL SHROUD
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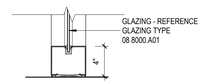

1 A521 TYPICAL STOREFRONT BASE DETAIL
1 1/2" = 1'-0"

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INTERIOR STOREFRONT SYSTEM DETAILS

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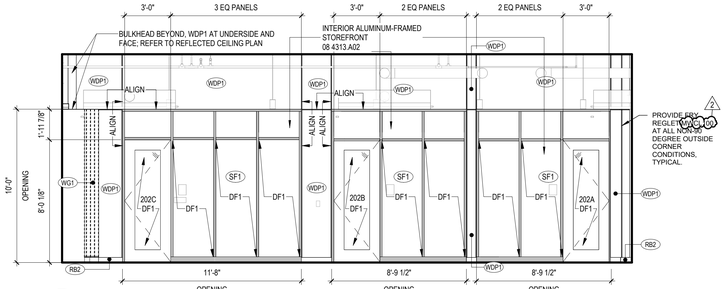
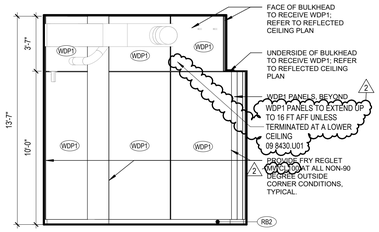
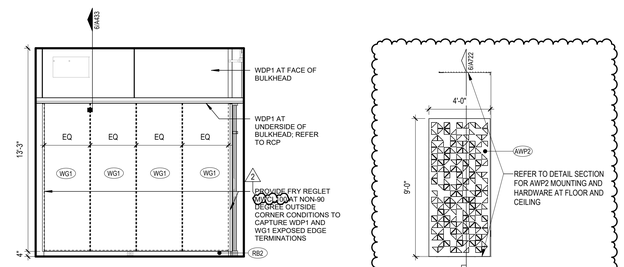


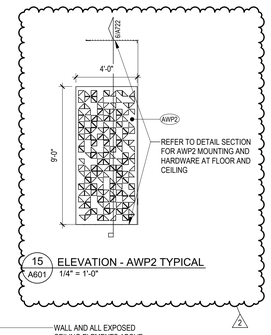
14 A601 ELEVATION - L2 COWORK OFFICES ENTRY
1/4" = 1'-0"



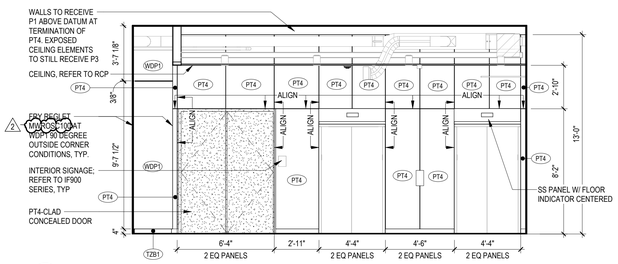
13 A601 ELEVATION - L2 COWORK WOOD PANELING 2
1/4" = 1'-0"



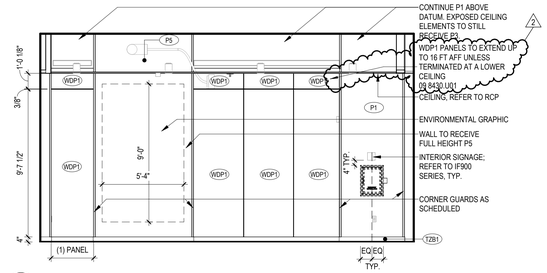
12 A601 ELEVATION - L2 COWORK EAST CORE WALL
1/4" = 1'-0"



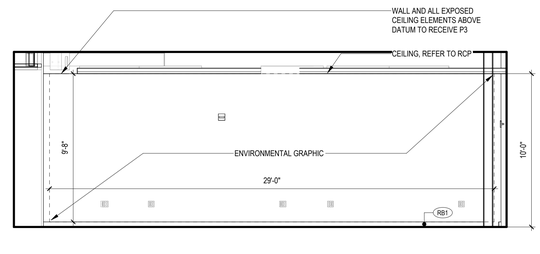
15 A601 ELEVATION - AWP2 TYPICAL
1/4" = 1'-0"



11 A601 ELEVATION - UPPER FLOOR ELEVATOR LOBBY WEST TYPICAL
1/4" = 1'-0"



10 A601 ELEVATION - UPPER FLOOR ELEVATOR LOBBY TYPICAL
1/4" = 1'-0"



9 A601 ELEVATION - L2 COWORK GRAPHIC WALL
1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

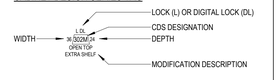
INTERIOR ELEVATION NOTES

A. REFER TO FLOOR PLANS AND THE EQUIPMENT SCHEDULE FOR EQUIPMENT. COORDINATE CONNECTIONS.
B. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
C. DIMENSIONS ARE TAKEN TO THE FACE OF FINISHED MATERIAL, UNLESS NOTED OTHERWISE
D. REFER TO ARCHITECTURAL AND/OR INTERIOR DRAWINGS FOR SOLID SURFACE SINK TYPES.

CASEWORK NOTES

A. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION OF CABINETS.
B. CASEWORK TO BE PLASTIC LAMINATE, UNLESS NOTED OTHERWISE
C. GYPSUM WALLBOARD SOFFITS ABOVE UPPER CABINETS TO BE 1 " DEEPER AND WIDER THAN CABINETS BELOW, UNLESS NOTED OTHERWISE.
D. COORDINATE WALL DEVICE LOCATIONS TO AVOID CONFLICT WITH CASEWORK AND COUNTERTOPS.
E. COORDINATE COUNTERTOP SUPPORT BRACKET LOCATIONS WITH UNDER-COUNTER EQUIPMENT INDICATED ELSEWHERE IN DRAWINGS.
F. PROVIDE 1" MIN - 2" MAX WIDE SCRIBE FILLERS WHERE CABINETS ABUT AN ADJACENT WALL.
G. PROVIDE 4" HIGH INTEGRAL BACK SPLASH ON ALL COUNTERTOPS WITH SINKS AND INSTALL END SPLASHES WHERE COUNTERTOPS ABUT A WALL.
H. PROVIDE ADJUSTABLE SHELVES IN CABINETS AS INDICATED BY DASHED LINE.
I. SURFACE FINISHES TO MEET CASEWORK STANDARD REQUIREMENTS AS INDICATED IN SPECIFICATION.
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG



INTERIOR ELEVATION SYMBOLS

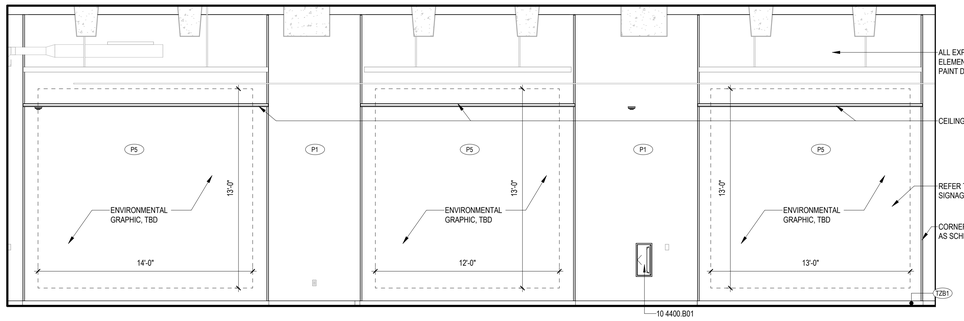
BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

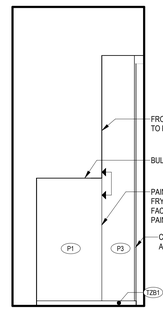
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

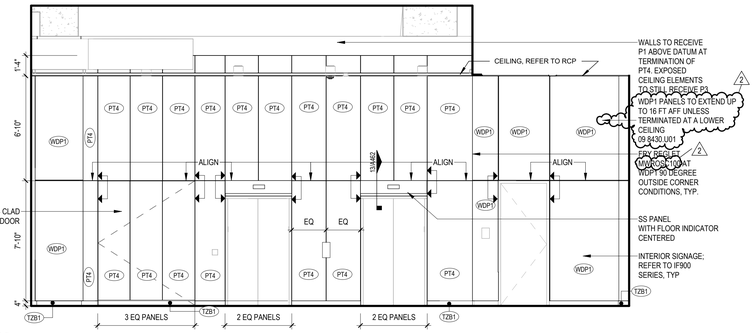
CLIENT PROJECT NO. - 20250072



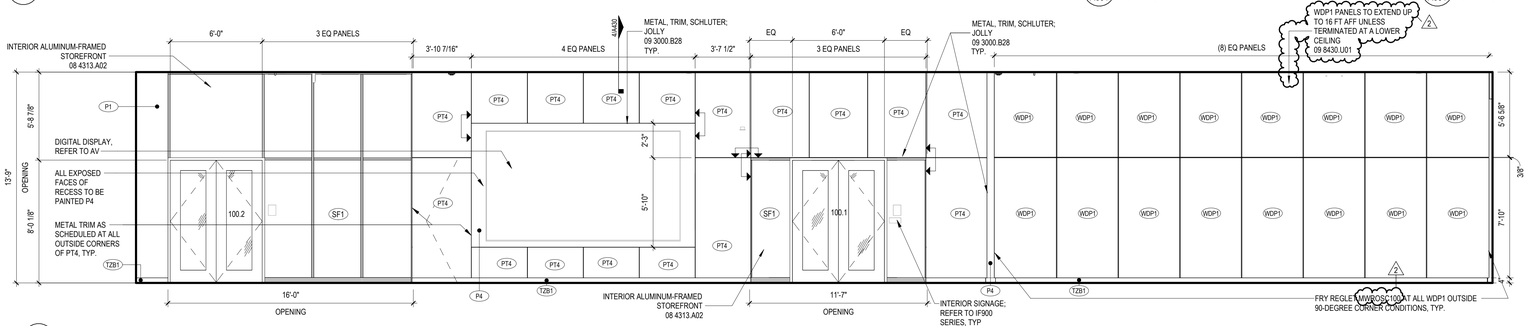
8 A601 ELEVATION - NORTH CORRIDOR, WEST
1/4" = 1'-0"



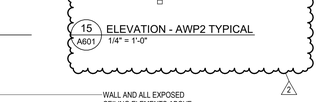
7 A601 ELEVATION - NORTH CORRIDOR SIDE WALL
1/4" = 1'-0"



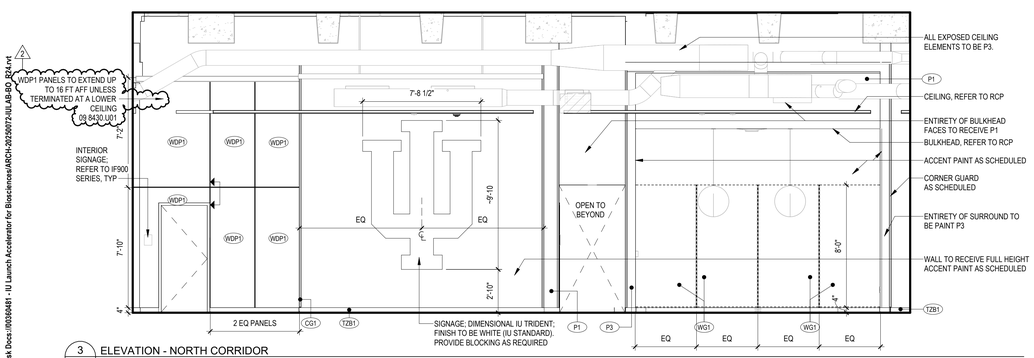
6 A601 ELEVATION - L1 ELEVATORS
1/4" = 1'-0"



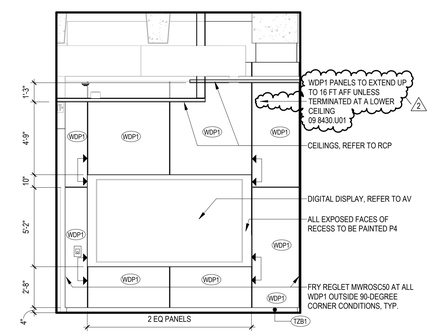
5 A601 ELEVATION - MULTIPURPOSE ENTRY
1/4" = 1'-0"



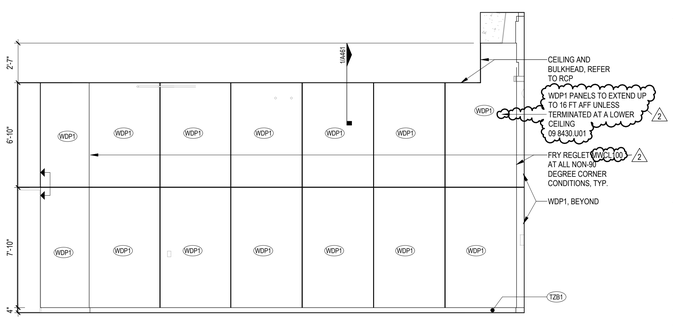
4 A601 ELEVATION - CORRIDOR SEATING
1/4" = 1'-0"



3 A601 ELEVATION - NORTH CORRIDOR
1/4" = 1'-0"



2 A601 ELEVATION - CENTER CORRIDOR
1/4" = 1'-0"



1 A601 ELEVATION - LOBBY WOOD PANELING
1/4" = 1'-0"

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

JOHN M. YOUNG
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

INTERIOR ELEVATIONS

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

A601

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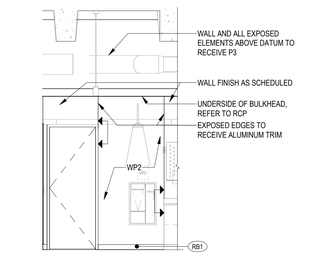
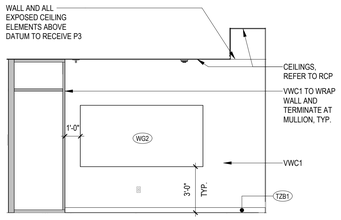
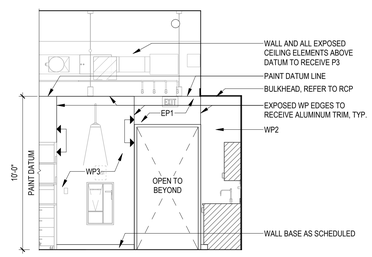


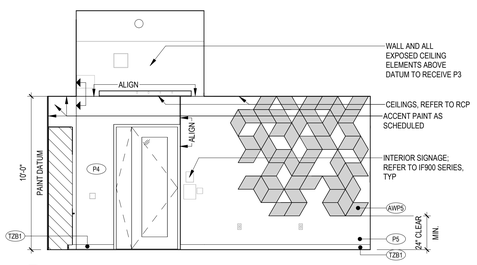
20 A602 ELEVATION - WET LAB 327 WP2
1/4" = 1'-0"



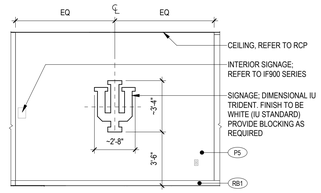
19 A602 ELEVATION - PROJECT ROOM 329
1/4" = 1'-0"



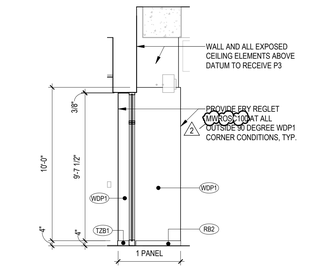
18 A602 ELEVATION - WET LAB 327 WP3
1/4" = 1'-0"



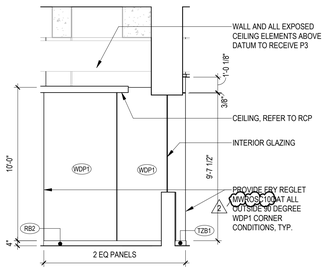
17 A602 ELEVATION - L3 LAB ENTRY
1/4" = 1'-0"



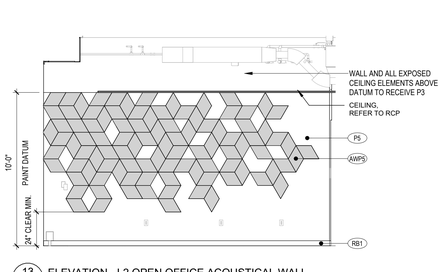
16 A602 ELEVATION - L3 FEATURE WALL
1/4" = 1'-0"



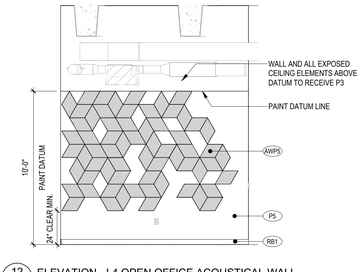
15 A602 ELEVATION - OFFICE WOOD PANELING EAST
1/4" = 1'-0"



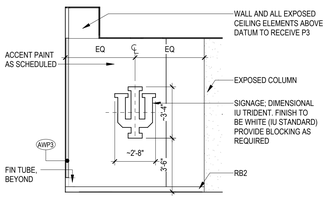
14 A602 ELEVATION - OFFICE WOOD PANELING NORTH
1/4" = 1'-0"



13 A602 ELEVATION - L2 OPEN OFFICE ACOUSTICAL WALL
1/4" = 1'-0"



12 A602 ELEVATION - L4 OPEN OFFICE ACOUSTICAL WALL
1/4" = 1'-0"



11 A602 ELEVATION - 231 ACCENT WALL
1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

INTERIOR ELEVATION NOTES

A. REFER TO FLOOR PLANS AND THE EQUIPMENT SCHEDULE FOR EQUIPMENT. COORDINATE CONNECTIONS.
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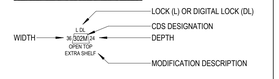
I. SURFACE FINISHES TO MEET CASEWORK STANDARD REQUIREMENTS AS INDICATED IN SPECIFICATION.
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG



INTERIOR ELEVATION SYMBOLS

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

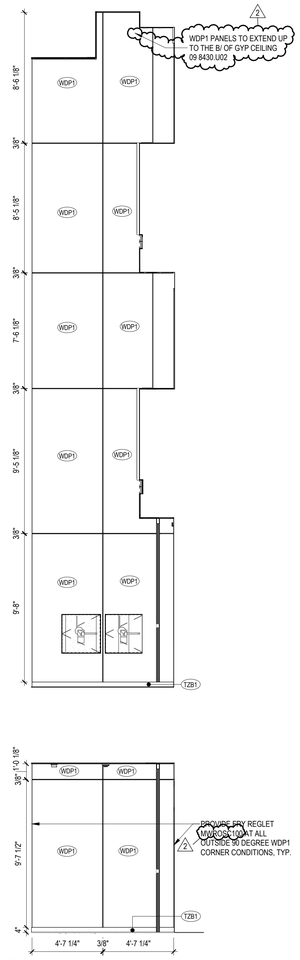
SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

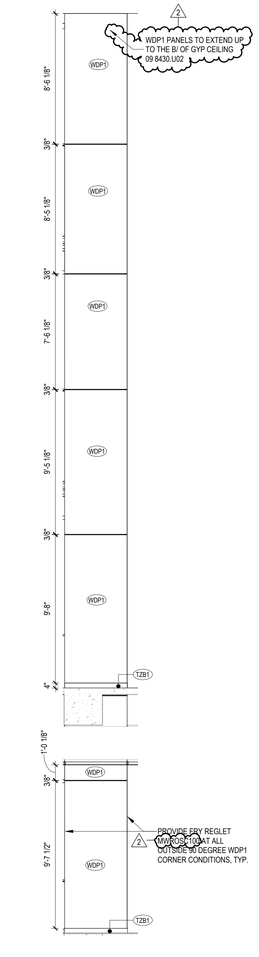
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

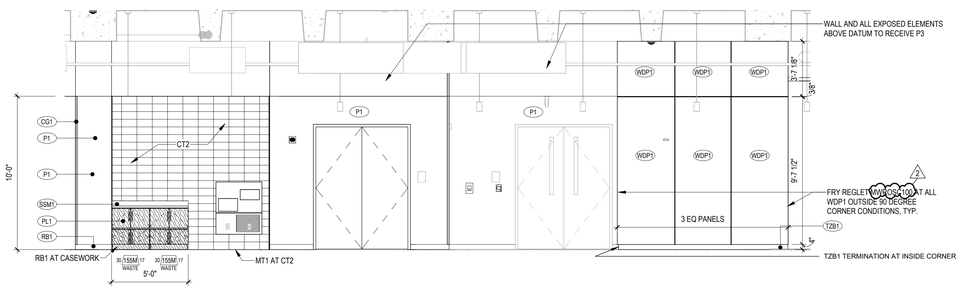
CLIENT PROJECT NO. - 20250072



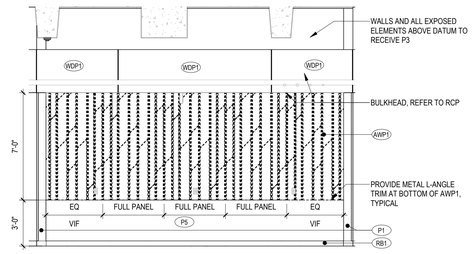
6 A602 ELEVATION - MULTI-LEVEL WOOD PANELING (SOUTH)
1/4" = 1'-0"



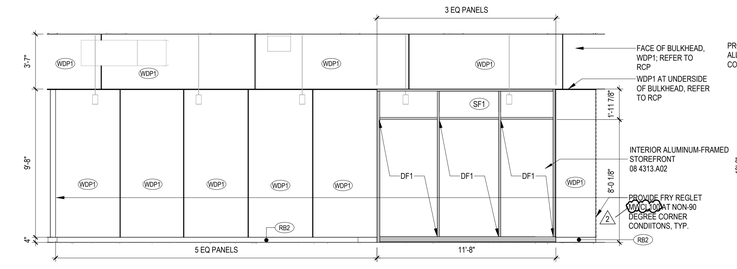
5 A602 ELEVATION - MULTI-FLOOR WOOD PANELING (WEST)
1/4" = 1'-0"



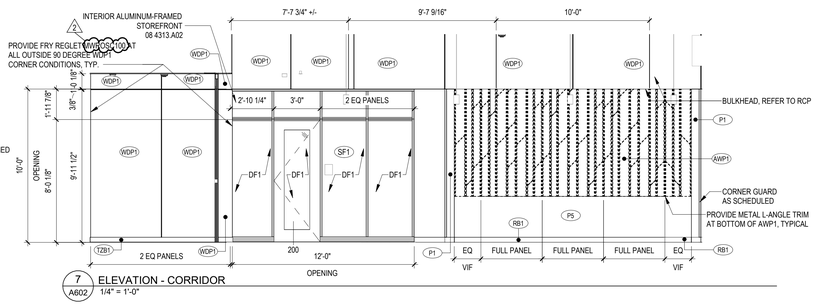
10 A602 ELEVATION - UPPER LEVEL CORRIDOR AT RESTROOMS
1/4" = 1'-0"



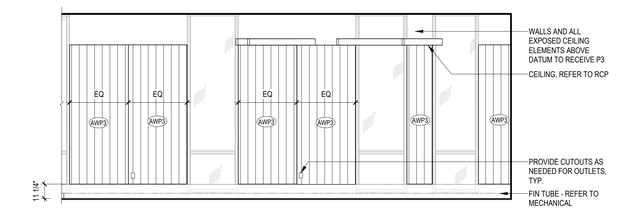
9 A602 ELEVATION - UPPER LEVEL TYP ALCOVE
1/4" = 1'-0"



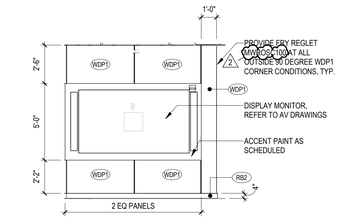
8 A602 ELEVATION - L2 COWORK WOOD PANELING
1/4" = 1'-0"



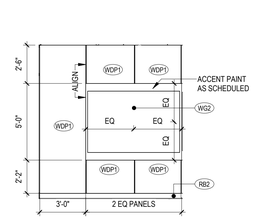
7 A602 ELEVATION - CORRIDOR
1/4" = 1'-0"



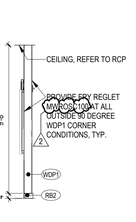
4 A602 ELEVATION - 231 MEETING EXTERIOR WALL
1/4" = 1'-0"



3 A602 ELEVATION - 231 WOOD PANELING, MEDIA WALL
1/4" = 1'-0"



2 A602 ELEVATION - 231 WOOD PANELING
1/4" = 1'-0"



1 A602 ELEVATION - 231 WOOD PANELING SIDE
1/4" = 1'-0"

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANGELA JOHN JOHNSON
REGISTERED
No. AR10400213 STATE OF INDIANA
ARCHITECT

INTERIOR ELEVATIONS

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

A602

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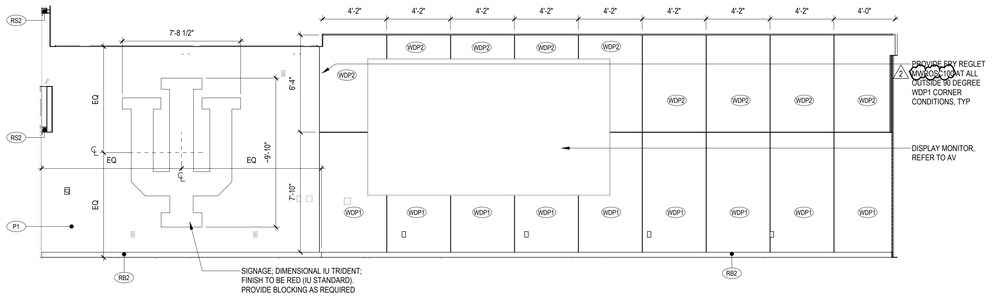
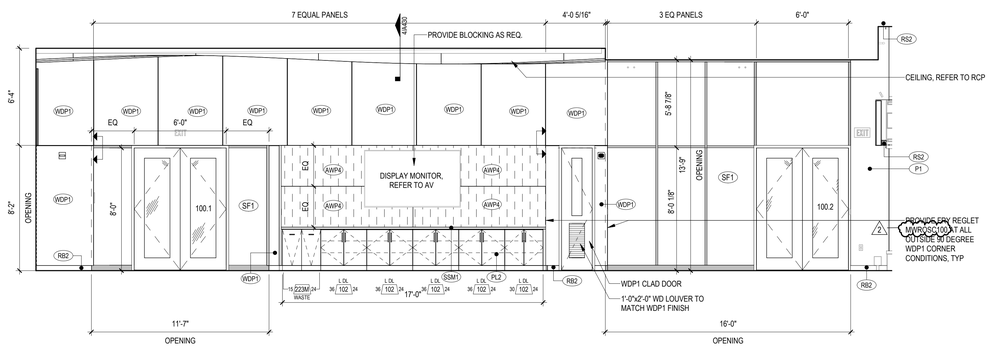
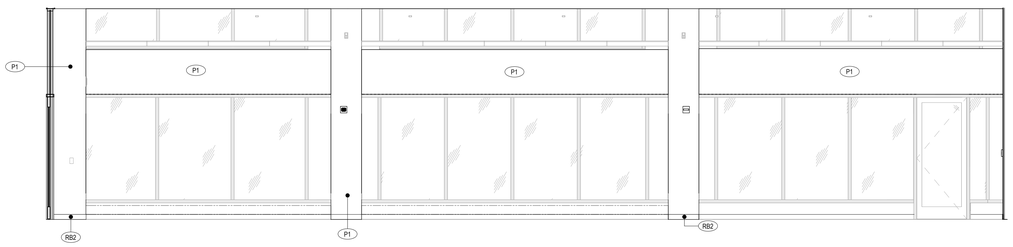


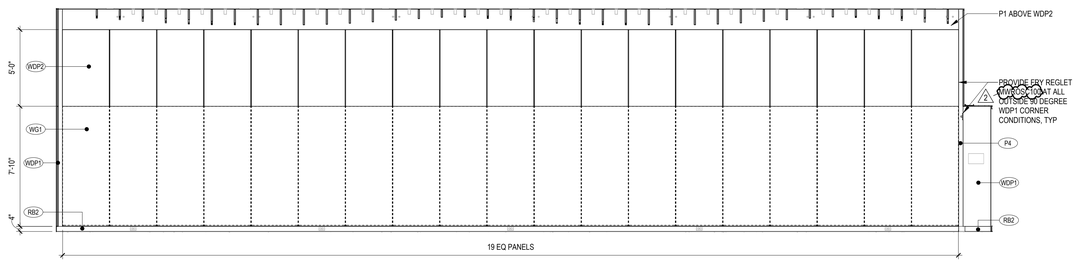
8 A603 ELEVATION - LARGE MULTI-PURPOSE, WEST WALL
1/4" = 1'-0"



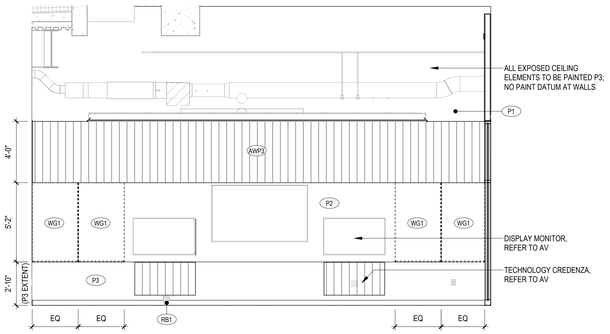
6 A603 ELEVATION - LARGE MULTI-PURPOSE, EAST WALL
1/4" = 1'-0"



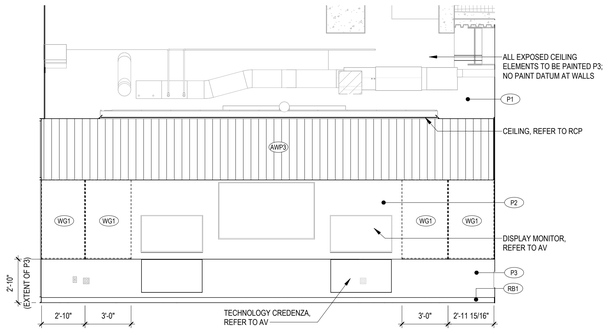
4 A603 ELEVATION - LARGE MULTIPUPOSE, SOUTH WALL
1/4" = 1'-0"



2 A603 ELEVATION - LARGE MULTIPURPOSE, NORTH WALL
1/4" = 1'-0"



7 A603 ELEVATION - CLASSROOMS, WEST WALL
1/4" = 1'-0"



5 A603 ELEVATION - CLASSROOMS, EAST WALL
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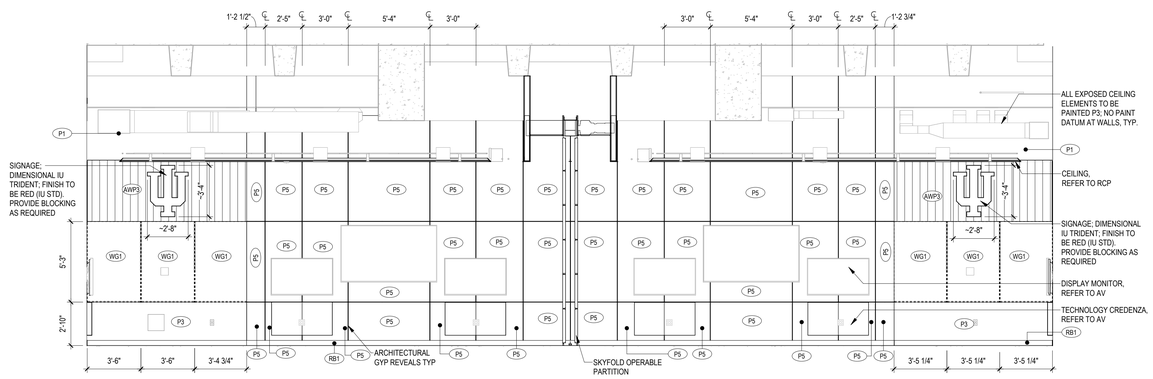
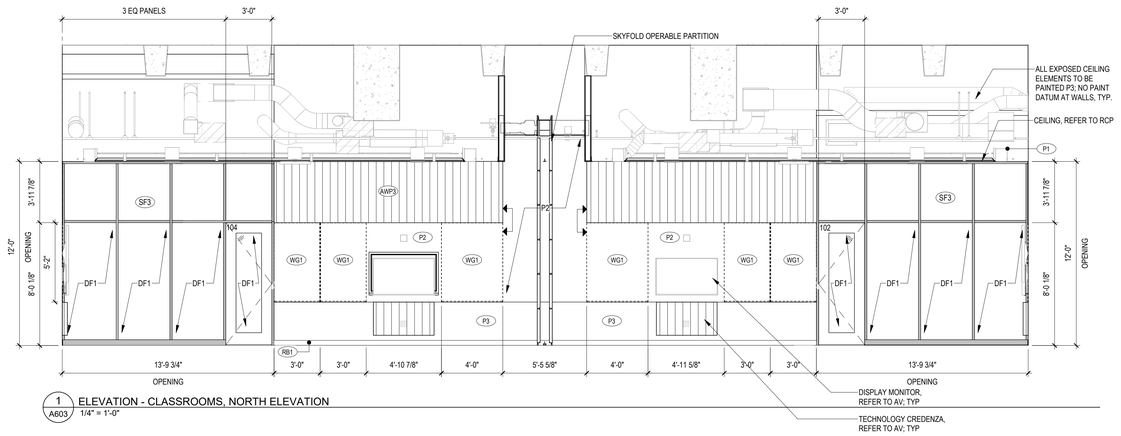


3 A603 ELEVATION - CLASSROOMS, SOUTH WALL
1/4" = 1'-0"



1 A603 ELEVATION - CLASSROOMS, NORTH ELEVATION
1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

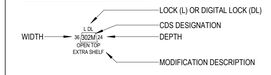
INTERIOR ELEVATION NOTES

A. REFER TO FLOOR PLANS AND THE EQUIPMENT SCHEDULE FOR EQUIPMENT. COORDINATE CONNECTIONS.
B. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
C. DIMENSIONS ARE TAKEN TO THE FACE OF FINISHED MATERIAL, UNLESS NOTED OTHERWISE
D. REFER TO ARCHITECTURAL AND/OR INTERIOR DRAWINGS FOR SOLID SURFACE SINK TYPES.

CASEWORK NOTES

A. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION OF CABINETS.
B. CASEWORK TO BE PLASTIC LAMINATE, UNLESS NOTED OTHERWISE
C. GYPSUM WALLBOARD SOFFITS ABOVE UPPER CABINETS TO BE 1 " DEEPER AND WIDER THAN CABINETS BELOW, UNLESS NOTED OTHERWISE.
D. COORDINATE WALL DEVICE LOCATIONS TO AVOID CONFLICT WITH CASEWORK AND COUNTERTOPS.
E. COORDINATE COUNTERTOP SUPPORT BRACKET LOCATIONS WITH UNDER-COUNTER EQUIPMENT INDICATED ELSEWHERE IN DRAWINGS.
F. PROVIDE 1" MIN - 2" MAX WIDE SCRIBE FILLERS WHERE CABINETS ABUT AN ADJACENT WALL.
G. PROVIDE 4" HIGH INTEGRAL BACK SPLASH ON ALL COUNTERTOPS WITH SINKS AND INSTALL END SPLASHES WHERE COUNTERTOPS ABUT A WALL.
H. PROVIDE ADJUSTABLE SHELVES IN CABINETS AS INDICATED BY DASHED LINE.
I. SURFACE FINISHES TO MEET CASEWORK STANDARD REQUIREMENTS AS INDICATED IN SPECIFICATION.
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG



INTERIOR ELEVATION SYMBOLS

_KEYNOTE SCHEDULE

NUMBER	TEXT

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN ANDERSON
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

INTERIOR ELEVATIONS

DATE
BSA PROJECT NO. 00360481
REF: SHEET INDEX

A603

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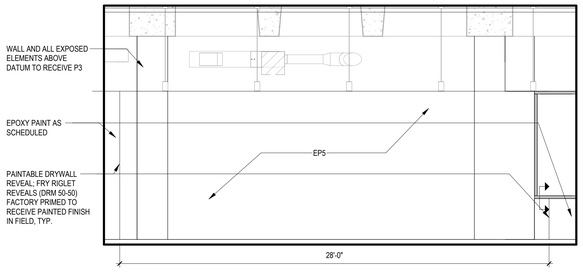
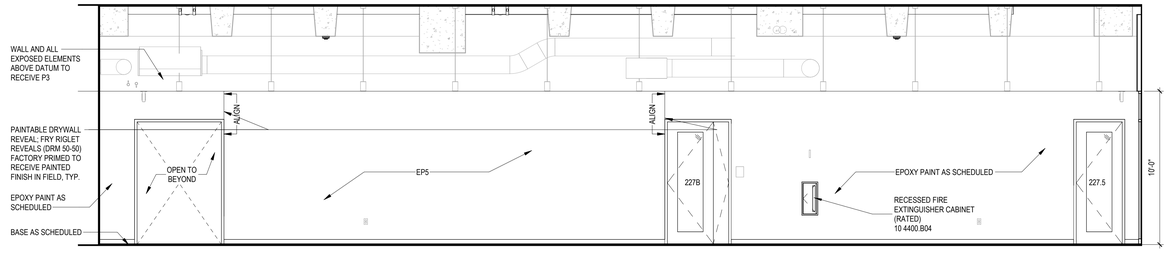
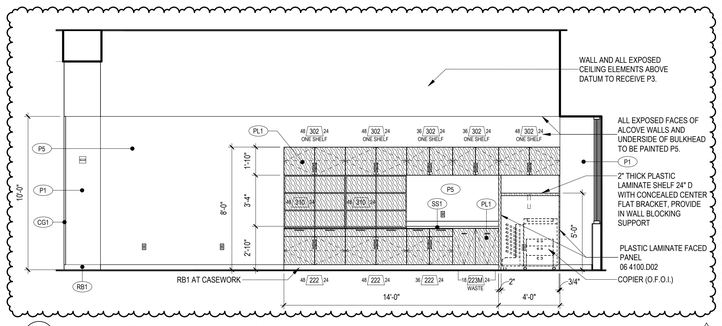


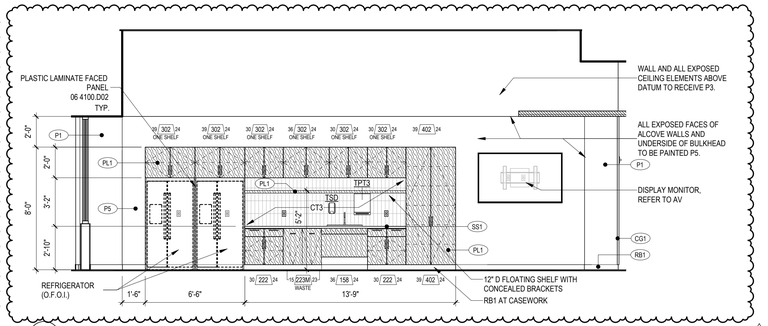
20 A604 ELEVATION - L2 LAB ACCENT WALL
1/4" = 1'-0"



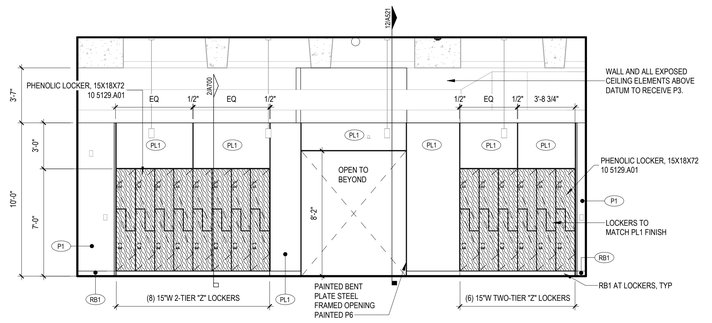
19 A604 ELEVATION - L2 LAB ACCENT WALL (CONT.)
1/4" = 1'-0"



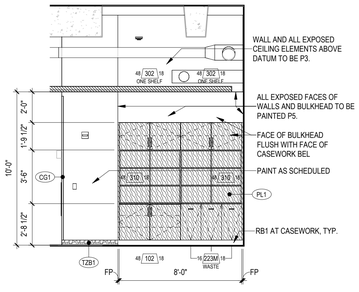
18 A604 ELEVATION - CENTRAL COLLAB WORK STATION
1/4" = 1'-0"



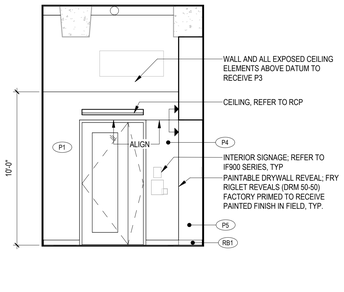
17 A604 ELEVATION - CENTRAL COLLAB, KITCHENETTE
1/4" = 1'-0"



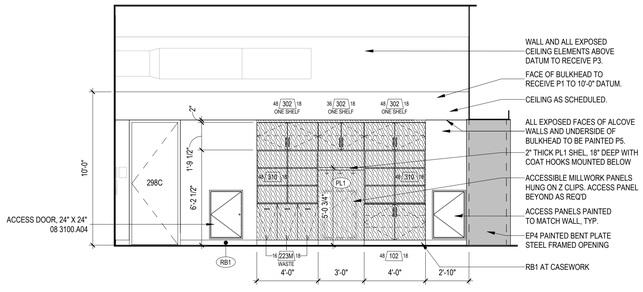
16 A604 ELEVATION - LOCKERS AT UPPER LEVELS
1/4" = 1'-0"



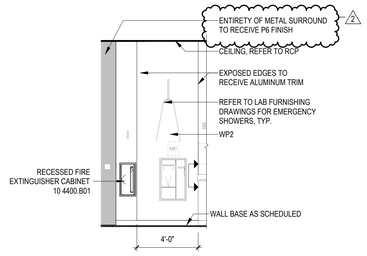
15 A604 ELEVATION - LAB FOYER
1/4" = 1'-0"



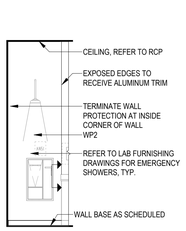
14 A604 ELEVATION - LAB ENTRY
1/4" = 1'-0"



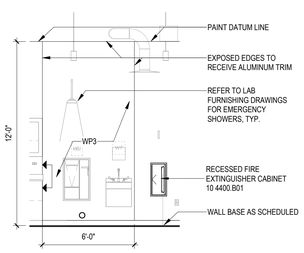
13 A604 ELEVATION - SERVICE CORRIDOR
1/4" = 1'-0"



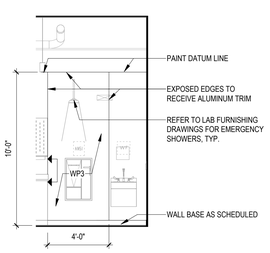
12 A604 ELEVATION - 107 EMERGENCY SHOWER 1
1/4" = 1'-0"



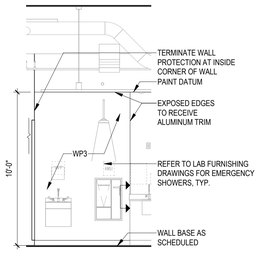
11 A604 ELEVATION - 107 EMERGENCY SHOWER 2
1/4" = 1'-0"



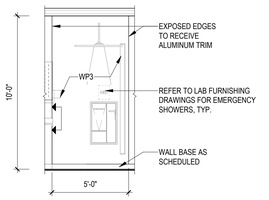
10 A604 ELEVATION - 103 EMERGENCY SHOWER 2
1/4" = 1'-0"



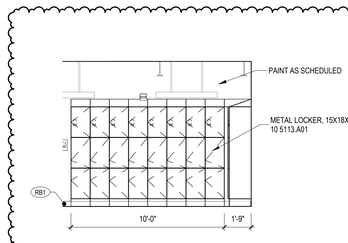
9 A604 ELEVATION - 227C EMERGENCY SHOWER
1/4" = 1'-0"



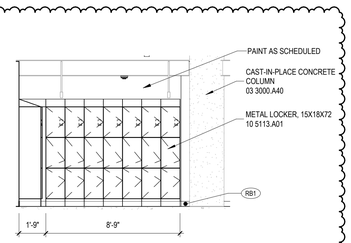
8 A604 ELEVATION - 227E EMERGENCY SHOWER
1/4" = 1'-0"



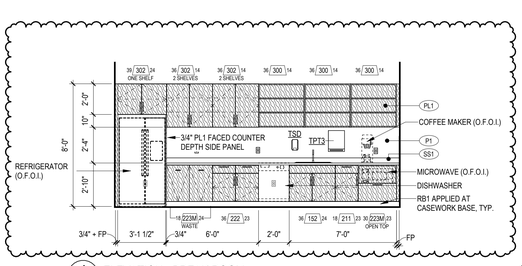
7 A604 ELEVATION - 427 EMERGENCY SHOWER
1/4" = 1'-0"



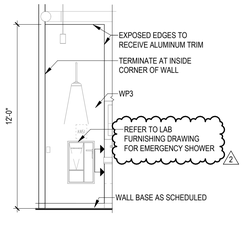
6 A604 ELEVATION - LOCKERS AT MAIL ROOM, WEST WALL
1/4" = 1'-0"



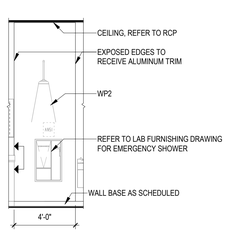
5 A604 ELEVATION - LOCKERS AT MAIL ROOM, SOUTH WALL
1/4" = 1'-0"



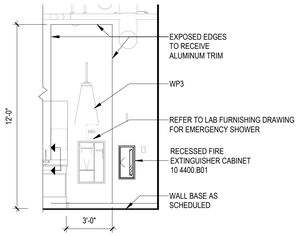
4 A604 ELEVATION - BREAK ROOM
1/4" = 1'-0"



3 A604 ELEVATION - 103 EMERGENCY SHOWER
1/4" = 1'-0"



2 A604 ELEVATION - 108A EMERGENCY SHOWER
1/4" = 1'-0"



1 A604 ELEVATION - 106 EMERGENCY SHOWER
1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

INTERIOR ELEVATION NOTES

A. REFER TO FLOOR PLANS AND THE EQUIPMENT SCHEDULE FOR EQUIPMENT. COORDINATE CONNECTIONS.
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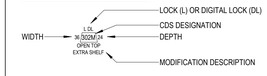
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG



INTERIOR ELEVATION SYMBOLS

_KEYNOTE SCHEDULE

NUMBER	TEXT
03 3000.A40	CAST-IN-PLACE CONCRETE COLUMN
06 4100.D02	PLASTIC LAMINATE FACED PANEL
08 3100.A04	ACCESS DOOR, 24" X 24"
10 4400.B01	RECESSED FIRE EXTINGUISHER CABINET
10 4400.B04	RECESSED FIRE EXTINGUISHER CABINET (RATED)
10 5113.A01	METAL LOCKER, 15X18X72
10 5129.A01	PHENOLIC LOCKER, 15X18X72

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN HUCK REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR ELEVATIONS

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

A604

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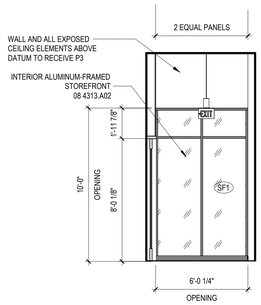

11 A605 INTERIOR ELEVATION
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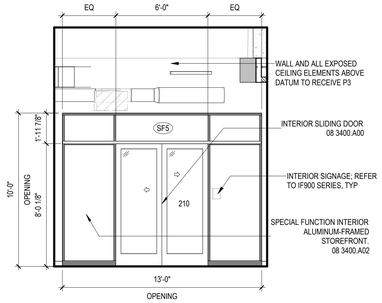
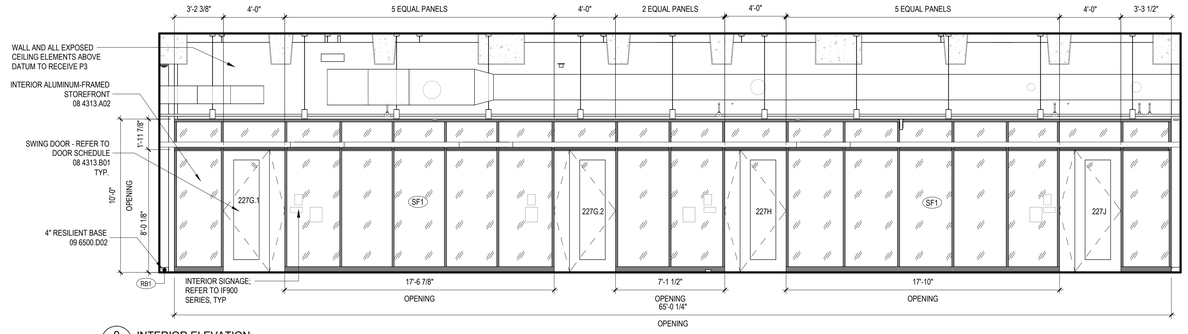


10 A605 INTERIOR ELEVATION
1/4" = 1'-0"



9 A605 INTERIOR ELEVATION
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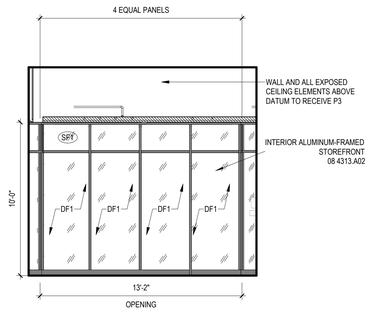
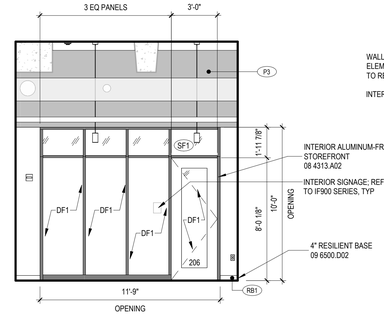
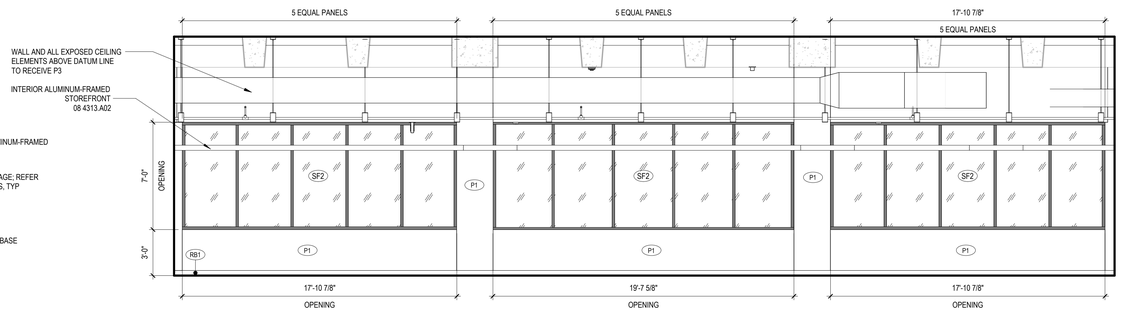


8 A605 INTERIOR ELEVATION
1/4" = 1'-0"



7 A605 HOTELING OFFICE 206 ENTRY
1/4" = 1'-0"



6 A605 INTERIOR ELEVATION
1/4" = 1'-0"

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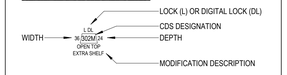
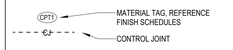
C. GYPSUM WALLBOARD SOFFITS ABOVE UPPER CABINETS TO BE 1 " DEEPER AND WIDER THAN CABINETS BELOW, UNLESS NOTED OTHERWISE.
D. COORDINATE WALL DEVICE LOCATIONS TO AVOID CONFLICT WITH CASEWORK AND COUNTERTOPS.
E. COORDINATE COUNTERTOP SUPPORT BRACKET LOCATIONS WITH UNDER-COUNTER EQUIPMENT INDICATED ELSEWHERE IN DRAWINGS.
F. PROVIDE 1" MIN - 2" MAX WIDE SCRIBE FILLERS WHERE CABINETS ABUT AN ADJACENT WALL.
G. PROVIDE 4" HIGH INTEGRAL BACK SPLASH ON ALL COUNTERTOPS WITH SINKS AND INSTALL END SPLASHES WHERE COUNTERTOPS ABUT A WALL.
H. PROVIDE ADJUSTABLE SHELVES IN CABINETS AS INDICATED BY DASHED LINE.
I. SURFACE FINISHES TO MEET CASEWORK STANDARD REQUIREMENTS AS INDICATED IN SPECIFICATION.
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG

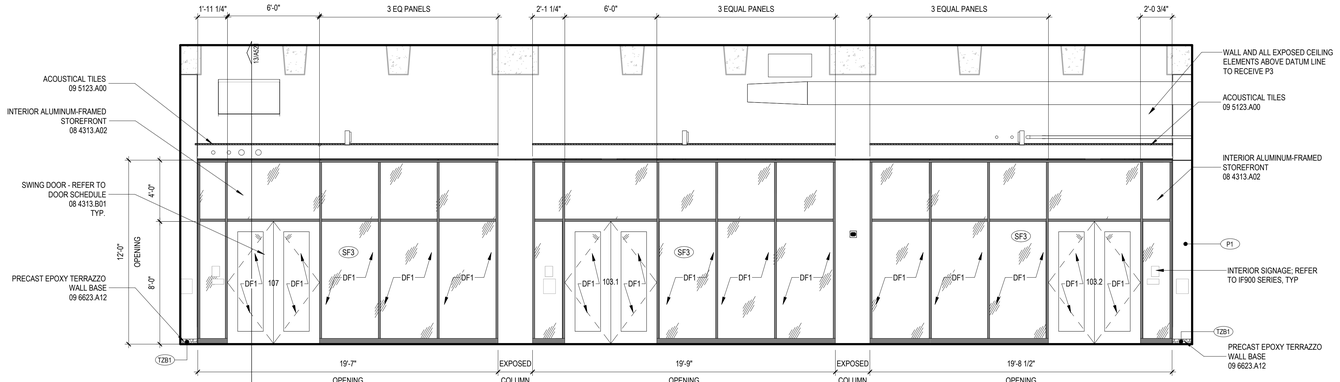


INTERIOR ELEVATION SYMBOLS

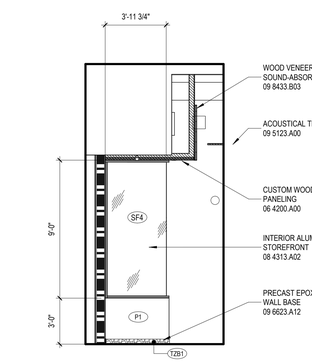


_KEYNOTE SCHEDULE

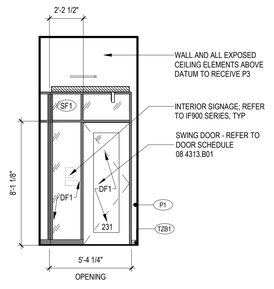
NUMBER	TEXT
06 4200.A00	CUSTOM WOOD VENEER PANELING
08 3400.A00	INTERIOR SLIDING DOOR
08 3400.A02	SPECIAL FUNCTION INTERIOR ALUMINUM-FRAMED STOREFRONT.
08 4313.A02	INTERIOR ALUMINUM-FRAMED STOREFRONT
08 4313.B01	SWING DOOR - REFER TO DOOR SCHEDULE
08 4435.B01	INTERIOR PROTECTED FRAMED GLAZING DOOR
09 2116.G03	5/8" GYPSUM WALLBOARD
09 5123.A00	ACOUSTICAL TILES
09 6500.D02	4" RESILIENT BASE
09 6623.A12	PRECAST EPOXY TERRAZZO WALL BASE
09 8433.B03	WOOD VENEER SOUND-ABSORBING UNITS
10 2600.D00	CORNER GUARD



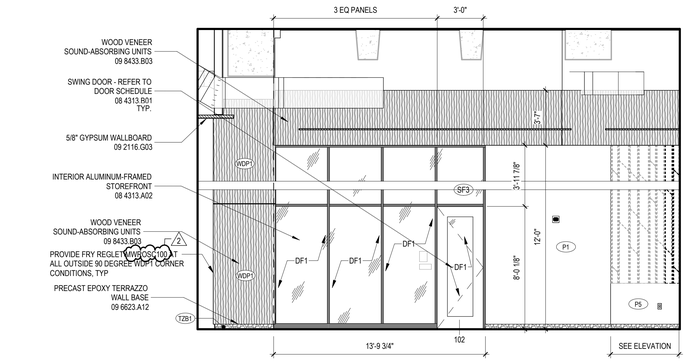
5 A605 01B - CIRCULATION TO IMAGING LAB/ INSTRUCTIONAL LAB
1/4" = 1'-0"



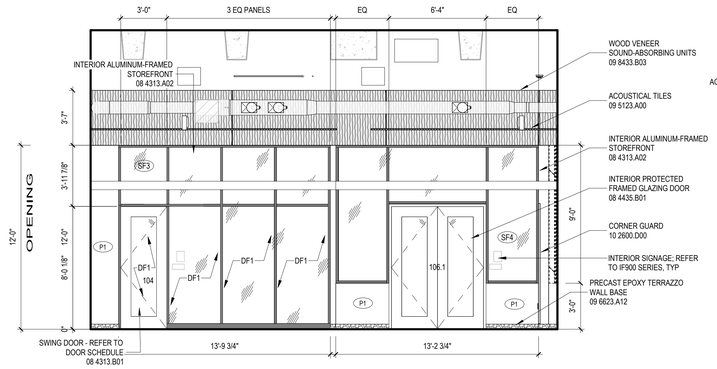
4 A605 01B - CORRIDOR / ELEC & SENSORS STUDIO - B
1/4" = 1'-0"



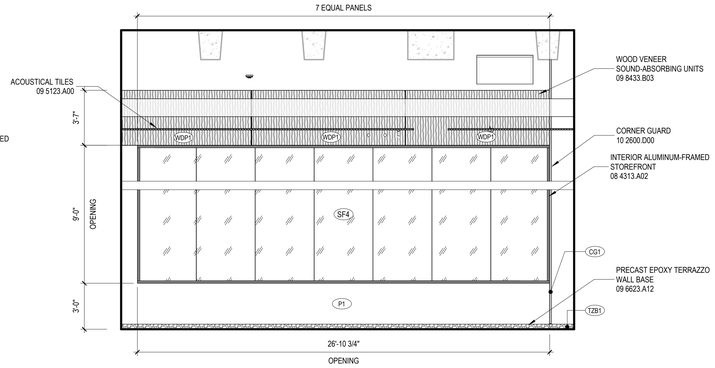
3 A605 INTERIOR ELEVATION
1/4" = 1'-0"



2 A605 01B - CORRIDOR / CLASSROOMS, ELEC & SENSORS STUDIO - A
1/4" = 1'-0"



1 A605 01A - CORRIDOR / ADVANCED WET LAB
1/4" = 1'-0"



ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

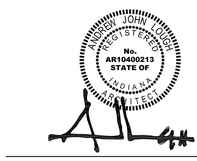
BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



INTERIOR ELEVATIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A605

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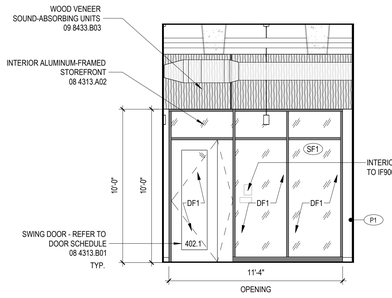
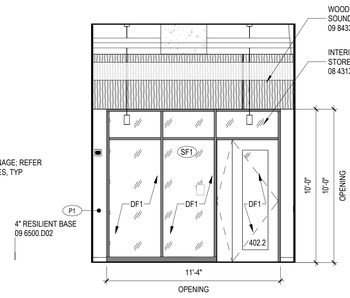
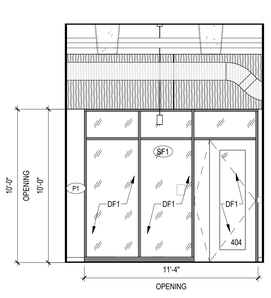
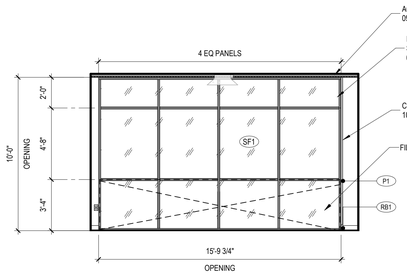






12x A606 INTERIOR ELEVATION
1/4" = 1'-0"



11 A606 04A- OPEN OFFICE WORKSPACE (TO WET LAB)
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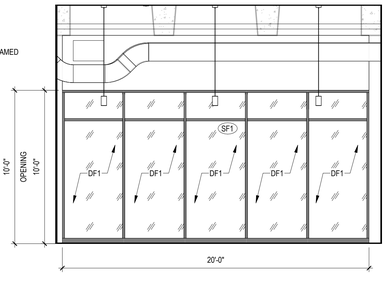
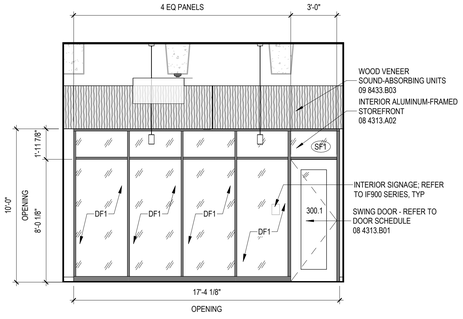


10 A606 INTERIOR ELEVATION
1/4" = 1'-0"



9 A606 INTERIOR ELEVATION
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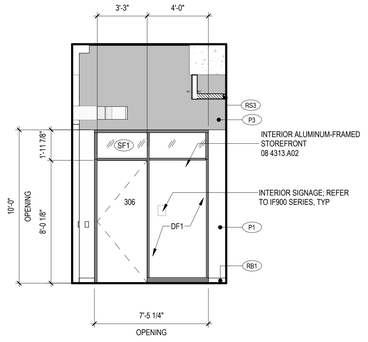

8 A606 INTERIOR ELEVATION
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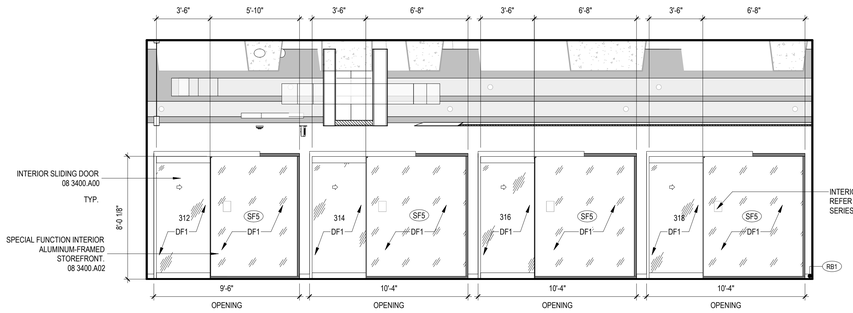
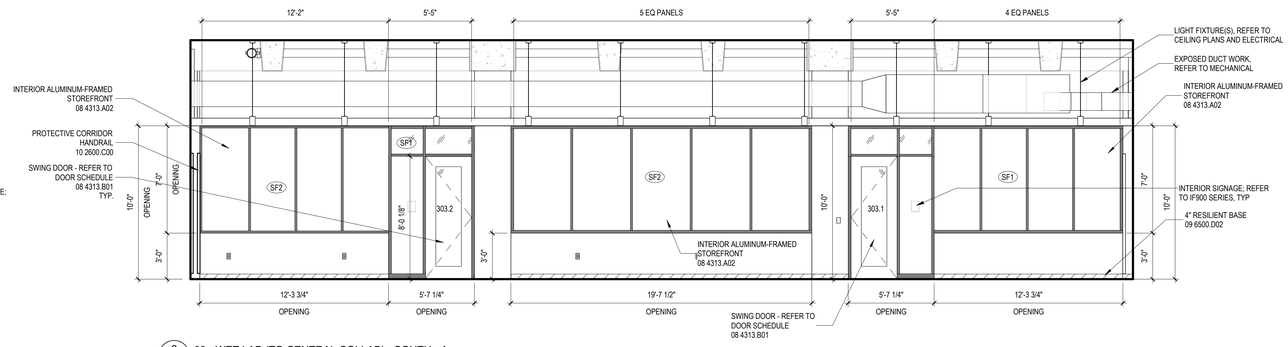
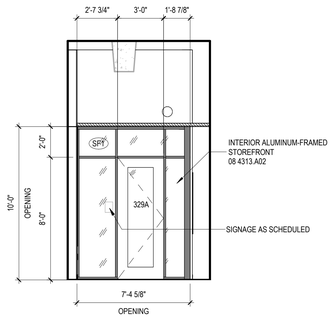


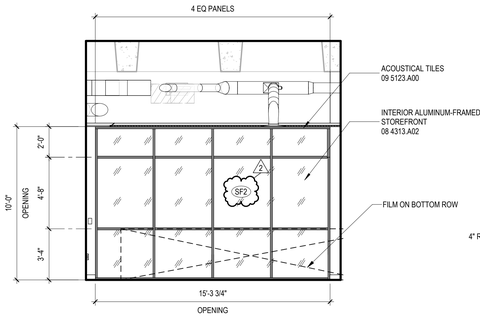
7 A606 INTERIOR ELEVATION
1/4" = 1'-0"



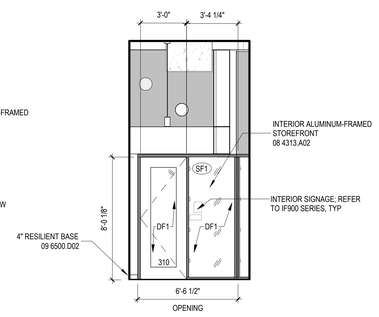
6 A606 03 - WET LAB (TO CENTRAL COLLAB) - SOUTH - A
1/4" = 1'-0"



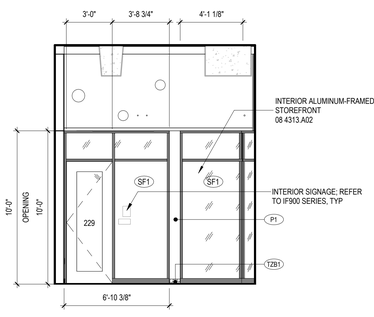
5 A606 INTERIOR ELEVATION
1/4" = 1'-0"



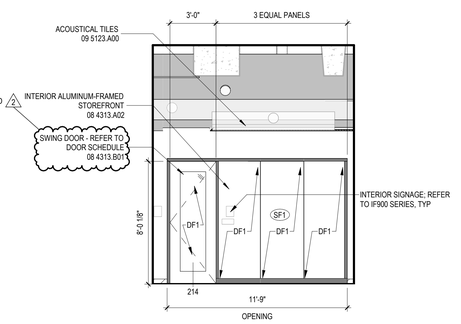
4 A606 03A- SHARED OFFICE SPACE (TO WET LAB)
1/4" = 1'-0"



3 A606 INTERIOR ELEVATION - 310 MTG ROOM
1/4" = 1'-0"



2 A606 INTERIOR ELEVATION
1/4" = 1'-0"



1 A606 ELEVATION - MTG RM 214 ENTRY
1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

INTERIOR ELEVATION NOTES

A. REFER TO FLOOR PLANS AND THE EQUIPMENT SCHEDULE FOR EQUIPMENT. COORDINATE CONNECTIONS.
B. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
C. DIMENSIONS ARE TAKEN TO THE FACE OF FINISHED MATERIAL, UNLESS NOTED OTHERWISE
D. REFER TO ARCHITECTURAL AND/OR INTERIOR DRAWINGS FOR SOLID SURFACE SINK TYPES.

CASEWORK NOTES

A. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION OF CABINETS.
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J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG

INTERIOR ELEVATION SYMBOLS

_KEYNOTE SCHEDULE

NUMBER	TEXT
06 4200.A00	CUSTOM WOOD VENEER PANELING
08 3400.A00	INTERIOR SLIDING DOOR
08 3400.A02	SPECIAL FUNCTION INTERIOR ALUMINUM-FRAMED STOREFRONT.
08 4313.A02	INTERIOR ALUMINUM-FRAMED STOREFRONT
08 4313.B01	SWING DOOR - REFER TO DOOR SCHEDULE
09 5123.A00	ACOUSTICAL TILES
09 6500.D02	4" RESILIENT BASE
09 8433.B03	WOOD VENEER SOUND-ABSORBING UNITS
10 2600.C00	PROTECTIVE CORRIDOR HANDRAIL
10 2600.D00	CORNER GUARD

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

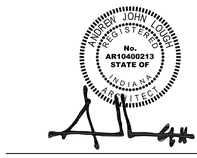
BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



INTERIOR ELEVATIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A606

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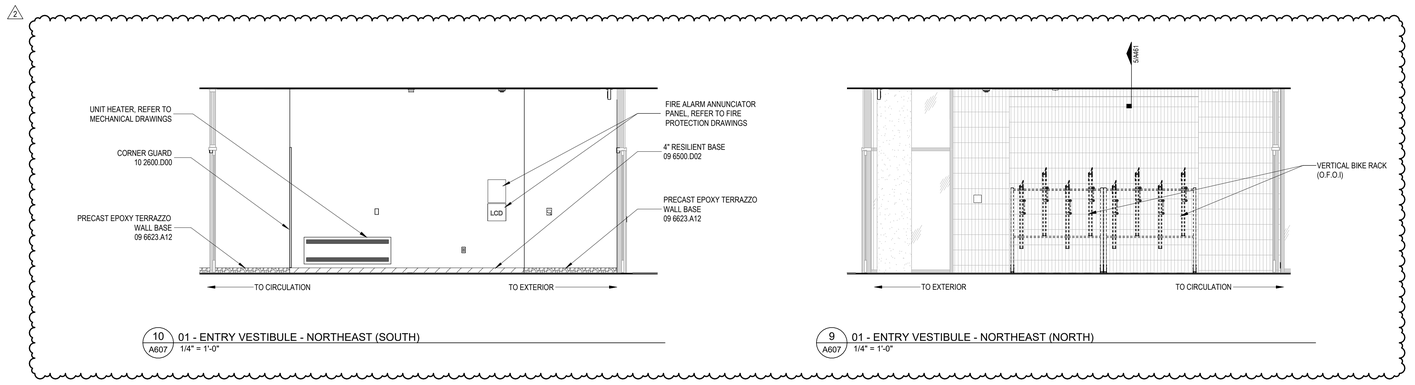
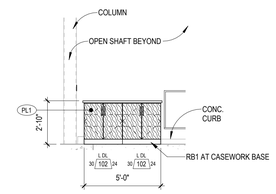
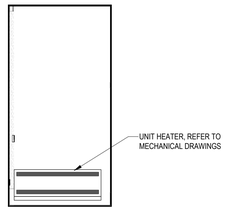


10 / A607 01 - ENTRY VESTIBULE - NORTHEAST (SOUTH) 1/4" = 1'-0"

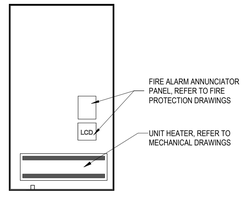
9 / A607 01 - ENTRY VESTIBULE - NORTHEAST (NORTH) 1/4" = 1'-0"



8 / A607 05A - WATER TESTING STATION - NORTH 1/4" = 1'-0"



7 / A607 01B - (NORTHEAST) ENTRY VESTIBULE - SOUTH 1/4" = 1'-0"



6 / A607 01 - (SOUTHEAST) ENTRY VESTIBULE - WEST 1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

INTERIOR ELEVATION NOTES

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B. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
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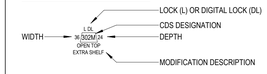
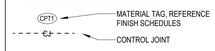
J. DRAWER AND DOOR PULLS TO BE TYPE **A**, UNLESS NOTED OTHERWISE.

CABINET DESIGN SERIES TAG



INTERIOR ELEVATION SYMBOLS



_KEYNOTE SCHEDULE

NUMBER	TEXT
08 4313.A02	INTERIOR ALUMINUM-FRAMED STOREFRONT
08 4313.B01	SWING DOOR - REFER TO DOOR SCHEDULE
09 6500.D02	4" RESILIENT BASE
09 6623.A12	PRECAST EPOXY TERRAZZO WALL BASE
09 8433.B03	WOOD VENEER SOUND-ABSORBING UNITS
10 2600.D00	CORNER GUARD

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

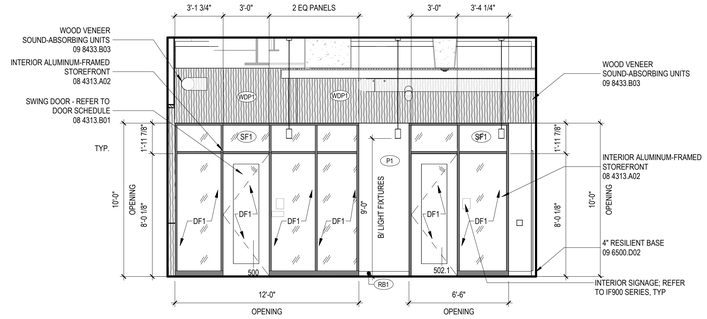
SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

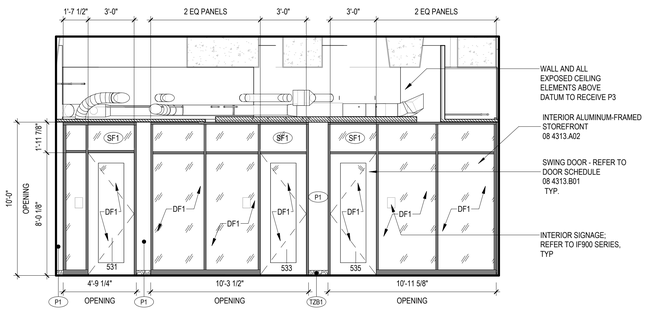
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

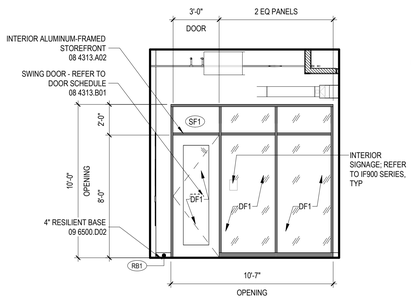
CLIENT PROJECT NO. - 20250072



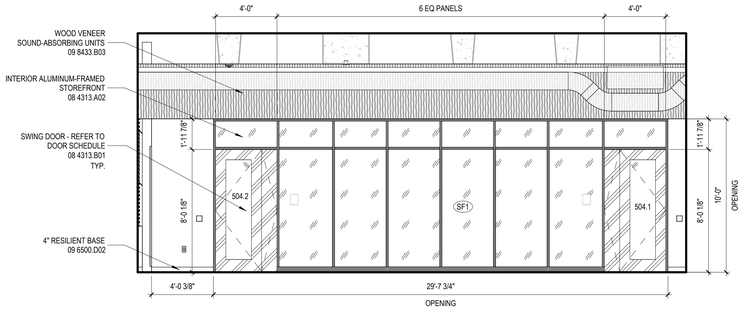
5 / A607 INTERIOR ELEVATION 1/4" = 1'-0"



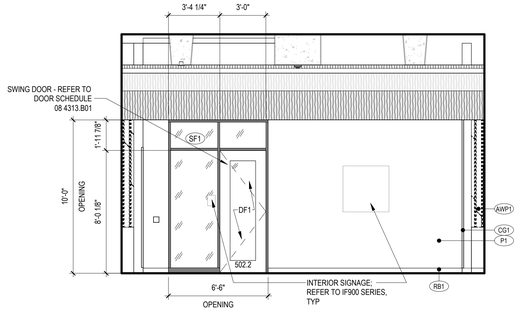
4 / A607 INTERIOR ELEVATION 1/4" = 1'-0"



3 / A607 05A - OFFICE ENTRY - ELEVATION A 1/4" = 1'-0"



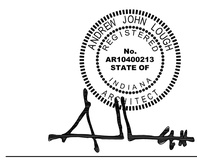
2 / A607 05 - CIRCULATION (TO ANALYXIN GENOMICS CORE) - SOUTH - A 1/4" = 1'-0"



1 / A607 05B - CIRCULATION (TO ANALYXIN GENOMICS COMP LAB) - SOUTH - B 1/4" = 1'-0"

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



INTERIOR ELEVATIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A607

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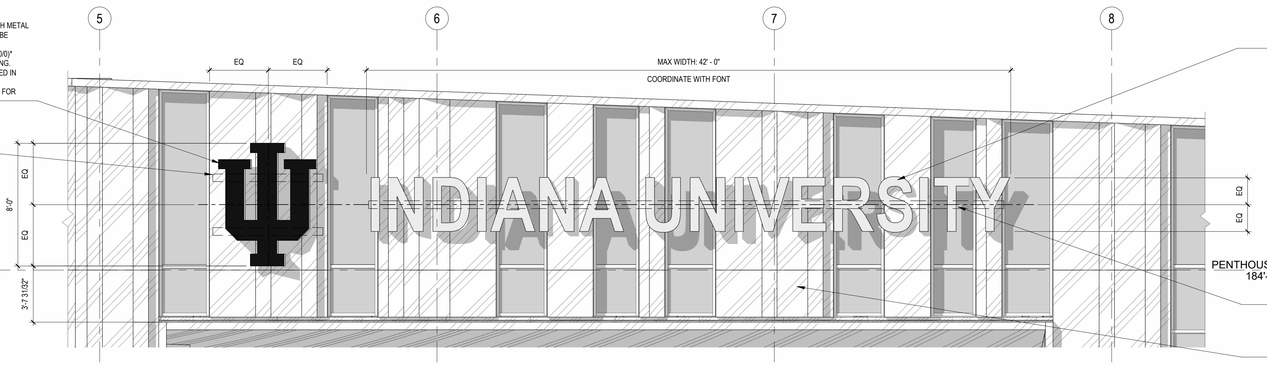
4/20/2026 4:31:14 PM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH_R23/20072-IULAB-BO_R24.rvt

INDIANA UNIVERSITY TRIDENT
- FABRICATED ALUMINUM CHANNEL LETTERS WITH TRANSLUCENT ACRYLIC FACE.
  a. CHARACTER DEPTH: 6"
  b. CHARACTER HEIGHT: 8'-0"
  c. FINISH: POWDER COAT FINISH TO MATCH METAL PANEL FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
  d. ACRYLIC FINISH: IU CRIMSON (RGB 153/0/0)*
- LIGHTING: INTERNALLY FACE LIT LED LIGHTING.
  a. TRANSFORMER TO BE REMOTE MOUNTED IN ADJACENT CEILING IN 5TH FLOOR.
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

2 CHANNEL/RACEWAY MOUNT

SIGNAGE VENDOR TO PROVIDE BRACKET MOUNTING DESIGN AND ENGINEERING TO BACKUP STRUCTURE BEHIND METAL PANEL WALL ASSEMBLY. REFER TO WALL SECTIONS IN BID ISSUE 3 DOCUMENTS. COORDINATE WITH CM AND ASSOCIATED TRADES THROUGH DESIGN TO ENSURE COORDINATION OF THRU-WALL PENETRATIONS OF STEEL, WIRING, AND ACCESSORIES.



SIGN TEXT
- FABRICATED ALUMINUM CHANNEL LETTERS WITH TRANSLUCENT ACRYLIC FACE.
  a. CHARACTER DEPTH: 6"
  b. CHARACTER HEIGHT: 3'-6"
  c. FINISH: POWDER COAT FINISH TO MATCH METAL PANEL FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
  d. ACRYLIC FINISH: IU CREAM (RGB 255/255/255)*
- LIGHTING: INTERNALLY FACE LIT LED LIGHTING.
  a. TRANSFORMER TO BE REMOTE MOUNTED IN ADJACENT CEILING IN 5TH FLOOR.
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

CHANNEL/RACEWAY MOUNT (2 RACEWAYS ARE ACCEPTABLE IF REQUIRED FOR MOUNTING DUE TO HEIGHT OF LETTERING)

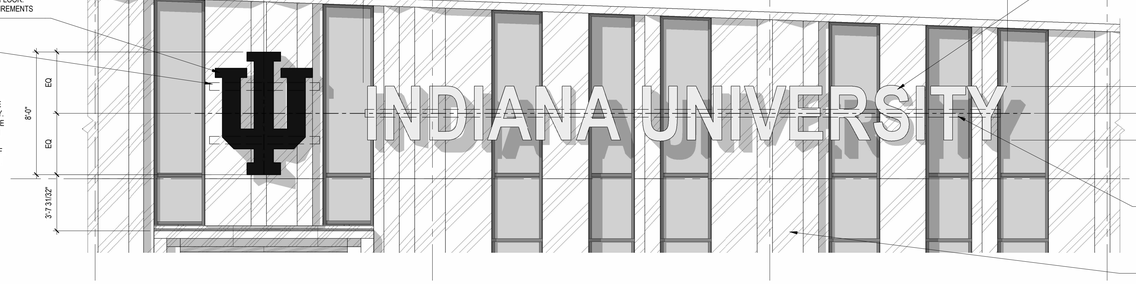
EXTERIOR WALL ASSEMBLY W3.1 - SEE BID ISSUE 3 DRAWINGS.

5 / A710 SOUTH - TOWER SIGNAGE
1/4" = 1'-0"

INDIANA UNIVERSITY TRIDENT
- FABRICATED ALUMINUM CHANNEL LETTERS WITH TRANSLUCENT ACRYLIC FACE.
  a. CHARACTER DEPTH: 6"
  b. CHARACTER HEIGHT: 8'-0"
  c. FINISH: POWDER COAT FINISH TO MATCH METAL PANEL FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
  d. ACRYLIC FINISH: IU CRIMSON (RGB 153/0/0)*
- LIGHTING: INTERNALLY FACE LIT LED.
  a. TRANSFORMER TO BE REMOTE MOUNTED IN ADJACENT CEILING IN 5TH FLOOR.
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

2 CHANNEL/RACEWAY MOUNT

SIGNAGE VENDOR TO PROVIDE BRACKET MOUNTING DESIGN AND ENGINEERING TO BACKUP STRUCTURE BEHIND METAL PANEL WALL ASSEMBLY. REFER TO WALL SECTIONS IN BID ISSUE 3 DOCUMENTS. COORDINATE WITH CM AND ASSOCIATED TRADES THROUGH DESIGN TO ENSURE COORDINATION OF THRU-WALL PENETRATIONS OF STEEL, WIRING, AND ACCESSORIES.



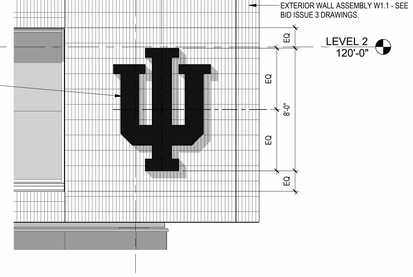
SIGN TEXT
- FABRICATED ALUMINUM CHANNEL LETTERS WITH TRANSLUCENT ACRYLIC FACE.
  a. CHARACTER DEPTH: 6"
  b. CHARACTER HEIGHT: 3'-6"
  c. FINISH: POWDER COAT FINISH TO MATCH METAL PANEL FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
  d. ACRYLIC FINISH: IU CREAM (RGB 255/255/255)*
- LIGHTING: INTERNALLY FACE LIT LED.
  a. TRANSFORMER TO BE REMOTE MOUNTED IN ADJACENT CEILING IN 5TH FLOOR.
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

CHANNEL/RACEWAY MOUNT (2 RACEWAYS ARE ACCEPTABLE IF REQUIRED FOR MOUNTING DUE TO HEIGHT OF LETTERING)

EXTERIOR WALL ASSEMBLY W3.1 - SEE BID ISSUE 3 DRAWINGS.

4 / A710 NORTH - TOWER SIGNAGE
1/4" = 1'-0"

INDIANA UNIVERSITY TRIDENT
- FABRICATED ALUMINUM REVERSE CHANNEL LETTERS WITH HALO LIGHTING AND 2" OFFSET STUD MOUNTING INTO MASONRY WALL ASSEMBLY..
  a. CHARACTER DEPTH: 6"
  b. CHARACTER HEIGHT: 8'-0"
  c. FINISH: POWDER COAT FINISH TO MATCH IU CRIMSON (RGB 153/0/0), CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
  d. 1/8" (MIN) CLEAR ACRYLIC/LEXAN REAR PANEL
- LIGHTING: INTERNAL REVERSE HALO-LIT LED LIGHTING.
  a. TRANSFORMER TO BE REMOTE MOUNTED IN ADJACENT CEILING IN 1ST FLOOR.
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

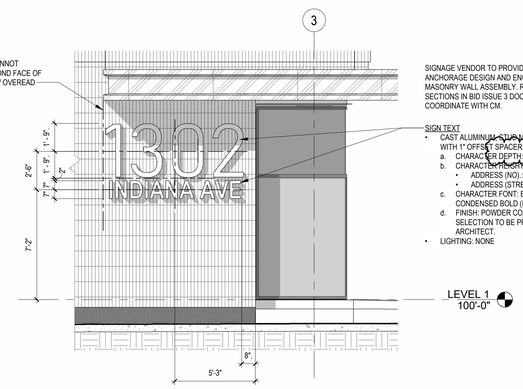


3 / A710 SOUTH TRIDENT
1/4" = 1'-0"

NOTE: SIGN CANNOT PROJECT BEYOND FACE OF CANOPY BROW OVEREAD

SIGNAGE VENDOR TO PROVIDE STUD MOUNT ANCHORAGE DESIGN AND ENGINEERING TO MASONRY WALL ASSEMBLY. REFER TO WALL SECTIONS IN BID ISSUE 3 DOCUMENTS. COORDINATE WITH CM.

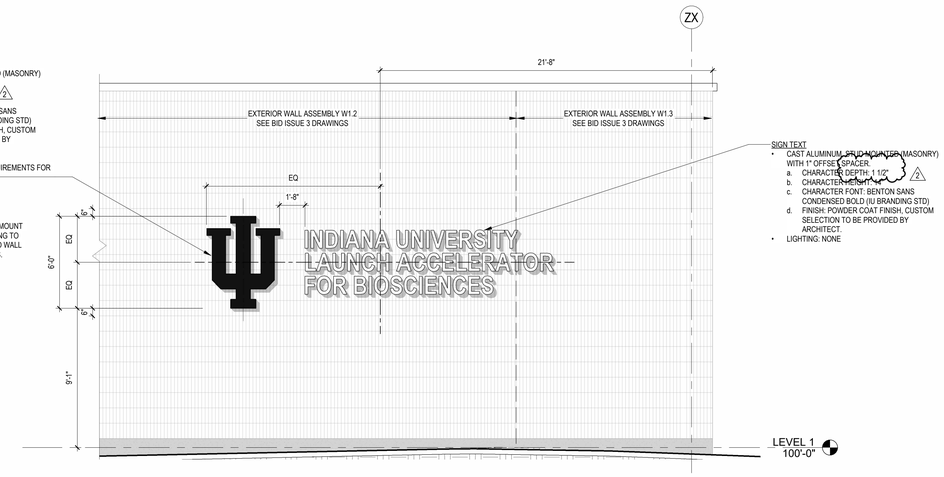
SIGN TEXT
- CAST ALUMINUM STUD MOUNTED (MASONRY) WITH 1" OFFSET SPACER.
  a. CHARACTER DEPTH: 1 1/2"
  b. CHARACTER HEIGHT: 8"
     - ADDRESS (NO1): 42"
     - ADDRESS (STREET): 14"
  c. CHARACTER FONT: BENTON SANS CONDENSED BOLD (IU BRANDING STD)
  d. FINISH: POWDER COAT FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
- LIGHTING: NONE



2 / A710 NORTH - BUILDING ADDRESS SIGNAGE
1/4" = 1'-0"

INDIANA UNIVERSITY TRIDENT
- CAST ALUMINUM STUD MOUNTED (MASONRY) WITH 1" OFFSET SPACER.
  a. CHARACTER DEPTH: 1 1/2" (2)
  b. CHARACTER HEIGHT: 8"
  c. CHARACTER FONT: BENTON SANS CONDENSED BOLD (IU BRANDING STD)
  d. FINISH: POWDER COAT FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
- LIGHTING: NONE
- CONFORM TO IU BRANDING REQUIREMENTS FOR TRIDENT PROPORTIONS

SIGNAGE VENDOR TO PROVIDE STUD MOUNT ANCHORAGE DESIGN AND ENGINEERING TO MASONRY WALL ASSEMBLY. REFER TO WALL SECTIONS IN BID ISSUE 3 DOCUMENTS. COORDINATE WITH CM.



SIGN TEXT
- CAST ALUMINUM STUD MOUNTED (MASONRY) WITH 1" OFFSET SPACER.
  a. CHARACTER DEPTH: 1 1/2"
  b. CHARACTER HEIGHT: 8" (2)
  c. CHARACTER FONT: BENTON SANS CONDENSED BOLD (IU BRANDING STD)
  d. FINISH: POWDER COAT FINISH, CUSTOM SELECTION TO BE PROVIDED BY ARCHITECT.
- LIGHTING: NONE

1 / A710 NORTH SCREENWALL - CAST SIGNAGE
1/4" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN HITCHCOCK REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

EXTERIOR BUILDING SIGNAGE

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

A710

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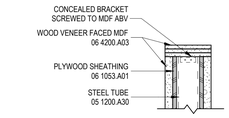
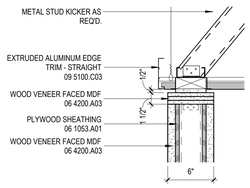
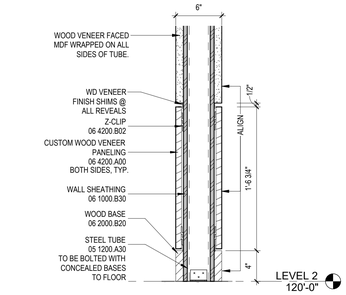


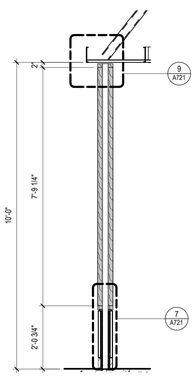
10 A721 WD SLAT WALL DETAIL @ HEAD UNCONNECTED
1 1/2" = 1'-0"



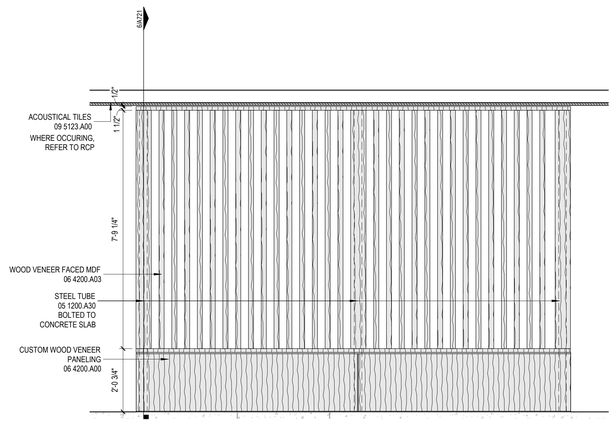
9 A721 SECTION DETAIL - SCREEN WALL END POST @ CEILING - ALT. 2
1 1/2" = 1'-0"



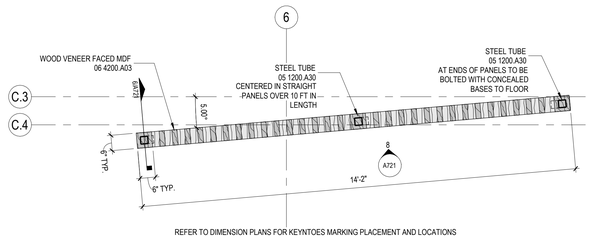
7 A721 SECTION DETAIL - END SUPPORT POST @ WD PANELING - ALT. 2
1 1/2" = 1'-0"



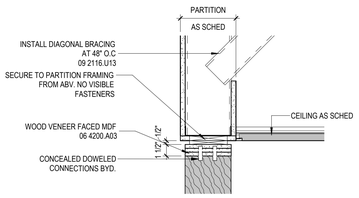
6 A721 SECTION - SCREEN WALL END POST W/ WD PANELED BASE - ALT. 2
1/2" = 1'-0"



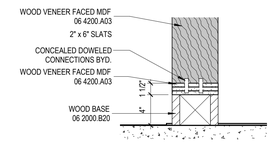
8 A721 ELEVATION - SCREEN WALL AT PLANTER LOCATIONS - ALT. 2
1/2" = 1'-0"



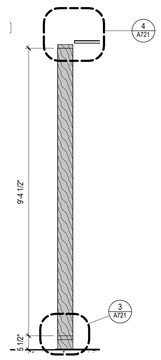
5 A721 PLAN - SCREEN WALL W/ WD PANELED BASE - ALT. 2 (SW2)
1/2" = 1'-0"



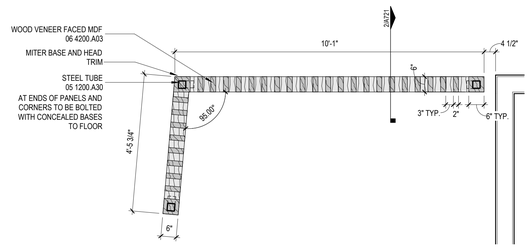
4 A721 SECTION DETAIL - FULL HEIGHT SCREEN WALL AT BULKHEAD - ALT. 2
1 1/2" = 1'-0"



3 A721 SECTION - FULL HEIGHT SCREEN WALL @ BASE - ALT. 2
1 1/2" = 1'-0"



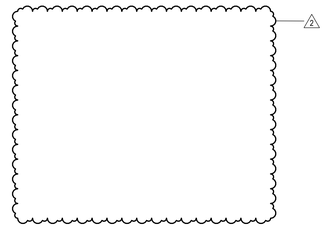
2 A721 SECTION - SCREEN WALL - ALT. 2
1/2" = 1'-0"

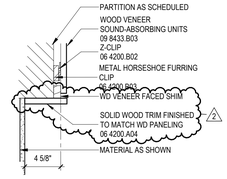


1 A721 PLAN - FULL HEIGHT SCREEN WALL - ALT. 2 (SW1)
1/2" = 1'-0"

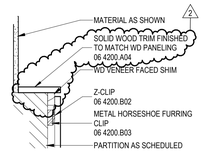
ALTERNATE #2 - SLAT WALLS

ALL PANEL STEEL REINFORCEMENT TO BE ENGINEERED BY CONTRACTOR

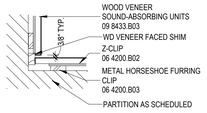




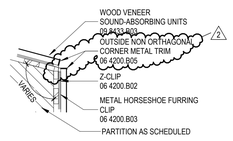
HEAD DETAIL @ INSET IN PANELING



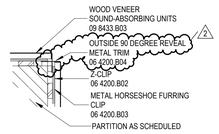
SILL AND JAMB DETAIL @ INSET IN PANELING



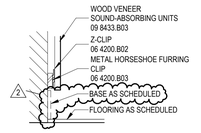
INSIDE CORNER AT WALL



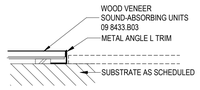
OUTSIDE NON ORTHAGONAL CORNER AT WALL



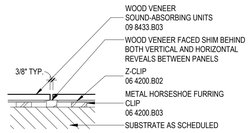
OUTSIDE 90 DEGREE CORNER AT WALL



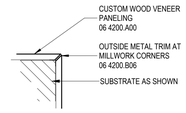
BASE DETAIL AT WALL PANELS



PLAN DETAIL AT PANEL TERMINATION



PLAN DETAIL AT WALL AND MILLWORK



OUTSIDE 90 DEGREE CORNER MILLWORK

11 A721 WD PANELING DETAILS - TYP.
1 1/2" = 1'-0"

_KEYNOTE SCHEDULE	
NUMBER	TEXT
05 1200.A30	STEEL TUBE
06 1000.B30	WALL SHEATHING
06 1053.A01	PLYWOOD SHEATHING
06 2000.B20	WOOD BASE
06 4200.A00	CUSTOM WOOD VENEER PANELING
06 4200.A03	WOOD VENEER FACED MDF
06 4200.A04	SOLID WOOD TRIM FINISHED TO MATCH WD PANELING
06 4200.B02	Z-CLIP
06 4200.B03	METAL HORSESHOE FURRING CLIP
06 4200.B04	OUTSIDE 90 DEGREE REVEAL METAL TRIM
06 4200.B05	OUTSIDE NON ORTHAGONAL CORNER METAL TRIM
06 4200.B06	OUTSIDE METAL TRIM AT MILLWORK CORNERS
09 2116.U13	INSTALL DIAGONAL BRACING AT 48" O.C
09 5100.C03	EXTRUDED ALUMINUM EDGE TRIM - STRAIGHT
09 5123.A00	ACOUSTICAL TILES
09 8433.B03	WOOD VENEER SOUND-ABSORBING UNITS

BSA LifeStructures
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ph 317.819.7878 fx 317.819.7288

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313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN CONDON REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

MILLWORK

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A721

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4/20/2026 4:31:33 PM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250072-IUL-AB-BO_R24.rvt

_KEYNOTE SCHEDULE	
NUMBER	TEXT
06 1000.A10	WOOD BLOCKING
06 1053.A01	PLYWOOD SHEATHING
06 2000.D02	1/8" METAL CORNER ACCENT TRIM AT OUTSIDE CORNERS. TYP.
06 4200.A00	CUSTOM WOOD VENEER PANELING
06 4200.B02	Z-CLIP
06 4200.B06	OUTSIDE METAL TRIM AT MILLWORK CORNERS
06 4200.U02	VENEER EDGEBAND AT ALL VISIBLE PANEL EDGES
09 5000.A01	ACOUSTIC WALL PANELING. AWP2
09 5100.B14	AIRCRAFT CABLE HANGER
09 6500.D02	4" RESILIENT BASE
10 1101.B03	NONMAGNETIC GLASS MARKERBOARD
12 5283.A02	REMOVABLE UPHOLSTERED BOOTH SEATING

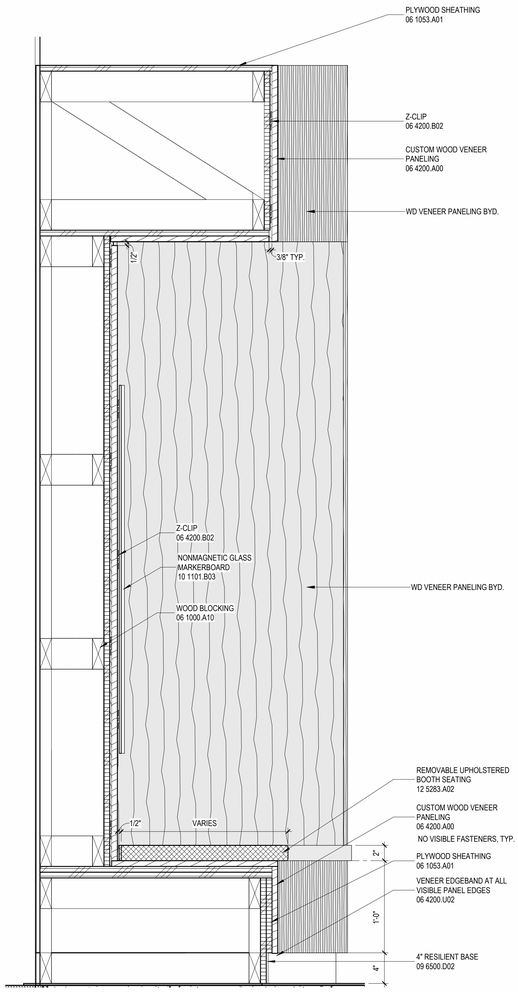
BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

SMITHGROUP
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

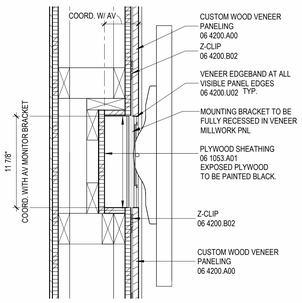
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

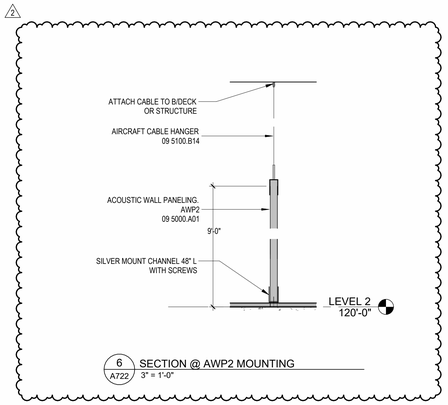
CLIENT PROJECT NO. - 20250072



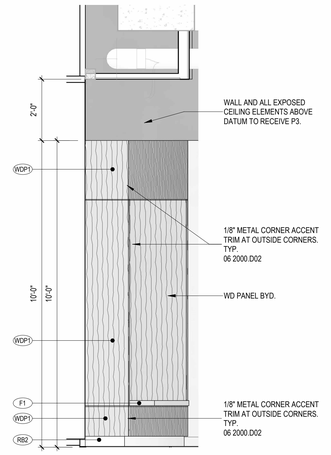
4 SECTION - BENCH AT UPPER LEVELS
A722 1 1/2" = 1'-0"



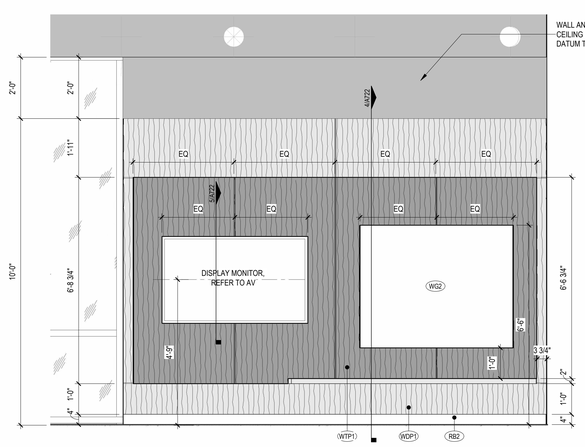
5 SECTION AT MONITOR
A722 1 1/2" = 1'-0"



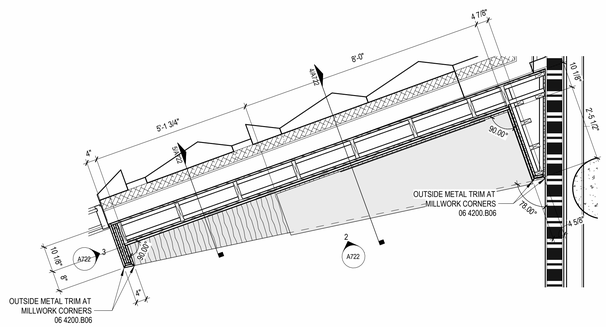
6 SECTION @ AWP2 MOUNTING
A722 3" = 1'-0"



3 ELEVATION - BENCH AT UPPER LEVELS, END
A722 1/2" = 1'-0"



2 ELEVATION - BENCH AT UPPER LEVELS, FRONT
A722 1/2" = 1'-0"



1 PLAN - BENCH AT UPPER LEVELS
A722 1/2" = 1'-0"

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

MILLWORK

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A722

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Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250072-IULAB-BO_R24.rvt

INTERIOR DESIGN SELECTION SUMMARY

SPEC	NAME	MANUFACTURER	STYLE	NUMBER	COLOR	SIZE	COMMENTS
ACOUSTICAL CEILING BAFFLE							
095100	ACB1	ARMSTRONG	SOUNDSCAPE BLADES		LIGHT GRAY	2" X 5'D; REFER TO PLANS	15/16" GRID MOUNTED; GRID PAINTED TO MATCH EXPOSED CEILING COLOR
095100	ACB2	ARKTURA	ATMOSPHERA RISE SOUND SOFT ELEMENTALS		MOREL	7'6" X 7'-6" X 10 7/8"	CO-WORKING SPACE
095100	ACB3	CERTAINTEED	DECOUSTICS CLARO CUSTOM WAVE BAFFLE & LAY-IN CEILING TILE SYSTEM		BAFFLES: COLOR MATCH PAINT P2; CEILING TILE: COLOR MATCH PAINT P3	REFER TO PLANS	MULTI-PURPOSE
ACOUSTICAL CEILING TILE							
095123	ACT1	ARMSTRONG	ULTIMA LOW EMBODIED CARBON, SQUARE LAY-IN	1910LEC	WHITE	24" X 24" X 3/4"	15/16" GRID, WHITE
095123	ACT2	ARMSTRONG	CLEAN ROOM VL	868	WHITE	24" X 24"	15/16" GRID, WHITE
095123	ACT3	ARMSTRONG	CLEAN ROOM VL	868	WHITE	24" X 24"	GASKETED 15/16" GRID, WHITE
095123	ACT4	ARMSTRONG	ULTIMA LOW EMBODIED CARBON TEGULAR	FZ2536533	WHITE	24" X 72" X 3/4"	15/16" GRID, WHITE
095123	ACT5	ARMSTRONG	LYRA CONCEALED	8431	WHITE	24" X 72"	15/16" GRID, WHITE
095123	ACT6	ARMSTRONG	CERAMAGUARD	607	WHITE	24" X 24"	15/16" ALUMINUM GRID, WHITE
ACOUSTICAL WALL PANEL							
095000	AWP1	ACOUFELT	FRACTURE WALL PANELS (PREMIER): OPTICS		FRONT FACE: CURRANT, INSET COLOR: ALMOND	14MM, 48"W X 108"H	REFER TO INTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION
095000	AWP2	ACOUFELT	CREATIVE CUT SCREENS (PREMIER): ORIGAMI		CURRANT	12MM, 48"W X 108"H	REFER TO INTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION
097713	AWP3	MAHARAM	TEK-WALL LUMEN	399982	008 LIGHTHOUSE	24"	FABRIC WRAPPED PANEL SYSTEM
097713	AWP4	CARNEGIE	XOREL SEACREST	6331	42	56"W	UNBACKED; FABRIC WRAPPED PANEL SYSTEM; RAILROAD FABRIC
095000	AWP5	ACOUFELT	WALL TILE SHAPES, DIAMOND	AL 55	ALMOND	12"W x 20.78"H	
097713	AWP6	CARNEGIE	XOREL METEOR	6427	766	56"W	UNBACKED; SKYFOLD PARTITION
CARPET							
096813	CPT1	MILLIKEN	HEAVY META FOUNDRY	FDR259	OXIDE	25 CM X 1 M	INSTALL: MONOLITHIC; OPEN OFFICE
096813	CPT2	MILLIKEN	THE GALLERY - WATERCOLOR	WTR169	VERMILLION	50 CM X 50 CM	INSTALL: MONOLITHIC; LOBBY AREA RUG ;FACTORY APPLIED ADHESIVE
096813	CPT3	MILLIKEN	SOUND OF COLOR	SOC120	BUZZ	25CM X 1M	INSTALL: ASHLAR; CENTRAL COLLAB AREA RUG; FACTORY APPLIED ADHESIVE
CERAMIC TILE							
093013	CT1	STONE SOURCE	VITA LUCE DI CERAMICA		BORDEAUX	8" X 8"	INSTALL: STACK (RANDOM); RESTROOM WALL ACCENT; FINISH: MATTE, TEXTURE
093013	CT2	MOSA TILE	MURALS CHANGE	34040	CLAY BEIGE	6" X 12"	INSTALL: HORIZONTAL STACK; WATER COOLERS / TRASH ALCOVE
093013	CT3	PORTOBELLA AMERICA	VIVANT	204209E / 204229E	VIVANT MAGENTA - GLOSSY BOLD / LIGNE MAGENTA - MATTE BOLD	3"X10"	INSTALL: VERTICAL STACK; 70% VIVANT MAGENTA, 30% LIGNE MAGENTA; KITCHENETTE BACKSPLASH
CORNER GUARDS							
092236	CG1	FRY REGLET	CORNER TRIM	DMCT-1250	STANDARD METAL FINISH	2.125" X 2.125" X FULL HEIGHT	DRYWALL TAPE AND MUD INSTALLATION
102600	CG2	INPRO	STAINLESS STEEL CORNER GUARD	TYPE 304 16-GAUGE	NO. 4 SATIN FINISH	2"X2"X8'	MECHANICAL FASTNER ATTACHEMENT. PRE-DRILLED BEVELED HOLES W/ COUNTERSUNK SCREWS TO MATCH
102600	CG3	INPRO	STAINLESS STEEL CORNER GUARD	TYPE 304 16-GAUGE	NO. 4 SATIN FINISH	2"X2"X8'	END WALLS; MECHANICAL FASTNER ATTACHEMENT. PRE-DRILLED BEVELED HOLES W/ COUNTERSUNK SCREWS TO MATCH
092236	CG4	FRY REGLET	CORNER TRIM	DMCT-1250	CUSTOM COLOR MATCH SW7582 SALUTE (P5)	2.125" X 2.125" X FULL HEIGHT	DRYWALL TAPE AND MUD INSTALLATION
092236	CG5	FRY REGLET	CORNER TRIM	DMCT-1250	CUSTOM COLOR MATCH SW7045 INTELLECTUAL GRAY (P3)	2.125" X 2.125" X FULL HEIGHT	DRYWALL TAPE AND MUD INSTALLATION
DECORATIVE FILM							
088720	DF1	DESIGNTEX BESPOKE	CUSTOM GRAPHIC GLASS FILM	TBD	TBD		COORDINATE WITH INTERIOR DESIGNER
DECORATIVE PANEL							
066413	DP1	3FORM	VARIA		SWEETHEART (R2S) + AVALANCHE (D01)	1/4" THICK	PATINA FINISH, SEALED EDGES. THERMOFORMED; LOBBY FEATURE WALL
066413	DP2	3FORM	VARIA		NEBULOUS (N47) + AVALANCHE DEFUSION	1/8" THICK	PATINA FINISH, SEALED EDGES. THERMOFORMED; INTEGRATED LIGHTING (BACKLIGHTING)
EPOXY PAINT							
099123	EP1	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7631	CITY LOFT		EGGSHELL FINISH
099123	EP5	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7582	SALUTE		EGGSHELL FINISH
EPOXY POURED FLOORING							
033511	EPF1	SIKA	SIKAFLOOR MERFLEX PB				ALTERNATE #1: FOR EPF1 WALL BASE: INSTALL COATING AT ALL CURBS. INSTALL COATING 4"H ON ALL OTHER WALLS. AT WALL LOCATIONS, INSTALL SEALANT BETWEEN WALL AND FLOOR PRIOR TO INSTALLING COATING, FOLLOWING MANUFACTURER RECOMMENDATIONS.
FABRIC							
126200	F1	PALLAS	EVER	27.384.218	CRIMSON		UPHOLSTERED MILLWORK BENCHES
LUXURY VINYL TILE							
096519	LVT1	MANNINGTON	COLOR ANCHOR - STRIDE	C167	TRUFFLE	6" X 36"	INSTALL: 1/2 OFFSET
096519	LVT2	MANNINGTON	COLOR ANCHOR - STRIDE	C128	COTTONTAIL	6" X 36"	INSTALL: 1/2 OFFSET
096519	LVT3	PATCRAFT	TREELINE	132	BARE-V2	7" X 48", 20 MIL	INSTALL: 1/2 OFFSET; WELLNESS ROOMS
METAL CEILING							
095423	MTCL1	ARMSTRONG	METALWORKS MESH SQUARE WEAVE - SQUARE LAY-IN	ITEM 6415AM	GUNMETAL GRAY	24X48	15/16" GRID TO MATCH GUNMETAL GRAY
095423	MTCL2	ARKTURA	VAPOR GRAPHIC PERF WITH INTEGRATED LIGHTING		WHITE		TORSION GRID; WHITE
095423	MTCL3	ARMSTRONG	METALWORKS MESH LINEAR WEAVE - SQUARE LAY-IN	ITEM 6413AM	GUNMETAL GRAY	24X24	15/16" GRID TO MATCH GUNMETAL GRAY
METAL TRIM							
093013	MT1	SCHLUTER	DILEX METAL COVE BASE	AHK1S125AE	SATIN ANODIZED ALUMINUM	COORDINATE WITH TILE THICKNESS	
093013	MT2	SCHLUTER	JOLLY EDGE TRIM		SATIN ANNODIZED ALUMINUM	COORDINATE WITH TILE THICKNESS	OUTSIDE CORNER CONDITIONS, PTB1
093013	MT3	SCHLUTER	FINEC		SATIN ANNODIZED ALUMINUM	COORDINATE WITH TILE THICKNESS	PT4 OUTSIDE CORNER CONDITIONS
102600	MT4	KOROSEAL	ALUMINUM JCAP MOLDING	SWPJC12001			USED IN CONJUNCTION WITH SWP2
PAINT AND HIGH PERFORMANCE COATING							
099123	P1	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7631	CITY LOFT		
099123	P2	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7044	AMAZING GRAY		
099123	P3	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7045	INTELLECTUAL GRAY		
099000	P3	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7045	INTELLECTUAL GRAY		EXPOSED CEILINGS, INCLUDING ALL DUCTWORK, CONDUIT, PIPING, AND OTHER ELEMENTS LOCATED AT CEILING, U.N.O.
099123	P4	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7048	URBANE BRONZE		LAB ENTRIES, SHADOW REVEALS
099123	P5	SHERWIN WILLIAMS	REFER TO PROJECT MANUAL	SW7582	SALUTE		
099123	P6	SCUFFMASTER	SOLID METAL		COLOR MATCH SHERWIN WILLIAMS 399C2616 NATURAL SUEDE		
PLASTIC LAMINATE							
064116	PL1	WILSONART	HPL	7981K-12	LANDMARK WOOD		WOOD-LOOK
064116	PL2	FORMICA	HPL	464-58	GRAY STONE		NEUTRAL SOLID; MULTI-PURPOSE ROOM
PORCELAIN TILE							
093013	PT1	PLATFORM SURFACES	GHIAIA		IVORY MATTE	2X2 MOSAIC	RESTROOM FLOOR
093013	PT2	PLATFORM SURFACES	GHIAIA		CREAM MATTE	12" X 24"	INSTALL: HORIZONTAL STACK; RESTROOM WALLS
093013	PT3	GENROSE STONE AND TILE	HIBIKI		GREIGE	4.5" X 9"	INSTALL: HORIZONTAL STACK; ISLAND BACKSPLASH
093013	PT4	PLATFORM SURFACES	GHIAIA		CREAM MATTE	48" X 110"	INSTALL: VERTICAL STACK; LARGE FORMAT, WALL APPLICATION; PUBLIC AREAS
PORCELAIN TILE BASE							
	PTB1	PLATFORM SURFACES	GHIAIA		CREAM MATTE	12" X 4" (CUT TILE)	
QUARTZ							
12 36 61	QZ1	CAMBRIA			IRONSBRIDGE		OPEN COLLABORATION; POLISHED
RESILIENT BASE							
096513	RB1	JOHNSONITE	BASEWORKS COVE BASE	32	PEBBLE	4"H	
096513	RB2	JOHNSONITE	MONUMENT MILLWORK WALL BASE	32	PEBBLE	4"H	MILLWORK CONDITIONS, WOOD PANELING
RESILIENT EDGE TRIM							
096513	RT1	TARKETT JOHNSONITE	METAL EDGE TRIM	179	STEEL		COORDINATE WITH CARPET TILE THICKNESS; AREA RUG LOCATIONS
ROLLER SHADE							
122413	RS1	MECHOSHADE	SOHO 1600 SERIES - 3% OPENNESS	1603	LIGHT GREY		MANUAL OPERATION; RECESSED SHADE POCKET
122413	RS2	MECHOSHADE	SOHO 1100 SERIES - 1% OPENNESS	1603	LIGHT GREY		MOTORIZED OPERATION; RECESSED SHADE POCKET & CLERSTORY WINDOW CONDITION
122413	RS3	MECHOSHADE	SOHO 1600 SERIES - 3% OPENNESS	1603	LIGHT GREY		MOTORIZED OPERATION; RECESSED SHADE POCKET
SEALED CONCRETE							
033511	SC1	EUCLID CHEMICAL COMPANY	POLISHED CONCRETE - REFER TO PROJECT MANUAL		SALT AND PEPPER FINISH		
033511	SC2	EUCLID CHEMICAL COMPANY	EUCO DIAMOND HARD		CLEAR		
033511	SC3	UNITED STATIC CONTROL PRODUCTS	ELECTRASEAL ESD CONCRETE SEALER		CLEAR		STATIC DISSIPATIVE
SHEET VINYL BASE							
096513	SVB1	GERFLOR	MIPOLAM SYMBIOZ	6041	CLAY	6'-6"W	SVT1 ALTERNATE
SHEET VINYL FLOORING							
096516	SV1	GERFLOR	MIPOLAM SYMBIOZ	6041	CLAY		ADVANCED WET LAB + SVT1 ADD ALTERNATE
096516	SV2	GERFLOR	MIPOLAM SYMBIOZ	6043	WOOD		SVT2 ADD ALTERNATE
SHEET WALL PROTECTION							
102600	SWP1	INPRO	RIGID SHEET	238	FEATHER	.040" THICK	BOD; JANITOR CLOSET
102600	SWP2	KOROSEAL	TRAFFIC PATTERNS - GALARIE II		POPPY FIELD	.040" THICK	
SOLID SURFACE							
123661	SS1	FORMICA		757	LUNA SAND	1/2" THICK	
123661	SS2	CORIAN			CAMEO WHITE		SOLID SURFACE SINKS
SOLID VINYL TILE							
096519	SVT1	TARKETT	IQ OPTIMA TILE	807	DARK SAND	2' X 2'	INSTALLATION: QUARTER TURN
096519	SVT2	TARKETT	IQ OPTIMA TILE	977	SOFT BROWN	2' X 2'	INSTALLATION: QUARTER TURN
STATIC DISSIPATIVE TILE							
096536	SDT1	TARKETT	IQ GRANIT SD TILE	949	DARK GREY	2' X 2' TILE	BOD
TERRAZZO							
096623	TZ1	TERRAZO & MARBLE SUPPLY CO.	TERROXY	TM#25-4352	CUSTOM COLOR		SAMPLE NUMBER PROVIDED FOR REFERENCE ONLY. FINAL SELECTION TO BE DETERMINED.
TERRAZZO BASE							
096623	TZB1	TERRAZO & MARBLE SUPPLY CO.	TERROXY	TM#25-4352	CUSTOM COLOR	4"H	SAMPLE NUMBER PROVIDED FOR REFERENCE ONLY. FINAL SELECTION TO BE DETERMINED.
TERRAZZO STAIR TREAD							
096623	TZST1			TM#25-4352	CUSTOM COLOR		SAMPLE NUMBER PROVIDED FOR REFERENCE ONLY. FINAL SELECTION TO BE DETERMINED.
VINYL WALLCOVERING							
097200	VWC1	MDC	NVOLVE ZEPHYR - WITH MICROVENT TREATMENT	ENV1005	TAUPE	52" - 54"W	18" VERTICAL REPEAT; MFR REQUIRES FULL BOLTS
WALK-OFF MAT							
096813	WM1	INTERFACE	STEP REPEAT	SR899	104940 IRON	50 CM X 50 CM	MONOLITHIC INSTALL; VESTIBULE WALK-OFF
WOOD PANEL							
098433	WDP1	RULON	FLAT PANELS		RIFT-CUT WHITE OAK; STAIN TO MATCH WILSONART 7981K-12 LANDMARK WOOD		REFER TO INTERIOR FINISH GENERAL NOTES FOR INSTALLATION REQUIREMENTS
098433	WDP2	RULON	ALURATONE A750		RIFT-CUT WHITE OAK; STAIN TO MATCH WILSONART 7981K-12 LANDMARK WOOD		CONTRACTOR TO PROVIDE BLACK ACOUSTICAL BLANKET BEHIND PANEL; REF. INTERIOR FINISH GENERAL NOTES FOR INSTALLATION REQUIREMENTS
WOOD VENEER PANEL							
064200	WDV1				RIFT-CUT WHITE OAK; STAIN TO MATCH WILSONART 7981K-12 LANDMARK WOOD		MILLWORK LOCATIONS
WOODWORK							
062000	WD1				RIFT-CUT WHITE OAK; STAIN TO MATCH WILSONART 7981K-12 LANDMARK WOOD		MISC. WOOD TRIM
WRITABLE GLASS							
101100	WG1	CLARUS	WALL 2 WALL - LOW GLARE MATTE FINISH; MAGNETIC	CBC-122	SILK		MULTI-PURPOSE ROOM; FRAMELESS
101100	WG2	CLARUS	FLOAT DEPTH - LOW GLARE MATTE FINISH; MAGNETIC	CBC-100	PURE WHITE SILK FINISH	120" x 48"	MEETING ROOMS; FRAMELESS; CONCEALED MOUNTING SYSTEM

INTERIOR FINISH GENERAL NOTES

A. MATERIALS INDICATED IN ROOM FINISH TAG ARE GENERAL FINISHES FOR ROOM UNLESS OTHERWISE INDICATED BY REMARK, ACCENT WALL TAG, NOTE, DETAIL AND/OR ELEVATION.
B. PATTERN NAME, COLOR AND NUMBER FOR EACH MATERIAL ARE INDICATED WHENEVER POSSIBLE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT / INTERIOR DESIGNER TO ENSURE THAT THE CORRECT MATERIAL IS INSTALLED.
C. REFER TO SHEET IF001 FOR TYPICAL BASE DETAILS, WALL PROTECTION ASSEMBLIES, FLOORING INSTALLATION PATTERNS, WALL TILE INSTALLATION PATTERNS, AND FLOORING TRANSITION DETAILS.
D. REFER TO LEVEL 1 INTERIOR FINISH PLANS (IF111A, IF111B) FOR ELEVATOR FINISHES.
E. REFER TO A600 SERIES INTERIOR ELEVATION SHEETS FOR ADDITIONAL INTERIOR FINISH INFORMATION, INCLUDING ADDITIONAL WALL MATERIALS NOT INDICATED IN ROOM FINISH TAG.
F. REFER TO INTERIOR FINISH PLANS (IF110 SERIES) FOR DIMENSIONING OF TERRAZZO RECESSED SLAB LOCATIONS AT FLOORING TRANSITIONS. REFER TO FLOORING TRANSITION DETAILS AND STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
G. REFER TO IF900 SERIES FOR INTERIOR SIGNAGE; INCLUDING BUT NOT LIMITED TO ENVIRONMENTAL GRAPHICS AND IU BRANDING LOCATIONS NOT INDICATED IN INTERIOR FINISH PLANS.
H. WELDING ROD AT WELDED SEAMS IN SHEET VINYL SHALL MATCH THE DARKER OF THE SHEET VINYL COLORS AT SEAMS WITH DIVIDE THE TWO COLORS, U.N.O.
I. NO ADDITIONAL WALL FINISH OR WALL BASE IS TO BE APPLIED TO EXPOSED BRICK OR EXPOSED CONCRETE COLUMNS.
J. UPPER WALLS AND CEILINGS:
   a. REFER TO REFLECTED CEILING PLANS FOR CEILING FINISHES.
   b. ALL EXPOSED CEILING ELEMENTS INCLUDING BUT NOT LIMITED TO STRUCTURE, STRUCTURAL DECK, DUCTWORK, CONDUIT, PIPING, AND EQUIPMENT SHALL BE PAINTED P3 ABOVE A 12'-0" DATUM ON LEVEL 1 AND 10'-0" DATUM ON LEVELS 2 AND ABOVE.
   c. PAINT PROVIDED AT ALL WALLS IS TO TRANSITION TO P3 AT A 12'-0" DATUM ON LEVEL 1 AND 10'-0" DATUM ON LEVELS 2 AND ABOVE, U.N.O..
   d. FINISH BULKHEADS AND SOFFITS WITH THE SAME FINISH OR COLOR ON VERTICAL AND HORIZONTAL SURFACES, U.N.O.
   e. SPRINKLER HEAD FINISH TO CORRESPOND WITH ADJACENT CEILING / BULKHEAD FINISH.
K. WDP1, WDP2:
   a. AT ALL INSTANCES OF WDP1 AND WDP2 INSTALLATION, WALLS AND Z-CLIP MOUNTING HARDWARE ARE TO BE PAINTED P4 BEHIND WDP1 AND WDP2 PANELS.
   b. AT ALL INSTANCES OF WDP1 AND WDP2, PROVIDE FRY REGLET MWROSC100 AT ALL OUTSIDE 90 DEGREE CORNER CONDITIONS, TYPICAL.
   c. AT ALL INSTANCES OF WDP1 AND WDP2, PROVIDE FRY REGLET MWRISC100 AT ALL INSIDE 90 DEGREE CORNER CONDITIONS, TYPICAL.
   d. AT ALL INSTANCES OF WDP1 AND WDP2, PROVIDE FRY REGLET MWCL100 AT ALL ENDS OF PANELS RUNS WITH NON-90 DEGREE CORNER CONDITIONS, TYPICAL.
L. FOR WALLS RECEIVING PAINT P4 AND P5, PROVIDE LEVEL 5 DRYWALL FINISH.
M. ELECTRICAL PANELS LOCATED AT WALLS RECEIVING FINISH OF EITHER SWP2 (WP2,WP3) OR PAINT P5, ARE TO RECEIVE PAINTED FINISH OF P5. ALL OTHER ELECTRICAL PANELS AT REMAINING LOCATIONS ARE TO RECEIVE STANDARD GRAYBEIGE FACTORY FINISH. REFER TO ELECTRICAL DRAWINGS.
N. ALL FLOORING TRANSITIONS SHALL BE CENTERED UNDER THE DOOR IN THE CLOSED POSITION.

(X) INTERIOR FINISH KEYED NOTES

1. ENTIRETY OF METAL SURROUND TO RECEIVE P6 FINISH.
2. WALL(S) TO RECEIVE WDP1. REFER TO INTERIOR ELEVATIONS FOR EXTENTS.
3. DP1. REFER TO ARCHITECTURE ELEVATIONS AND DETAILS.
4. DP2. REFER TO ARCHITECTURE ELEVATIONS AND DETAILS.
5. WALL(S) TO RECEIVE FULL-HEIGHT CT2.
6. WALL(S) TO RECEIVE FULL-HEIGHT CT1. REFER TO ARCHICTURAL ELEVATIONS.
7. WALL(S) TO RECEIVE AWP1. REFER TO INTERIOR ELEVATIONS FOR EXTENTS.
8. INSTALL AWP2. REFER TO REFER TO INTERIOR ELEVATIONS AND ARCHITECTURAL DETAILS.
9. WALL(S) TO RECEIVE AWP3 PANELS. REFER TO INTERIOR ELEVATIONS FOR EXTENTS.
10. WALL TO RECEIVE FULL-HEIGHT AWP4 FROM TOP OF BACKSPLASH TO UNDERSIDE OF CEILING.
11. WALL TO RECEIVE CT3 FROM TOP OF BACKSPLASH TO UNDERSIDE OF CASEWORK.
12. WALL(S) TO RECEIVE FULL-HEIGHT PT4. REFER TO INTERIOR ELEVATIONS.
13. WALL(S) TO RECEIVE FULL-HEIGHT P3.
14. WALL(S) TO RECEIVE P4 TO 10'-0" A.F.F..
15. WALL TO RECEIVE P4; ALIGN WITH TOP OF DOOR FRAME.
16. WALL(S) TO RECEIVE FULL-HEIGHT EPS5P5. REFER TO INTERIOR ELEVATIONS.
17. WALL(S) AND UNDERSIDE OF BULKHEAD ABOVE TO RECEIVE FULL-HEIGHT P5.
18. WALL(S) TO RECEIVE WP2. BULKHEAD ABOVE TO RECEIVE P5.
19. DF1 APPLIED TO GLAZING FROM BOTTOM OF GLASS TO 8'-0" A.F.F..
20. WALL(S) TO RECEIVE FULL-HEIGHT VWC1.
21. **WD1 WOOD SLAT PARTITION. REFER TO ARCHITECTURAL DETAILS AND ELEVATIONS.**
22. WALL(S) TO RECEIVE P5 AND AWP5 TO 10'-0" A.F.F.. REFER TO INTERIOR ELEVATIONS.
23. ALL EXPOSED SURFACES OF RECESS TO BE PAINTED P4.
24. WALL(S) TO RECEIVE P5/EP5 TO 12'-0" A.F.F..
25. WALL(S) TO RECEIVE P5/EP5 TO 10'-0" A.F.F..
26. ALIGN TERMINATION OF ACCENT PAINT WITH BULKHEAD ABOVE.
27. DOOR FRAME AND DOOR TO BE PAINTED TO MATCH P4 ON ENTRY SIDE INTO LAB ONLY. OPPOSITE SIDE OF DOOR AND DOOR FRAME TO FOLLOW INTERIOR TYPICAL FINISHES (P2).
28. UNDERSIDE OF BULKHEAD TO RECEIVE P5.
29. WALL(S) TO RECEIVE PT4 TO 16'-4" A.F.F.. REFER TO INTERIOR ELEVATIONS.
30. WALL(S) TO RECEIVE PT4 TO 13'-0" A.F.F.. REFER TO INTERIOR ELEVATIONS.
31. TERRAZZO WALL BASE TO TERMINATE AT INSIDE CORNER OF WALL AT THIS LOCATION. WALL BASE TO TRANSITION TO RUBBER BASE AS SCHEDULED.
32. WALL TO RECEIVE WP2. REFER TO WALL PROTECTION ASSEMBLIES AND INTERIOR ELEVATIONS.
33. AT 2'-0" OFFSET FROM ALL EDGES OF CARPET TERMINATION, CARPET TILES ARE TO BE TAPED TOGETHER TO ENSURE SECURED EDGE.
34. PROVIDE RT1 AT ALL EXPOSED EDGES OF AREA RUG. SECURE RT1 TO FLOOR WITH ADHESIVE.
35. ALIGN TERRAZZO STRIP(S) WITH CORNER OF WALL.
36. WALL TO RECEIVE WP3. REFER TO WALL PROTECTION ASSEMBLIES AND INTERIOR ELEVATIONS.
37. WALL TO RECEIVE PTB1 ABOVE MT1; WALL TO RECEIVE FULL-HEIGHT P1.
38. COLUMN TO RECEIVE TZB1. RADIUS PRE-CAST TERRAZZO BASE AT COLUMN.
39. ENTIRETY OF COLUMN COVER TO RECEIVE PAINT P6 FINISH.
40. PROVIDE FULL COVERAGE AWP6 AT SKYFOLD PARTITION.

INTERIOR FINISH REMARKS

1. FLOORING IS TO BE INSTALLED CONTINOUSLY UNDERNEATH CARPET. SEE TYPICAL FLOOR TRANSITION DETAILS FOR CARPET OVER TERRAZO AND SEALED CONCRETE CONDITION.
2. ALL WALLS TO RECEIVE WP1.
3. ALL WALLS IN ROOM WILL NOT RECEIVE A PAINT P3 TRANSITION AT DATUM (10'-0" OR 12'-0" A.F.F.). ALL EXPOSED CEILING ELEMENTS TO STILL RECEIVE PAINT P3, U.N.O.. SEE GENERAL NOTE J FOR ADDITIONAL INFORMATION.
4. PROVIDE PRICING FOR FLOORING ADD ALTERNATE SV1 WITH RB1.
5. PROVIDE PRICING FOR FLOORING ADD ALTERNATES SV1 AND SV2 WITH RB1.
6. PROVIDE PRICING FOR FLOORING ADD ALTERNATE SV2 WITH RB1.

INTERIOR TYPICAL FINISHES (UNLESS NOTED OTHERWISE)

P2	HOLLOW METAL DOOR FRAMES
P2	INTERIOR HOLLOW METAL DOORS
P3	EXPOSED DUCTWORK, CONDUIT, PIPING, EQUIPMENT, MEP COMPONENTS
P3	PRE-FINISHED GRILLES/DIFFUSERS ON EXPOSED DUCTWORK
P3	EXPOSED STRUCTURE, STRUCTURAL DECK
SS2	WINDOW SILLS
SS2	SOLID SURFACE SINKS
SS1	SOLID SURFACE COUNTERTOPS
PL1	VERTICAL PLASTIC LAMINATE CASEWORK

FINISH TAG LEGEND

ROOM NAME — STORAGE
ROOM NUMBER — 101
FLOOR — LVT1
BASE — RB1
TYPICAL WALL — P1
*REMARKS — 1

*REMARKS NUMBERS COORDINATE WITH "INTERIOR FINISH REMARKS" NOTES LEGEND

OTHER SYMBOLS

GRAIN — FINISH PATTERN / MATERIAL / GRAIN DIRECTION SYMBOL
CPT1 — MATERIAL TAG, REFERENCE FINISH SCHEDULES
P1 — ACCENT WALL MATERIAL TAG
ALIGN
FLOOR FINISH TRANSITION SYMBOL
1 — INTERIOR FINISH KEYED NOTE

INTERIOR FINISH LEGEND

ACB	ACOUSTIC CEILING BAFFLE
ACT	ACOUSTICAL CEILING TILE
AWP	ACOUSTIC WALL PANEL
CG	CORNER GUARD
CPT	CARPET
CT	CERAMIC TILE
DF	DECORATIVE FILM
DP	DECORATIVE PANEL
EP	EPOXY PAINT
EPF	EPOXY POURED FLOORING
F	FABRIC
LVT	LUXURY VINYL TILE
MT	METAL TRIM
MTCL	METAL CEILING
P	PAINT
PL	PLASTIC LAMINATE
PT	PORCELAIN TILE
PTB	PORCELAIN TILE BASE
QZ	QUARTZ
RB	RESILIENT BASE
RS	ROLLER SHADE
RT	RESILIENT EDGE TRIM
SC	SEALED CONCRETE
SDT	STATIC DISSIPATIVE TILE
SS	SOLID SURFACE
SV	SHEET VINYL FLOORING
SVB	SHEET VINYL BASE
SVT	SOLID VINYL TILE
SWP	SHEET WALL PROTECTION
TZ	TERRAZZO
TZB	TERRAZO BASE
TZST	TERRAZZO STAIR TREAD
VWC	VINYL WALLCOVERING
WDP	WOOD PANEL
WDV	WOOD VENEER PANEL
WG	WRITABLE GLASS
WM	WALK-OFF MAT
WP	WALL PROTECTION

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ANDREW JOHN HOLLOWELL
REGISTERED
No. AR10400213
STATE OF
INDIANA
ARCHITECT

INTERIOR FINISH SCHEDULE

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

IF000

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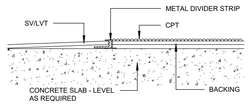
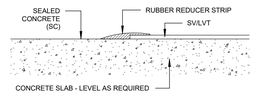
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250972-ALL&E-BD_R24.rvt

TYPICAL FLOOR TRANSITION DETAILS SCALE: 6" = 1' - 0"

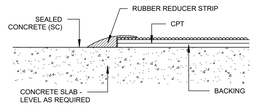


PROVIDE TROWELABLE UNDERLAYMENT AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

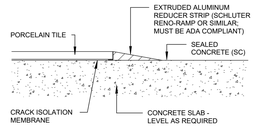
RESILIENT TO CARPET TILE



SEALED CONCRETE TO RESILIENT

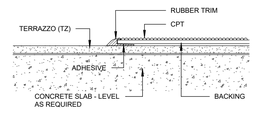


SEALED CONCRETE TO CARPET TILE

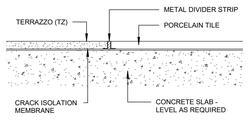


PROVIDE TROWELABLE UNDERLAYMENT AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

PORCELAIN TILE TO CONCRETE

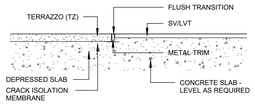


AREA RUG CARPET OVER TERRAZZO AND SEALED CONCRETE



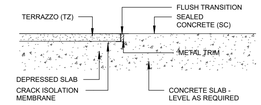
PROVIDE TROWELABLE UNDERLAYMENT AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

TERRAZZO TO PORCELAIN TILE



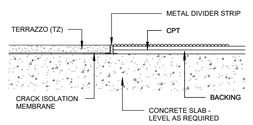
RECESS SLAB AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

TERRAZZO TO RESILIENT



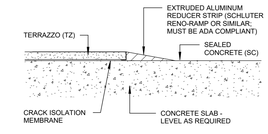
RECESS SLAB AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

TERRAZZO TO CONCRETE



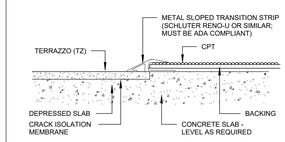
PROVIDE TROWELABLE UNDERLAYMENT AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

TERRAZZO TO CARPET TILE (LEVEL 1)



PROVIDE TROWELABLE UNDERLAYMENT AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

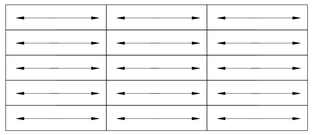
TERRAZZO TO CONCRETE (LEVEL 1)



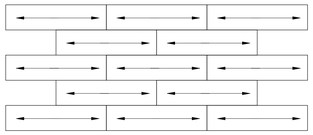
RECESS SLAB AS REQUIRED TO ALLOW FOR FLUSH AND LEVEL TRANSITION.

TERRAZZO TO CARPET (LEVELS 2-5)

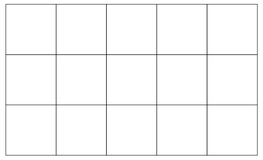
FLOORING INSTALLATION PATTERNS SCALE: 1/2" = 1' - 0"



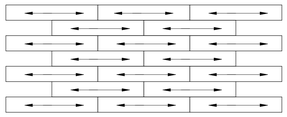
CPT1 - MONOLITHIC



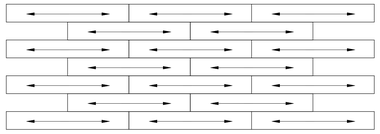
CPT3 - ASHLAR



CPT2 - STACK (TILES ROTATED RANDOMLY)

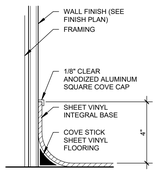


LVT1, LVT2 - 1/2 OFFSET (ASHLAR)

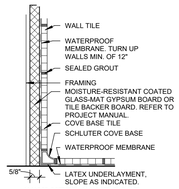


LVT3 - 1/2 OFFSET (ASHLAR)

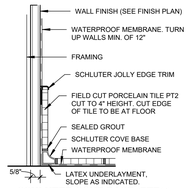
TYPICAL BASE DETAILS SCALE: 3" = 1' - 0"



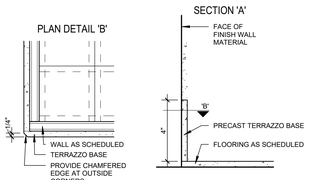
SHEET VINYL COVE



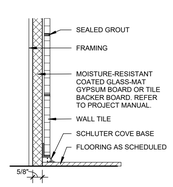
SCHLUTER COVE BASE



SCHLUTER COVE BASE (PTB1)

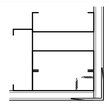


TERRAZZO



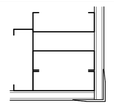
SCHLUTER COVE BASE

CORNER GUARD COMPONENTS SCALE: 3" = 1' - 0"



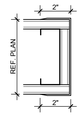
CG1, CG4, CG5 - ALUMINUM TRIM - FULL HEIGHT

CORNER GUARD



CG2 - STAINLESS - TOP OF BASE TO 8'-0" (ALIGN WITH TOP OF DOOR FRAME)

CORNER GUARD

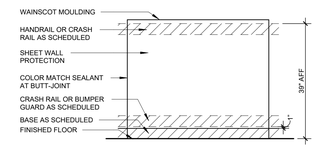


CG3 - STAINLESS - TOP OF BASE TO 8'-0" (ALIGN WITH TOP OF DOOR FRAME)

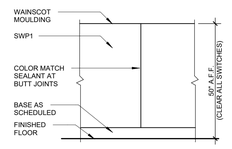
CORNER GUARD

DRAWING DESIGNATION		
CG1	DRYWALL TAPE AND MUD INSTALLATION	
CG2	SURFACE MOUNTED - NOT FIRE RATED	
CG3	SURFACE MOUNTED - NOT FIRE RATED	

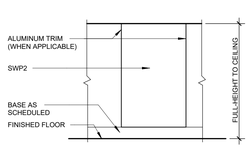
WALL PROTECTION ASSEMBLIES SCALE: NTS



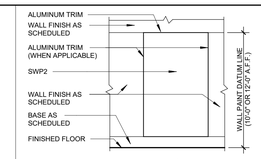
WP - TYP INSTALL DETAILS



WP1
WALL PROTECTION



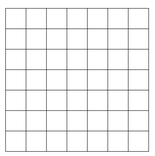
WP2
WALL PROTECTION



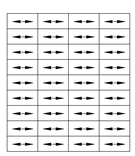
WP3
WALL PROTECTION

DRAWING DESIGNATION			
	WP1	WP2	WP3

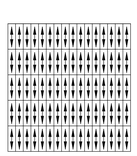
WALL TILE INSTALLATION SCALE: 1/2" = 1' - 0"



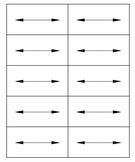
CT1 - STACK



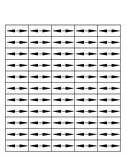
CT2 - HORIZONTAL STACK



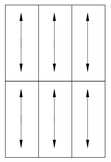
CT3 - VERTICAL STACK



PT2 - HORIZONTAL STACK



PT3 - HORIZONTAL STACK



PT4 - VERTICAL STACK
NOT TO SCALE

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN DOE REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR FINISH DETAILS

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

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1 IF111A INTERIOR FINISH PLAN - LEVEL 1 - AREA A
1/8" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

INTERIOR FINISH PLAN - LEVEL 1 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF111A

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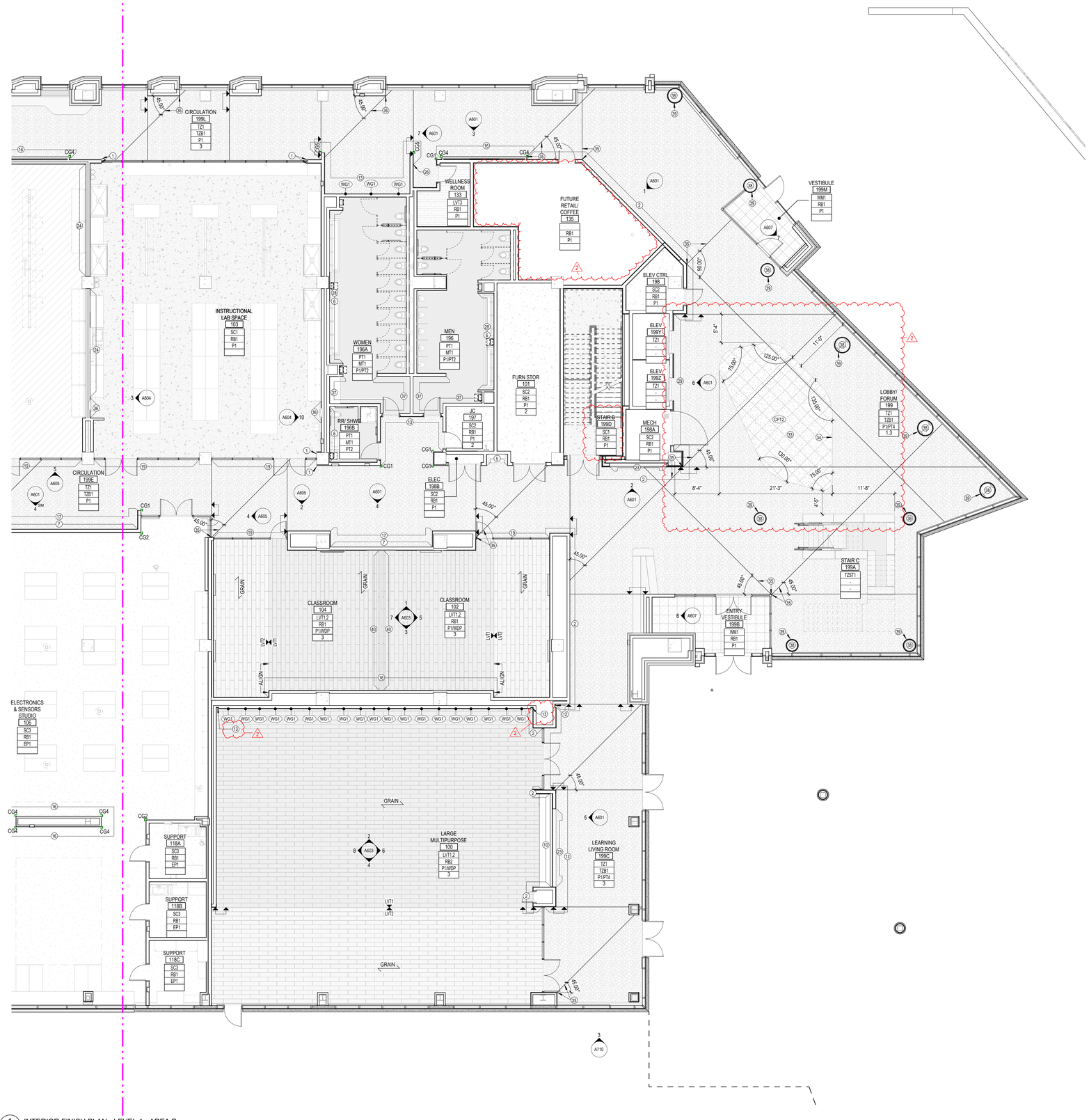

1 IF111B INTERIOR FINISH PLAN - LEVEL 1 - AREA B
1/8" = 1'-0"

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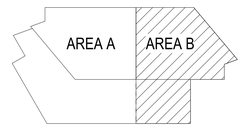
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
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INTERIOR FINISH PLAN - LEVEL 1 - AREA B

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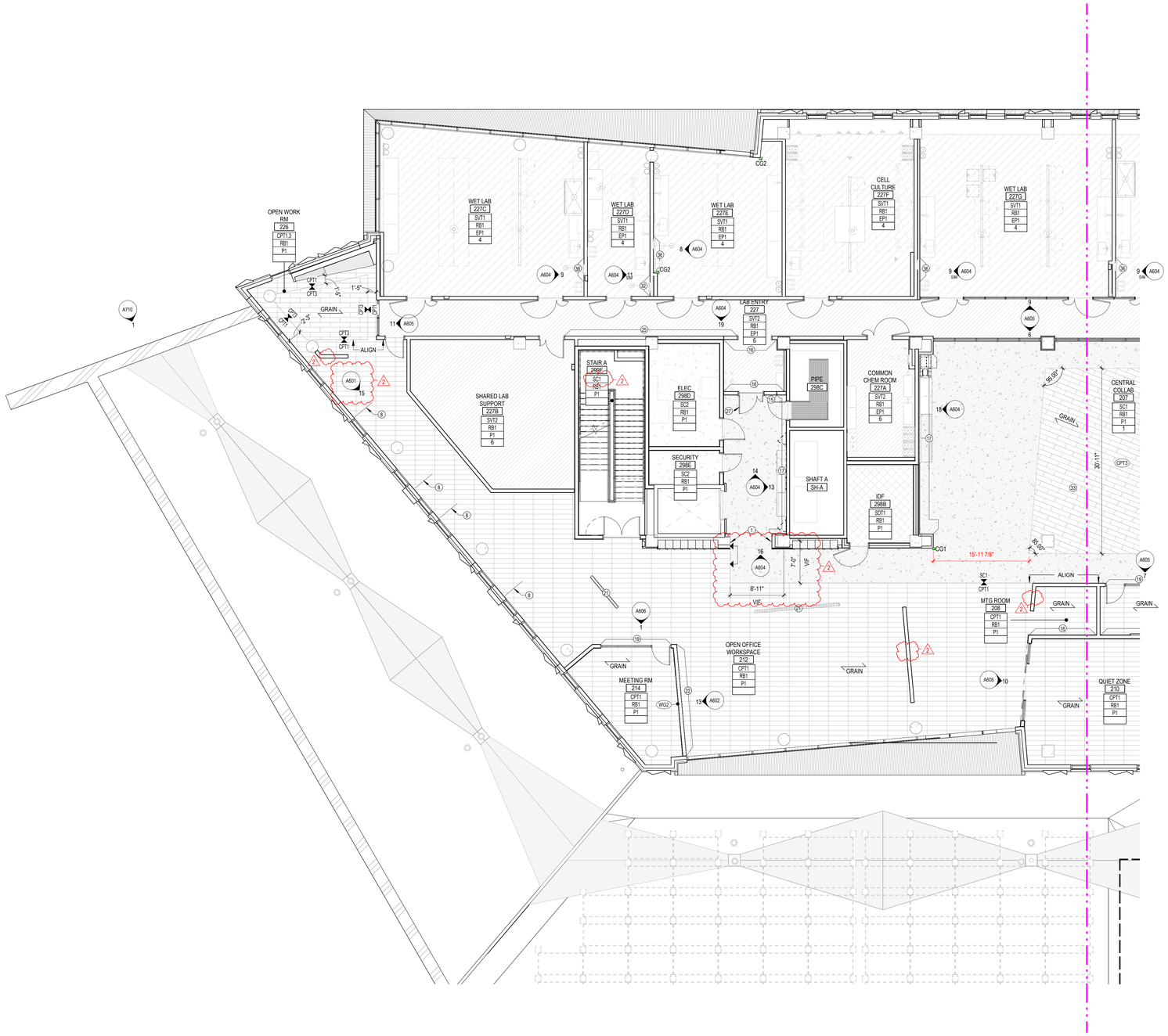

1 IF112A INTERIOR FINISH PLAN - LEVEL 2 - AREA A
1/8" = 1'-0"

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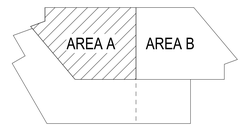
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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2	04/20/2026	BP4-CD: ADDENDUM 01
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ANDREW JOHN JONES REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR FINISH PLAN - LEVEL 2 - AREA A

DATE
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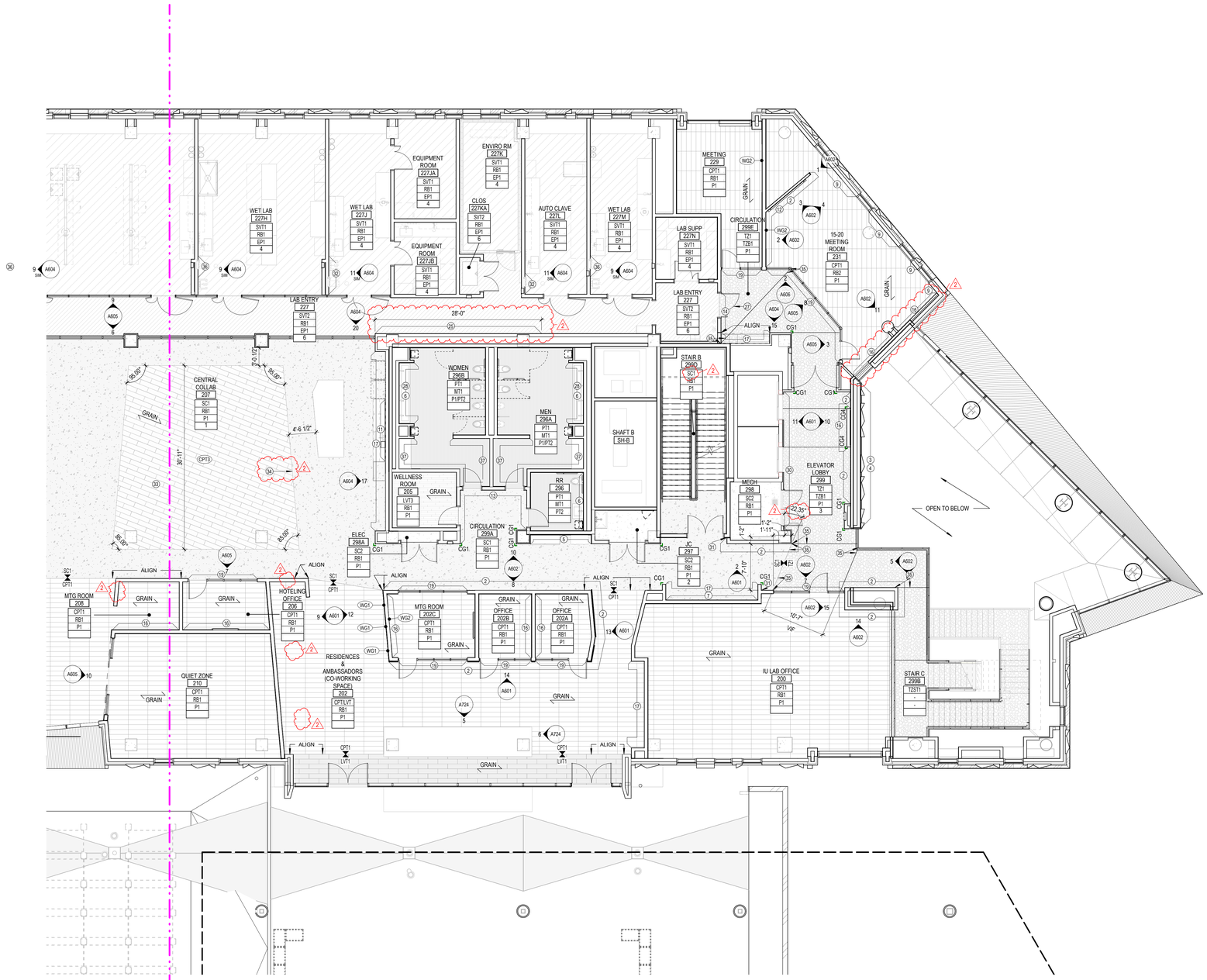

1 IF112B INTERIOR FINISH PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"

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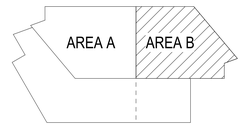
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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MARK	DATE	DESCRIPTION
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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
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INTERIOR FINISH PLAN - LEVEL 2 - AREA B

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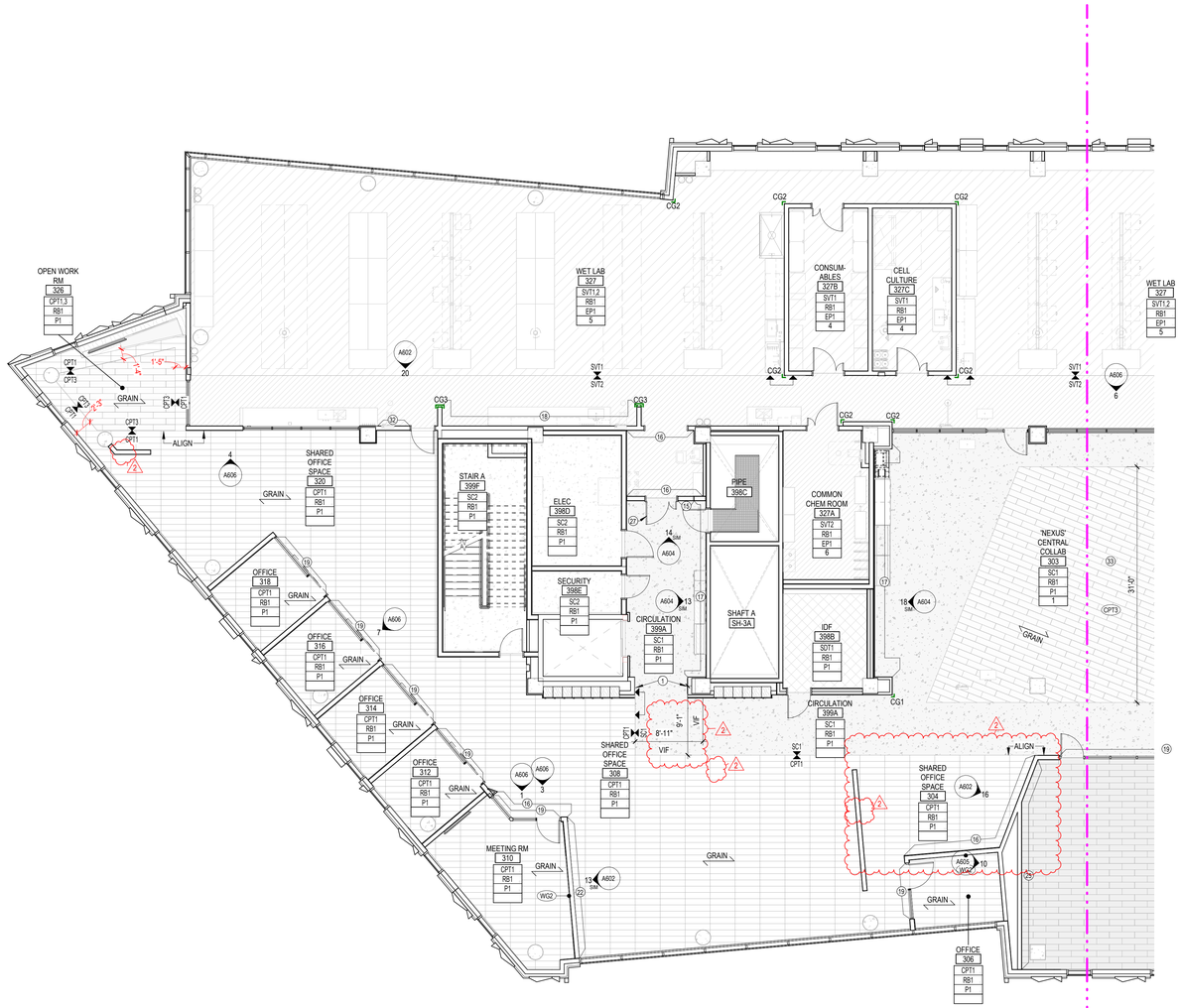

1 IF113A INTERIOR FINISH PLAN - LEVEL 3 - AREA A
1/8" = 1'-0"

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INDIANAPOLIS, INDIANA

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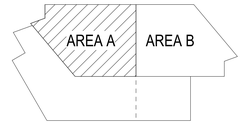

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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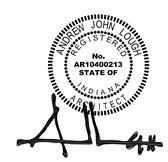
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



INTERIOR FINISH PLAN - LEVEL 3 - AREA A

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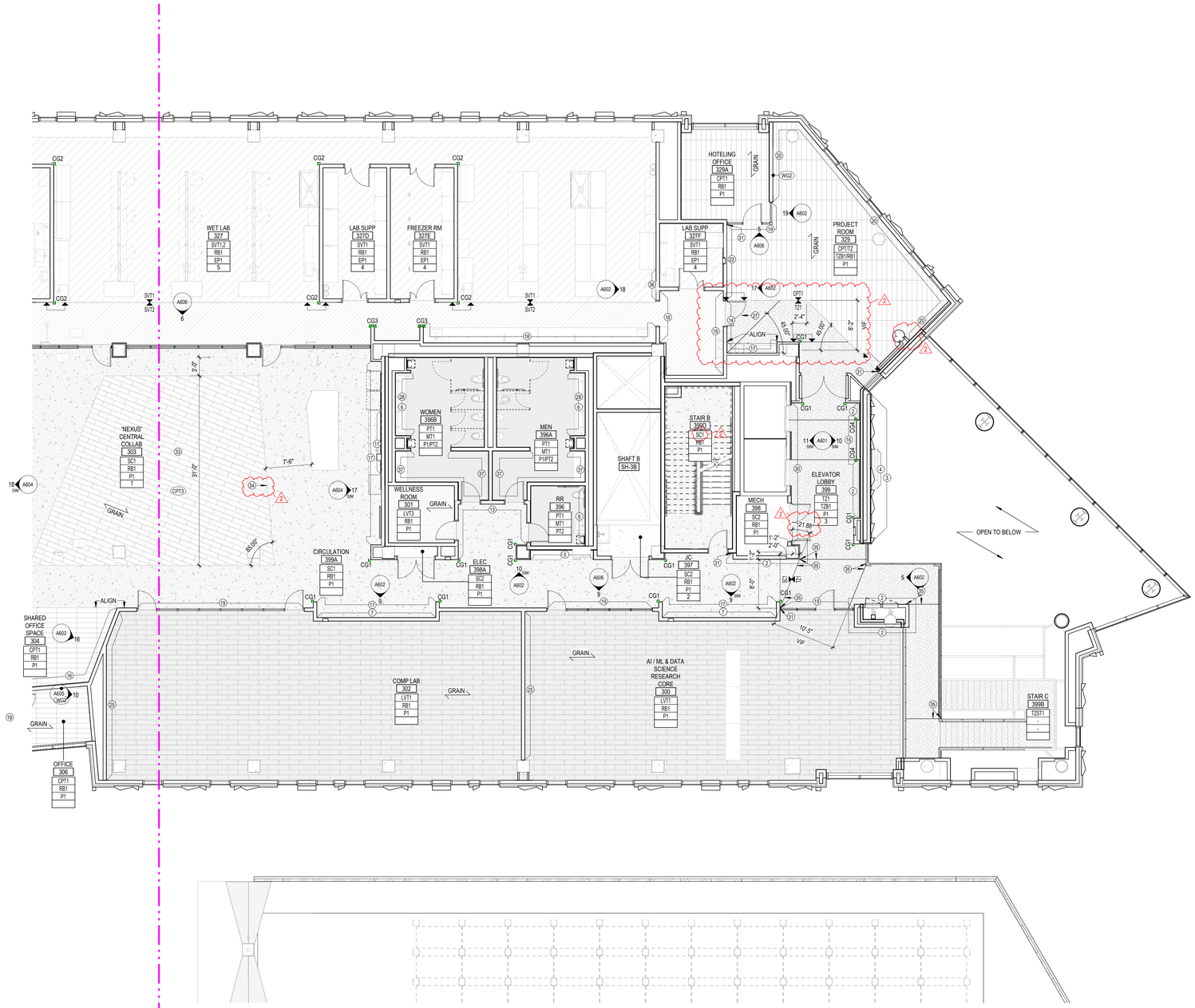

1 IF113B INTERIOR FINISH PLAN - LEVEL 3 - AREA B
1/8" = 1'-0"

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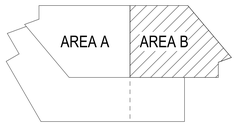

KEYPLAN
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MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

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INTERIOR FINISH PLAN - LEVEL 3 - AREA B

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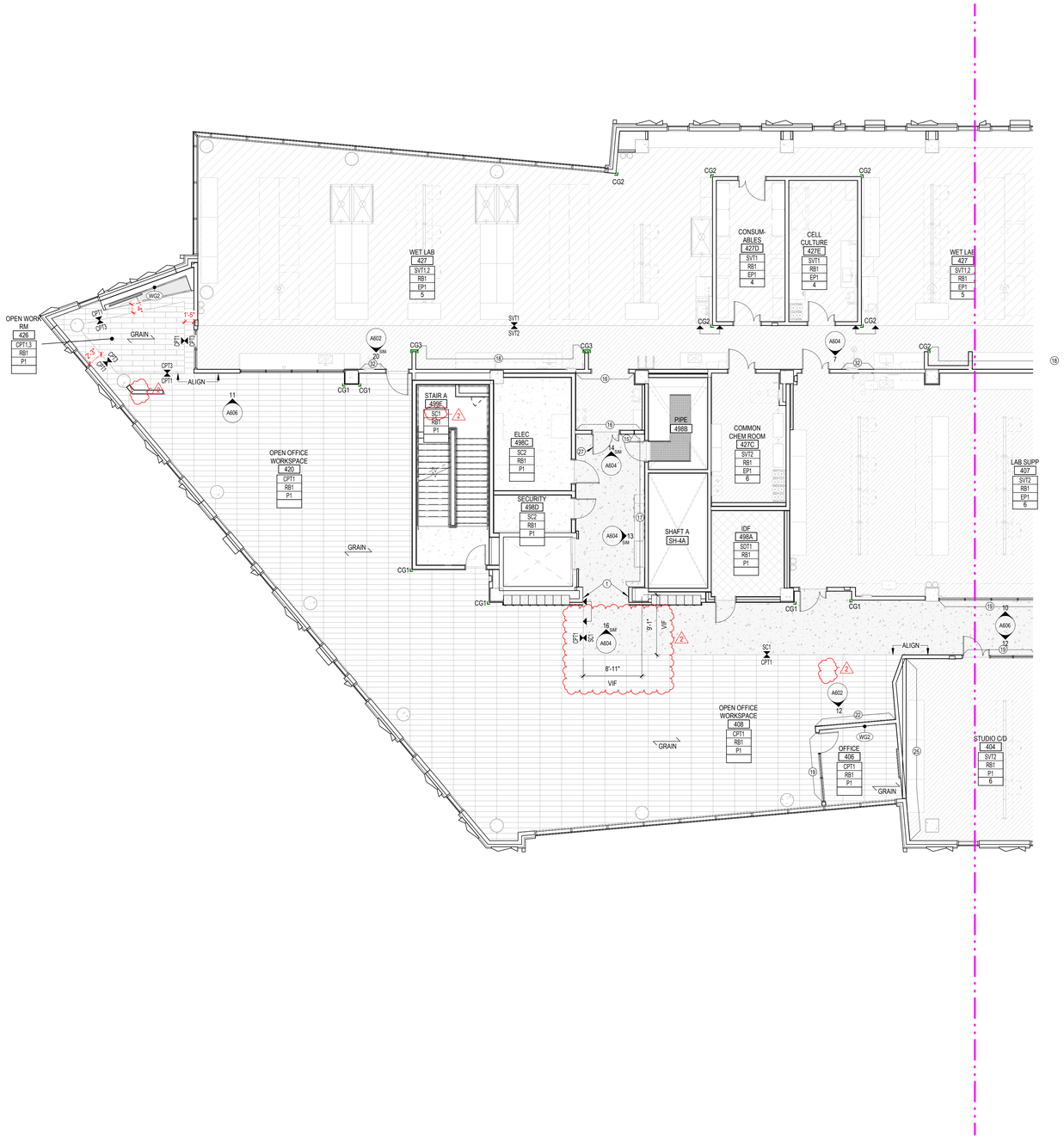

1 INTERIOR FINISH PLAN - LEVEL 4 - AREA A
IF114A 1/8" = 1'-0"

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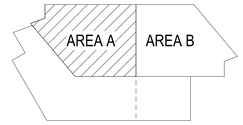
CLIENT PROJECT NO. - 20250072



KEYPLAN
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2	04/20/2026	BP4-CD: ADDENDUM 01
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INTERIOR FINISH PLAN - LEVEL 4 - AREA A

DATE	REF: SHEET INDEX
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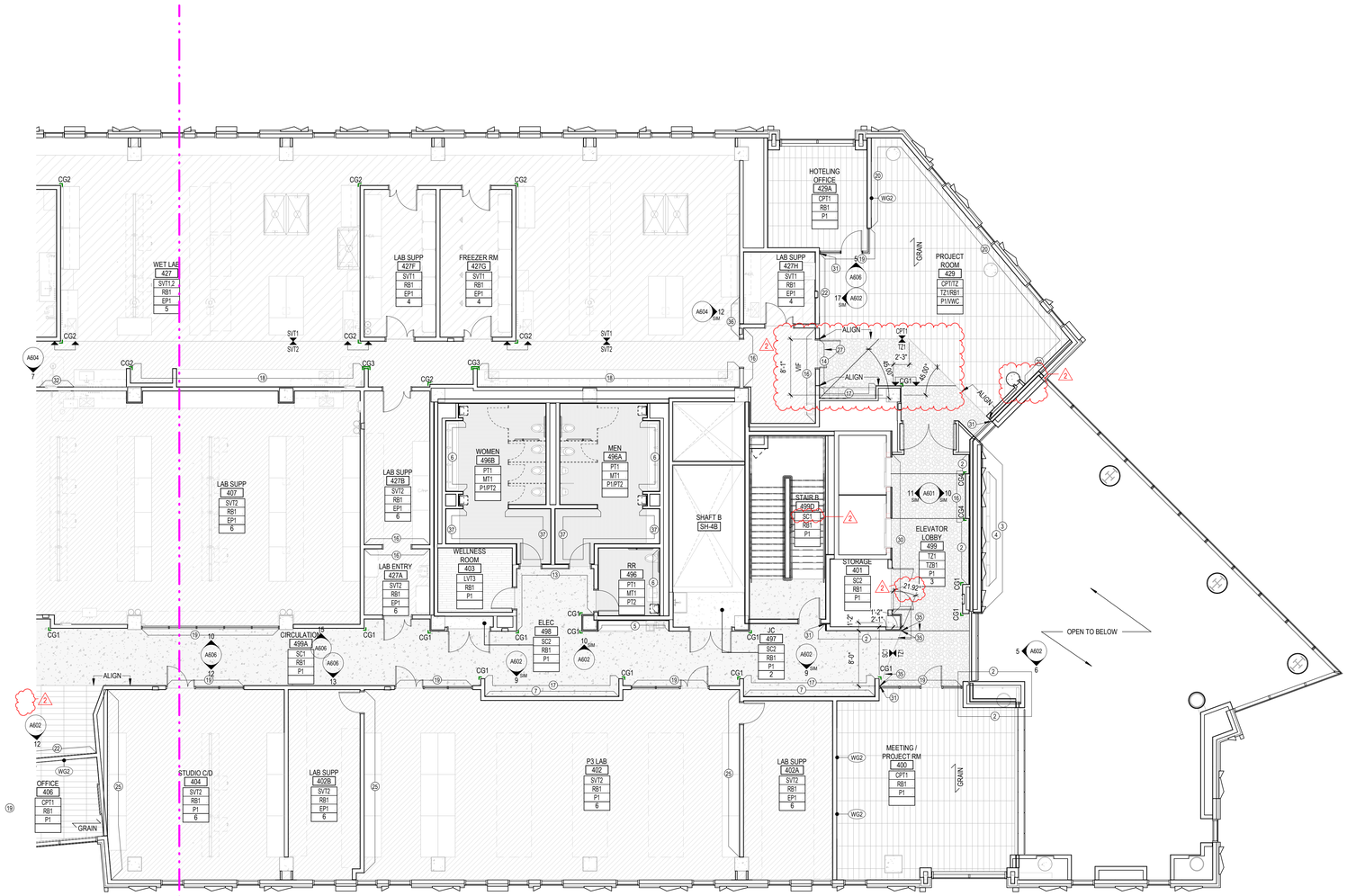

1 INTERIOR FINISH PLAN - LEVEL 4 - AREA B
IF114B 1/8" = 1'-0"

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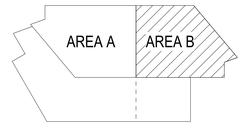
CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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INTERIOR FINISH PLAN - LEVEL 4 - AREA B

DATE	REF: SHEET INDEX
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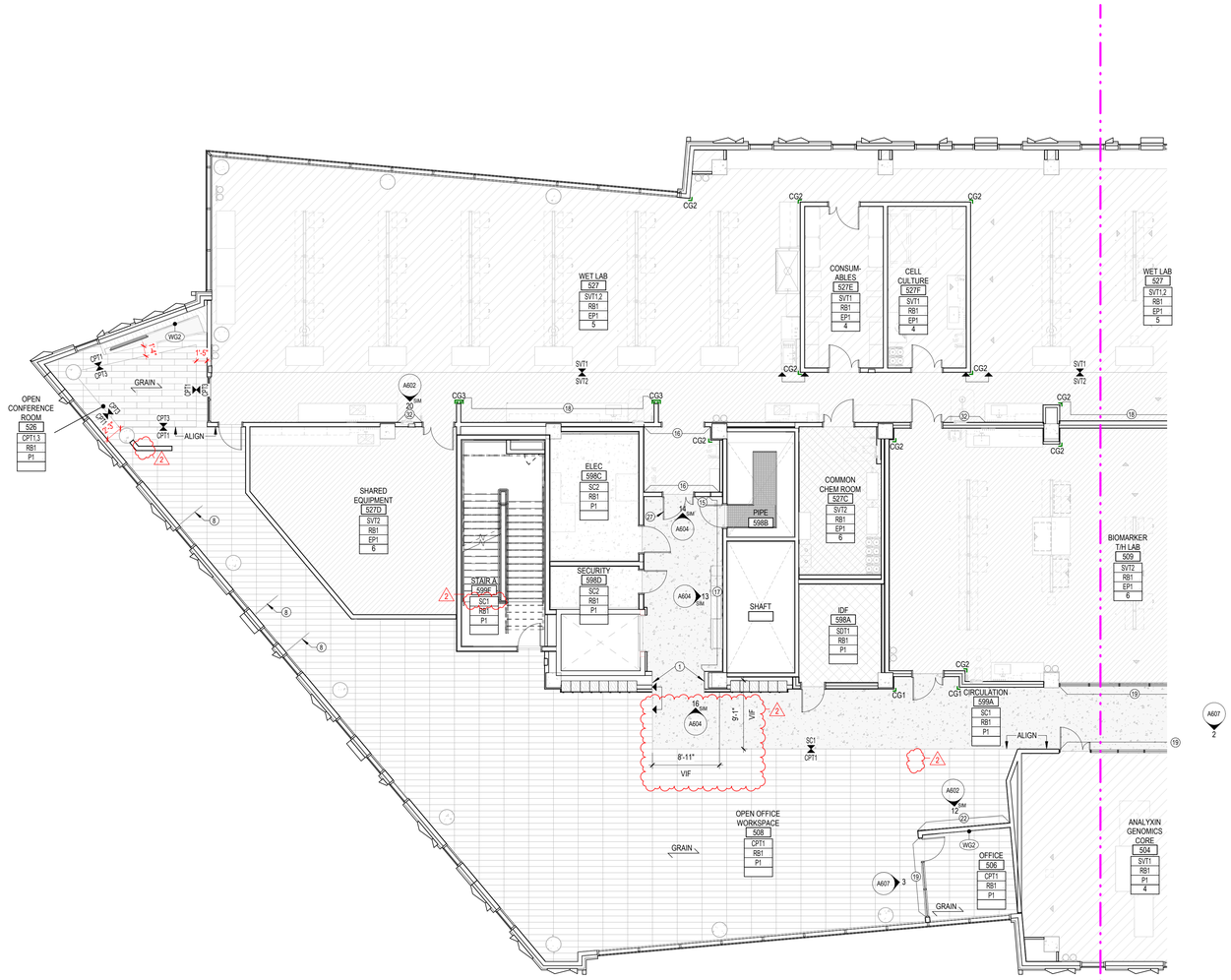

1 INTERIOR FINISH PLAN - LEVEL 5 - AREA A
IF115A 1/8" = 1'-0"

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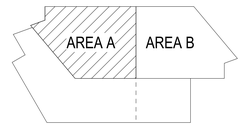
CLIENT PROJECT NO. - 20250072



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INTERIOR FINISH PLAN - LEVEL 5 - AREA A

DATE	REF: SHEET INDEX
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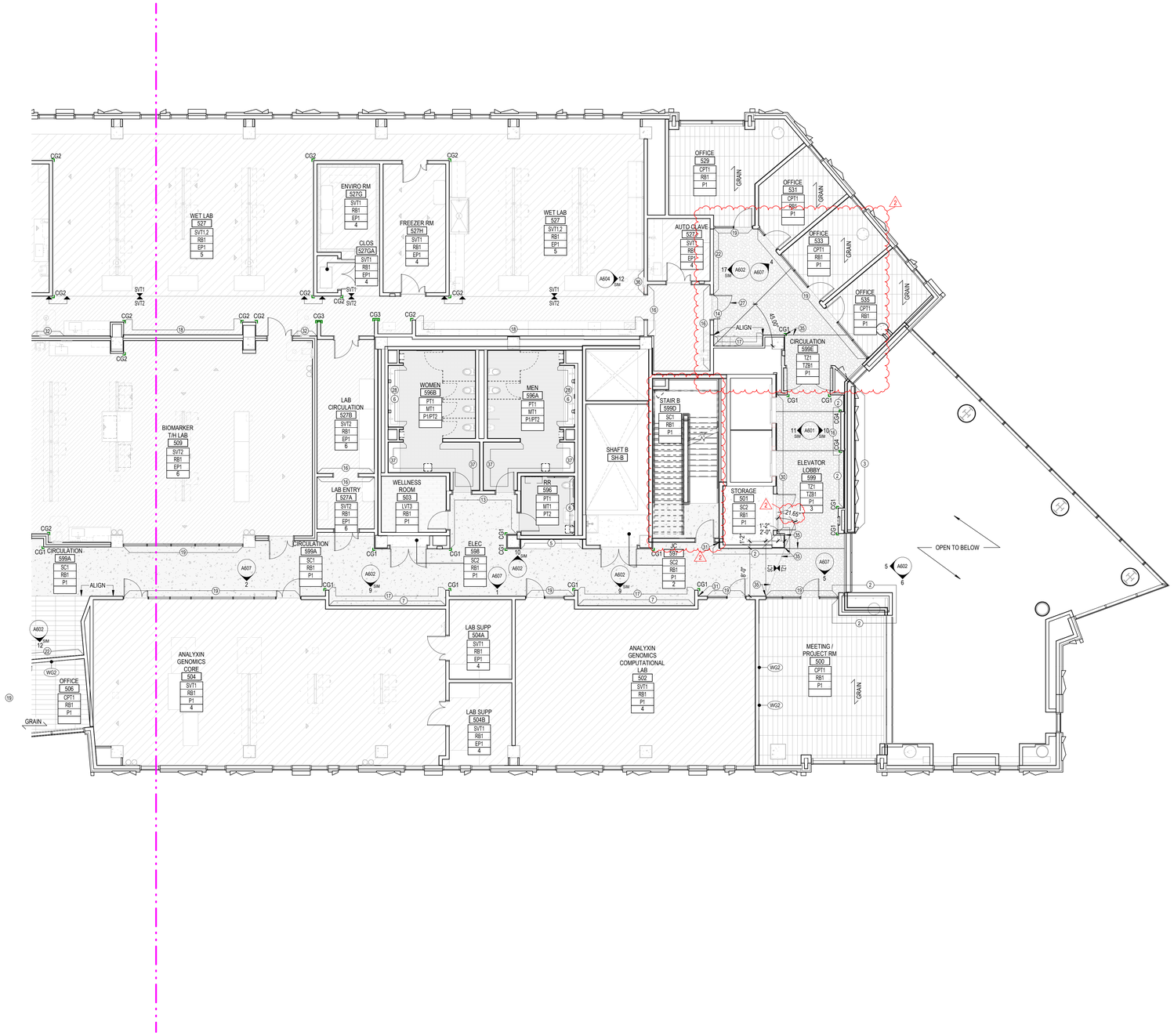

1 IF115B INTERIOR FINISH PLAN - LEVEL 5 - AREA B
1/8" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

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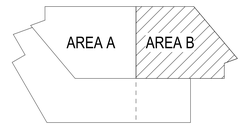

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INTERIOR FINISH PLAN - LEVEL 5 - AREA B

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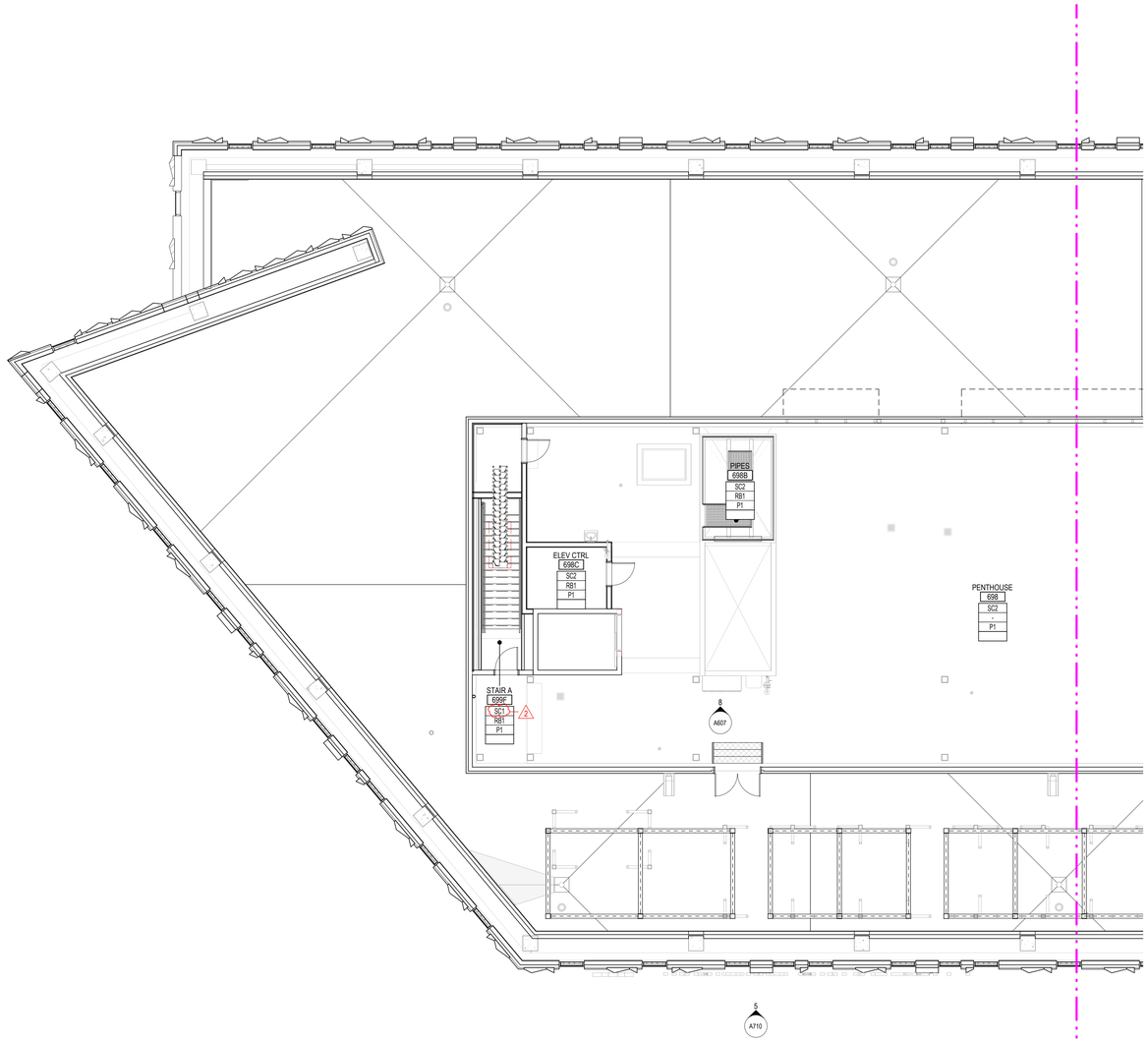

1 IF116A INTERIOR FINISH PLAN - LEVEL 6 - AREA A
1/8" = 1'-0"

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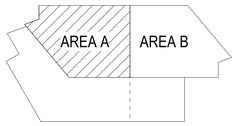

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INTERIOR FINISH PLAN - LEVEL 6 - AREA A

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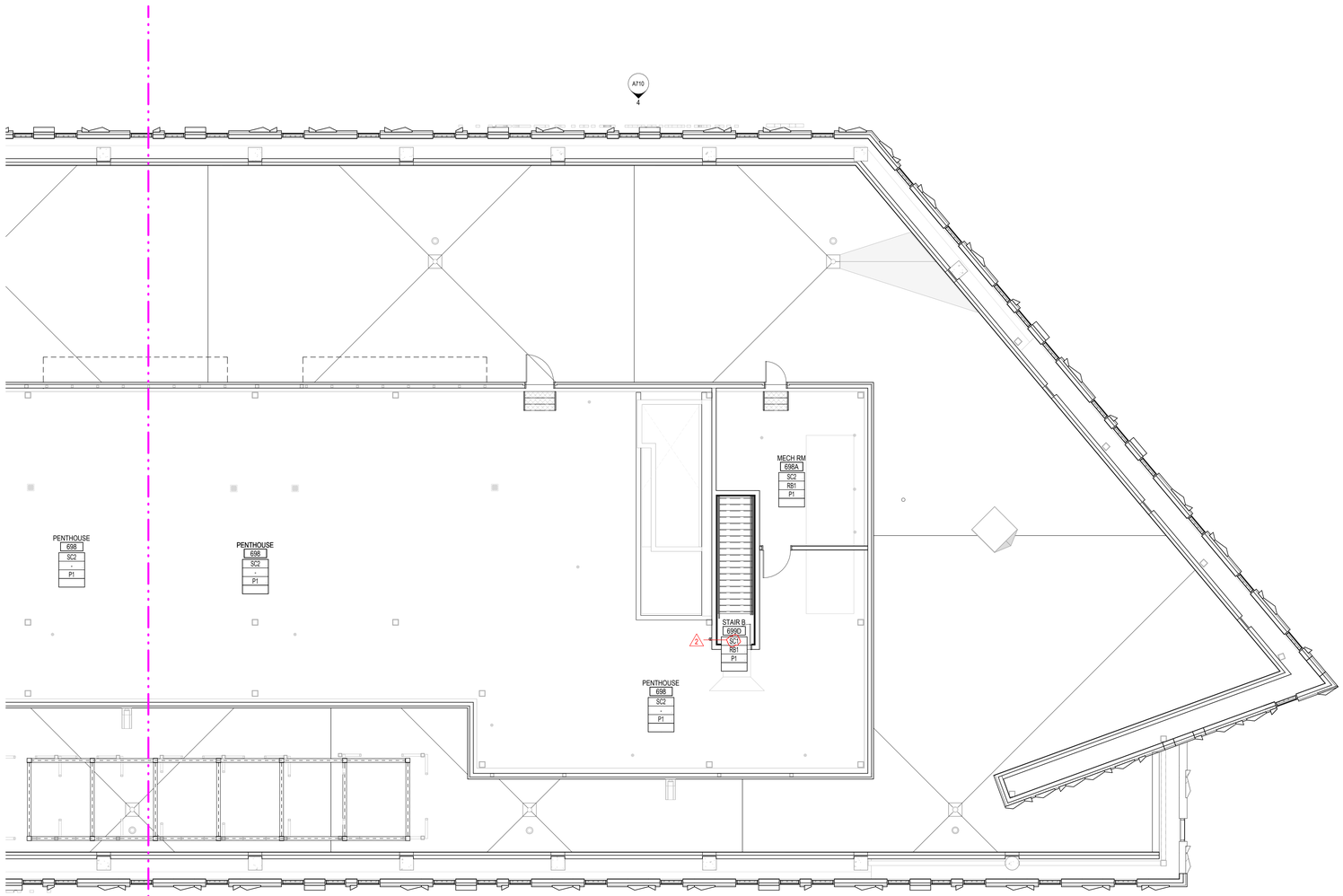

1 IF116B INTERIOR FINISH PLAN - LEVEL 6 - AREA B
1/8" = 1'-0"

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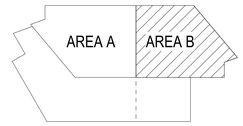

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INTERIOR FINISH PLAN - LEVEL 6 - AREA B

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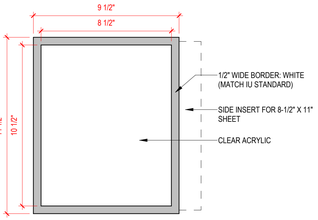
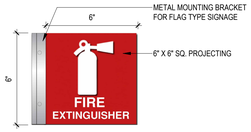
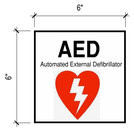


5 IF911 SIGN TYPE O LAB SAFETY
3" = 1'-0"



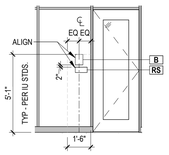
7 IF911 SIGN TYPE P - FIRE EXTINGUISHER
3" = 1'-0"



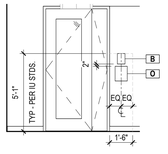
8 IF911 SIGN TYPE U - AEC DEBRILLATOR
3" = 1'-0"

9 IF911 SIGN TYPE V - NON-POTABLE WATER
3" = 1'-0"

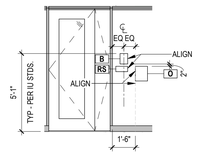
10 IF911 SIGN TYPE W - WELLFIELD SIGNAGE
3" = 1'-0"



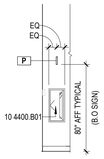
2 IF911 ROOM ID + ROOM SCHEDULER TYPICAL
1/4" = 1'-0"



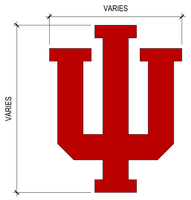
3 IF911 ROOM ID + LAB SAFETY TYPICAL
1/4" = 1'-0"



4 IF911 ROOM ID, ROOM SCHEDULER + LAB SAFETY TYPICAL
1/4" = 1'-0"



6 IF911 SIGN TYPE P TYPICAL
1/4" = 1'-0"



DIMENSIONAL, NON-ILLUMINATED.

3/16" ACRYLIC WITH 1" ALUMINUM RETURN EDGE, COLOR MATCH TO ACRYLIC.

SIZE: VARIES.

REFER TO ARCHITECTURAL ELEVATIONS A601-3, A602-11 & 12, A603-1 & 8 FOR OVERALL DIMENSIONS & COLOR BY LOCATION. FOLLOW ALL IU BRANDING STANDARDS FOR TRIDENT.

FOLLOW ALL IU BRANDING STANDARDS FOR TRIDENT.

11 IF911 SIGN TYPE Q - IU TRIDENT
3" = 1'-0"

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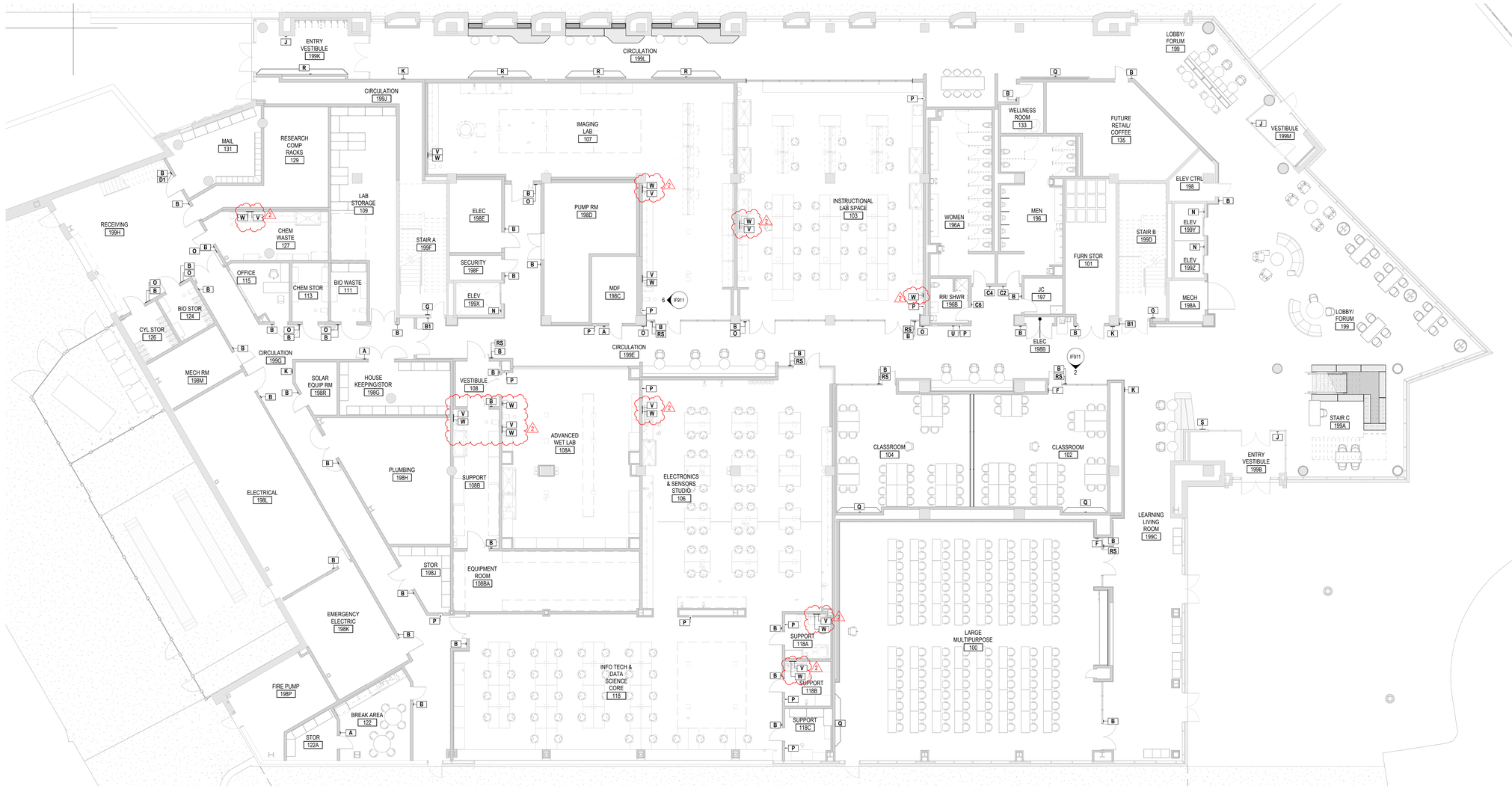
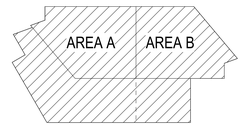
W	WELLFIELD





1 IF911 INTERIOR SIGNAGE PLAN - LEVEL 1 - COMPOSITE
3/32" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN HOLLOWAY
REGISTERED
No. AR10400213
STATE OF
INDIANA
ARCHITECT

INTERIOR SIGNAGE PLAN - LEVEL 1

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

IF911

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T	ARTWORK (SHOWN FOR REFERENCE ONLY)
U	DEFIBRILLATOR
V	NON POTABLE WATER
W	WELLFIELD

1 IF912 INTERIOR SIGNAGE PLAN - LEVEL 2 - COMPOSITE
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175 S. Rangeline Rd, Suite 200
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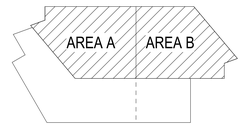
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN TOMPKINS REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

INTERIOR SIGNAGE PLAN - LEVEL 2

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF912

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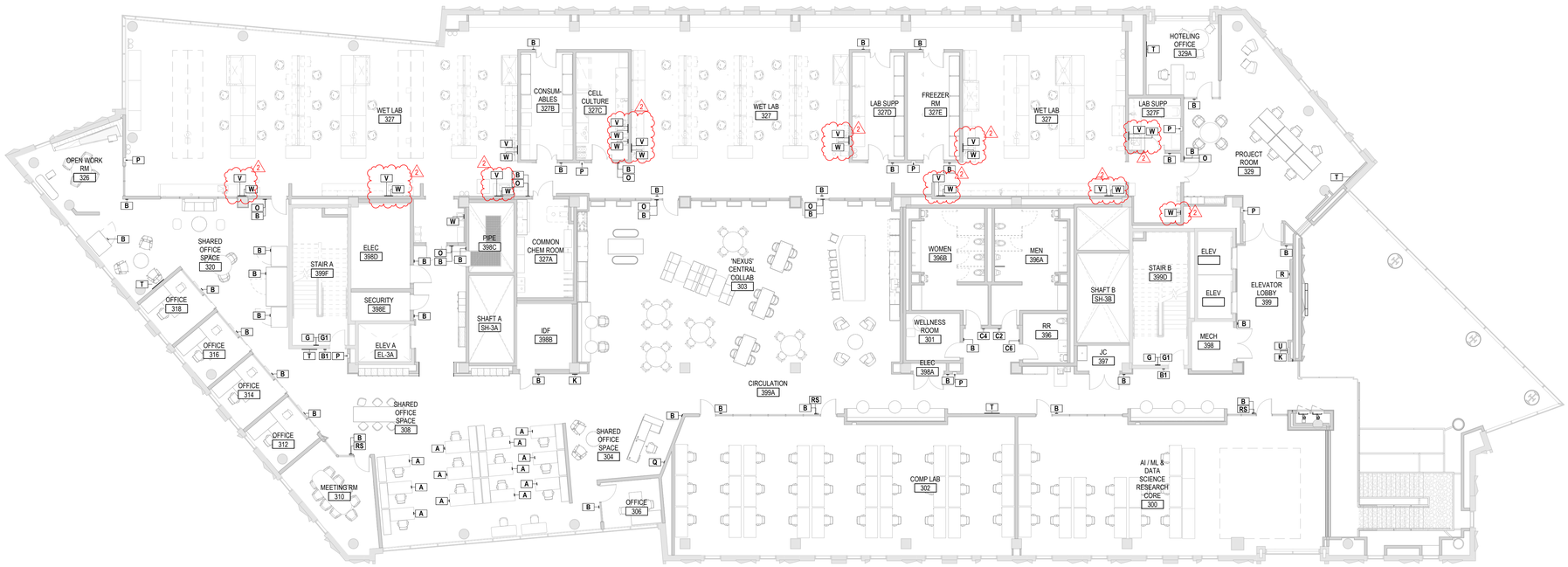

1 IF913 INTERIOR SIGNAGE PLAN - LEVEL 3 - COMPOSITE
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175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
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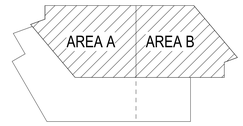
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



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ANDREW JOHN HOLLIN REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR SIGNAGE PLAN - LEVEL 3

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

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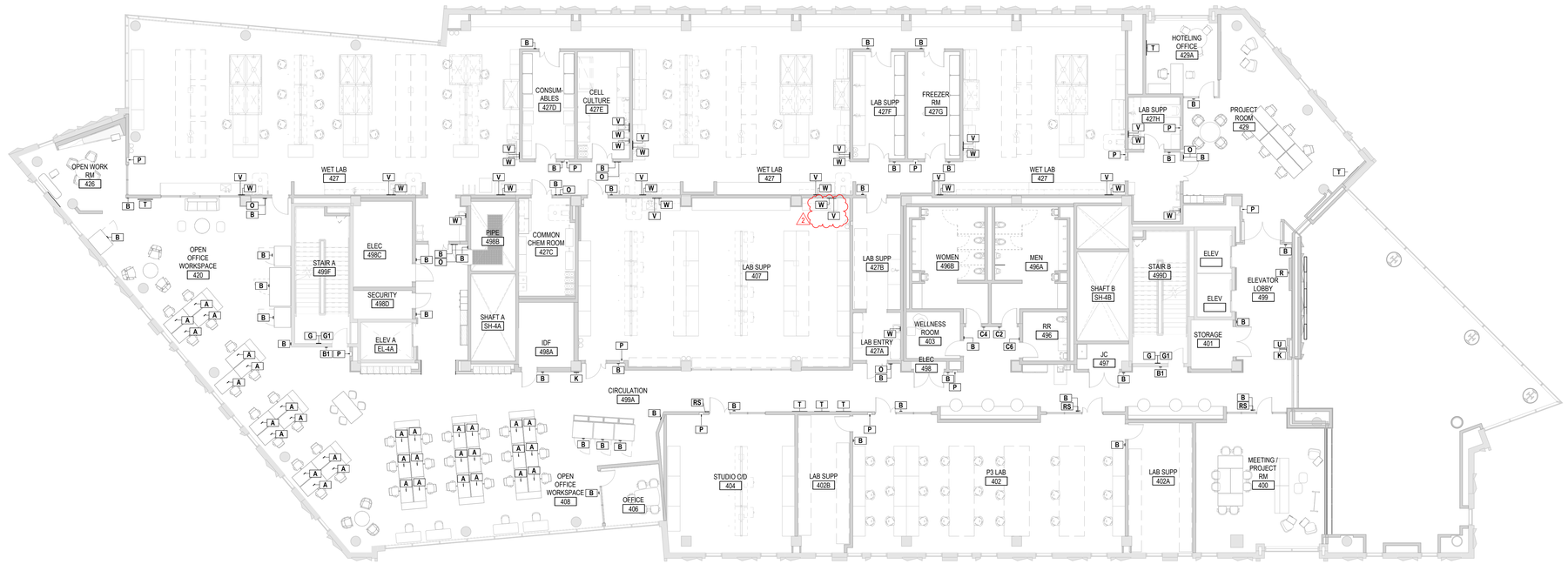

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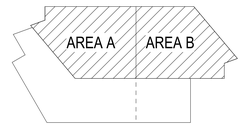
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



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ANDREW JOHN HOLDEN
REGISTERED
No. AR10400213
STATE OF
INDIANA
ARCHITECT

INTERIOR SIGNAGE PLAN - LEVEL 4

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

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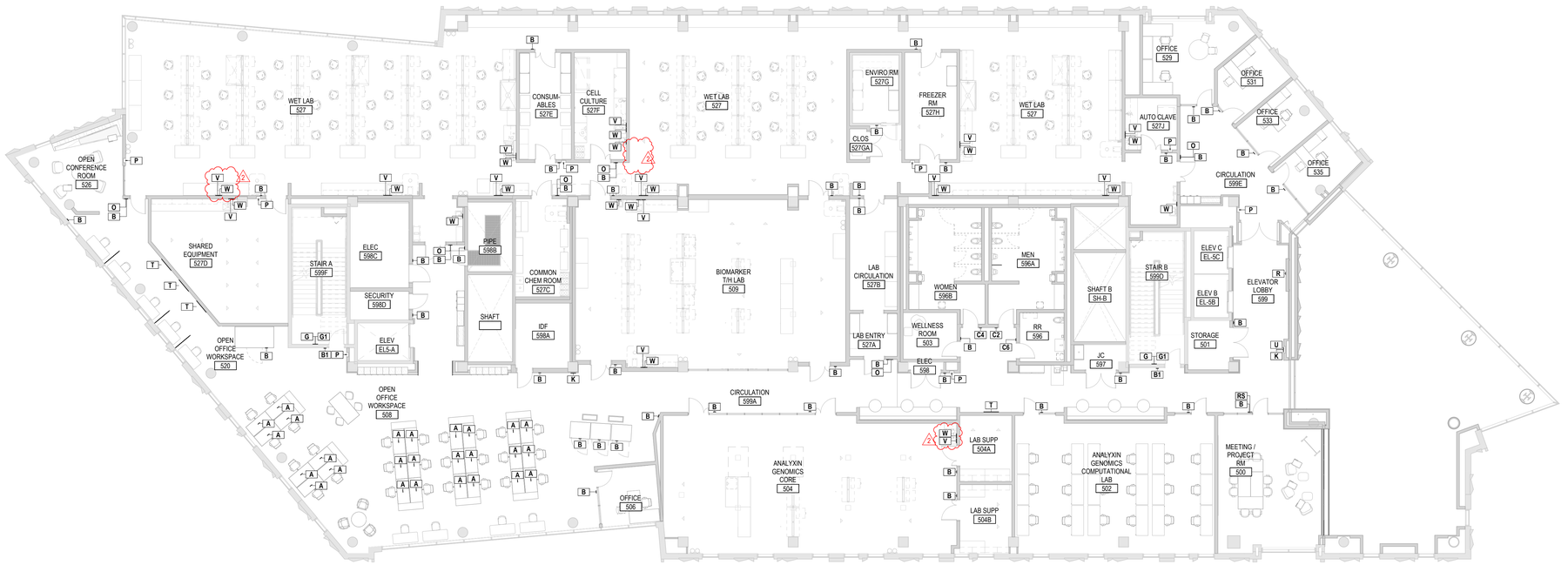
V	NON POTABLE WATER
W	WELLFIELD



1 IF915 INTERIOR SIGNAGE PLAN - LEVEL 5 - COMPOSITE
3/32" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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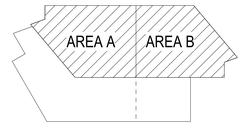
500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

INTERIOR SIGNAGE PLAN - LEVEL 5

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF915

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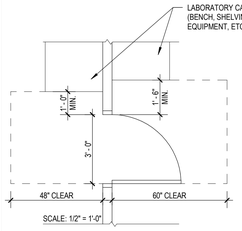
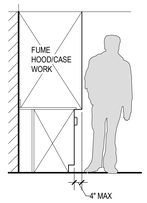
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ARCH-20250072-IULAB-BO_R24.rvt

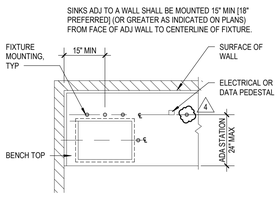
TYPICAL ACCESSIBLE DIMENSIONS AND CLEARANCES



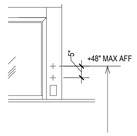
DOOR/ CASEWORK CLEARANCES
(PLAN VIEW)



LIMIT OF PROTRUDING OBJECTS
(WALKING PARALLEL TO A WALL)

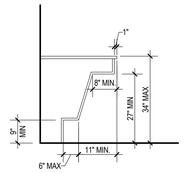


CONDITION AT LAB SINK
(PLAN VIEW)



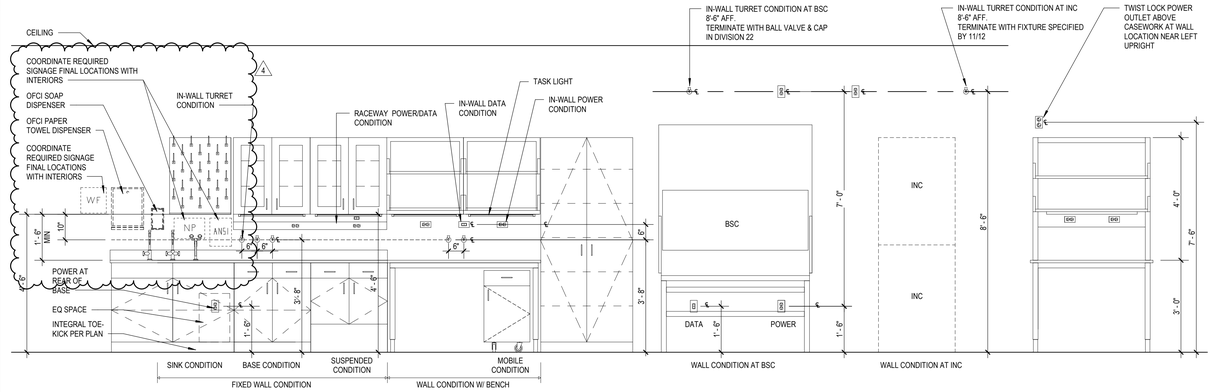
FOR ADA FUME HOODS ONLY: CENTERLINE OF TOP MOST VALVE TO BE A MAXIMUM OF 48" AFF. ANY ADDITIONAL VALVES TO BE MOUNTED IN THE CABINET APRON BELOW. PROVIDE PIPING BETWEEN VALVES AND OUTLETS AS PART OF THE FUME HOOD PRE-PIPING.

ADA FUME HOOD SERVICES
(ELEV. VIEW)

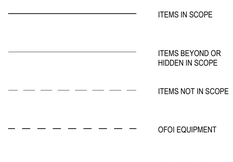


ACCESSIBLE KNEE SPACE CLEARANCES
(SIDE VIEW)

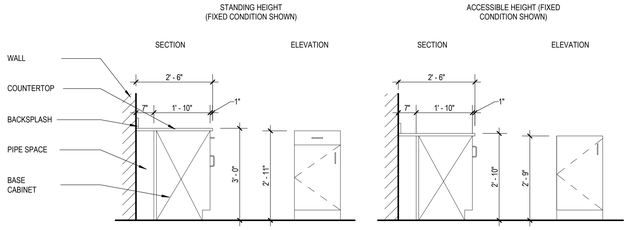
TYPICAL MOUNTING HEIGHT



LINE TYPE LEGEND



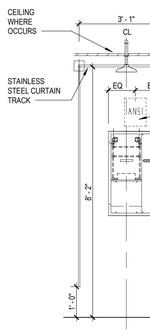
BASE CABINET HEIGHT DEFINITION - 1/2" = 1'-0"



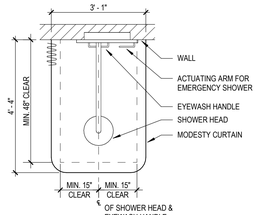
NOTE:
- PROVIDE REAR FILLER PANEL AT EXPOSED SIDE OF FIXED CASEWORK AND KNEE SPACE, TYPICAL. MATCH ADJACENT BASE CABINET FINISH AND TOE KICK DETAIL.
- PROVIDE LOCKS AS INDICATED WITH THE CHARACTER "Q"

ACCESSIBLE HEIGHT CABINETS ARE INDICATED IN PLAN WITH A SYMBOL

RECESSED SAFETY SHOWER/ EYEWASH - 1/2" = 1'-0"

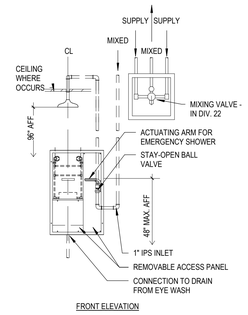


MODESTY CURTAIN ELEVATION

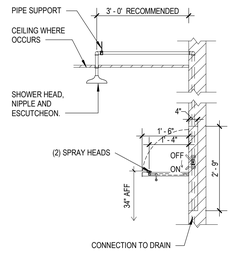


MINIMUM CLEAR FLOOR SPACE REQUIREMENTS FOR FORWARD APPROACH

PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

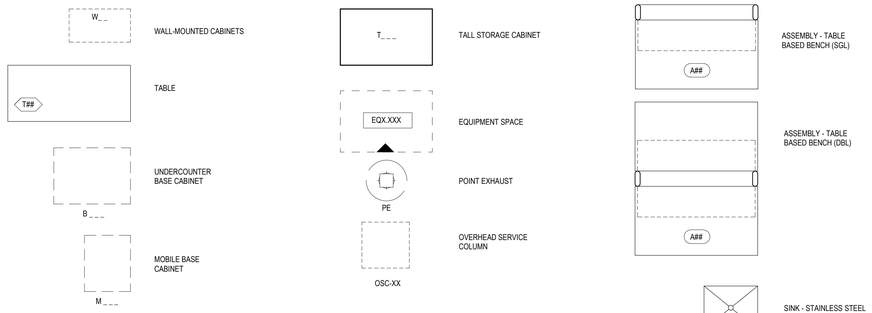
NOTE:

IF CEILING IS AT OR GREATER THAN 120" AFF, SHOWER HEAD HORIZONTAL SUPPLY PIPE SHALL COME FROM WALL WITH ESCUTCHEON AND BE OF FINISHED MATERIAL MATCHING SHOWER HEAD.

ELEVATION OF EMERGENCY SHOWER SHALL BE AT OR BELOW SURROUNDING THAT WOULD OTHERWISE IMPACT THE SHOWER FLUID COLUMN.

MODESTY CURTAINS TO BE PROVIDED AT ESEWS ON LEVELS 4 AND 5

PLAN SYMBOLS - 1/2" = 1'-0"



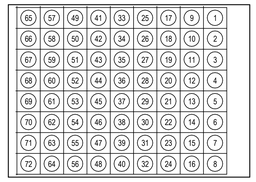
EQUIPMENT ABBREVIATIONS

#	120V	120 VOLTAGE ELECTRICAL RECEPTACLE
	208V	208 VOLTAGE ELECTRICAL RECEPTACLE
A	ADA	ACCESSIBILITY PROPERTIES ACT
	ANSI	ANSI COMPLIANT SIGNAGE (4)
	AS	ADJUSTABLE SHELF
	AV	ATMOSPHERIC VENT
B	BSC	BIOLOGICAL SAFETY CABINET
C	CA	COMPRESSED AIR
	CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
	CH4	METHANE
	CHW	CHILLED WATER
	CNG	COUNTER GROMMET
	CO2	CARBON DIOXIDE
	CP	CLOSURE PANEL
	CRT	CYLINDER RESTRAINTS
	CS	CUP SINK
	CSC	CEILING SERVICE COLUMN
	CSP	CEILING SERVICE PANEL
	CW	COLD WATER
D	DA	DATA RECEPTACLE
	DGV	DOUBLE GAS VALVE
	DI	DEIONIZED WATER
	DR	DRYING RACK (GLASSWARE)
	DUP	DUPLEX OUTLET
E	ELA	END LEG ASSEMBLY
	ER	EPOXY RESIN
	EP	ELECTRICAL PANEL
	ESEW	EMERGENCY SHOWER EYE WASH
	EW	EYE WASH/DRENCH HOSE
F	FA	FAUCET ASSEMBLY
	FC	FILE CABINET
	FF&E	FURNITURE, FIXTURES, & EQUIPMENT
	FH	FUME HOOD
	FP	FILLER PANEL
H	H2	HYDROGEN
	H2S	HYDROGEN SULFIDE
	HDS	HEAVY DUTY SHELVING
	HP	HIGH PRESSURE
	HW	HOT WATER
L	LA	LAB AIR
	LCH	LAB COAT HOOK
	LCR	LAB CORE ASSEMBLY
	LCS	LAB CUP SINK
	LFH	LAMINAR FLOW HOOD
	LM	LAB MODULE
	LN2	LIQUID NITROGEN
	LS	LIGHT SWITCH
	LSK	LAB SINK
	LV	LAB VACUUM
M	MKB	MARKERBOARD
N	N2	NITROGEN
	NH3	AMONIA
	NO2	NITROGEN DIOXIDE
	NPC	NO PLUMBING (4)
	NP	NON-POTABLE WATER SIGNAGE (4)
O	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
	OFOI	OWNER FURNISHED OWNER INSTALLED
	OH	OPPOSITE HAND
	OSC	OVERHEAD SERVICE CARRIER
P	PCH	PIPE CHASE
	PCWR	PROCESS COOLING WATER RETURN
	PCWS	PROCESS COOLING WATER SUPPLY
	PE	POINT EXHAUST
	PO	POWER OUTLET
	PPR	PAPER TOWEL DISPENSER
	PRF	PRE RINSE FIXTURE
	PW	PURE WATER
Q	QGV	QUAD GAS VALVE
R	RO	REVERSE OSMOSIS WATER
	RO/DI	REVERSE OSMOSIS DEIONIZED WATER
S	SGV	SINGLE GAS VALVE
	SO	SENSOR OPERATED
	SPD	SOAP DISPENSER
	SR	SURFACE RACEWAY
	SUL	SULPHER
	SVF	SERVICE FIXTURE
	SVG	SERVICE FIXTURE GROUP
	SG	SPECIALTY GAS
	TL	TASK LIGHT
	TLO	TELECOMM OUTLET
	TRC	TRASH RECEPTACLE
T	TBD	TO BE DETERMINED
U	UON	UNLESS OTHERWISE NOTED
	VIF	VERIFY IN FIELD
V	VAB	VACUUM BREAKER
	WSH	WIRE SHELF
	WSL	WIRE SHELVING WITH GROW LIGHTS
W	WFA	WALL FRAME ASSEMBLY
	WF	WELLFIELD SIGNAGE (4)

GENERAL CASEWORK NOTES

1. CASEWORK IS IDENTIFIED WITH A CASEWORK TYPE SYMBOL. REFER TO CASEWORK TYPE SYMBOL DEFINITION FOR MORE DETAIL.
2. MAINTAIN THE OVERALL NOMINAL HEIGHT OF BASE CABINET TOPS AS SHOWN ON DRAWINGS. BEGIN INSTALLATION OF CASEWORK AT THE HIGH POINT OF THE FLOOR AT EACH BENCH WITH THE LEVELERS SCREWED IN AS FAR AS POSSIBLE.
3. OVERALL LENGTH OF BENCH TOPS EQUALS THE DIMENSIONED LENGTH OF THE CASEWORK, PLUS 1/2 INCH OVERHANG AT EACH END.
4. BASE TO BE APPLIED TO FIXED CASEWORK/COMPONENTS AT FLOOR CONDITIONS.
5. PROVIDE TASK LIGHTS AT UNDERSIDE OF WALL CABINETS AND BOTTOM SHELF OF WALL FRAME ASSEMBLY. LIGHT TO BE CENTERED ON UNIT. LIGHT FIXTURE NOMINAL WIDTH SHALL MATCH ACTUAL CASEWORK UNIT DIMENSION. NO VALANCE UON ON ELEVATION
6. PROVIDE RAIL COVERS AT WALL FRAME ASSEMBLIES.
7. SINK ACCESSORIES (SOAP, PAPER TOWEL DISPENSERS) SHALL BE OWNER PROVIDED AND CONTRACTOR INSTALLED, UON.
8. PROVIDE LOCKS AT TALL CABINETS, CHEMICAL STORAGE CABINETS, AND AS DESIGNATED WITH CHARACTER 'Q'.
9. PROVIDE 2'-6" DEEP SINGLE-SIDED WALL BENCH TOPS AND TABLE SURFACES, INCLUDING BACKSPLASH AND 1" FRONT OVERHANG, UON. PROVIDE 5'-0" DEEP DOUBLE-SIDED ISLAND AND PENINSULA BENCH TOPS, INCLUDING A 1" OVERHANG ON EACH SIDE, UON.
10. CHAIRS/STOOLS INDICATED IN THE Q SET ARE FOR INFORMATION ONLY.
11. ACCESSIBLE LOCATIONS ARE INDICATED ON FLOOR PLANS WITH A HATCH (REFER TO PLAN SYMBOLS FOR HATCH PATTERN). MODIFY STANDING HEIGHT CABINETS TO FIT UNDER BENCH TOPS INDICATED AT +34" FOR ACCESSIBLE COMPLIANCE.
12. ADJUSTABLE WALL-SHELVES SHALL SPAN A MAXIMUM OF 48 INCHES, UON.
13. CASEWORK EQUAL OR LESS THAN 24" IN WIDTH SHALL HAVE A SINGLE HINGED DOOR.
14. PROVIDE PAINTED STEEL CASEWORK AND FUME HOODS, AND SOLID PHENOLIC RESIN TOPS OR BUTCHER BLOCK SURFACES
15. FOR VENTING OF UNDERCOUNTER AND TALL ACID AND BASE CHEMICAL STORAGE CABINETS, REFER TO SPECIFICATION SECTIONS 123553 AND 115300 RESPECTIVELY.
16. MOBILE - CABINET ON CASTERS THAT CAN BE EASILY MOVED
MOVABLE - CABINET ON GLIDES

DETAIL NUMBERING AND PAGE LAYOUT GUIDE

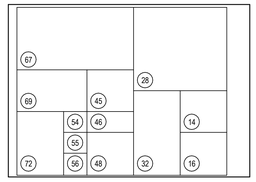


DETAIL MODULE LAYOUT

DETAILS ARE NUMBERED ACCORDING TO THEIR LOCATION ON EACH SHEET AND ARE NOT NUMBERED CONSECUTIVELY. EACH MODULE MAINTAINS THE NUMBER ASSOCIATED WITH IT

THIS SYSTEM CAN BE APPLIED TO ANY SHEET THAT CONTAINS MULTIPLE IMAGES. THE IMAGES ARE NUMBERED ACCORDING TO THE MODULE SYSTEM SHOWN ILLUSTRATED TO THE LEFT

EACH DETAIL MAY OCCUPY ONE OR MORE WHOLE MODULES. THE DETAIL MODULE IS USED TO ESTABLISH THE IDENTIFYING LABEL FOR EACH DETAIL, NOT TO LIMIT THE SIZE OF THE DETAIL



DETAIL NUMBERING EXAMPLE

THE NUMBER OF THE MODULE WHICH OCCURS IN THE LOWER LEFT CORNER OF A SINGLE MODULE OR SEVERAL MODULES GROUPED TOGETHER WILL DEFINE THE FINAL DETAIL NUMBER AS SHOWN IN THE ILLUSTRATION TO THE LEFT. ALTHOUGH THE MODULE NUMBERS OCCUR IN CONSECUTIVE ORDER, NOT ALL NUMBERS ARE NECESSARILY USED ON EACH SHEET

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

GENERAL INFORMATION

DATE

BSA PROJECT NO. 00360481

Q0.1

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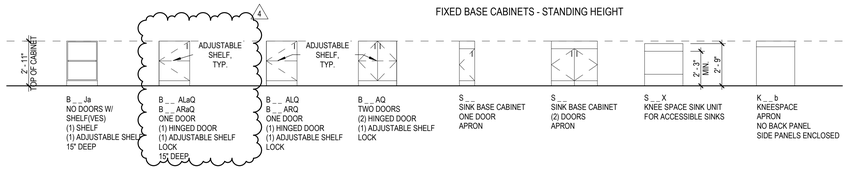
FIXED BASE CABINETS - STANDING HEIGHT



B __ Ja
NO DOORS W/ SHELF(VES)
(1) SHELF
(1) ADJUSTABLE SHELF
15" DEEP

B __ ALaQ
B __ ARaQ
ONE DOOR
(1) HINGED DOOR
(1) ADJUSTABLE SHELF
LOCK
15" DEEP

B __ ALQ
B __ ARQ
ONE DOOR
(1) HINGED DOOR
(1) ADJUSTABLE SHELF
LOCK

B __ AQ
TWO DOORS
(2) HINGED DOOR
(1) ADJUSTABLE SHELF
LOCK

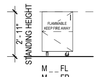
S __
SINK BASE CABINET
ONE DOOR
APRON

S __
SINK BASE CABINET
(2) DOORS
APRON

S __ X
KNEE SPACE SINK UNIT
FOR ACCESSIBLE SINKS

K __ b
KNEESPACE
APRON
NO BACK PANEL
SIDE PANELS ENCLOSED

SPECIALTY MOBILE BASE CABINETS



M __ FL
M __ FR
FLAMMABLE
(1) DOOR
(4) CASTERS, (2) WITH LOCKS
(SHOWN M __ FL)
LOCK

SPECIALTY FIXED BASE CABINETS - STANDING HEIGHT

B __ FL
B __ FR
FLAMMABLE
(1) HINGED DOOR
(1) ADJUSTABLE SHELF
(SHOWN B __ FL)
LOCK

B __ F
FLAMMABLE
(2) HINGED DOORS
(1) ADJUSTABLE SHELF
LOCK

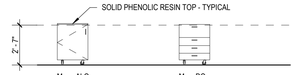
B __ NL
B __ NR
CORROSIVE
(1) HINGED DOOR
(1) SHELF
(SHOWN B __ NL)
LOCK

B __ N
CORROSIVE
(2) HINGED DOORS
(1) ADJUSTABLE SHELF
LOCK

B __ VQ
VACUUM PUMP CABINET
(1) HINGED DOOR
LOCK

B __ VQ
VACUUM PUMP CABINET
(2) HINGED DOORS
LOCK

MOBILE BASE CABINETS - STANDING HEIGHT

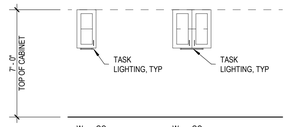


M __ ALQ
M __ ARQ
(1) DOOR
(4) CASTERS, (2) WITH LOCKS
LOCK

M __ DQ
(4) DRAWERS, (1) LARGE & (3) EQUAL
(4) CASTERS,
(2) WITH LOCKS
LOCK

ALL MOBILE BASE CABINETS HAVE A RETRACTING GRAB BAR HANDLE AND FRONT AND REAR RUBBER BUMPERS

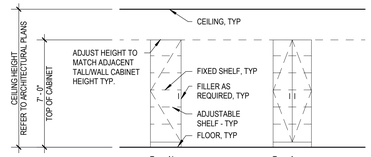
WALL MOUNTED CABINETS



W __ GQ
(1) SPLIT ADJUSTABLE SHELF
(1) HINGED DOORS
LOCK

W __ GQ
(1) SPLIT ADJUSTABLE SHELF
(2) HINGED DOORS
LOCK

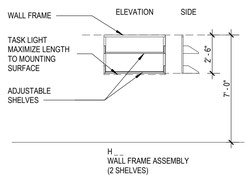
TALL CABINETS



T __ AL
T __ AR
(1) HINGED DOOR
(1) FIXED SHELF (MIDDLE SHELF)
(4) ADJUSTABLE SHELF
(SHOWN T __ AL)

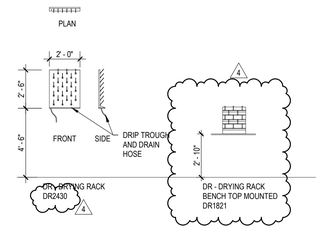
T __ A
(2) HINGED DOORS
(1) FIXED SHELF (MIDDLE SHELF)
(4) ADJUSTABLE SHELF

UPPER SHELVING



H __
WALL FRAME ASSEMBLY
(2 SHELVES)

ACCESSORIES



DR2430
DRYING RACK

DR - DRYING RACK
BENCH TOP MOUNTED
DR1821

CASEWORK TYPE SYMBOL

B 24 AL b

LOCATION DESIGNATION:
B = FIXED BASE
F = FILLER PANEL
H = SHELVING
K = KNEESPACE
M = MOBILE BASE
S = SINK CABINET
T = TALL CABINET
U = SUSPENDED BASE
V = MOVABLE BASE
W = WALL CABINET

CABINET WIDTH:
EXAMPLE : 24 = 24 INCHES

EXAMPLE: **B24AL**
FIXED BASE CABINET
24" WIDTH
DOOR(S) ONLY
LEFT HINGED

DEPTH:
a = 15 INCHES DEEP
b = KNEESPACE W/O REAR CLOSURE PANEL
c = VARIATION 3
d = VARIATION 4
e = VARIATION 5
f = VARIATION 6

FEATURES DESIGNATION:
A = DOOR ONLY
B = BLIND CORNER CABINET
C = DOOR/ DRAWER
D = DRAWER (UNEVEN)
E = DRAWER (EVEN)
F = FLAMMABLES W/ KEYED LOCK
G = GLASS DOOR(S)
H = CUBBY
J = NO DOOR W/ SHELF(VES)
L = LEFT HINGED
N = ACID pH / CORROSIVES W/ KEYED LOCK
P = OXIDIZERS W/ KEYED LOCK
Q = LOCK
R = RIGHT HINGED
S = BASE pH/ ALKALINE W/ KEYED LOCK
T = TRASH
U = VENTED
V = VACUUM
W = LOCKERS

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175 S. Rangeline Rd, Suite 200
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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

CASEWORK LEGEND

DATE

BSA PROJECT NO. 00360481

Q0.2

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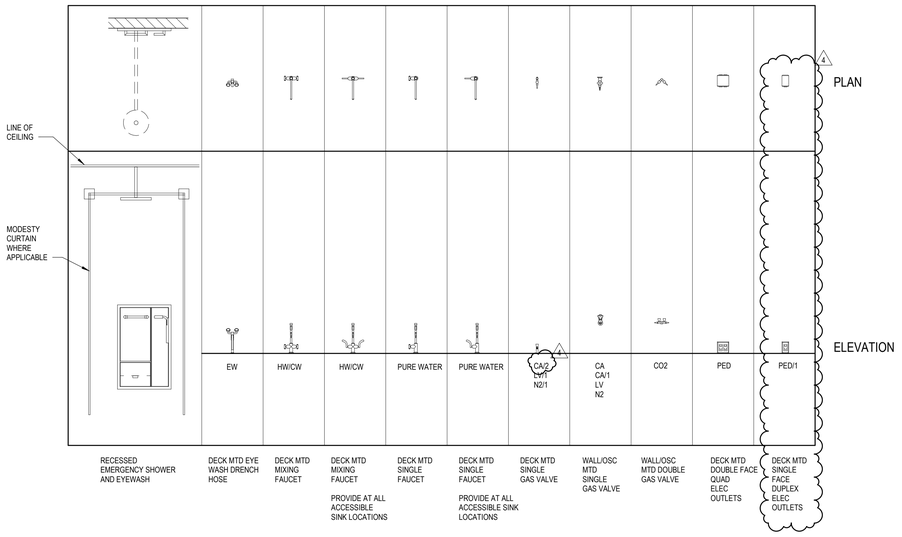
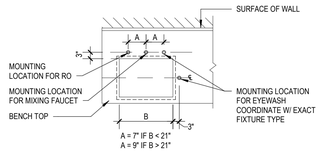
FIXTURE LEGEND



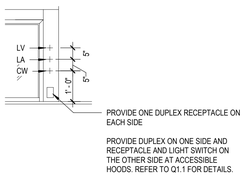
SERVICE FIXTURE SCHEDULE

SVG GROUP #	SERVICE(S)	MOUNTING	DESCRIPTION	BOD MODEL
ESEW	TEMPERED WATER	WALL	RECESSED EYE WASH/ EMERGENCY SHOWER STATION WITH DRAIN PAN, EXPOSED SHOWER HEAD, THERMOSTATIC MIXING VALVE IN DIV. 22, ELECTRIC LIGHT AND ALARM HORN	WATERSAVER SSBF2170
ESEW/3	TEMPERED WATER	WALL	RECESSED EYE WASH/ EMERGENCY SHOWER STATION WITH DRAIN PAN & DAYLIGHT DRAIN, SURFACE MOUNTED, EXPOSED SHOWER HEAD, THERMOSTATIC MIXING VALVE, ELECTRIC LIGHT AND ALARM HORN	WATERSAVER SSBF2173
RO	PURE WATER	DECK	PURE WATER FAUCET, POLYPROPYLENE-LINED, DECK MOUNTED, 8" RIGID GOOSENECK, SELF-CLOSING LEVER HANDLE	WATERSAVER L7853SC-8LE
RO/1	PURE WATER	DECK	PURE WATER FAUCET, POLYPROPYLENE-LINED, DECK MOUNTED, 8" RIGID GOOSENECK, SELF-CLOSING LEVER HANDLE	WATERSAVER L7853SC-8LE
EW	TEMPERED WATER	DECK	DECK MOUNTED EYEWASH/DRENCH HOSE UNIT, BACKFLOW PREVENTER, THERMOSTATIC MIXING VALVE IN DIV. 22	WATERSAVER EW1022BP
MF	HW / CW	DECK	MIXING FAUCET, 8" RIGID/SWING GOOSENECK, AERATOR, VACUUM BREAKER, FOUR-ARM HANDLES	WATERSAVER L414VB-8
MF/1	HW / CW	DECK, ADA	MIXING FAUCET, 8" RIGID/SWING GOOSENECK, AERATOR, VACUUM BREAKER, WRIST BLADE HANDLES	WATERSAVER L414VB-8BH
CA	COMPRESSED AIR (100 PSI)	WALL	SINGLE PRESSURE REGULATOR AND STRAIGHT PATTERN, HIGH PURITY GASES (1-150 PSIG), QUICK DISCONNECT, FOUR-ARM HANDLE	WATERSAVER L3173-367
CA/1	COMPRESSED AIR (100 PSI)	OSC	SINGLE PRESSURE REGULATOR AND STRAIGHT PATTERN, HIGH PURITY GASES (2-125 PSIG), QUICK DISCONNECT, FOUR-ARM HANDLE	WATERSAVER L2873-366H-758WS
CA/2	COMPRESSED AIR (100 PSI)	DECK, ADA	BALL VALVE ASSEMBLY, SERRATED HOSE END, LEVER HANDLE	WATERSAVER L4200-131WSA
C02	CARBON DIOXIDE	WALL / OSC	SINGLE PRESSURE REGULATOR AND STRAIGHT PATTERN, HIGH PURITY GASES (1-150 PSIG), QUICK DISCONNECT, FOUR-ARM HANDLE	WATERSAVER L4203-364EL-179FT
LV	LAB VACUUM	DECK / WALL / PANEL	VACUUBRAND FIXTURE	VACUUBRAND VCL K A5
LV/1	LAB VACUUM	DECK, ADA	VACUUBRAND FIXTURE	VACUUBRAND VCL K A5
N2	NITROGEN	OSC	SINGLE PRESSURE REGULATOR AND STRAIGHT PATTERN, HIGH PURITY GASES (2-125 PSIG), QUICK DISCONNECT, FOUR-ARM HANDLE	WATERSAVER L2873-366H-758WS
N2/1	NITROGEN	DECK, ADA	BALL VALVE ASSEMBLY, SERRATED HOSE END, LEVER HANDLE	WATERSAVER L4200-131WSA
PED	ELECTRICAL	DECK	DOUBLE GANG, DOUBLE FACE ELECTRICAL PEDESTAL BOX	WATERSAVER 600WS-SA
PED/1	ELECTRICAL	DECK	SINGLE GANG, SINGLE FACE ELECTRICAL PEDESTAL BOX	WATERSAVER 300WS-SA
SVG-1	LV	HOOD	VACUUBRAND FIXTURES	VACUUBRAND VCL AR
	LA		REMOTE CONTROL, ANGLED NEEDLE VALVE, 45 DEGREE ANGLED OUTLET, TEN SERRATION HOSE END, FOUR-ARM HANDLE	WATERSAVER L2885, L022WSA
SVG-2	LV	HOOD	VACUUBRAND FIXTURES	VACUUBRAND VCL AR
	LA		REMOTE CONTROL, ANGLED NEEDLE VALVE, 45 DEGREE ANGLED OUTLET, TEN SERRATION HOSE END, FOUR-ARM HANDLE	WATERSAVER L2885, L022WSA
	CW		REMOTE CONTROL, ANGLED NEEDLE VALVE, VACUUM BREAKER, 90 DEGREE ANGLED OUTLET, ANTI-SPLASH SERRATED HOSE END, FOUR-ARM HANDLE	WATERSAVER L2885, L051WSA
SVG-3	LV	HOOD, ADA	VACUUBRAND FIXTURES	VACUUBRAND VCL AK-A
	LA		REMOTE CONTROL, ANGLED BALL VALVE, 45 DEGREE ANGLED OUTLET, TEN SERRATION HOSE END, LEVER HANDLE	WATERSAVER L4285, L022WSA
SVG-4	LV	HOOD, ADA	VACUUBRAND FIXTURES	VACUUBRAND VCL AK-A
	LA		REMOTE CONTROL, ANGLED BALL VALVE, 45 DEGREE ANGLED OUTLET, TEN SERRATION HOSE END, LEVER HANDLE	WATERSAVER L4285, L022WSA
	CW		REMOTE CONTROL, ANGLED BALL VALVE, VACUUM BREAKER, 90 DEGREE ANGLED OUTLET, ANTI-SPLASH SERRATED HOSE END, LEVER HANDLE, VALVE LOCATED ON EXTERIOR OF BASE CABINET - FINAL CONNECTION IN DIV. 22	WATERSAVER L4285, L051WSA

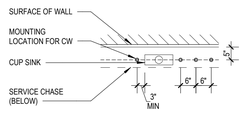
TYPICAL SERVICE FIXTURE DIMENSIONS



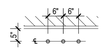
CONDITION AT LAB SINK
(PLAN VIEW)



CONDITION AT FUME HOOD
(ELEV. VIEW)



CONDITION AT CUPSINK WALL
(PLAN VIEW)

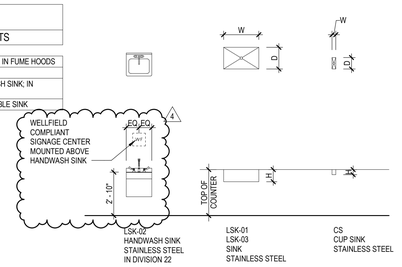


CONDITION AT WALL
(PLAN VIEW)

SINK LEGEND

SINK SCHEDULE

TAG	MOUNTING	W	D	H	COMMENTS
CS	DROP IN	0' - 3"	0' - 5"	0' - 4"	STAINLESS STEEL; LOCATED IN FUME HOODS
LSK-01	UNDERMOUNT	2' - 1"	1' - 3"	1' - 0"	STAINLESS STEEL
LSK-02	WALL				STAINLESS STEEL HANDWASH SINK; IN DIVISION 22
LSK-03	DROP IN	2' - 1"	1' - 3"	0' - 5"	STAINLESS STEEL; ACCESSIBLE SINK



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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

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1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR
REGISTERED
No. AR12500214
STATE OF INDIANA
ARCHITECT

CASEWORK SCHEDULES

DATE

BSA PROJECT NO. 00360481

Q0.4

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STERILIZER SCHEDULE - (ST-##)

TAG	OVERALL DIM. W	OVERALL DIM. D	OVERALL DIM. H	CHAMBER SIZE W	CHAMBER SIZE D	CHAMBER SIZE H	TYPE	ENCLOSURE	DOORS DOOR NO.	DOORS DOOR TYPE	STEAM TO CHAMBER QUALITY	STEAM TO CHAMBER SOURCE	STEAM TO CHAMBER PEAK CAPACITY (IN CYCLE) (GPM)	STEAM TO CHAMBER PRESS	CW MAX FLOW (GPM) PEAK CAPACITY (IN CYCLE)	ELECTRICAL CONTROLS V/PH/Hz	ELECTRICAL CONTROLS AMP	ELECTRICAL STEAM GEN. V/PH/Hz	ELECTRICAL STEAM GEN. AMP	COMMENTS
ST-01	2' - 6"	3' - 10"	6' - 5"	1' - 8"	3' - 2"	1' - 8"	STEAM	CABINET ENCLOSED/FREESTANDING	1	POWER - VERTICAL SLIDING	CARBON STEEL CLEAN STEAM	INTEGRAL ELECTRIC STEAM GENERATOR	1	20-50 (PSIG)	6	120V, 1 PH, 50/60 HZ	9.5	480V, 3 PH, 50/60 HZ	37	BOD: STERIS AMSCO 250LS

LAB EQUIPMENT SCHEDULE - MQ-CFCI

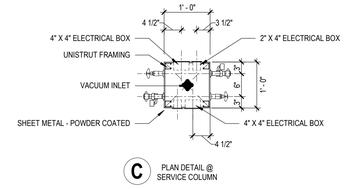
EQ NUMBER	DESCRIPTION	BOD MANUFACTURER	BOD MODEL	WIDTH	DEPTH	HEIGHT	UNIT WEIGHT	MOUNTING	VOLTAGE (VAC)	WATTS / AMPS	POWER PHASE	DEDICATED CIRCUIT	NEMA	STAND-BY POWER	UPS	DATA	ELECTRICAL NOTES	LAB AIR (LA)	LAB VAC (LV)	SPECIALTY GASES	SPECIALTY GAS NOTES	CW	HW	DI/RO WATER	DRAIN	PLUMBING NOTES	EXHAUST (CFM)	DEDICATED EXHAUST	MECHANICAL NOTES	COMMENTS
MQ-03	UNDERCOUNTER GLASSWARE WASHER	STERIS	RELIANCE 100LS UNDERCOUNTER GLASSWARE WASHER	2' - 0 1/8"	2' - 3 3/4"	2' - 10 13/128"	-- LBS.	FLOOR	115 VAC, 60 HZ	16A	SINGLE	Yes	5-20P (IT IS RECOMMENDED TO HAVE THE UNIT HARDWIRED)	No	No	Yes	20A DEDICATED CIRCUIT NEEDED. ELECTRICAL CONNECTIONS NEEDED BEHIND UNIT INSIDE THE CASEWORK.	No	No	No	--	Yes	Yes	PURIFIED WATER NEEDED (0.9 GAL / MINUTE FLOW RATE)	Yes	COLD WATER REQUIREMENTS: 3.5 GPM FLOW RATE. HOT WATER REQUIREMENTS: MIN. 1.25 GPM FLOW RATE.	--	No	--	
MQ-04A	ICE MACHINE	SCOTSMAN	FS0522AX-1	1' - 10"	2' - 0"	1' - 11"	173 LBS.	50"	115V, 60 HZ	11.1 A	1	Yes	--	No	No	No	HARD WIRED	No	No	No	--	Yes	No	--	Yes	WATER USAGE: GALLONS/100 LB POTABLE 90°F (32°C)/70°F (21°C): 12.0/45.5.	--	No	--	
MQ-04B	ICE MACHINE BIN	SCOTSMAN	B530S	2' - 6"	2' - 10"	4' - 2"	150 LBS.	FLOOR	--	--	--	No	--	No	No	No	--	No	No	No	--	No	No	--	No	--	--	No	--	

OVERHEAD SERVICE COLUMNS

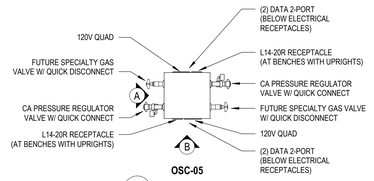
(OSC) OVERHEAD SERVICE COLUMN SCHEDULE

OSC TAG	WIDTH	DEPTH	120V POWER	208V POWER	DATA	ELECRICAL NOTES	COMPRESSED AIR (CA)	LAB VACUUM (LV)	NITROGEN (N2)	SPECIALTY GASES	COMMENTS
OSC-01	1' - 0"	1' - 0"	Yes	Yes	RJ45	208V POWER TO BE 20A, 3-PHASE DEDICATED CIRCUIT.	Yes	No	No	FUTURE SPECIALTY GAS CONNECTIONS TBD.	BOTTOM OF OSC AT 86" A.F.F.
OSC-02	1' - 0"	1' - 0"	Yes	Yes	RJ45	208V POWER TO BE 20A, 3-PHASE DEDICATED CIRCUIT.	Yes	No	No	FUTURE SPECIALTY GAS CONNECTIONS TBD.	BOTTOM OF OSC AT 86" A.F.F PROVIDE SUPPORT BRACKET FOR EXTRACTION ARM (SEE DETAIL Q9.1/72)
OSC-02A	1' - 0"	1' - 0"	Yes	Yes	RJ45	208V POWER TO BE 20A, 3-PHASE DEDICATED CIRCUIT.	No	No	No	CO2 TO BE PIPED TO CO2 VALVES	BOTTOM OF OSC AT 86" A.F.F PROVIDE SUPPORT BRACKET FOR EXTRACTION ARM (SEE DETAIL Q9.1/72)
OSC-03	1' - 0"	1' - 0"	Yes	Yes	RJ45 - 10GB (DUAL PORTS)	EACH 208V RECEPTACLE TO BE ON DEDICATED CIRCUITS.	No	No	No	--	BOTTOM OF OSC AT 86" A.F.F.
OSC-03A	1' - 0"	1' - 0"	Yes	Yes	RJ45 - 10GB (DUAL PORTS)	EACH 208V RECEPTACLE TO BE ON DEDICATED CIRCUITS.	No	No	No	--	BOTTOM OF OSC AT 92" A.F.F.
OSC-04	1' - 0"	1' - 0"	Yes	Yes	RJ45	208V POWER TO BE 20A, 3-PHASE DEDICATED CIRCUIT.	Yes	No	Yes	NITROGEN (N2) GAS CONNECTIONS NEEDED.	BOTTOM OF OSC AT 86" A.F.F.
OSC-05	1' - 0"	1' - 0"	Yes	Yes	RJ45	208V POWER TO BE 20A, 3-PHASE DEDICATED CIRCUIT.	Yes	Yes	No	FUTURE SPECIALTY GAS CONNECTIONS TBD.	BOTTOM OF OSC AT 86" A.F.F.

NOTE:
*CEILING SERVICE COLUMN PROVIDED BY CASEWORK MANUFACTURER TO BE PRE-PIPPED & PRE-WIRED - CONFIRM CONSTRUCTION WITH CASEWORK SHOP DRAWINGS

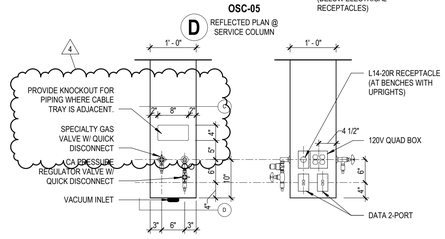


C PLAN DETAIL @ SERVICE COLUMN

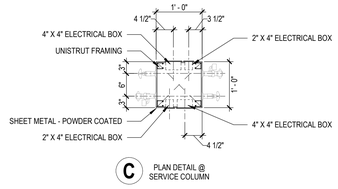


OSC-05

D REFLECTED PLAN @ SERVICE COLUMN



ELEVATION A ELEVATION B



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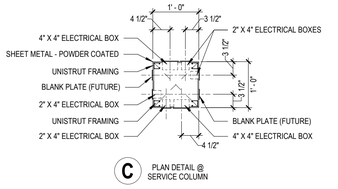

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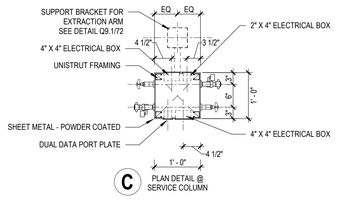

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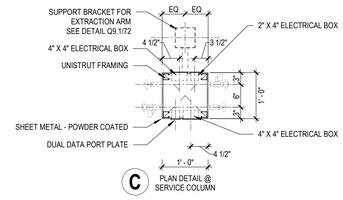

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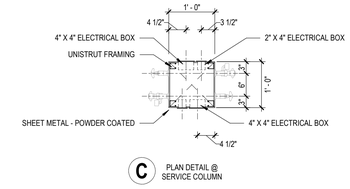

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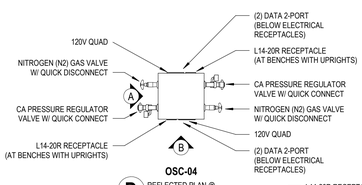
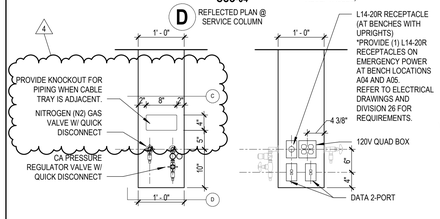
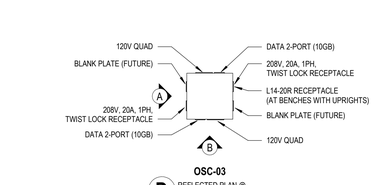


OSC-04

D REFLECTED PLAN @ SERVICE COLUMN



ELEVATION A ELEVATION B



OSC-03

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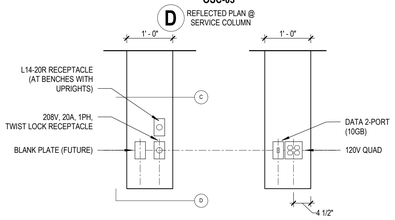
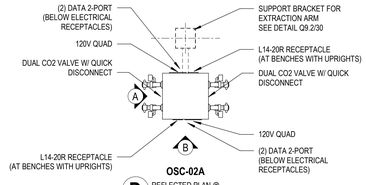
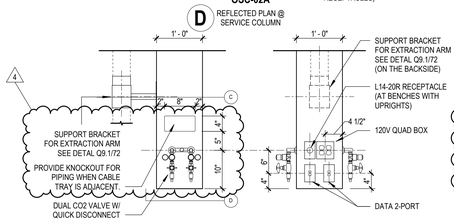


ELEVATION A ELEVATION B

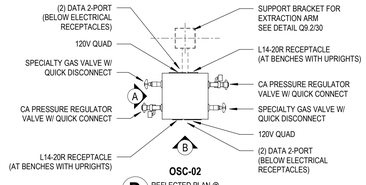


OSC-02A

D REFLECTED PLAN @ SERVICE COLUMN

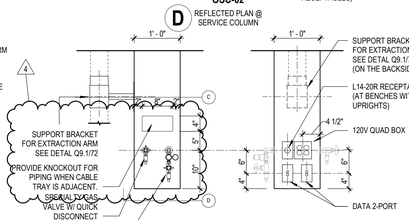


ELEVATION A ELEVATION B

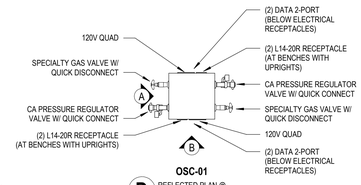


OSC-02

D REFLECTED PLAN @ SERVICE COLUMN

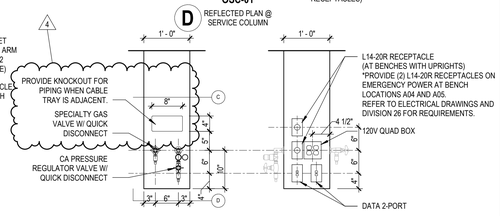


ELEVATION A ELEVATION B



OSC-01

D REFLECTED PLAN @ SERVICE COLUMN



ELEVATION A ELEVATION B

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

EQUIPMENT SCHEDULES

DATE

BSA PROJECT NO. 00360481

Q1.2

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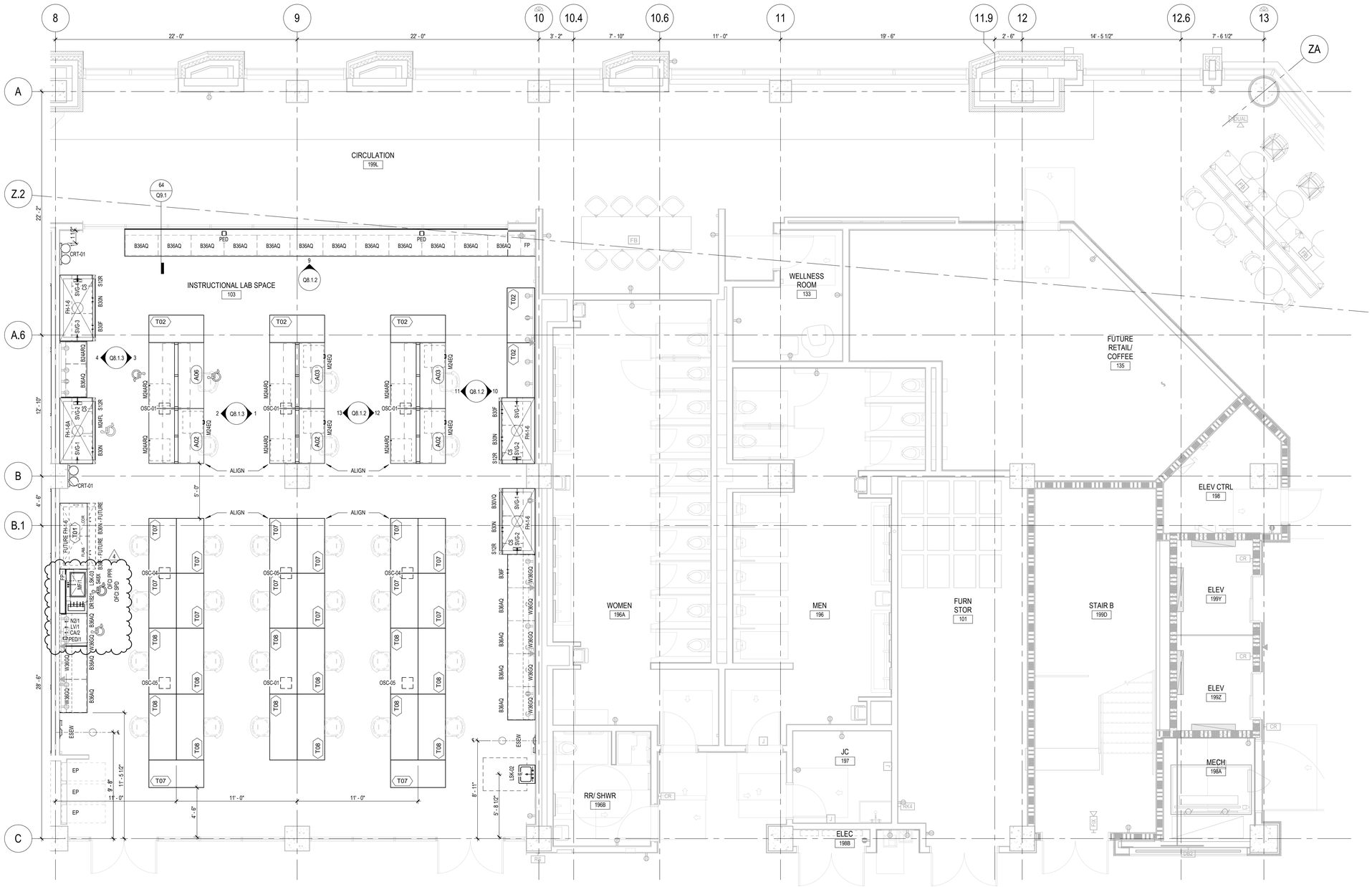

1 ENLARGED PLAN - LEVEL 1 - AREA B -NORTH
SCALE: 1/4" = 1'-0"

GENERAL NOTES

A. REFER TO THE Q0.X SERIES SHEETS FOR LABATORY GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO THE A0.X SERIES DRAWINGS FOR ARCHITECTURAL GENERALS NOTES, DRAWINGS, REFERENCE AND MATERIAL SYMBOLS AS WELL AS ABBREVIATIONS USED ON THIS DRAWING.

C. REFER TO AND COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL FOR ADDITIONAL INFORMATION NOT SHOWN ON THIS SHEET.

D. REFER TO Q9.X SERIES OF SHEETS FOR GENERAL LAB SPECIFIC DETAILS.

E. ALL GAS CYLINDERS SHOWN ARE FOR REFERENCE ONLY AND WILL BE PROVIDED BY OWNER / OWNER REP (NIC).

F. REFER TO THE A13X SERIES FOR LABORATORY CEILING COMPONENTS.

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

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CLIENT PROJECT NO. - 20250072

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BP4-CD: BUILD-OUT PACKAGE

AREA A AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
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1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

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LEVEL 1 - ENLARGED PLAN

DATE
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Q7.1.3

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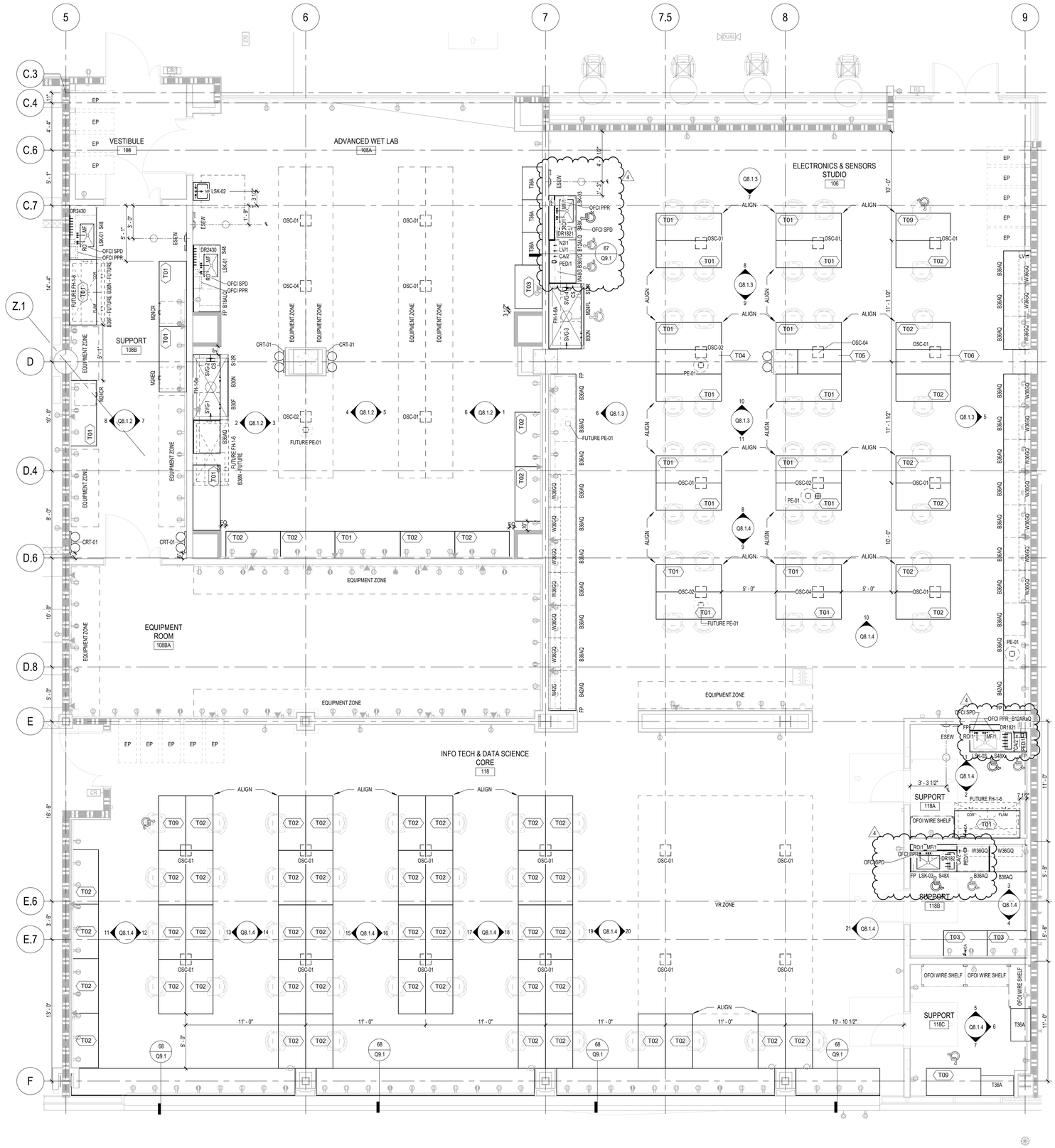

1 ENLARGED PLAN - LEVEL 1 - AREA A - SOUTH
SCALE: 1/4" = 1'-0"

GENERAL NOTES

A. REFER TO THE G0.X SERIES SHEETS FOR LABATORY GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

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AREA A AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

LEVEL 1 - ENLARGED PLAN

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

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F. REFER TO THE A13X SERIES FOR LABORATORY CEILING COMPONENTS.

1 ENLARGED PLAN - LEVEL 3 - AREA A - NORTH
SCALE: 1/4" = 1'-0"

2 ENLARGED PLAN - LEVEL 3 - AREA B - NORTH
SCALE: 1/4" = 1'-0"

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

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CLIENT PROJECT NO. - 20250072

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AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
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2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR
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LEVEL 3 - ENLARGED PLAN

DATE

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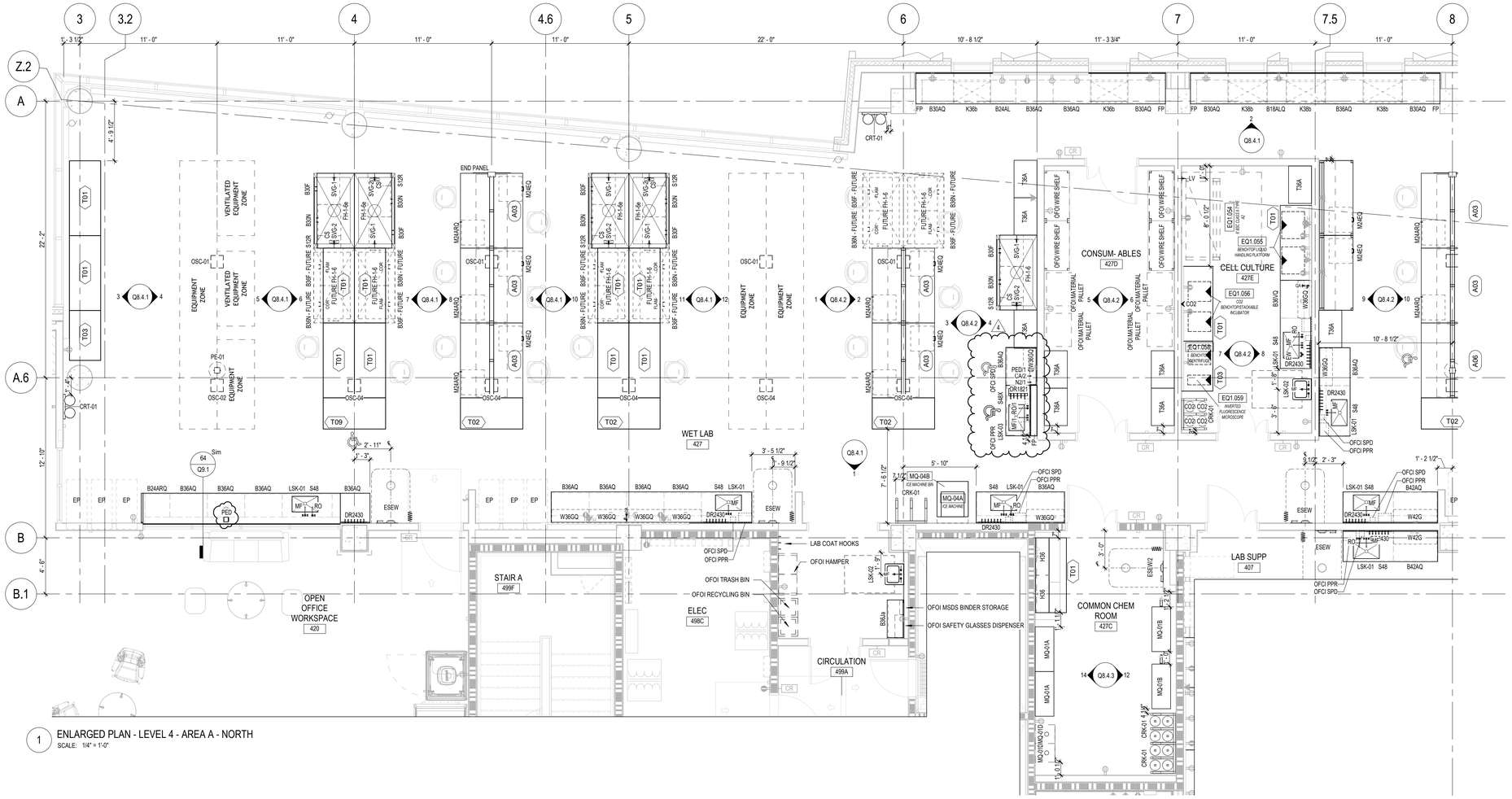

1 ENLARGED PLAN - LEVEL 4 - AREA A - NORTH
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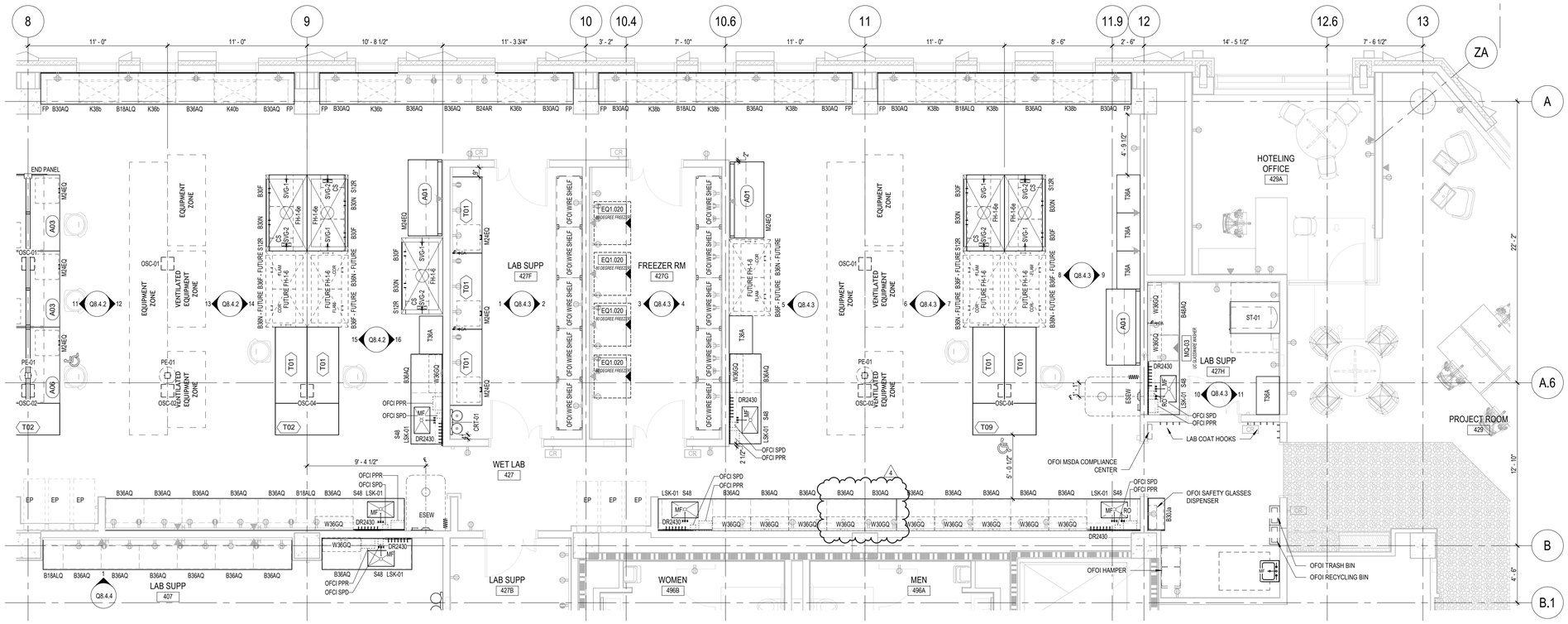

2 ENLARGED PLAN - LEVEL 4 - AREA B - NORTH
SCALE: 1/4" = 1'-0"

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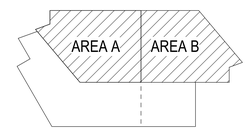
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
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1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

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

LEVEL 4 - ENLARGED PLAN

DATE

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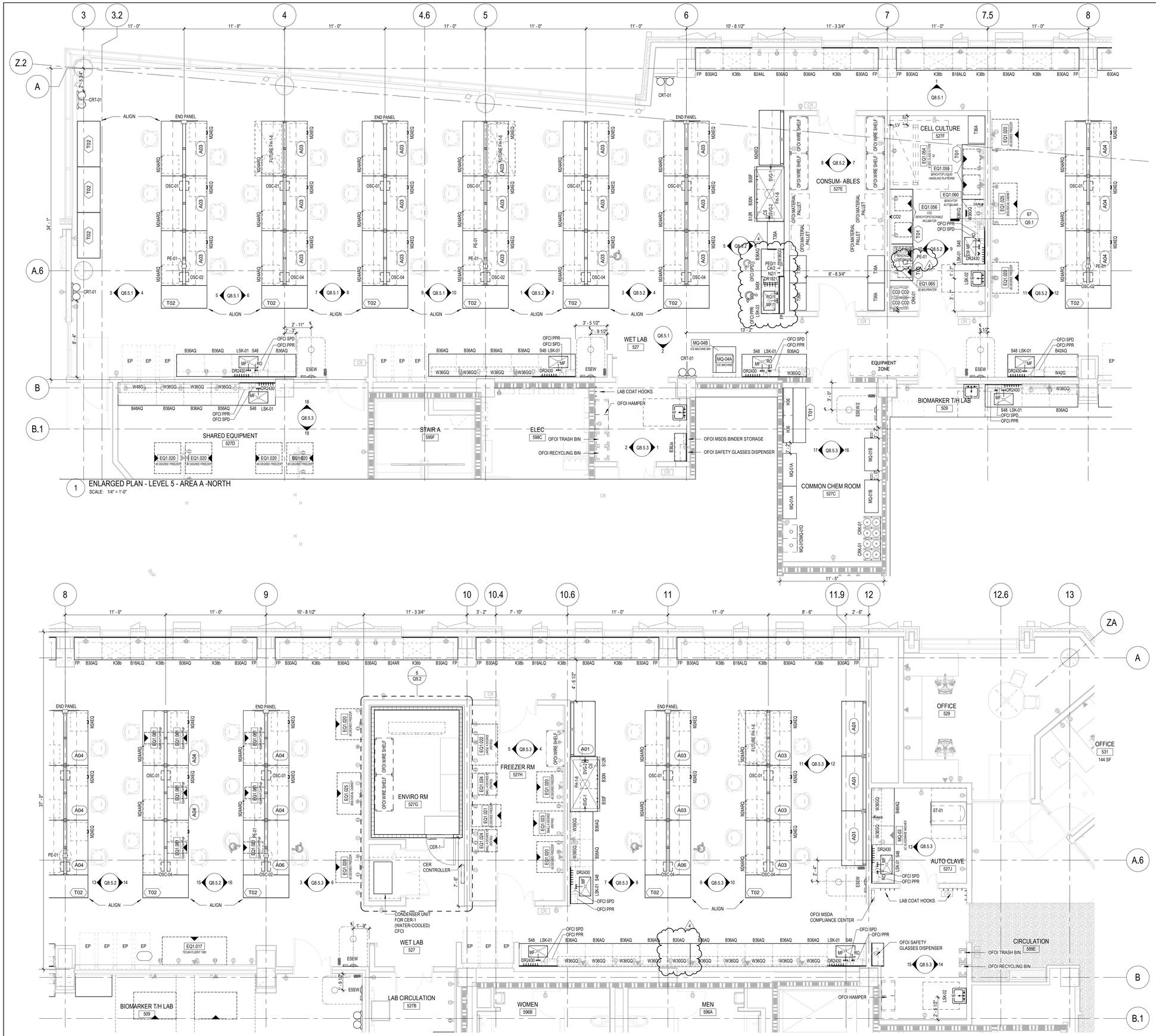

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
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LEVEL 5 - ENLARGED PLAN

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

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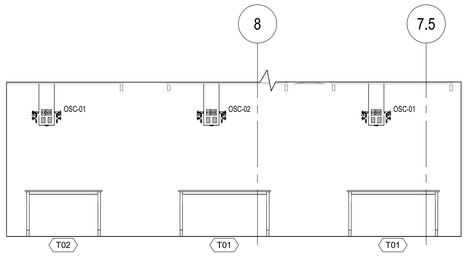

11 106 ELECTRONICS & SENSORS STUDIO - ISLAND 3-NORTH
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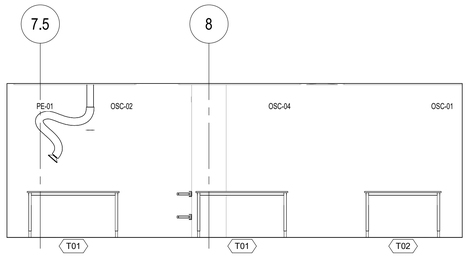

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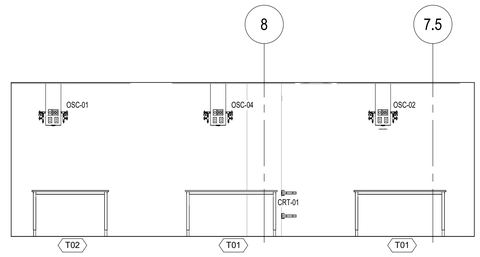

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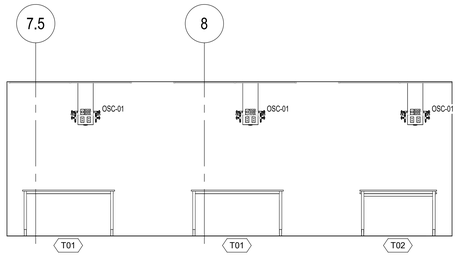
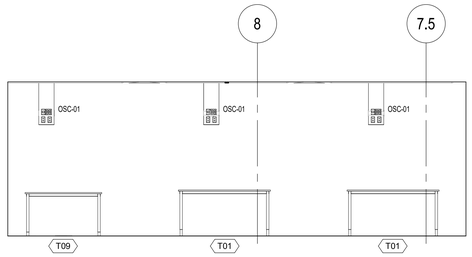


8 106 ELECTRONICS & SENSORS STUDIO - ISLAND 1-SOUTH
SCALE: 1/4" = 1'-0"



7 106 ELECTRONICS & SENSORS STUDIO - ISLAND 1-NORTH
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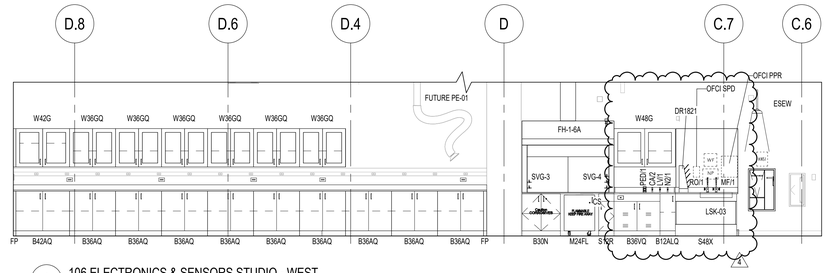

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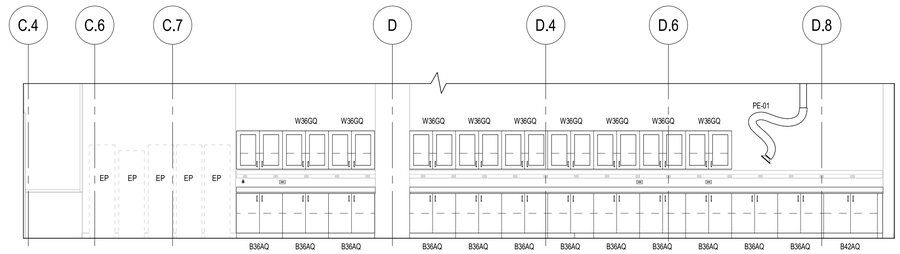
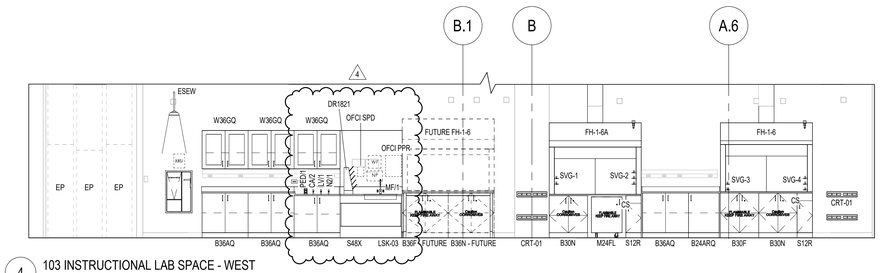
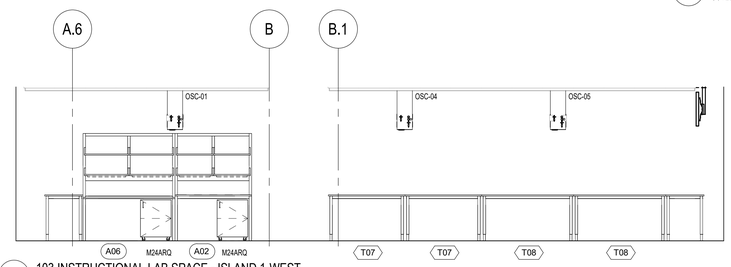


5 106 ELECTRONICS & SENSORS STUDIO - EAST
SCALE: 1/4" = 1'-0"



4 103 INSTRUCTIONAL LAB SPACE - WEST
SCALE: 1/4" = 1'-0"



3 103 INSTRUCTIONAL LAB SPACE - ISLAND 1-WEST
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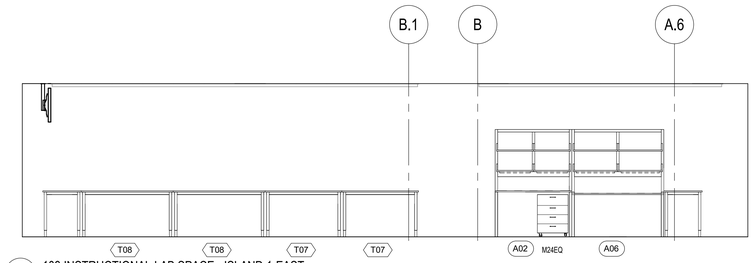

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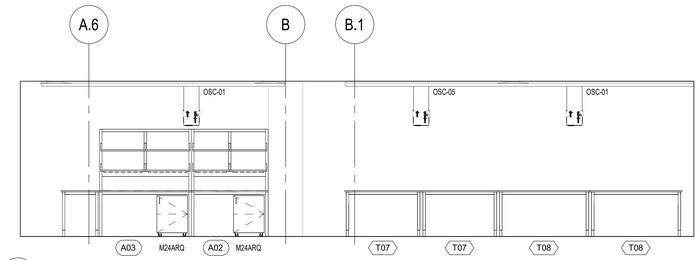
SCALE: 1/4" = 1'-0"



1 103 INSTRUCTIONAL LAB SPACE - ISLAND 2-WEST
SCALE: 1/4" = 1'-0"

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

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2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

4' 2' 0' 4' 8'

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

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

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DATE

BSA PROJECT NO. 00360481

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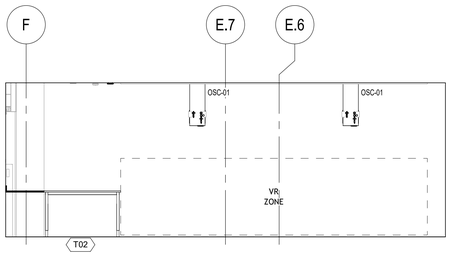

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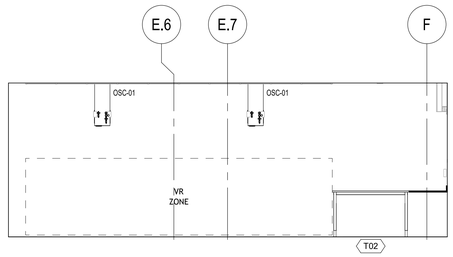

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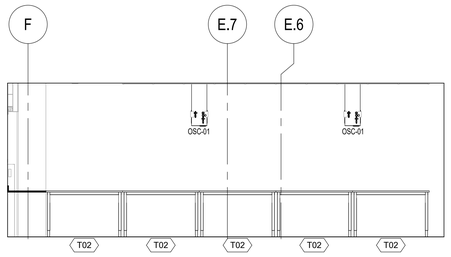

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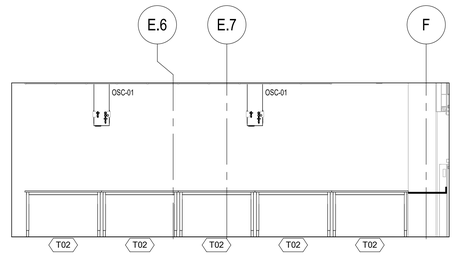
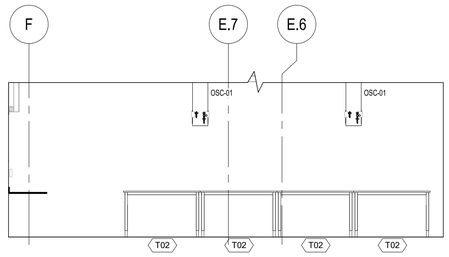
SCALE: 1/4" = 1'-0"



18 118 INFO TECH & DATA SCIENCE CORE - ISLAND 4-WEST
SCALE: 1/4" = 1'-0"



17 118 INFO TECH & DATA SCIENCE CORE - ISLAND 3-EAST
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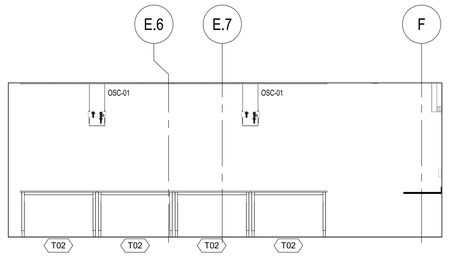

16 118 INFO TECH & DATA SCIENCE CORE - ISLAND 3-WEST
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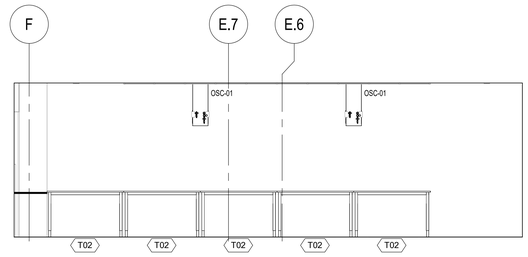

15 118 INFO TECH & DATA SCIENCE CORE - ISLAND 2-EAST
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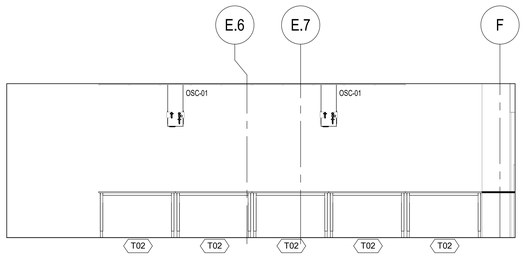

14 118 INFO TECH & DATA SCIENCE CORE - ISLAND 2-WEST
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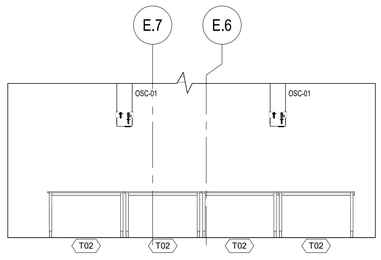

13 118 INFO TECH & DATA SCIENCE CORE - ISLAND 1-EAST
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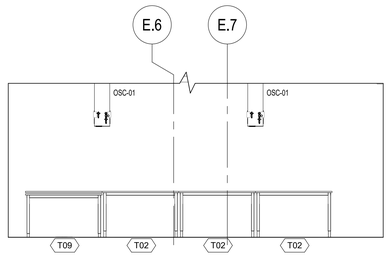

12 118 INFO TECH & DATA SCIENCE CORE - ISLAND 1-WEST
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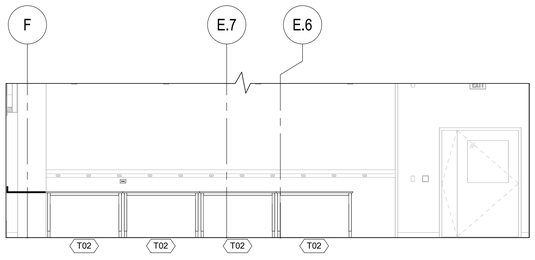

11 118 INFO TECH & DATA SCIENCE CORE - WEST
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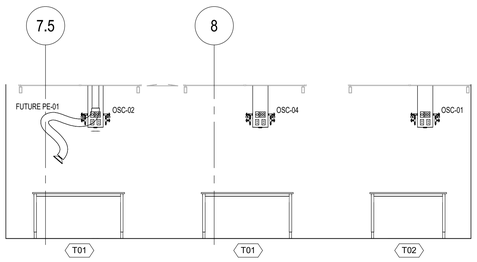
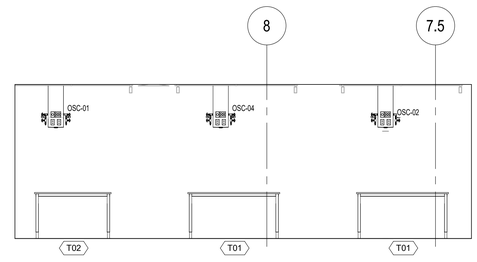


10 106 ELECTRONICS & SENSORS STUDIO - ISLAND 4-SOUTH
SCALE: 1/4" = 1'-0"



9 106 ELECTRONICS & SENSORS STUDIO - ISLAND 4-NORTH
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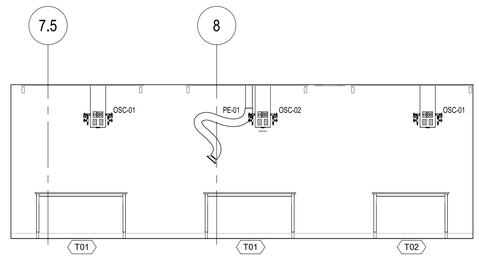
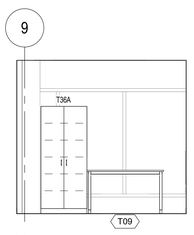
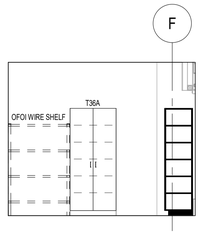


8 106 ELECTRONICS & SENSORS STUDIO - ISLAND 3-SOUTH
SCALE: 1/4" = 1'-0"



7 118C SUPPORT - SOUTH
SCALE: 1/4" = 1'-0"



6 118C SUPPORT - EAST
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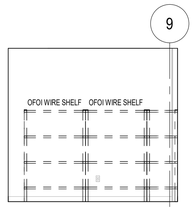

5 118C SUPPORT - NORTH
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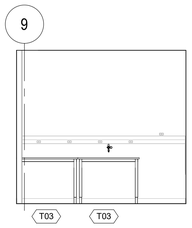

4 118B SUPPORT - SOUTH
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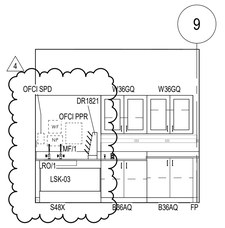

3 118B SUPPORT - NORTH
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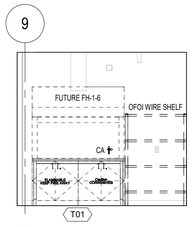

2 118A SUPPORT - SOUTH
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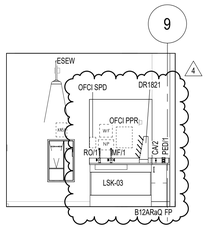

1 118A SUPPORT - NORTH
SCALE: 1/4" = 1'-0"

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Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

4' 2' 0' 4' 8'

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

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

ELEVATIONS

DATE

BSA PROJECT NO. 00360481

Q8.1.4

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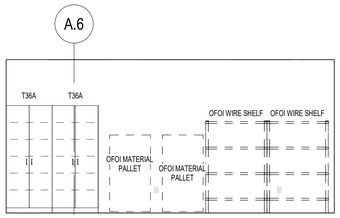

12 327B CONSUM- ABLES - WEST
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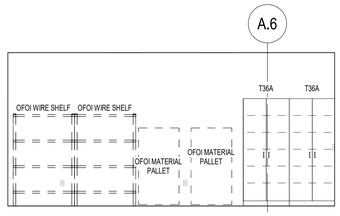

11 327B CONSUM- ABLES - EAST
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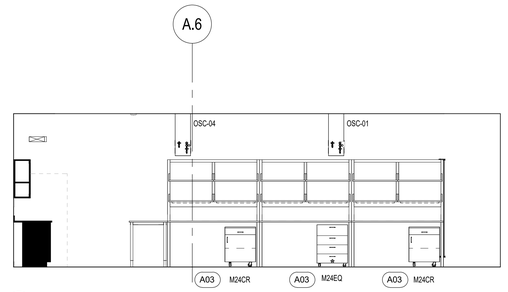

10 327 WET LAB - ISLAND 3- AREA A-EAST
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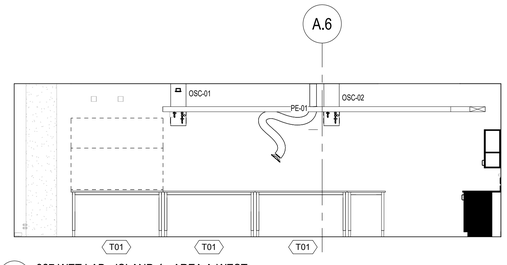

9 327 WET LAB - ISLAND 4 - AREA A-WEST
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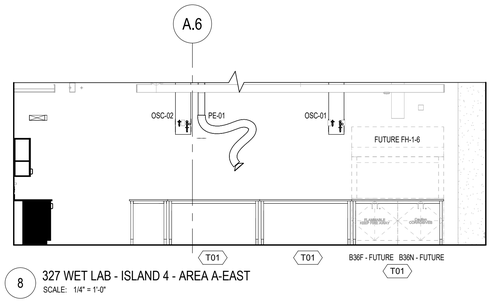

8 327 WET LAB - ISLAND 4 - AREA A-EAST
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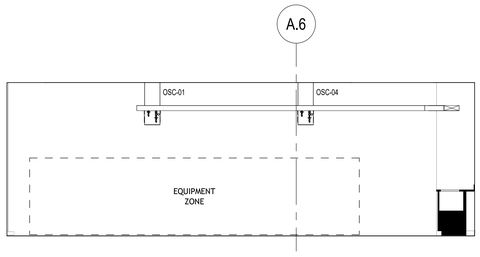

7 327 WET LAB - ISLAND 5 - AREA A-WEST
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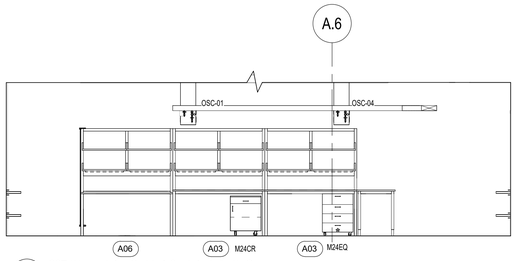

6 327 WET LAB - ISLAND 6 - AREA A-WEST
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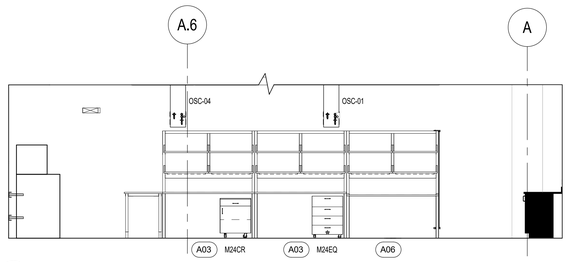

5 327 WET LAB - ISLAND 6 - AREA A-EAST
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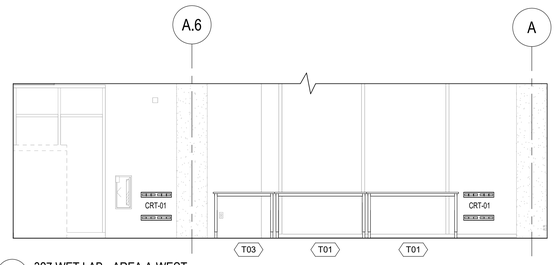

4 327 WET LAB - AREA A-WEST
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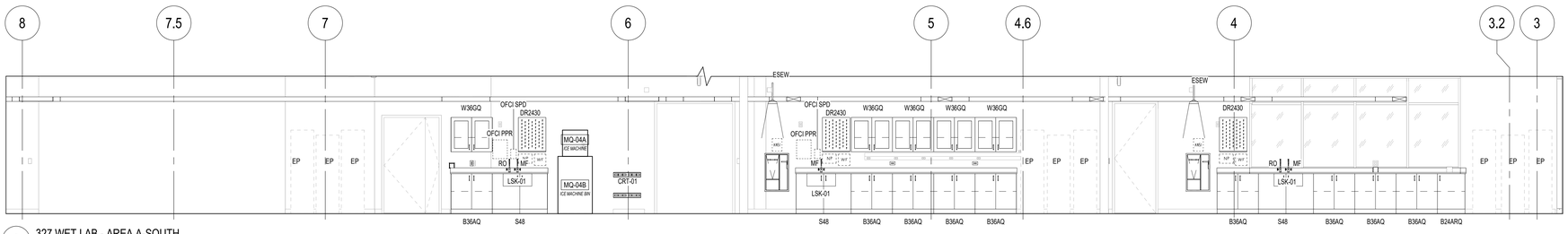

3 327 WET LAB - AREA A-SOUTH
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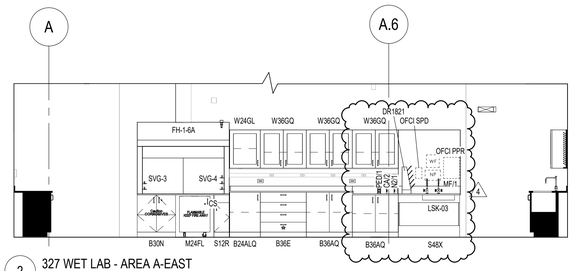

2 327 WET LAB - AREA A-EAST
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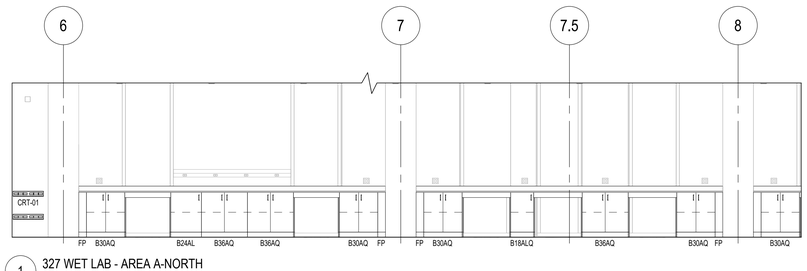

1 327 WET LAB - AREA A-NORTH
SCALE: 1/4" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

4' 2' 0' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

NICOLLE TAYLOR
REGISTERED
No. AR12500214
STATE OF
INDIANA
ARCHITECT

ELEVATIONS

DATE

BSA PROJECT NO. 00360481

Q8.3.1

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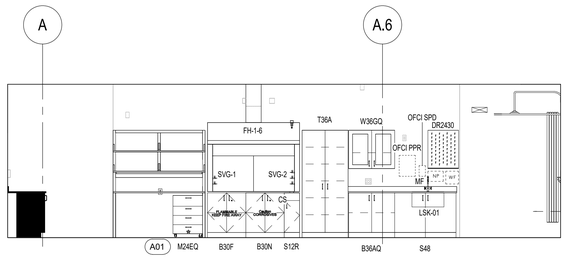

16 427 WET LAB - CENTER - AREA B-EAST
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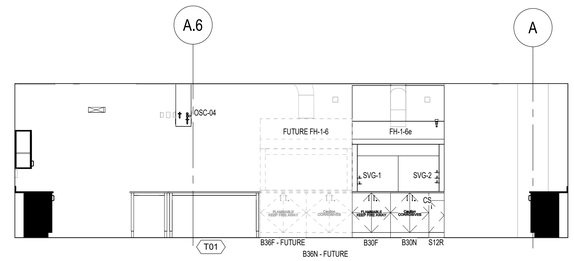

15 427 WET LAB - ISLAND 9 - AREA B-WEST
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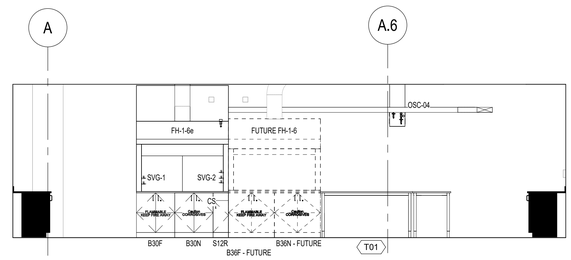

14 427 WET LAB - ISLAND 9 - AREA B-EAST
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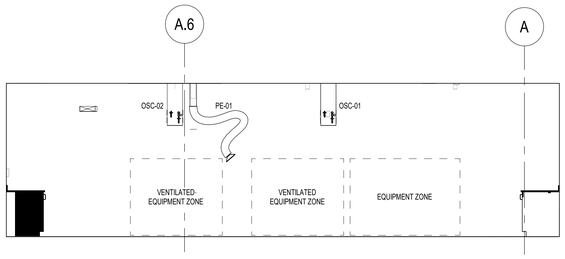

13 427 WET LAB - ISLAND 8 - AREA B-WEST
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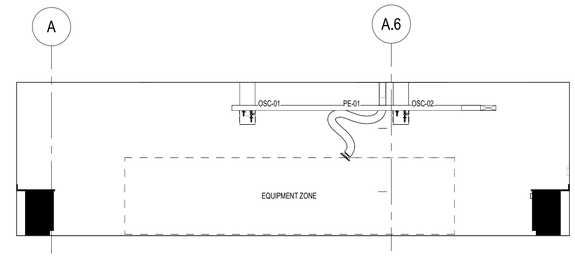

12 427 WET LAB - ISLAND 8 - AREA B-EAST
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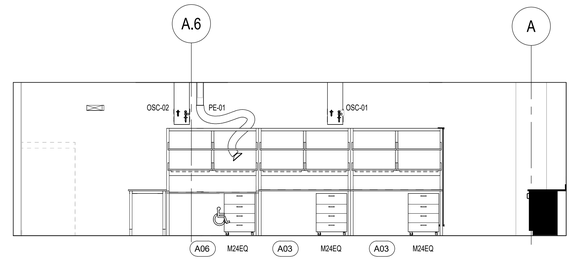

11 427 WET LAB - ISLAND 7 - AREA B-WEST
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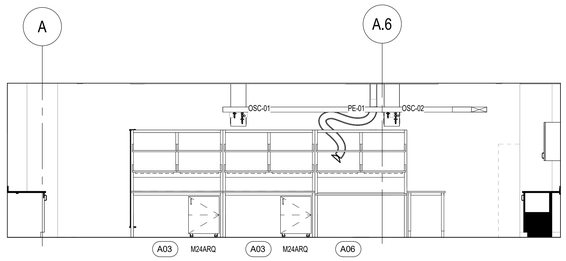

10 427 WET LAB - ISLAND 7 - AREA A-EAST
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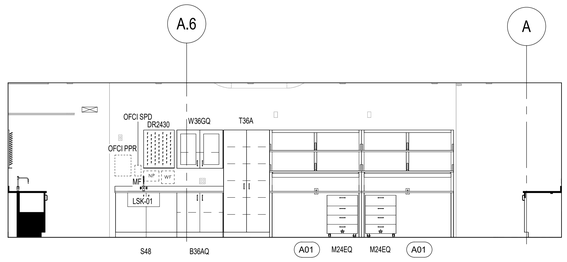
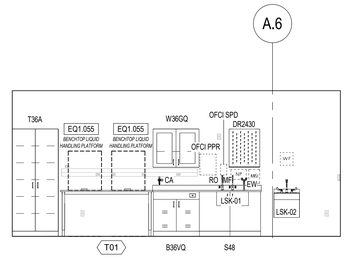


9 427 WET LAB - CENTER - AREA A-WEST
SCALE: 1/4" = 1'-0"



8 427E CELL CULTURE - EAST
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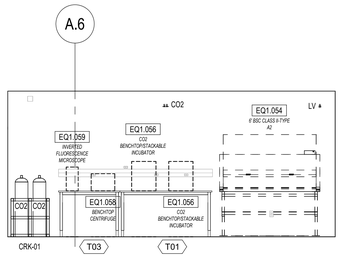

7 427E CELL CULTURE - WEST
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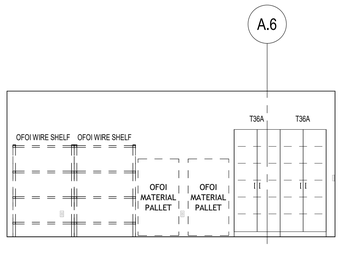

6 427D CONSUM- ABLES - EAST
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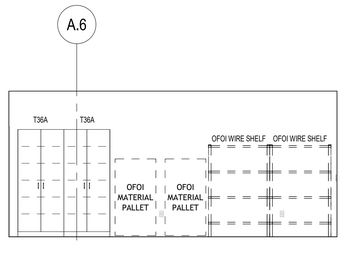
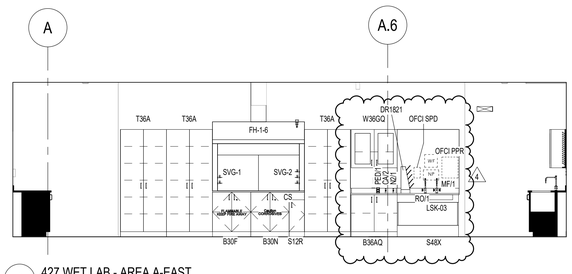
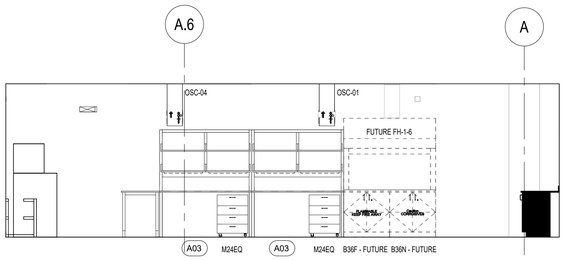


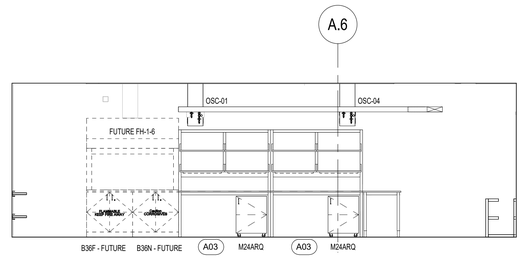
5 427D CONSUM- ABLES - WEST
SCALE: 1/4" = 1'-0"



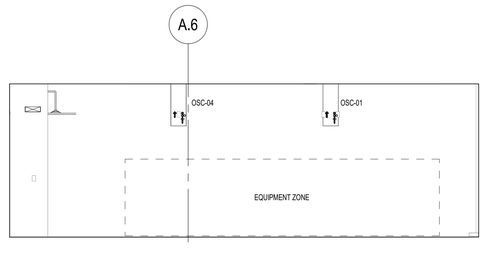
4 427 WET LAB - AREA A-EAST
SCALE: 1/4" = 1'-0"



3 427 WET LAB - ISLAND 6 - AREA A-WEST
SCALE: 1/4" = 1'-0"



2 427 WET LAB - ISLAND 6 - AREA A-EAST
SCALE: 1/4" = 1'-0"



1 427 WET LAB - ISLAND 5 - AREA A-EAST
SCALE: 1/4" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

4' 2' 0' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

NICOLLE TAYLOR
REGISTERED
No. AR12500214
STATE OF
INDIANA
ARCHITECT

ELEVATIONS

DATE
BSA PROJECT NO. 00360481

Q8.4.2

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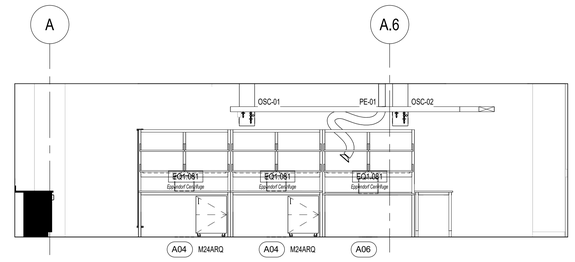
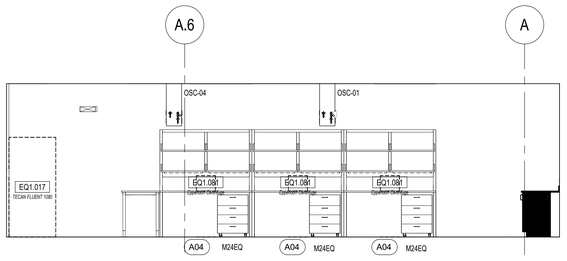
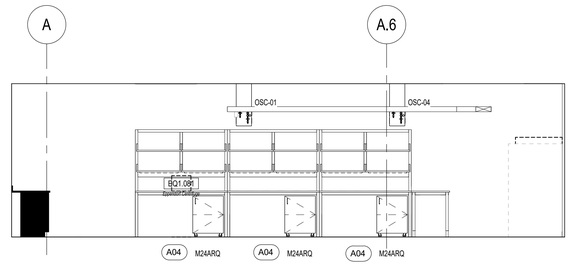


16 527 WET LAB - ISLAND 9 - AREA B-WEST
SCALE: 1/4" = 1'-0"



15 527 WET LAB - ISLAND 8 - AREA B-EAST
SCALE: 1/4" = 1'-0"



14 527 WET LAB - ISLAND 8 - AREA B-WEST
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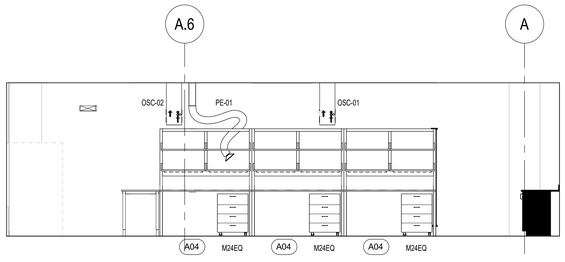
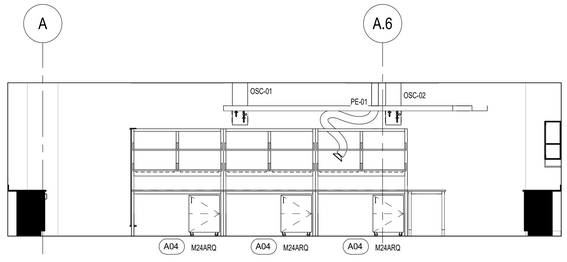
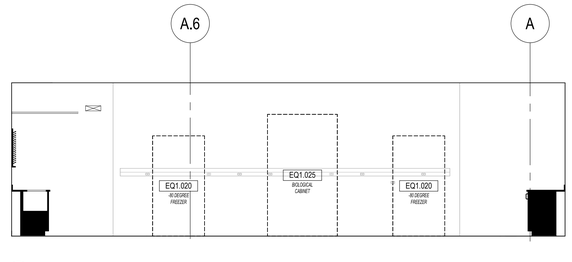


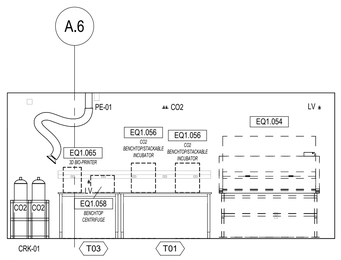
13 527 WET LAB - ISLAND 7 - AREA B-EAST
SCALE: 1/4" = 1'-0"



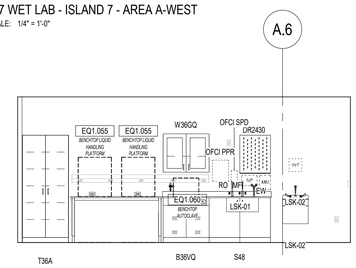
12 527 WET LAB - ISLAND 7 - AREA A-WEST
SCALE: 1/4" = 1'-0"



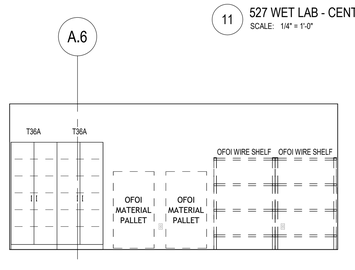
11 527 WET LAB - CENTER - AREA A-WEST
SCALE: 1/4" = 1'-0"



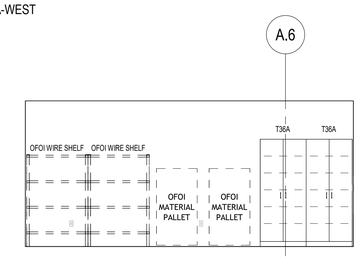
10 527F CELL CULTURE - WEST
SCALE: 1/4" = 1'-0"



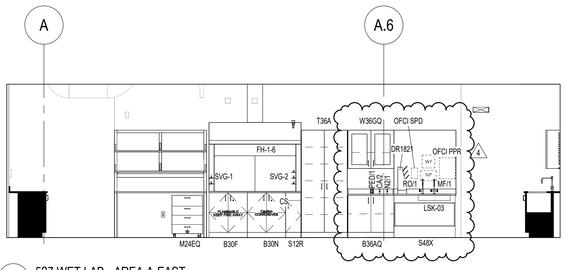
9 527F CELL CULTURE - EAST
SCALE: 1/4" = 1'-0"



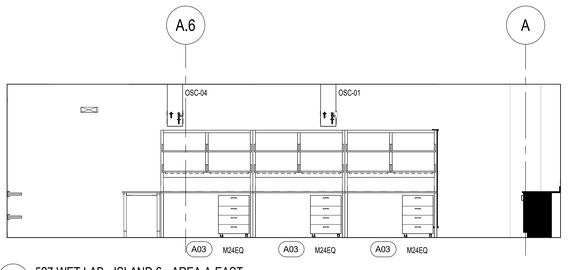
8 527E CONSUM- ABLES - WEST
SCALE: 1/4" = 1'-0"



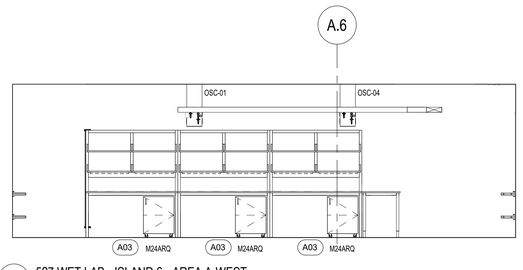
7 527E CONSUM- ABLES - EAST
SCALE: 1/4" = 1'-0"



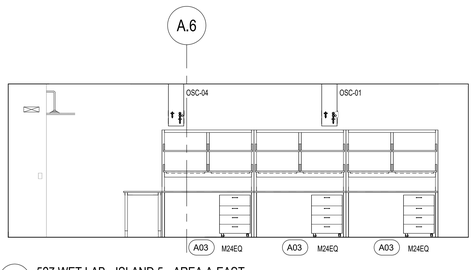
6 527 WET LAB - AREA A-EAST
SCALE: 1/4" = 1'-0"



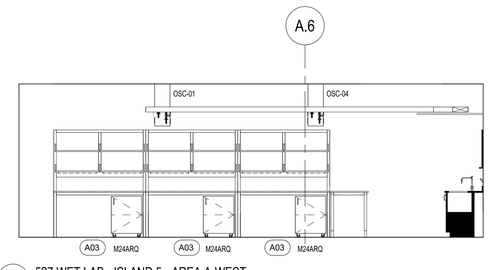
5 527 WET LAB - ISLAND 6 - AREA A-EAST
SCALE: 1/4" = 1'-0"



4 527 WET LAB - ISLAND 6 - AREA A-WEST
SCALE: 1/4" = 1'-0"



3 527 WET LAB - ISLAND 5 - AREA A-EAST
SCALE: 1/4" = 1'-0"



2 527 WET LAB - ISLAND 5 - AREA A-WEST
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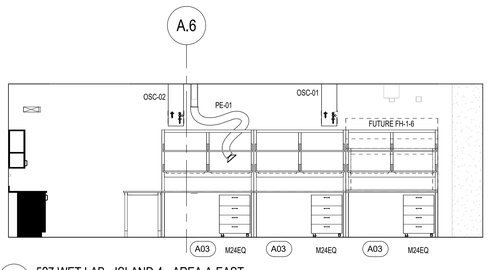

1 527 WET LAB - ISLAND 4 - AREA A-EAST
SCALE: 1/4" = 1'-0"

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SUITE 1700
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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

4' 2' 0' 4' 8'

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

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

ELEVATIONS

DATE

BSA PROJECT NO. 00360481

Q8.5.2

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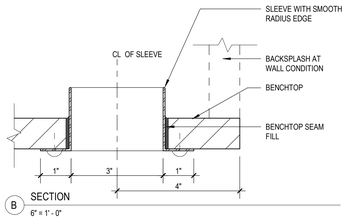
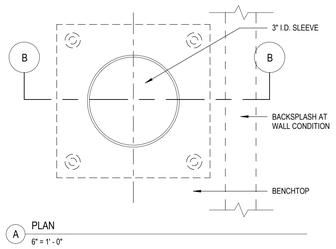
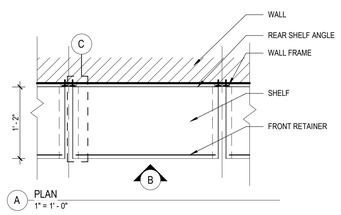


B SECTION
6" = 1' - 0"

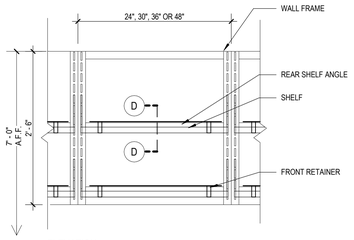


A PLAN
6" = 1' - 0"

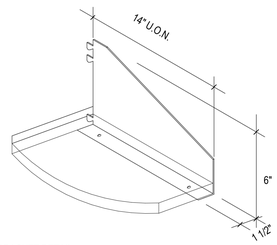
67 DETAIL - BENCH TOP SLEEVE
SCALE: 6" = 1'-0"



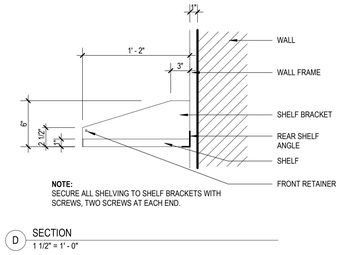
A PLAN
1" = 1' - 0"



B ELEVATION
1" = 1' - 0"

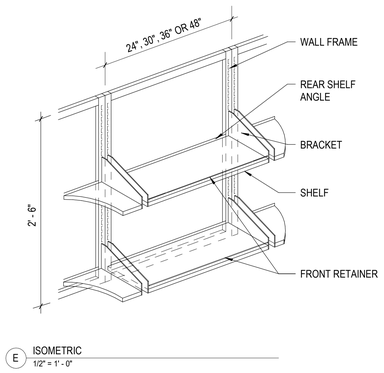


C BRACKET DETAIL
1 1/2" = 1' - 0"



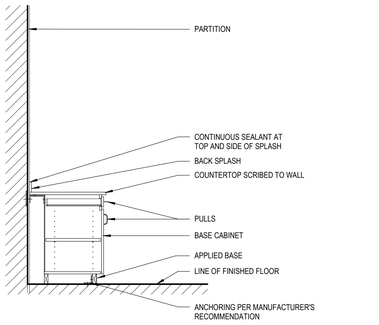
NOTE:
SECURE ALL SHELVING TO SHELF BRACKETS WITH SCREWS, TWO SCREWS AT EACH END.

D SECTION
1 1/2" = 1' - 0"

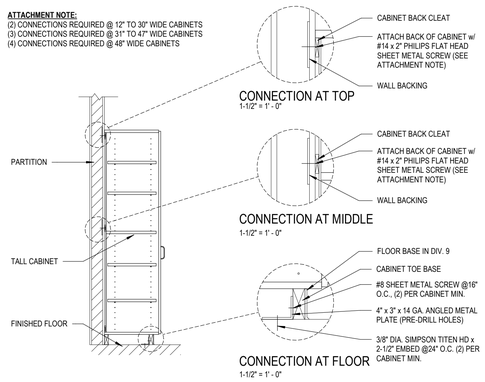


E ISOMETRIC
1/2" = 1' - 0"

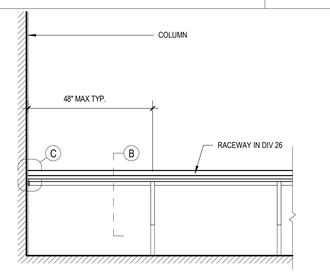
51 DETAIL - ADJUSTABLE WALL ASSEMBLY
SCALE: 1" = 1'-0"



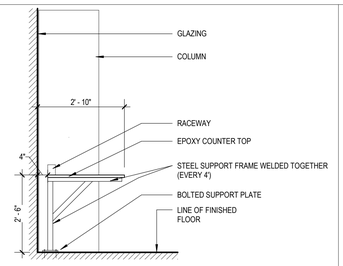
10 DETAIL - BASE CABINET ANCHORING
SCALE: 1/2" = 1'-0"



12 DETAIL - TALL CABINET ANCHORING
SCALE: 1/2" = 1'-0"

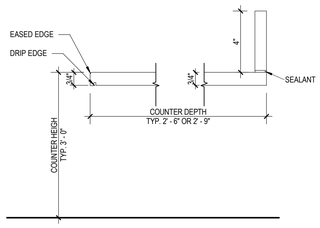


A TYPICAL ELEVATION
1/2" = 1'-0"



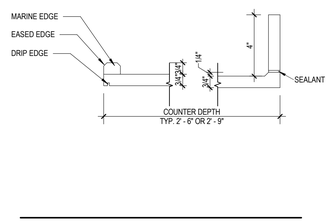
B SECTION
1/2" = 1'-0"

68 DETAIL - KNEE OPENING W/ CANTILEVER LEG PANEL
SCALE: 1/2" = 1'-0"



PHENOLIC RESIN COUNTER DETAIL

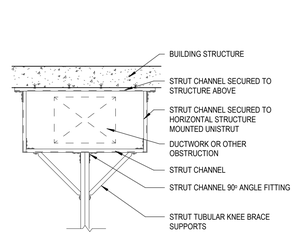
TYPICAL EDGE AND BACKSPLASH
PHENOLIC RESIN
REFER TO SPECIFICATIONS FOR TYPE AND COLOR



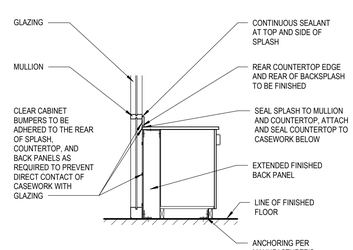
MARINE EDGE DETAIL

MARINE EDGE AND BACKSPLASH
PHENOLIC RESIN
REFER TO SPECIFICATIONS FOR TYPE AND COLOR

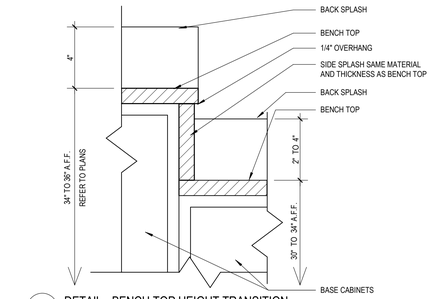
53 DETAIL - BENCH TOP COUNTER DETAIL
SCALE: 3" = 1'-0"



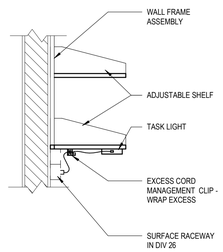
70 DETAIL - OVERHEAD SERVICE COLUMN - SECTION @ OBSTRUCTION
SCALE: 1/2" = 1'-0"



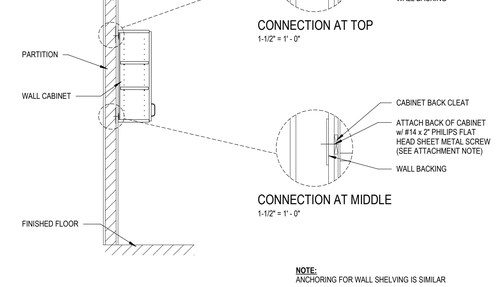
64 DETAIL - BASE CABINET @ GLAZING
SCALE: 1/2" = 1'-0"



38 DETAIL - BENCH TOP HEIGHT TRANSITION
SCALE: 3" = 1'-0"

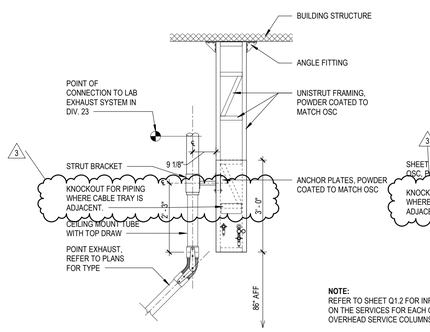


30 DETAIL - TASK LIGHT MOUNTING
SCALE: 1" = 1'-0"

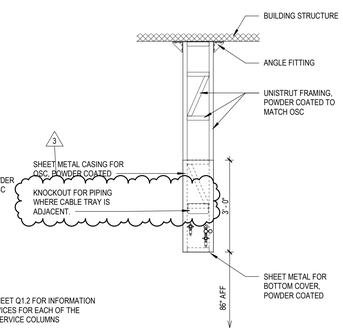


NOTE:
ANCHORING FOR WALL SHELVING IS SIMILAR

14 DETAIL - WALL CABINET ANCHORING
SCALE: 1/2" = 1'-0"

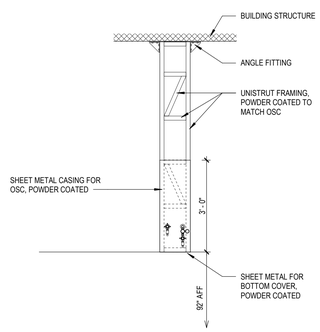


SIDE ELEVATION - OVERHEAD SERVICE COLUMN, W/ POINT EXHAUST OSC-02
A 1/2" = 1' - 0"



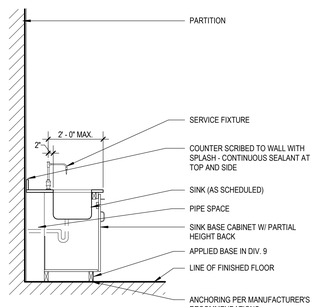
NOTE:
REFER TO SHEET 01.2 FOR INFORMATION ON THE SERVICES FOR EACH OF THE OVERHEAD SERVICE COLUMNS

SIDE ELEVATION - OVERHEAD SERVICE COLUMN OSC-01, OSC-03, OSC-04
B 1/2" = 1' - 0"

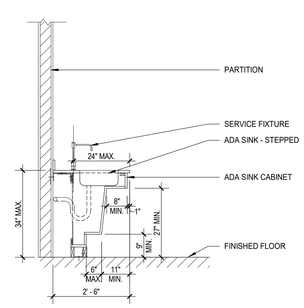


SIDE ELEVATION - OVERHEAD SERVICE COLUMN OSC-03A
C 1/2" = 1' - 0"

72 DETAIL - BENCH OVERHEAD SERVICE COLUMN - ELEVATION
SCALE: 1/2" = 1'-0"



32 DETAIL - BASE CABINET - SINK
SCALE: 1/2" = 1'-0"



NOTE:
SINK CABINET ANCHORING TO BE SIMILAR TO BASE CABINET ANCHORING REFER TO 10/Q9.1.1

16 DETAIL - BASE CABINET - ADA SINK
SCALE: 1/2" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/20/2026	BP4-CD: ADDENDUM 01
2	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
1	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

LAB CASEWORK DETAILS

DATE

BSA PROJECT NO. 00360481

Q9.1

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4/17/2026 10:51:09 AM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/LAB-20250972-IULAP-Q_R24.rvt

HVAC SYMBOLS

- SUPPLY DIFFUSER OR SUPPLY GRILLE (NO AIRFLOW IN SHADED REGION)
- RETURN DIFFUSER OR RETURN GRILLE
- EXHAUST DIFFUSER OR EXHAUST GRILLE
- MANUAL VOLUME DAMPER
- FD — FIRE DAMPER WITH ACCESS DOOR
- SD — SMOKE DAMPER WITH ACCESS DOOR
- F/SD — FIRE/SMOKE DAMPER WITH ACCESS DOOR
- MD — AUTOMATIC MOTOR OPERATED DAMPER
- BDD — BACKDRAFT DAMPER
- AD / AFMS — AIR FLOW MEASURING STATION
- DUCT TURNED UP (SOLID LINES)
- DUCT TURNED DOWN (DASHED LINES)
- PLAN VIEW / SECTION / WITH FLEX DUCT — RETURN BRANCH DUCT TO RETURN GRILLE/DIFFUSER "R#-CFM" DIFFUSER TAG DESIGNATION "R#-CFM" GRILLE TAG DESIGNATION
- PLAN VIEW / SECTION / WITH FLEX DUCT — SUPPLY BRANCH DUCT TO SUPPLY GRILLE/DIFFUSER "S#-CFM" DIFFUSER TAG DESIGNATION "S#-CFM" GRILLE TAG DESIGNATION
- PLAN VIEW / SECTION / WITH FLEX DUCT — EXHAUST BRANCH DUCT TO EXHAUST GRILLE/DIFFUSER "E#-CFM" DIFFUSER TAG DESIGNATION "E#-CFM" GRILLE TAG DESIGNATION
- SIDWALL SUPPLY, RETURN, OR EXHAUST GRILLE
- SUPPLY, RETURN, OR EXHAUST SLOT DIFFUSER
- STAINLESS WELDED DUCTWORK PER SPECIFICATION
- INSULATED METAL PANEL
- BOOT TAP OR 45 DEGREE ENTRY FITTING
- R OR D — R (RISE), D (DROP) ARROW IN DIRECTION OF AIR FLOW
- AD — ACCESS DOOR
- 90 DEGREE ELBOW WITH TURNING VANES
- STANDARD RADIUS ELBOW WITH CENTER RADIUS EQUAL TO 1-1/2 TIMES WIDTH OF DUCT.
- INTERNALLY Y LINED DUCTWORK
- 20"X12"Ø — FLAT OVAL DUCT (WIDTH X HEIGHT)
- 18"Ø — ROUND DUCT
- 20"X12" — RETANGULAR DUCT (WIDTH X HEIGHT)
- SPIN-IN FITTING WITH MANUAL VOLUME DAMPER AND FLEXIBLE DUCT CONNECTION
- CONICAL FITTING
- 12"Ø / 20"X12" — SQUARE-TO-ROUND TRANSITION
- TB-X — TYPICAL TERMINAL BOX WITH HEATING COIL, TWO WAY CONTROL VALVE, BOX DESIGNATION
- TB-X — TYPICAL TERMINAL BOX WITH HEATING COIL, THREE WAY CONTROL VALVE, BOX DESIGNATION
- TYPICAL CHILLED BEAM (24"X48")
- 90 DEGREE TEE (ROUND OR FLAT OVAL ONLY)

CONTROL SYMBOLS

- TT OR TTT — AIRFLOW MEASURING STATION
- AFS — AIR FLOW SWITCH
- AL — ALARM
- BDD — BACKDRAFT DAMPER (GRAVITY)
- D2 — 120/60/1 BY EC — CO_2 SENSOR
- CS — CURRENT SENSOR
- D — DISCONNECT SWITCH - FUSED
- D — DISCONNECT SWITCH - NON-FUSED
- DD — DUCT DETECTOR
- I/S — CURRENT TO PNEUMATIC TRANSDUCER
- E/S — DAMPER END SWITCH (BINARY)
- DD — DUCT-MOUNTED SMOKE DETECTOR
- DP — DIFFERENTIAL PRESSURE SENSOR (ANALOG)
- DPS — DIFFERENTIAL PRESSURE SWITCH SENSOR (BINARY)
- DPS (HL) — DIFFERENTIAL PRESSURE SWITCH (HIGH LIMIT) (BINARY)
- DPS (LL) — (LOW LIMIT) (BINARY)
- EP — ELECTRO-PNEUMATIC SWITCH
- EPT — ELECTRO-PNEUMATIC TRANSDUCER
- EAD — EXHAUST AIR DAMPER
- F&S — FACE & BY-PASS DAMPER
- FID — FAN ISOLATION DAMPER
- FC — FLOW CONTROLLER
- FS — FLOW SENSOR
- H/O/A — HAND-OFF-AUTO SWITCH
- H/TC — HUMIDITY CONTROLLER (PNEUMATIC)
- H/TE — HUMIDITY HIGH LIMIT (ELECTRIC)
- H — HUMIDITY SENSOR (ELECTRONIC)
- H/TT — HUMIDITY TRANSMITTER (PNEUMATIC)
- LS — LEVEL SENSOR
- T/LL — LOW LIMIT SAFETY THERMOSTAT
- MS — 120/60/1 BY EC — MAGNETIC INDUCTIVE FLOW METER SENSOR
- S — MANUAL SWITCH (ELECTRIC)
- MDM — MODEM
- MCC — MOTOR CONTROL CENTER
- STR — MOTOR STARTER
- OCC — OCCUPANCY SENSOR
- OWS — OPERATOR'S WORK STATION
- OAD — OUTDOOR AIR DAMPER
- VPS — OUTDOOR AIR VOLUME PROBE, TRANSDUCER AND MONITOR
- PR — PNEUMATIC RELAY
- PE — PRESSURE-ELECTRIC SWITCH
- PC — PRESSURE CONTROLLER (PNEUMATIC)
- P — PRESSURE SENSOR (ELECTRONIC)
- PT — PRESSURE TRANSMITTER (PNEUMATIC)
- RM — ROOM MONITOR
- RAD — RETURN AIR DAMPER
- SD — SMOKE DAMPER
- S/S — START/STOP SWITCH
- CM — 120/60/1 BY EC — STEAM FLOW MEASUREMENT ORIFICE PLATE & MASS FLOW COMPUTER
- SAD — SUPPLY AIR DAMPER
- TC — OVERRIDE TIMER
- TC — TEMPERATURE CONTROLLER (PNEUMATIC)
- T — TEMPERATURE SENSOR (ELECTRONIC)
- TT — TEMPERATURE TRANSMITTER (PNEUMATIC)
- M — TERMINAL BOX ACTUATOR
- TM — TURBINE METER
- VFC — VARIABLE FREQUENCY CONTROLLER FOR MOTOR
- UPS — UNINTERRUPTED POWER (SUPPLY)
- VP — VELOCITY PRESSURE SENSOR (ELECTRONIC)
- VS — VIBRATION SWITCH
- VD — VOLUME DAMPER (MANUAL)
- VXT — VORTEX SHEDDING AIR FLOW TRANSMITTER
- VSM — 120/60/1 BY EC — VORTEX SHEDDING FLOW METER
- 20 — 20 PSIG MAIN CONTROL AIR
- PRESSURE GAUGE
- HC — HOLDING COIL
- H — HUMIDISTAT (SPACE)
- S — SWITCH (PHEUMATIC)
- T — THERMOSTAT OR TEMPERATURE SENSOR (SPACE)
- T/N — THERMOSTAT (SPACE) NIGHT CYCLE
- 0-30 PSIG AIR GAUGE
- LAN — LOCAL AREA NETWORK
- TCC — TEMPERATURE CONTROL CONTRACTOR
- ECC — ENVIRONMENTAL CONTROL CONTRACTOR
- (NOTE: TCC & ECC ARE USED INTERCHANGEABLY)
- EC — ELECTRICAL CONTRACTOR
- P — OR — PNEUMATIC
- E — OR — ELECTRICAL WIRING
- AI-X — ANALOG INPUT (DDC CONTROLLER)
- AO-X — ANALOG OUTPUT (DDC CONTROLLER)
- BI-X — BINARY INPUT (DDC CONTROLLER)
- BO-X — BINARY OUTPUT (DDC CONTROLLER)

VALVE AND FITTING SYMBOLS

PLAN VIEW / DETAIL VIEW

- PIPING FLEXIBLE CONNECTION
- PIPE TURNED UP (UNLESS NOTED OTHERWISE)
- PIPE TURNED DOWN
- PIPE OUT TOP
- PIPE OUT BOTTOM
- THREADED NIPPLE W/CAP
- PIPE WITH BLIND FLANGE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- ISOLATION VALVE
- CHECK VALVE
- UNION
- GATE VALVE
- BALL VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- TEMPERATURE CONTROL - 2-WAY MODULATING VALVE
- TEMPERATURE CONTROL - 2-WAY, 2-POSITION ISOLATION VALVE
- NC / NO — TEMPERATURE CONTROL - 3-WAY MODULATING VALVE
- NC / NO — TEMPERATURE CONTROL - 3-WAY, 2-POSITION ISOLATION VALVE
- CALIBRATED BALANCE VALVE
- SAFETY RELIEF VALVE
- STRAINER
- FLOW METER
- FLOOR DRAIN BY PC
- A — AUTOMATIC FLOW CONTROL VALVE
- FLOW MEASURING DEVICE
- MANUAL AIR RELIEF VENT
- AUTOMATIC AIR RELIEF VENT
- LUBRICATED PLUG VALVE
- PRESSURE REDUCING VALVE(STEAM, GAS, COMPRESSED AIR)
- ANGLE VALVE
- REFRIGERANT HOT GAS BY-PASS VALVE
- SHUT-OFF COCK (HYDRONICS)
- SOLENOID VALVE
- REFRIGERANT EXPANSION VALVE
- WATER PRESSURE REDUCING/REGULATING VALVE
- STEAM TRAP
- DIELECTRIC FITTING BETWEEN STEEL AND COPPER
- STRAINER (STEAM)
- PRESSURE AND TEMPERATURE PLUG
- REFRIGERANT SIGHT GLASS
- THERMOMETER
- P,S,V,T — (P=PRESS V=VAC T=TEMP) GAUGE
- SENSOR (T-TEMP H-HUMIDITY)
- FS — FLOW SWITCH
- CO — CLEAN OUT
- INDICATED EXPANSION LOOP (COLD SPRUNG)
- ANCHOR
- GUIDE
- REFRIGERANT SHUT-OFF VALVE
- EXPANSION JOINT
- DIFFERENTIAL SWITCH
- REDUCED PRESSURE BACKFLOW PREVENTER
- DOUBLE CHECK VALVE ASSEMBLY
- FIRE DEPARTMENT CONNECTION
- FIRE PROTECTION INDICATING CONTROL VALVE
- FLOW SWITCH AND TEST&DRAIN ASSEMBLY

FLOOR PLAN SYMBOLS

- A101-A — SM — SECTION WITH TOP NUMBER INDICATING SECTION DESIGNATION AND BOTTOM NUMBER INDICATING DRAWING THAT SECTION IS CUT ON OR DRAWING THAT SECTION IS DRAWN ON
- 1 / A101 — SM — DETAIL WITH TOP NUMBER INDICATING DETAIL DESIGNATION AND BOTTOM NUMBER INDICATING DRAWING THAT DETAIL IS REFERENCED ON OR DRAWING THAT DETAIL IS DRAWN ON
- A. GENERAL NOTE
- 1. PLAN NOTE LIST
- 1 — PLAN NOTE
- T — THERMOSTAT
- H — HUMIDISTAT
- PM — PRESSURE MONITOR (FLOOR PLAN)
- 202 — C02 MONITOR (FLOOR PLAN)
- 123 — HYDRAULIC REFERENCE POINT
- TS — TAMPER SWITCH
- FS — FLOW SWITCH
- CONNECTION OF NEW WORK TO EXISTING

MECHANICAL AND PLUMBING ABBREVIATIONS

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS USED ON PROJECT

A/E	ARCHITECT AND ENGINEER
AD	ACCESS DOOR
ADJ	ADJUSTABLE OR ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECT
ASHRAE	AMERICAN SOCIETY HEATING, REFRIGERATION, AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASPE	AMERICAN SOCIETY OF PLUMBING ENGINEERS
ASSY	ASSEMBLY
ATM	ATMOSPHERE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP/RPZ	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOT	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CAP	CAPACITY
CENTRIF	CENTRIFUGAL
CFCI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFOI	CONTRACTOR FURNISHED/OWNER INSTALLED
CI	CAST IRON
CLG	CEILING
CO	CLEANOUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CSP	CEILING SERVICE PANEL
DEG	DEGREE
DEPT	DEPARTMENT
DIA	DIAMETER
DISC	DISCONNECT
DISCH	DISCHARGE
DN	DOWN
DOE	DEPARTMENT OF ENERGY
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
ECC	ENVIRONMENTAL CONTROL CONTRACTOR
EER	ENERGY EFFICIENCY RATING
EJ	EXPANSION JOINT
ELEC	ELECTRIC(AL)
ELEV	ELEVATION
EMER	EMERGENCY
ENCL	ENCLOSURE
ENTR	ENTERING
EQUIP	EQUIPMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EX OR EXIST	EXISTING
EXT	EXTERIOR
F	DEGREES FAHRENHEIT
FC	FLEXIBLE CONNECTION
FH	FUME HOOD
FIN	FINISH
FM	FACTORY MUTUAL
FLA	FULL LOAD AMPS
FLR	FLOOR
FPC	FIRE PROTECTION CONTRACTOR
FPC	FIRE PROTECTION CONTRACTOR
FT	FEET
FTG	FOOTING
G	GAS, NATURAL
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GAS, NATURAL VENT
GW	GLASSWARE WASHER
H	HEIGHT
HD	HEAD
HGT	HEIGHT
HOA	HAND-OFF-AUTOMATIC
HORZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER
HR	HOUR
HZ	HERTZ
ID	INSIDE DIAMETER (DIMENSION)
IN	INCHES
IN WC	INCHES WATER COLUMN
INCL	INCLUDE
INSUL	INSULATED
INT	INTERIOR
INV	INVERT
I.P.S.	INTERNATIONAL PIPE SIZING
IW	INDIRECT WASTE
JT	JOINT
KAIC	SHORT CIRCUIT RATING
KEC	KITCHEN EQUIPMENT CONTRACTOR
KW	KILOWATT
KWHR	KILOWATT-HOUR
L	LENGTH
LBS or #	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT (FEET)
LFT	LEAVING FLUID TEMPERATURE
LOC	LOCATION
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
M	METER
MAX	MAXIMUM
MBH	1000 BTU/HR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
N	NORTH
NA	NOT APPLICABLE
NC	NORMALLY CLOSED OR NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN OR NUMBER
NOM	NOMINAL
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER (DIMENSION)
OFCI	OWNER FURNISHED/CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED/OWNER INSTALLED
OPER	OPERATOR
OPNG	OPENING
ORIG	ORIGINAL
P	PUMP, PNEUMATIC OR PRESSURE
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PDI	PLUMBING AND DRAINAGE INSTITUTE
PG	PRESSURE GAUGE
POC	POINT OF CONNECTION
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PREFAB	PREFABRICATED
PRES	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
REC	RECEIVER
RECIRC	RECIRCULATING
REF	REFRIGERATOR OR REFERENCE
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR OR SOUND ATTENUATOR
SCFM	STANDARD CUBIC FEET PER MINUTE
SCH	SCHEDULE
SEC	SECTION
SENS	SENSIBLE
SHT	SHEET
SPEC	SPECIFICATIONS
SQ	SQUARE
SQFT or SF	SQUARE FOOT (FEET)
SRV	SAFETY RELIEF VALVE
SS	STAINLESS STEEL
STD	STANDARD
STR	STARTER OR STRUCTURE
STRUC	STRUCTURAL
SYS	SYSTEM
T	THERMOSTAT
TCC	TEMPERATURE CONTROL CONTRACTOR
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
TLL	TEMPERATURE LOW LIMIT
TMBH	TOTAL MBH
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UL	UNDERWRITERS LISTED
UNO	UNLESS NOTED OTHERWISE
UVL	ULTRA VIOLET LIGHT
VB	VACUUM BREAKER
VEL	VELOCITY
VFC	VARIABLE FREQUENCY CONTROLLER
VSC	VARIABLE SPEED CONTROLLER
VTR	VENT THROUGH ROOF
W	WATTS OR WIDTH
W/	WITH
W/O	WITHOUT
WC	WATER COLUMN
WFMD	WATER FLOW MEASURING DEVICE
WG	WATER GAUGE
WGT	WEIGHT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WTR	WATER

MECHANICAL ABBREVIATIONS

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS USED ON PROJECT

AC or ACU	AIR CONDITIONING UNIT OR AIR COMPRESSOR
ACCU	AIR COOLED CONDENSING UNIT
AFCV	AIR FLOW CONTROL VALVE
AFMS	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
AR	AIR RECEIVER
AS	AIR SEPARATOR
AVMS	AIR VOLUME MEASURING STATION
B	BOILER
BCU	BLOWER COIL UNIT
BDD	BACKDRAFT DAMPER
BI	BACKWARD INCLINE
BOD	BOTTOM OF DUCT
CAV	CONSTANT AIR VOLUME
CC	COOLING COIL
CCP	COOLING COIL PUMP
CD	CONDENSATE DRAIN
CH	CHILLER
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CP	CONDENSATE PUMP
CPD	CONDENSATE PUMP DISCHARGE
CUH	CABINET UNIT HEATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
D	DIFFUSER OR DAMPER
DE	DEAERATOR
DB	DECIBELS OR DRY BULB
DC	DUCT COIL
DD	DUAL DUCT
DDC	DIRECT DIGITAL CONTROL
DEFL	DEFLECTION
DUC	DOOR UNDER CUT
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EBH	ELECTRIC BASEBOARD HEATER
ECG	EGG CRATE GRILLE
ED	EXHAUST DIFFUSER
EDC	ELECTRIC DUCT COIL
EF	EXHAUST AIR FAN
EFT	ENTERING FLUID TEMPERATURE
EG	EXHAUST GRILLE OR ETHYLENE GLYCOL
EMG	EXTRUDED METAL GRILLE
ERP	ELECTRIC RADIANT PANEL
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EXH	EXHAUST
F&B	FACE & BYPASS
F&T	FLOAT AND THERMOSTATIC TRAP
F/SD	FIRE AND SMOKE DAMPER
FCU	FAN COIL UNIT
FD	FIRE DAMPER
H	HUMIDIFIER OR HUMIDITY
HC	HEATING COIL
HCP	HEATING COIL PUMP (HOT WATER)
HE	HEAT EXCHANGER
HPR	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
HRC	HEAT RECOVERY COIL
HTR	HEATER
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HW	HOT WATER
HWP	HEATING HOT WATER PUMP
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HX	HEAT EXCHANGER
IFB	INTEGRAL FACE AND BYPASS
LAN	LOCAL AREA NETWORK
LAT	LEAVING AIR TEMPERATURE
LBD	LINEAR BAR DIFFUSER
LD	LINEAR DIFFUSER
LFD	LAMINAR FLOW DIFFUSER
LFT	LEAVING FLUID TEMPERATURE
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
MAT	MIXED AIR TEMPERATURE
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MPCR	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
PE	PNEUMATIC ELECTRIC
PF	PREFILTERS
PG	PROPYLENE GLYCOL
PHC	PREHEAT COIL
PRD	PRESSURE RELIEF DOOR
PUH	PROPELLER UNIT HEATER
RA	RETURN AIR OR RELIEF AIR
RAD	RADIATION OR RADIATED
RAT	RETURN AIR TEMPERATURE
R/H	REHEAT
RF	RETURN AIR FAN
RG	RETURN GRILLE
RH	RELIEF HOOD OR RELATIVE HUMIDITY
RHC	REHEAT COIL
RP	RADIANT PANELS
RPG	RETURN PERFORATED GRILLE
RV	ROOF VENTILATOR
SA	SUPPLY AIR OR SOUND ATTENUATOR
SB	STEAM BOILER
SC	STEAM COIL
SCC	STEAM CONDENSATE COOLER
SCCH	SUBCOOLED CHILLER
SD	SUPPLY DIFFUSER OR SMOKE DAMPER
SF	SUPPLY AIR FAN
SG	SUPPLY GRILLE
SMBH	SENSIBLE MBH
SMC	SHEET METAL CONTRACTOR
SP	STATIC PRESSURE
ST	STEAM TRAP
SV	STEAM VENT
T	THERMOSTAT
TB	TERMINAL BOX
TDV	TRIPLE DUTY VALVE
TLL	TEMPERATURE LOW LIMIT
TSP	TOTAL STATIC PRESSURE
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL)
WB	WET BULB

MECHANICAL CODE AND STANDARD INFORMATION

MECHANICAL CODE: 2014 INDIANA MECHANICAL CODE (2012 INTERNATIONAL MECHANICAL CODE WITH 675 IAC 18-1.6 IMPLEMENTING AMENDMENTS).

FUEL GAS CODE: 2014 INDIANA FUEL GAS CODE (2012 INTERNATIONAL FUEL GAS CODE WITH 675 IAC 25-3 IMPLEMENTING AMENDMENTS).

ENERGY CODE: 2010 INDIANA ENERGY CONSERVATION CODE (ASHRAE 90.1-2007 WITH 675 IAC 19-4 IMPLEMENTING AMENDMENTS).

MECHANICAL SYSTEM DESIGN CRITERIA: CLIMATE ZONE 5A.

ECONOMIZER DESCRIPTION: SEE TEMPERATURE CONTROL SHEETS.

EQUIPMENT AND SYSTEM CONTROL DESCRIPTION: SEE TEMPERATURE CONTROL SHEETS.

FAN MOTOR HORSEPOWER (hp) AND CONTROLS: SEE EQUIPMENT SCHEDULE SHEETS FOR MOTOR HORSEPOWER SIZES. SEE TEMPERATURE CONTROL SHEETS FOR MOTOR CONTROL.

DUCT SEALING AND DUCT AND PIPE INSULATION INFORMATION: SEE HVAC SPECIFICATIONS 230700 AND 233113.

SEE ARCHITECTURAL DRAWINGS FOR THE REQUIRED INFORMATION REGARDING: INSULATION MATERIALS AND THEIR R-VALUES, FENESTRATION U FACTORS AND SHGC, AREA-WEIGHTED U FACTORS AND SHGC CALCULATIONS, AIR SEALING DETAILS, AND BUILDING THERMAL ENVELOPE DETAILS.

NFPA 99-2012: COMPLIES WITH CHAPTER 9.

HVAC GENERAL NOTES RELATED TO STRUCTURAL ITEMS

PENETRATION/ EMBEDMENTS RESTRICTION NOTES:

1. NO OPENINGS SHALL BE CUT IN STRUCTURAL BEAMS OR COLUMNS, UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS.
2. PENETRATIONS UP TO 12 INCHES IN CONCRETE WALLS MAY BE FIELD CUT BY THE CONTRACTOR.
3. PENETRATIONS LARGER THAN 12 INCHES IN CONCRETE WALLS SHALL BE SLEEVED AND CAST WITH ADDITIONAL REINFORCING AS SHOWN ON THE STRUCTURAL TYPICAL DETAILS.
4. PENETRATIONS UP TO 16 INCHES IN CMU WALLS MAY BE FIELD CUT BY THE CONTRACTOR.
5. PENETRATIONS LARGER THAN 16 INCHES IN LOAD BEARING CMU WALLS SHALL HAVE LINTEL AND JAMB REINFORCING AS SHOWN ON THE STRUCTURAL TYPICAL DETAILS.
6. PENETRATIONS UP TO 12 INCHES IN CONCRETE SLAB ON METAL DECK MAY BE FIELD CUT BY THE CONTRACTOR.
7. PENETRATIONS LARGER THAN 12 INCHES IN CONCRETE SLAB ON METAL DECK SHALL BE CONSTRUCTED AS SHOWN ON THE STRUCTURAL TYPICAL DETAILS.
8. ADJACENT PENETRATIONS CLOSER THAN 18" SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW.
9. NO CONDUITS SHALL BE EMBEDDED IN SLABS ON METAL DECK.
10. CM SHALL PROVIDE COORDINATED SUBMITTAL SHOWING ALL PENETRATIONS (SLEEVED AND FIELD CUT) FOR REVIEW PRIOR TO INSTALLATION AND POURING OF EACH WALL OR SLAB, OR MAKING FIELD CUT.
11. DO NOT OVERCUT CONCRETE.

ATTACHMENT RESTRICTIONS:

1. ANY ATTACHMENT GREATER THAN 1,000 LBS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED FOR REVIEW TO THE STRUCTURAL ENGINEER.
2. ATTACHMENTS SHALL NOT BE MADE TO THE UNDERSIDE OF METAL ROOF DECK WITHOUT CONCRETE TOPPING.

MECHANICAL PIPING SYMBOLS

- HWS — HEATING WATER SUPPLY
- HWR — HEATING WATER RETURN
- PHWS — PERIMETER HEATING WATER SUPPLY
- PHWR — PERIMETER HEATING WATER RETURN
- CBHWS — CHILLED BEAM HEATING WATER SUPPLY
- CBHWR — CHILLED BEAM HEATING WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CBS — CHILLED BEAM CHILLED WATER SUPPLY
- CBR — CHILLED BEAM CHILLED WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- LPS — LOW PRESSURE STEAM
- LPR — LOW PRESSURE CONDENSATE RETURN
- BAS — BUILDING AUTOMATION SYSTEM CONDUIT
- VM — VAPOR MITIGATION PIPING
- HPS — HIGH PRESSURE STEAM
- HPR — HIGH PRESSURE CONDENSATE RETURN
- TC — TRAPPED CONDENSATE IN TUNNEL (SYSTEM PRESSURE)
- SV — STEAM VENT
- CPD — CONDENSATE PUMP DISCHARGE
- GS — GLYCOL SUPPLY
- GR — GLYCOL RETURN
- CD — CONDENSATE & EQUIPMENT DRAIN
- BFW — BOILER FEED WATER
- BWCF — BOILER WATER CHEMICAL FEED
- CWCF — CONDENSER WATER CHEMICAL FEED
- ECWS — EQUIPMENT COOLING WATER SUPPLY
- ECWR — EQUIPMENT COOLING WATER RETURN
- HRS — HEAT RECOVERY SUPPLY
- HRR — HEAT RECOVERY RETURN
- RHG — REFRIGERANT HOT GAS
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- DIRECTION OF PIPE SLOPE (DOWN)

LINE SYMBOLS

- LIGHT/SCREENED SOLID OR DASHED LINES INDICATE EXISTING TO REMAIN
- HEAVY DASHED LINES INDICATE EXISTING TO BE REMOVED
- HEAVY CONTINUOUS LINES INDICATE NEW WORK

MECHANICAL DEMOLITION GENERAL NOTES

A. EXISTING SYSTEMS SHOWN ARE BASED ON EXISTING DRAWINGS AND FIELD VERIFIED TO THE EXTENT POSSIBLE. CONTRACTOR SHALL VERIFY THAT SERVICES INDICATED FOR REMOVAL DO NOT SERVE SPACES OUTSIDE THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY THAT EXISTING SYSTEMS SHOWN ARE REPRESENTATIVE OF THE INSTALLED SYSTEMS AND REPORT MAJOR DISCREPANCIES TO ENGINEER OF RECORD.

B. INACTIVE, ABANDONED SYSTEMS NOT SHOWN ARE TO BE REPORTED TO THE ENGINEER OF RECORD.

C. CONTRACTOR IS TO COORDINATE ALL SERVICE INTERRUPTIONS WITH OWNER REPRESENTATIVES, MAINTENANCE STAFF, AND END-USERS. CONTRACTOR SHALL PROVIDE SUFFICIENT ADVANCE NOTICE TO ALL AFFECTED PARTIES OF IMPENDING OUTAGE.

D. SYSTEMS INDICATED BY DASHED LINE ARE TO BE REMOVED IN THEIR ENTIRETY UNLESS OTHERWISE DESCRIBED BY PLAN NOTE(S). THIS INCLUDES THE REMOVAL OF EXISTING HANGERS, INSULATION, ASSOCIATED CONTROLS AND ACCESSORIES. ALL DUCTWORK AND PIPING TERMINATIONS NOT SHOWN AS BEING REUSED SHALL BE CAPPED. CONTRACTOR SHALL PATCH INSULATION DAMAGED DURING DEMOLITION AND WHERE PIPING IS SHOWN TO BE CAPPED.

E. WHEN EQUIPMENT REQUIRING ELECTRICAL POWER IS REMOVED, CONTRACTOR SHALL ALSO DEMOLISH EXISTING POWER WIRING AND CONDUIT. A LICENSED ELECTRICIAN SHALL BE RESPONSIBLE FOR REMOVING ALL POWER WIRING AND CONDUIT.

F. WHERE REMAINING MECHANICAL, ELECTRICAL, PLUMBING, OR FIRE PROTECTION WORK PENETRATES EXISTING WALLS OR FLOORS, THE OPENING CREATED MUST BE REPAIRED TO MATCH THE EXISTING CONSTRUCTION AND FIRE RATING BY THE GENERAL CONSTRUCTION TRADE SKILLED IN THE WORK TO BE PERFORMED.

G. IF THE WORK OF OTHER TRADES IS CURRENTLY SUPPORTED BY WORK TO BE DEMOLISHED, CONTRACTOR SHALL FURNISH AND INSTALL NEW SUPPORTS.

H. UNUSED HANGERS FOUND WITHIN THE PROJECT SCOPE AREA SHALL BE REMOVED.

I. WHERE REQUIRED, PERFORM PRE-DEMOLITION SYSTEM TESTING (AIRFLOW, TEMPERATURE, ETC.) PRIOR TO BEGINNING ANY DEMOLITION.

J. FOR PHASED SCOPE OF WORK, REFER TO ARCHITECTURAL PHASING PLANS AND OTHER PROJECT MANUAL REQUIREMENTS. CONTRACTOR IS TO VERIFY THE SPACES TO REMAIN ACTIVE UNDER THERMAL CONTROL AND EXHAUST SYSTEMS TO REMAIN ACTIVE TO SUPPORT THE PHASING. PROVIDE TEMPORARY SYSTEM MODIFICATIOS (BLANKOFFS, CAPS, TEMPORARY DUCT CONNECTIONS, TEMPORARY PIPE CONNECTIONS, ETC) AS REQUIRED TO SUPPORT THE PHASING.

MECHANICAL GENERAL NOTES

A. NEW WORK SHOWN ON DRAWINGS IS CONCEPTUAL IN NATURE. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL TRADES. CONTRACTOR SHALL PERFORM FINAL COORDINATION OF ALL TRADES AFTER CEILING REMOVAL ALLOWS FURTHER SITE INVESTIGATION ON EXISTING BUILDINGS.

B. UNLESS NOTED OTHERWISE ON THE DRAWINGS, REFER TO SCHEDULES FOR DIFFUSER, GRILLE, TERMINAL BOX, AND OTHER TERMINAL EQUIPMENT RUNOUT SIZES.

C. WHERE EQUIPMENT REQUIRING ACCESS MUST BE INSTALLED ABOVE GYPSUM CEILING, CONTRACTOR SHALL COORDINATE ADEQUATE ACCESS WITH ALL TRADES AND PROVIDE THE REQUIRED ACCESS PANELS.

D. AIRFLOW OFFSETS NOTED ARE INTENDED TO PROVIDE INITIAL VALUES FOR THE TEST AND BALANCE CONTRACTOR. FINAL AIRFLOW OFFSETS ARE TO BE DETERMINED DURING FUNCTIONAL TESTING AND FINAL VOLUMETRIC FLOW RATES SHALL BE DOCUMENTED ON AS-BUILT DRAWINGS.

E. COORDINATE WITH ALL TRADES TO PROVIDE THE REQUIRED EQUIPMENT ACCESS. REFER TO SPECIFICATION "COMMON WORK

X00	PLAN NOTES
390	MOUNT THE STATIC PRESSURE PICKUP INSIDE THE WALL, WITH FLAT FACE OF THE PICKUP FLUSH TO THE FINISHED FACE OF THE WALL, AT A HEIGHT OF 8'-0" AFF.
391	THIS SENSOR IS SPECIAL IN THAT IT IS THE ONLY BLACK COLORED GLASS SENSOR ON THE PROJECT. DO NOT INSTALL THE STANDARD WHITE GLASS SENSOR HERE. SEND IN AN RFI TO THE MECHANICAL ENGINEER WHERE YOU DIMENSION THE EXACT LOCATION PROPOSED FOR THIS SENSOR. ROUGH-IN WITH THE WOOD PANELING JOINTS INDICATED ON THE SKETCH. INCLUDE A PHOTOGRAPH OF THE EXACT BLACK GLASS SENSOR TO BE INSTALLED HERE IN THE SAME RFI. PLEASE DON'T SCREW THIS UP.
393	MOUNT THE BAS CONTROL TRANSFORMERS ON THE WALL AT A 7'-6" HEIGHT WHERE ABOVE BAS PANELS AND AT 3" ABOVE THE TOP OF THE DOORWAY HEIGHT WHEN LOCATED ABOVE THE DOORWAY. COORDINATE WITH KENNY ROOKS AND THE POWER INSTALLING TRADES PRIOR TO INSTALLATION.

ZONE PLAN LEGEND

1. EACH WALLED/ENCLOSED WITH A DOOR SPACE IS IT'S OWN INDIVIDUAL THERMOSTATIC ZONE, UNLESS:
   A. IT HAS MORE THAN ONE THERMOSTATIC ZONE INSIDE OF IT. THE APPROXIMATE BOUNDARY BETWEEN THERMOSTATIC ZONES WHICH ARE NOT SOLID WALLS IS REPRESENTED BY A MAGENTA COLORED LINE LIKE THIS:
   B. IT SHARES A THERMOSTAT WITH A NEARBY AREA. IN THIS CASE THE SPACES ARE CIRCUMSCRIBED BY A BLUE COLORED LINE LIKE THIS:
   C. IT IS UNCONDITIONED (AS NOTED).
2. SEE THE TERMINAL BOX LEGEND FOR HOW TO DISCERN WHICH AHU (1,2,3,4,5,6,7,8) SERVES WHICH SPACE (E.G. TB-X WHERE X IS THE AHU NUMBER). THIS CONVEYS "AHU ZONING".
3. SEE APPROXIMATE DIRECTIONAL AIRFLOW ARROWS AT DOORWAYS AS UTILIZED FOR CERTAIN FLOOR LEVEL AND BUILDING LEVEL PRESSURIZATION OFFSET SETTINGS.
4. SEE WHICH SPACES ARE OUTFITTED WITH CHILLED BEAMS (CB-XXX) AND WHICH ARE OUTFITTED WITH PERIMETER HEATING FINNED TUBE RADIATION PEDESTAL (FTRP).
5. SEE TEMPERATURE CONTROL SCHEMATICS AND SPECIFICATIONS FOR TYPES OF SPACE SENSORS PROPOSED IN EACH SPACE (E.G. T - TRADITIONAL THERMOSTAT: TEMPERATURE SENSING ONLY; ETC.). SENSOR DESIGNATIONS WITH A "C" IN THEIR NAME CONTAIN A CARBON DIOXIDE SENSOR WHICH IS UTILIZED FOR MONITORING (E.G. "CO2", "CHT") WHICH MEETS THE LEED MOUNTING HEIGHT REQUIREMENT AND ALERTS THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

1 M101 ZONE PLAN - LEVEL 1
1" = 10'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAMPEN REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

ZONE PLAN - LEVEL 1

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M101

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X00	PLAN NOTES
390	MOUNT THE STATIC PRESSURE PICKUP INSIDE THE WALL, WITH FLAT FACE OF THE PICKUP FLUSH TO THE FINISHED FACE OF THE WALL, AT A HEIGHT OF 8'-0" AFF.
393	MOUNT THE BAS CONTROL TRANSFORMERS ON THE WALL AT A 7'-6" HEIGHT WHERE ABOVE BAS PANELS AND AT 3" ABOVE THE TOP OF THE DOORWAY HEIGHT WHEN LOCATED ABOVE THE DOORWAY. COORDINATE WITH KENNY ROOKS AND THE POWER INSTALLING TRADES PRIOR TO INSTALLATION.

ZONE PLAN LEGEND

1. EACH WALLED/ENCLOSED WITH A DOOR SPACE IS IT'S OWN INDIVIDUAL THERMOSTATIC ZONE, UNLESS:
   A. IT HAS MORE THAN ONE THERMOSTATIC ZONE INSIDE OF IT. THE APPROXIMATE BOUNDARY BETWEEN THERMOSTATIC ZONES WHICH ARE NOT SOLID WALLS IS REPRESENTED BY A MAGENTA COLORED LINE LIKE THIS:
   B. IT SHARES A THERMOSTAT WITH A NEARBY AREA. IN THIS CASE THE SPACES ARE CIRCUMSCRIBED BY A BLUE COLORED LINE LIKE THIS:
   C. IT IS UNCONDITIONED (AS NOTED).
2. SEE THE TERMINAL BOX LEGEND FOR HOW TO DISCERN WHICH AHU (1,2,3,4,5,6,7,8) SERVES WHICH SPACE (E.G. TB-X WHERE X IS THE AHU NUMBER). THIS CONVEYS "AHU ZONING".
3. SEE APPROXIMATE DIRECTIONAL AIRFLOW ARROWS AT DOORWAYS AS UTILIZED FOR CERTAIN FLOOR LEVEL AND BUILDING LEVEL PRESSURIZATION OFFSET SETTINGS.
4. SEE WHICH SPACES ARE OUTFITTED WITH CHILLED BEAMS (CB-XXX) AND WHICH ARE OUTFITTED WITH PERIMETER HEATING FINNED TUBE RADIATION PEDESTAL (FTRP).
5. SEE TEMPERATURE CONTROL SCHEMATICS AND SPECIFICATIONS FOR TYPES OF SPACE SENSORS PROPOSED IN EACH SPACE (E.G. T - TRADITIONAL THERMOSTAT: TEMPERATURE SENSING ONLY; ETC.). SENSOR DESIGNATIONS WITH A "C" IN THEIR NAME CONTAIN A CARBON DIOXIDE SENSOR WHICH IS UTILIZED FOR MONITORING (E.G. "CO2", "CHT") WHICH MEETS THE LEED MOUNTING HEIGHT REQUIREMENT AND ALERTS THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

1 M102 ZONE PLAN - LEVEL 2
1/8" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

ZONE PLAN - LEVEL 2

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

M102

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ZONE PLAN LEGEND
1. EACH WALLED/ENCLOSED WITH A DOOR SPACE IS IT'S OWN INDIVIDUAL THERMOSTATIC ZONE, UNLESS: A. IT HAS MORE THAN ONE THERMOSTATIC ZONE INSIDE OF IT. THE APPROXIMATE BOUNDARY BETWEEN THERMOSTATIC ZONES WHICH ARE NOT SOLID WALLS IS REPRESENTED BY A MAGENTA COLORED LINE LIKE THIS: - - -

X00	PLAN NOTES
390	MOUNT THE STATIC PRESSURE PICKUP INSIDE THE WALL, WITH FLAT FACE OF THE PICKUP FLUSH TO THE FINISHED FACE OF THE WALL, AT A HEIGHT OF 6'-0" AFF.
393	MOUNT THE BAS CONTROL TRANSFORMERS ON THE WALL AT A 7'-6" HEIGHT WHERE ABOVE BAS PANELS AND AT 3" ABOVE THE TOP OF THE DOORWAY HEIGHT WHEN LOCATED ABOVE THE DOORWAY. COORDINATE WITH KENNY ROOKS AND THE POWER INSTALLING TRADES PRIOR TO INSTALLATION.

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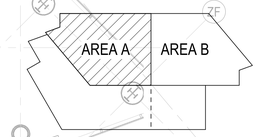
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

1 M104 ZONE PLAN - LEVEL 4
1/8" = 1'-0"

PETER HOGAN LANGHAM REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

ZONE PLAN - LEVEL 4

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M104

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X00	PLAN NOTES
390	MOUNT THE STATIC PRESSURE PICKUP INSIDE THE WALL. WITH FLAT FACE OF THE PICKUP FLUSH TO THE FINISHED FACE OF THE WALL, AT A HEIGHT OF 8'-0" AFF.
393	MOUNT THE BAS CONTROL TRANSFORMERS ON THE WALL AT A 7'-6" HEIGHT WHERE ABOVE BAS PANELS AND AT 3" ABOVE THE TOP OF THE DOORWAY HEIGHT WHEN LOCATED ABOVE THE DOORWAY. COORDINATE WITH KENNY ROOKS AND THE POWER INSTALLING TRADES PRIOR TO INSTALLATION.

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1 M105 ZONE PLAN - LEVEL 5
1/8" = 1'-0"

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

AREA A | AREA B

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

BSA
SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAKE REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

ZONE PLAN - LEVEL 5

DATE
BSA PROJECT NO. 00360481

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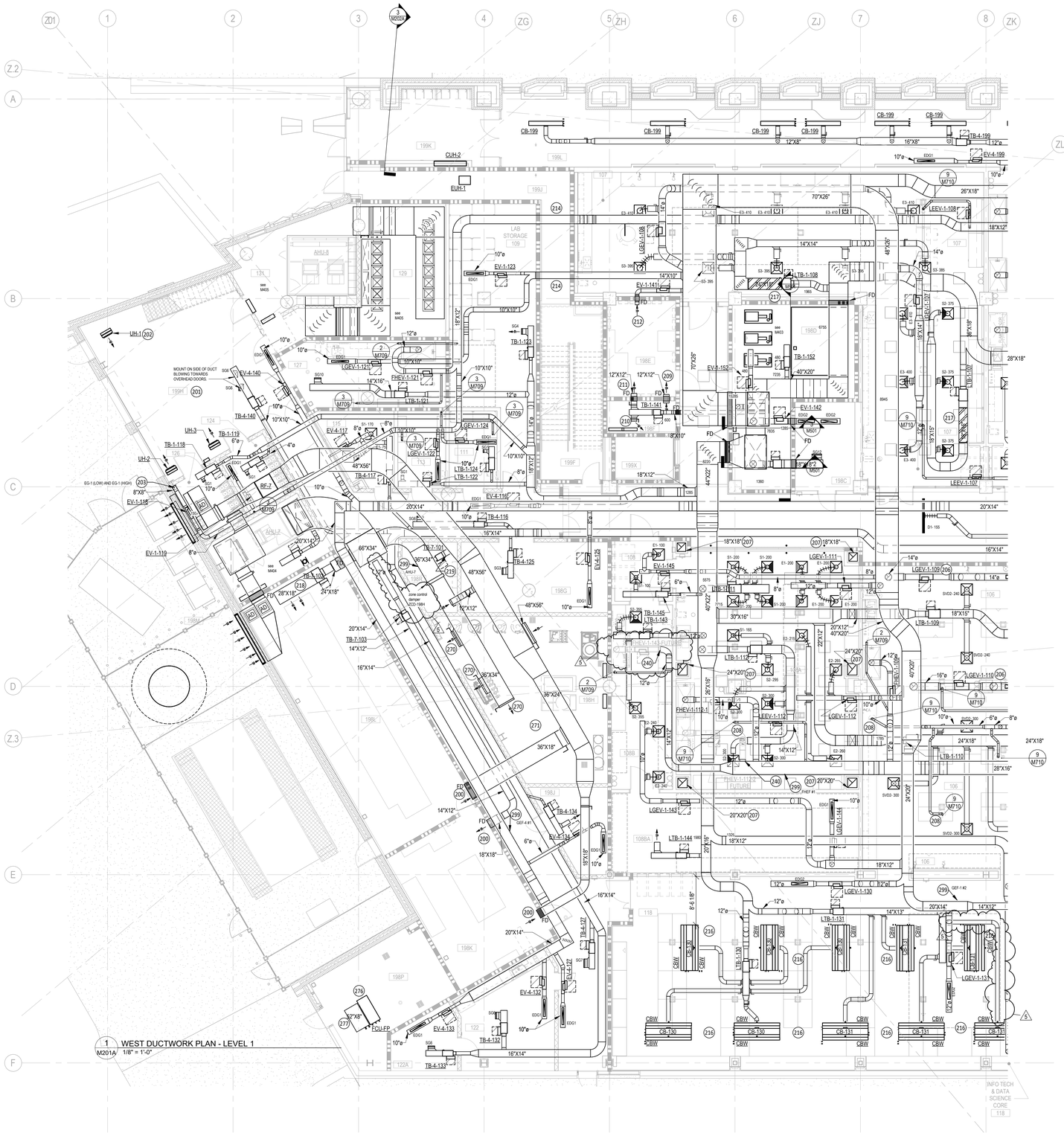

X00	PLAN NOTES
200	TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER IS VISIBLE FROM INSIDE THE ELECTRICAL ROOM. PROVIDE ACCESS DOOR IN DUCT ON THE HALLWAY SIDE OF THE WALL EVEN IF THE LINKS ARE LOCATED ON THE ELECTRICAL ROOM SIDE.
201	PROVIDE CLEAR ACCESS SPACE PER THE CONTRACTUAL REQUIREMENTS LEGEND OF A MINIMUM OF 12'-0" AFF IN THIS ENTIRE ROOM EXCEPT WHERE SPECIFICALLY NOTED TO BE 10'-0" (THE ONE UNIT HEATER).
202	PROVIDE CLEAR ACCESS SPACE PER THE CONTRACTUAL REQUIREMENTS LEGEND OF 10'-0" AT THIS ONE UNIT HEATER.
203	ROUTE LOW EXHAUST DOWN TO BOTTOM OF DUCT AT 9" A.F.F. MOUNT LOWER GRILLE ON DUCT FACE WITH BOTTOM OF GRILLE 12" A.F.F. MOUNT UPPER GRILLE ON DUCT FACE AT 9'-0" AFF. BALANCE AIRFLOW 50% TO EACH GRILLE.
206	DUCTWORK ROUTED SUCH THAT TERMINAL BOX/AFCV IS MAXIMUM 3' ABOVE CEILING. MAINTAIN DUCT ROUTING AS SHOWN FOR ACCESS TO TERMINAL BOX/AFCV.
207	PROVIDE EXHAUST DUCT (CAPPED ON TOP AND BOTTOM) IN WALL CAVITY AS PART OF THE SCOPE OF THIS PROJECT FOR FUTURE CONNECTION. DUCT TO TERMINATE 6" ABOVE FLOOR AND 6" ABOVE CEILING.
208	TERMINATE DUCTWORK OPEN ENDED TO THE ABOVE CEILING SPACE IF THE FUTURE SNORKEL IS NOT INSTALLED WHEN TAB WILL OCCUR AND BALANCE THE OPEN DUCT TO THE SAME CFM THAT THE SNORKEL WOULD HAVE HAD.
209	MOUNT TOP OF TRANSFER DUCT NO MORE THAN 12" BELOW THE BOTTOM OF THE STRUCTURAL SLAB ABOVE. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLES ON ENDS OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
210	BALANCE TO ACHIEVE 100 CFM AT MAX AIRFLOW.
211	MOUNT TOP OF SUPPLY DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
212	MOUNT TOP OF EXHAUST DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
214	COORDINATE WITH ALL TRADES SUCH THAT THIS DUCTWORK PASSES ABOVE THE "RATED LID" OF THIS HALLWAY/STAIR EXTENSION SUCH THAT NO PORTION OF THE DUCT IS PASSING THROUGH TWO HOUR FIRE RATED CONSTRUCTION.
216	MOUNT THE BOTTOM FACE OF ALL THE CHILLED BEAMS AND CB WINGS IN THIS ROOM AT 12'-0" AFF AND SPACE THEM AS DIMENSIONED HERE
217	BUILD THIS HUMIDIFIER INSTALLATION SECTION TODAY FOR USE BY A FUTURE HUMIDIFIER.
218	PROVIDE TB DISCHARGE DUCT (WITH A SOLID END AND WITH BOD AT 13'-0" AFF) WHERE THE DISCHARGE DUCT HAS A 36" LONG x 16" HIGH CUT OPENING ON THE SIDE NEAREST THE SWITCHGEAR.
219	PROVIDE TB DISCHARGE DUCT (WITH A SOLID END) WITH A 12" LONG x 10" HIGH CUT OPENING ON THE SIDE AWAY FROM THE WALL.
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
270	PROVIDE 36"x24" MANUAL VOLUME DAMPER AND BALANCE EACH DAMPER TO 2700 CFM WITH THE ZONE CONTROL DAMPER 75% OPEN AT THE DUCT STATIC PRESSURE SETPOINT.
271	PROVIDE CLEAR ACCESS SPACE PER THE CONTRACTUAL REQUIREMENTS LEGEND OF A MINIMUM OF 12'-0" AFF IN THIS ENTIRE ROOM.
276	PROVIDE CLEAR ACCESS SPACE BELOW ALL INSTALLATIONS RELATED TO THIS FCU OF NO LOWER THAN 10'-6" AFF. MOUNT BOTTOM OF FCU NO HIGHER THAN 11'-0" AFF.
277	PROVIDE FCU DISCHARGE DUCT (WITH A SOLID END) WHERE THE DISCHARGE DUCT HAS A 16" LONG x 6" HIGH CUT OPENING ON BOTH OF THE SIDES.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS** WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS SPACE. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

D. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE OF THAT SPACE'S PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) IN ALL SPACES WHICH HAVE PARTIAL CEILINGS. NOTE THAT THE "MINIMUM 1" ABOVE HEIGHT REQUIREMENT" NOTED IN THE PRIOR SENTENCE DOES NOT APPLY TO CHILLED BEAM MANUFACTURER'S INTEGRAL DIFFUSER MOUNTING HEIGHT: INSTALL THE BOTTOM HORIZONTAL FINISHED FACE OF THE CHILLED BEAM DIFFUSER AT EXACTLY THE SAME HEIGHT AS THE BOTTOM HORIZONTAL FINISHED FACE OF THE PARTIAL CEILING. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

E. IN SPACES WHICH CONTAIN **MORE THAN ONE PARTIAL CEILING** SURFACE, THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, EXPOSED BULKHEAD CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS). **OF THE LOWEST HEIGHT PARTIAL CEILING** IN ALL SPACES WHICH HAVE MULTIPLE PARTIAL CEILINGS. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

F. CLOSE COORDINATION AMONGST THE INSTALLING TRADES IS RECOMMENDED IN ORDER TO PROVIDE THE CONTRACTUALLY REQUIRED CLEAR ACCESS SPACE. THE REMOVAL AND REINSTALLATION OF IMPROPERLY INSTALLED COMPONENTS AS NEEDED TO PROVIDE THE CLEAR ACCESS SPACE SHALL OCCUR SOLELY AT THE EXPENSE OF THE CONTRACTOR WHICH INSTALLED THE IMPROPER COMPONENTS AND SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF PARTIAL SUBSTANTIAL COMPLETION OR ANY OTHER SUBSTANTIAL COMPLETION CERTIFICATE IS ISSUED. IMPROPERLY INSTALLED COMPONENTS SHALL INCLUDE THOSE COMPONENTS WHICH ARE BELOW THE REQUIRED CLEAR ACCESS HEIGHT AND ALSO INCLUDE ANY AND ALL COMPONENTS LOCATED ABOVE THE CLEAR ACCESS SPACE IN THE ADJOINING AREA WHICH MUST BE RELOCATED IN ORDER TO MEET BOTH THE FUNCTIONAL NEEDS OF THE COMPONENTS AND THE CLEAR ACCESS SPACE REQUIREMENT.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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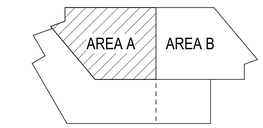

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

DUCTWORK PLAN - LEVEL 1 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

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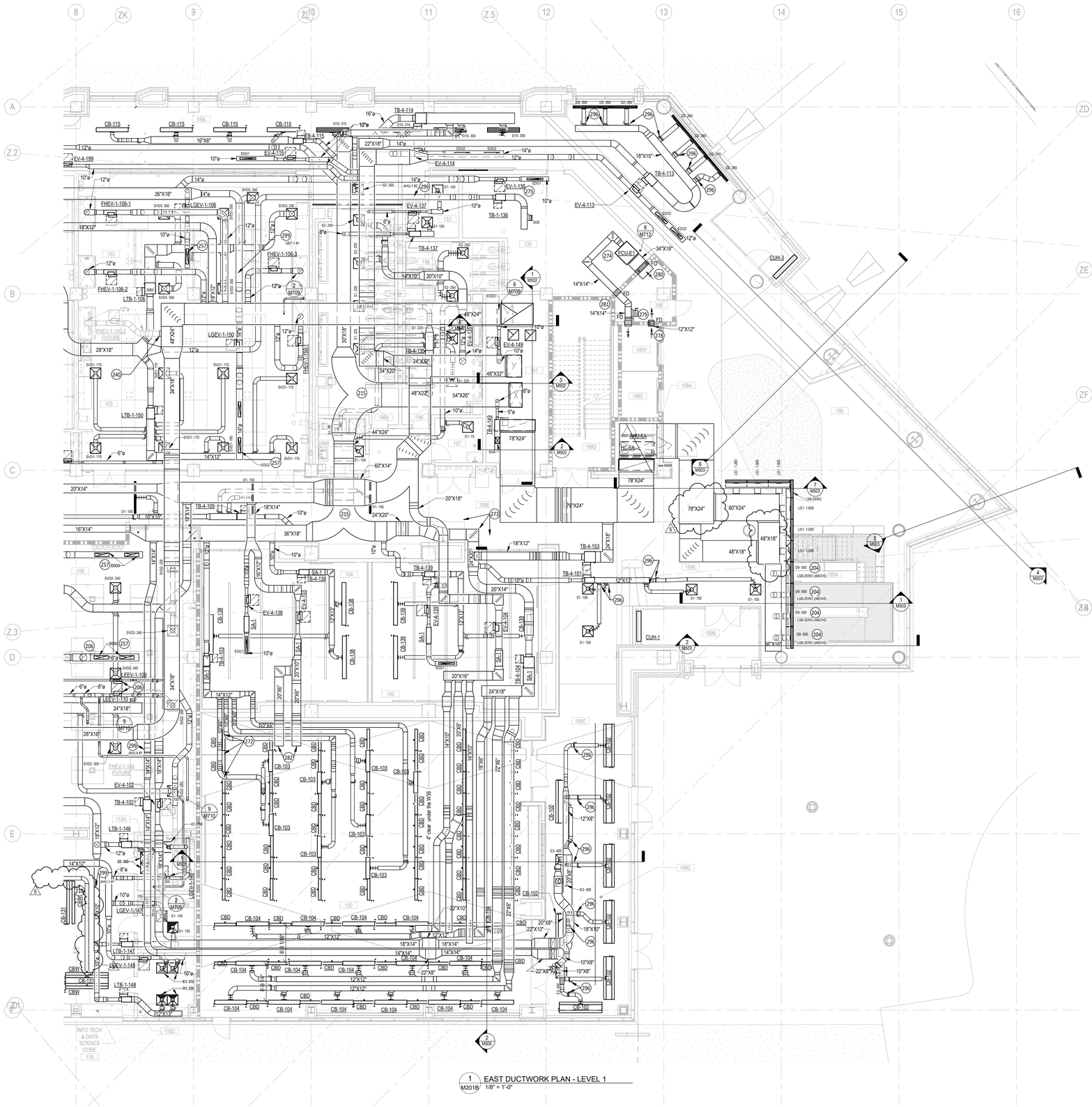
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X00	PLAN NOTES
209	MOUNT TOP OF TRANSFER DUCT NO MORE THAN 12" BELOW THE BOTTOM OF THE STRUCTURAL SLAB ABOVE. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLES ON ENDS OF DUCT. FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
211	MOUNT TOP OF SUPPLY DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT. FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
213	BALANCE TO ACHIEVE 50 CFM AT MAX AIRFLOW.
220	THIS CHILLED BEAM IS FURNISHED WITH A ONE-WAY (VERTICAL) DISCHARGE DIFFUSER. SEE SCHEDULES AND DETAILS.
221	THIS CHILLED BEAM IS POSITIONED SUCH THAT THE CB BETWEEN THE TWO CLOUDS IS CENTERED BETWEEN THE TWO CLOUDS AND THE CB WHICH ARE ADJACENT TO ONLY ONE CLOUD ARE SPACED THAT SAME DISTANCE FROM THE EDGE OF THE CLOUD AS THE CB CENTERED BETWEEN TWO CLOUDS. THE BOTTOM FACE OF THE CB IS AT THE SAME HEIGHT AS THE BOTTOM FACE OF THE CLOUD CEILING TILE.
222	THIS CHILLED BEAM IS POSITIONED SUCH THAT THE CB IS SPACED THAT SAME DISTANCE FROM THE EDGE OF THE CLOUD AS THE CB CENTERED BETWEEN TWO CLOUDS IN ROOM 213B (APPROXIMATELY 10" CLEAR BETWEEN THE EDGE OF THE WING AND THE EDGE OF THE CEILING). THE BOTTOM FACE OF THE CB IS AT THE SAME HEIGHT AS THE BOTTOM FACE OF THE CLOUD CEILING TILE.

X00	PLAN NOTES
225	THIS PARTICULAR CHILLED BEAM IS FURNISHED WITH A ONE-WAY (ALL AIR HORIZONTAL) DISCHARGE DIFFUSER SUCH THAT ALL THE AIR DISCHARGED IS DIRECTED AWAY FROM THE BUILDING'S EXTERIOR WALL HORIZONTALLY OVER TOP OF THE BUILT IN WOOD NOOK. THE OTHER CHILLED BEAMS WITH THIS SAME TAG WHICH ARE NOT LOCATED OVER TOP THE WOOD NOOK HAVE THE STANDARD TWO WAY HORIZONTAL DIFFUSERS.
232	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
297	ROUTE DUCTWORK TO ENTER ROOM OVER THE DOORWAY SO AS TO NOT BE ABOVE ANY WALLS THAT COULD BE USED FOR PANELBOARDS.
298	COORDINATE WITH ALL TRADES TO PROVIDE CLEAR ACCESS FOR A FUTURE CB AND FUTURE CBW WHICH ARE IDENTICAL IN SIZE AND LOCATION TO THE COMPONENTS LOCATED IN THE AISLEWAY DIRECTLY ADJACENT TO THIS AISLEWAY. THE CLEAR ACCESS SPACE SHALL EXTEND TO A HEIGHT OF 12" ABOVE THE REMAINING ROOM CLEAR ACCESS SPACE SUCH THAT A FUTURE CHILLED BEAM COULD BE INSTALLED IN THIS LOCATION WITHOUT THE RELOCATION OF ANY OTHER INSTALLED COMPONENTS. PLEASE DO NOT SEND ANY RFIS IN ABOUT THIS PLAN NOTE.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS** WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS SPACE. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

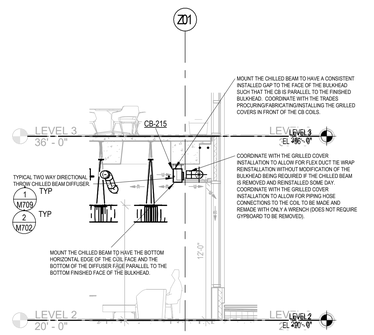
D. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE OF THAT SPACE'S PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING; OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) IN ALL SPACES WHICH HAVE PARTIAL CEILINGS. NOTE THAT THE "MINIMUM 1" ABOVE HEIGHT REQUIREMENT" NOTED IN THE PRIOR SENTENCE DOES NOT APPLY TO CHILLED BEAM MANUFACTURER'S INTEGRAL DIFFUSER MOUNTING HEIGHT: INSTALL THE BOTTOM HORIZONTAL FINISHED FACE OF THE CHILLED BEAM DIFFUSER AT EXACTLY THE SAME HEIGHT AS THE BOTTOM HORIZONTAL FINISHED FACE OF THE PARTIAL CEILING. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

E. IN SPACES WHICH CONTAIN **MORE THAN ONE PARTIAL CEILING** SURFACE, THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, EXPOSED BULKHEAD CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) **OF THE LOWEST HEIGHT PARTIAL CEILING** IN ALL SPACES WHICH HAVE MULTIPLE PARTIAL CEILINGS. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

F. CLOSE COORDINATION AMONGST THE INSTALLING TRADES IS RECOMMENDED IN ORDER TO PROVIDE THE CONTRACTUALLY REQUIRED CLEAR ACCESS SPACE. THE REMOVAL AND REINSTALLATION OF IMPROPERLY INSTALLED COMPONENTS AS NEEDED TO PROVIDE THE CLEAR ACCESS SPACE SHALL OCCUR SOLELY AT THE EXPENSE OF THE CONTRACTOR WHICH INSTALLED THE IMPROPER COMPONENTS AND SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF PARTIAL SUBSTANTIAL COMPLETION OR ANY OTHER SUBSTANTIAL COMPLETION CERTIFICATE IS ISSUED. IMPROPERLY INSTALLED COMPONENTS SHALL INCLUDE THOSE COMPONENTS WHICH ARE BELOW THE REQUIRED CLEAR ACCESS HEIGHT AND ALSO INCLUDE ANY AND ALL COMPONENTS LOCATED ABOVE THE CLEAR ACCESS SPACE IN THE ADJOINING AREA WHICH MUST BE RELOCATED IN ORDER TO MEET BOTH THE FUNCTIONAL NEEDS OF THE COMPONENTS AND THE CLEAR ACCESS SPACE REQUIREMENT.

1 M202A WEST DUCTWORK PLAN - LEVEL 2
3/16" = 1'-0"

3 M202A SECTION AT PERIMETER OF LAB OF CHILLED BEAM MOUNTED NEXT TO BULKHEAD
3/16" = 1'-0"



2 SECTION AT PERIMETER BULKHEAD WITH CHILLED BEAMS MOUNTED ADJOINING THE BULKHEAD
3/16" = 1'-0"

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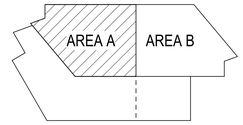

KEYPLAN
PROJECT NORTH
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DUCTWORK PLAN - LEVEL 2 - AREA A

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X00	PLAN NOTES
223	THIS CHILLED BEAM IS POSITIONED SUCH THAT THE CLOSEST VERTICAL FACE OF THE CB IS SPACED 13" FROM THE CLOSEST VERTICAL EDGE OF THE CLOUD. THE BOTTOM FACE OF THE CB IS AT THE SAME HEIGHT AS THE BOTTOM FACE OF THE CLOUD CEILING SURFACES.
224	MOUNT THE BOTTOM OF THIS CB DIFFUSER AT 10'-3" AFF AND SPACE THEM AS NOTED HERE.
232	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
233	ADJUST ALL FOUR SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY AWAY FROM THE EXTERIOR GLASS, DOWN THE LENGTH OF THE CLOUD CEILING

X00	PLAN NOTES
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
296	PROVIDE A VOLUME DAMPER WITH REMOTE OPERATOR FOR THIS SUPPLY DUCT SIMILAR TO YOUNG REGULATOR 830ACC WITH EBDP HAND-HELD POWER PACK POSITIONER AND CABLE. FABRICATE A BRACKET FOR THE EBDP AND LOCATE IT ADJOINING THE SUPPLY AIR TERMINAL DDC CONTROLLER IN AN ACCESSIBLE AREA.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT. FIRE PROTECTION BRANCH PIPING. FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS**. WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS SPACE. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

D. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE OF THAT SPACE'S PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) IN ALL SPACES WHICH HAVE PARTIAL CEILINGS. NOTE THAT THE "MINIMUM 1" ABOVE HEIGHT REQUIREMENT" NOTED IN THE PRIOR SENTENCE DOES NOT APPLY TO CHILLED BEAM MANUFACTURER'S INTEGRAL DIFFUSER MOUNTING HEIGHT. INSTALL THE BOTTOM HORIZONTAL FINISHED FACE OF THE CHILLED BEAM DIFFUSER AT EXACTLY THE SAME HEIGHT AS THE BOTTOM HORIZONTAL FINISHED FACE OF THE PARTIAL CEILING. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

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1 M202B EAST DUCTWORK PLAN - LEVEL 2
3/16" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LANGDON
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 2 - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M202B

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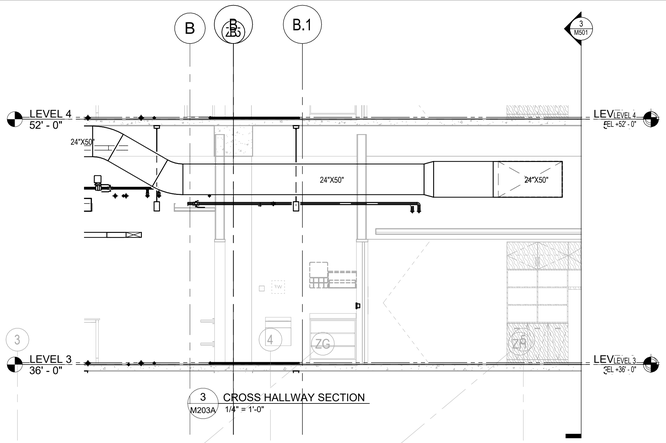
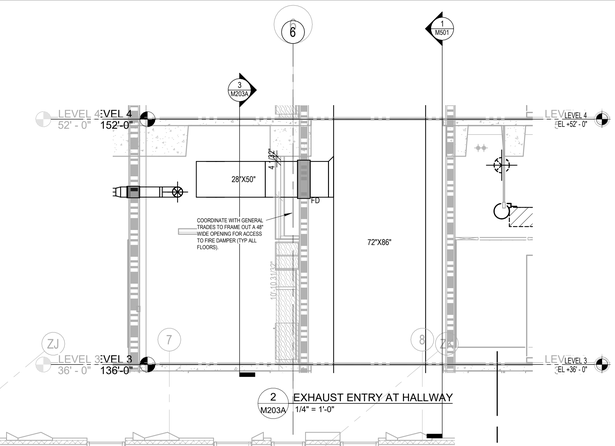
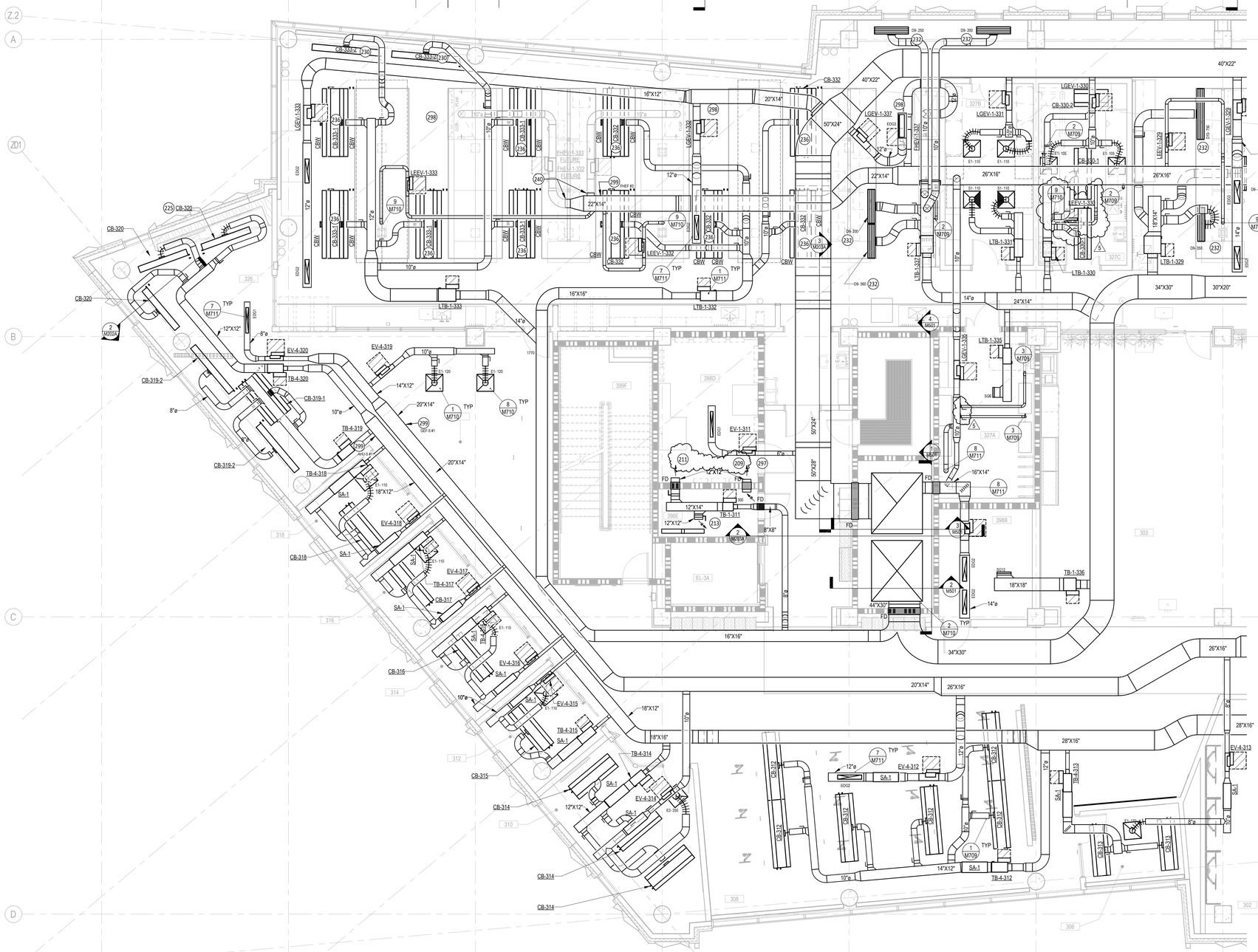


3 CROSS HALLWAY SECTION
M203A 1/4" = 1'-0"



2 EXHAUST ENTRY AT HALLWAY
M203A 1/4" = 1'-0"



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232	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
234	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE OVERHEAD SERVICE COLUMN AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE OVERHEAD SERVICE COLUMN).
235	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE BACK OF THE FUME HOOD AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE BACK OF THE FUME HOOD).
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
296	PROVIDE A VOLUME DAMPER WITH REMOTE OPERATOR FOR THIS SUPPLY DUCT SIMILAR TO YOUNG REGULATOR 830ACC WITH EBDP HAND-HELD POWER PACK POSITIONER AND CABLE. FABRICATE A BRACKET FOR THE EBDP AND LOCATE IT ADJOINING THE SUPPLY AIR TERMINAL DDC CONTROLLER IN AN ACCESSIBLE AREA.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

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1 M203B EAST DUCTWORK PLAN - LEVEL 3
3/16" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
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REFER TO CIVIL DRAWINGS FOR TRUE NORTH

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3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

REGISTERED INDIANA LANDSCAPE ARCHITECT No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 3 - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M203B

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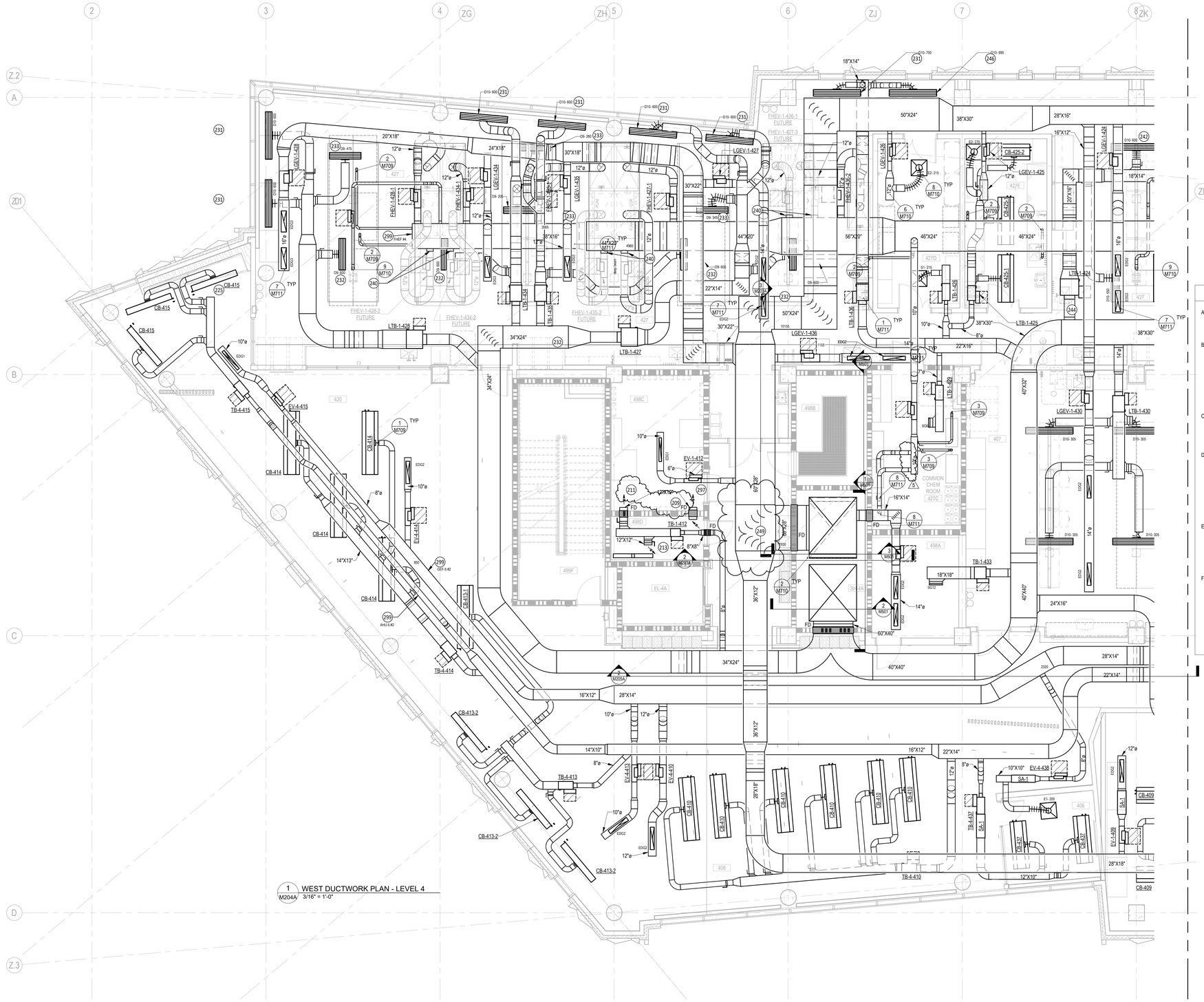

X00	PLAN NOTES
209	MOUNT TOP OF TRANSFER DUCT NO MORE THAN 12" BELOW THE BOTTOM OF THE STRUCTURAL SLAB ABOVE. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLES ON ENDS OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
211	MOUNT TOP OF SUPPLY DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
213	BALANCE TO ACHIEVE 50 CFM AT MAX AIRFLOW.
225	THIS PARTICULAR CHILLED BEAM IS FURNISHED WITH A ONE-WAY (ALL AIR HORIZONTAL) DISCHARGE DIFFUSER SUCH THAT ALL THE AIR DISCHARGED IS DIRECTED AWAY FROM THE BUILDING'S EXTERIOR WALL HORIZONTALLY OVER TOP OF THE BUILT IN WOOD NOOK. THE OTHER CHILLED BEAMS WITH THIS SAME TAG WHICH ARE NOT LOCATED OVER TOP THE WOOD NOOK HAVE THE STANDARD TWO WAY HORIZONTAL DIFFUSERS.
231	ADJUST ALL FOUR SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY TOWARD THE EXTERIOR GLASS.
232	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
233	ADJUST ALL FOUR SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY AWAY FROM THE EXTERIOR GLASS, DOWN THE LENGTH OF THE CLOUD CEILING
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
242	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION TOWARD THE EXTERIOR GLAZING AND ONE SLOT TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION ALONG THE CLOUD CEILING.
244	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION OFF THE EDGE OF THE CLOUD CEILING TOWARD THE WALL AND ONE SLOT TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION ALONG THE CLOUD CEILING TOWARD THE OVERHEAD SERVICE COLUMN.
246	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY TOWARD THE EXTERIOR GLASS AND TWO SLOTS TO DISCHARGE HORIZONTALLY TOWARD THE INTERIOR WALL OF ROOM 1717-417D.
249	ECCENTRIC CONVERGING BULLHEAD TEE WITH GUIDE VANES.
297	ROUTE DUCTWORK TO ENTER ROOM OVER THE DOORWAY SO AS TO NOT BE ABOVE ANY WALLS THAT COULD BE USED FOR PANELBOARDS
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

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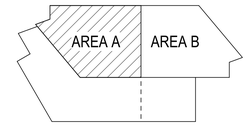

KEYPLAN
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PETER HOGAN LANCASTER REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 4 - AREA A

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

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241	PROVIDE 4" WELDED STAINLESS EXHAUST DUCT DOWN FLUSH WITH WALL BEHIND THE GLASSWARE WASHER. TERMINATE DUCT OPEN-ENDED 4" FROM THE WASHER DISCHARGE (SEE FINAL PROCESSED WASHER SUBMITTAL). INSTALL AN ELBOW ON THE WASHER DISCHARGE AND ORIENT THE ELBOW SUCH THAT IT BLOWS INTO THE OPEN-ENDED DUCT. COORDINATE WITH ALL TRADES TO ROUTE DUCT DROP WITHIN THE WALL. BALANCE TO 50 CFM.
242	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION TOWARD THE EXTERIOR GLAZING AND ONE SLOT TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION ALONG THE CLOUD CEILING.

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246	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY TOWARD THE EXTERIOR GLASS AND TWO SLOTS TO DISCHARGE HORIZONTALLY TOWARD THE INTERIOR WALL OF ROOM 417F/417D.
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B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS** WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS SPACE. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

D. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE OF THAT SPACE'S PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) IN ALL SPACES WHICH HAVE PARTIAL CEILINGS. NOTE THAT THE "MINIMUM 1" ABOVE HEIGHT REQUIREMENT" NOTED IN THE PRIOR SENTENCE DOES NOT APPLY TO CHILLED BEAM MANUFACTURER'S INTEGRAL DIFFUSER MOUNTING HEIGHT: INSTALL THE BOTTOM HORIZONTAL FINISHED FACE OF THE CHILLED BEAM DIFFUSER AT EXACTLY THE SAME HEIGHT AS THE BOTTOM HORIZONTAL FINISHED FACE OF THE PARTIAL CEILING. INCLUDE ADDITIONAL ACCESS SPACE AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

E. IN SPACES WHICH CONTAIN **MORE THAN ONE PARTIAL CEILING** SURFACE, THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, EXPOSED BULKHEAD CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) **OF THE LOWEST HEIGHT PARTIAL CEILING** IN ALL SPACES WHICH HAVE MULTIPLE PARTIAL CEILINGS. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

F. CLOSE COORDINATION AMONGST THE INSTALLING TRADES IS RECOMMENDED IN ORDER TO PROVIDE THE CONTRACTUALLY REQUIRED CLEAR ACCESS SPACE. THE REMOVAL AND REINSTALLATION OF IMPROPERLY INSTALLED COMPONENTS AS NEEDED TO PROVIDE THE CLEAR ACCESS SPACE SHALL OCCUR SOLELY AT THE EXPENSE OF THE CONTRACTOR WHICH INSTALLED THE IMPROPER COMPONENTS AND SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF PARTIAL SUBSTANTIAL COMPLETION OR ANY OTHER SUBSTANTIAL COMPLETION CERTIFICATE IS ISSUED. IMPROPERLY INSTALLED COMPONENTS SHALL INCLUDE THOSE COMPONENTS WHICH ARE BELOW THE REQUIRED CLEAR ACCESS HEIGHT AND ALSO INCLUDE ANY AND ALL COMPONENTS LOCATED ABOVE THE CLEAR ACCESS SPACE IN THE ADJOINING AREA WHICH MUST BE RELOCATED IN ORDER TO MEET BOTH THE FUNCTIONAL NEEDS OF THE COMPONENTS AND THE CLEAR ACCESS SPACE REQUIREMENT.

1 M204B EAST DUCTWORK PLAN - LEVEL 4
3/16" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAUGANI REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 4 - AREA B

DATE	REF: SHEET INDEX
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M204B

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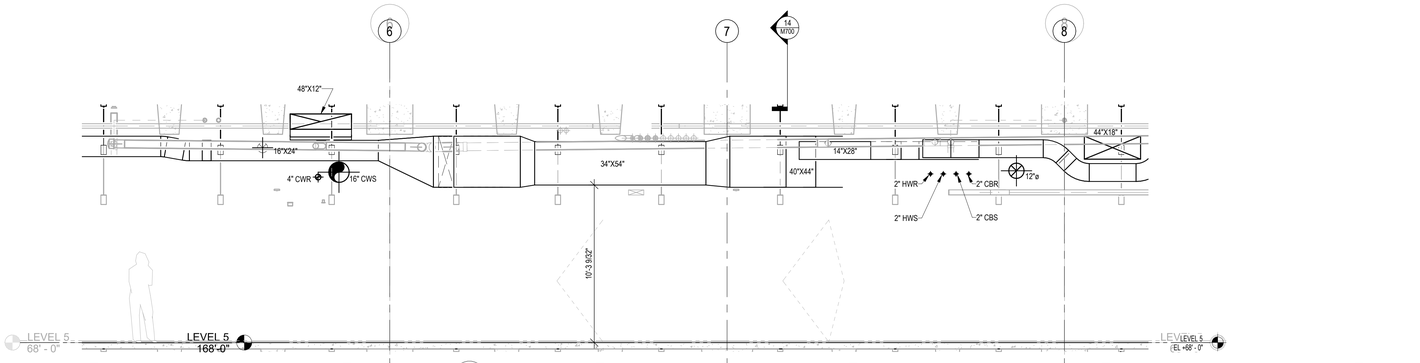
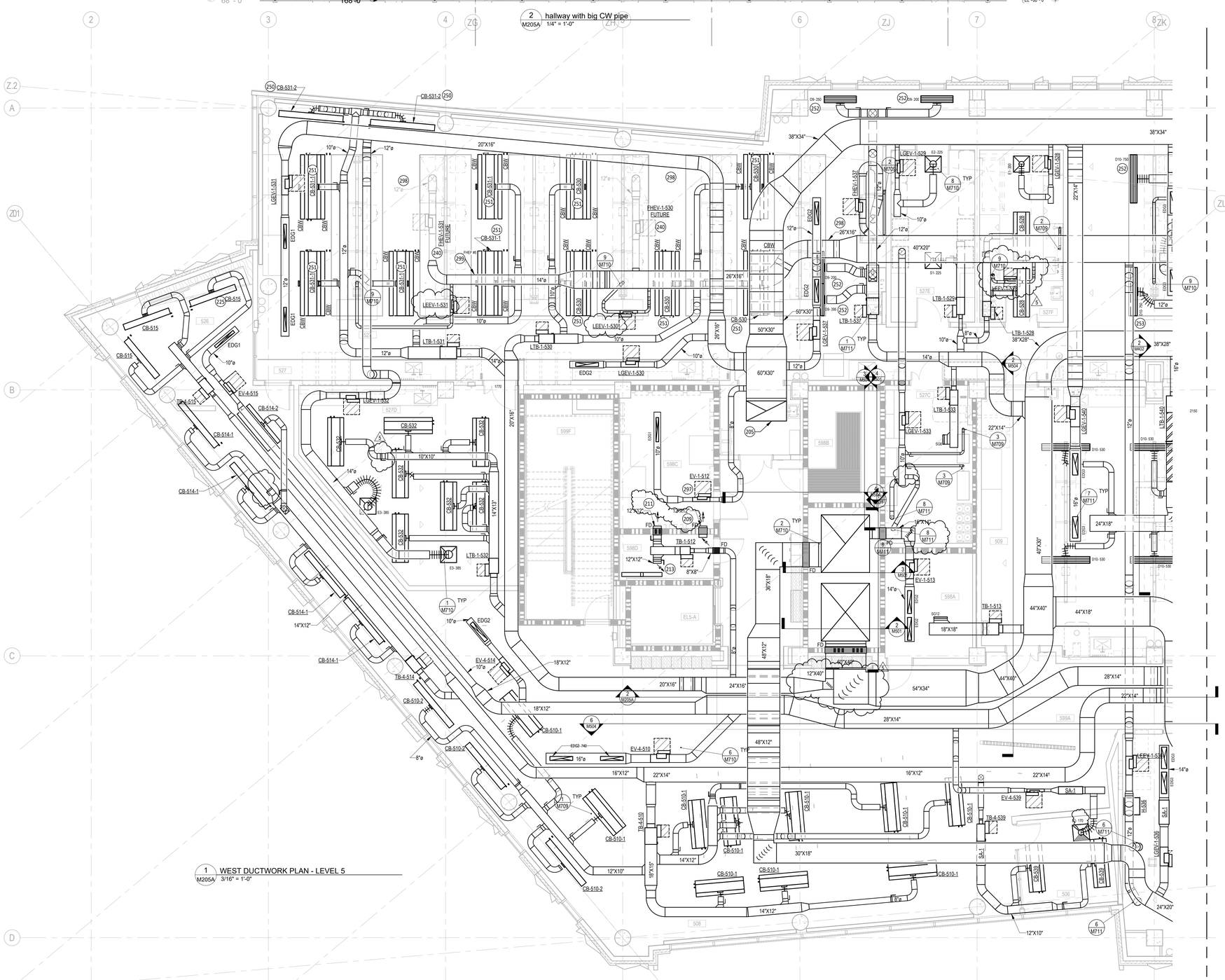


2 M205A hallway with big CW pipe
1/4" = 1'-0"



1 M205A WEST DUCTWORK PLAN - LEVEL 5
3/16" = 1'-0"

X00	PLAN NOTES
205	60"X28" EXHAUST UP TO PENTHOUSE. NO FIRE DAMPER AT PENTHOUSE FLOOR PENETRATION.
209	MOUNT TOP OF TRANSFER DUCT NO MORE THAN 12" BELOW THE BOTTOM OF THE STRUCTURAL SLAB ABOVE. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLES ON ENDS OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
211	MOUNT TOP OF SUPPLY DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE ELECTRICAL ROOM.
213	BALANCE TO ACHIEVE 90 CFM AT MAX AIRFLOW.
225	THIS PARTICULAR CHILLED BEAM IS FURNISHED WITH A ONE-WAY (ALL AIR HORIZONTAL) DISCHARGE DIFFUSER SUCH THAT ALL THE AIR DISCHARGED IS DIRECTED AWAY FROM THE BUILDING'S EXTERIOR WALL HORIZONTALLY OVER TOP OF THE BUILT IN WOOD NOOK. THE OTHER CHILLED BEAMS WITH THIS SAME TAG WHICH ARE NOT LOCATED OVER TOP THE WOOD NOOK HAVE THE STANDARD TWO WAY HORIZONTAL DIFFUSERS.
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
250	THIS CHILLED BEAM IS FURNISHED WITH A ONE-WAY (VERTICAL) DISCHARGE DIFFUSER. SEE SCHEDULES AND DETAILS.
251	THIS CHILLED BEAM IS POSITIONED SUCH THAT THE CB BETWEEN THE TWO CLOUDS IS CENTERED BETWEEN THE TWO CLOUDS AND THE CB WHICH ARE ADJACENT TO ONLY ONE CLOUD ARE SPACED THAT SAME DISTANCE FROM THE EDGE OF THE CLOUD AS THE CB CENTERED BETWEEN TWO CLOUDS. THE BOTTOM FACE OF THE CB IS AT THE SAME HEIGHT AS THE BOTTOM FACE OF THE CLOUD CEILING TILE.
252	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
253	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE OVERHEAD SERVICE COLUMN AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE OVERHEAD SERVICE COLUMN).
297	ROUTE DUCTWORK TO ENTER ROOM OVER THE DOORWAY SO AS TO NOT BE ABOVE ANY WALLS THAT COULD BE USED FOR PANELBOARDS.
298	COORDINATE WITH ALL TRADES TO PROVIDE CLEAR ACCESS FOR A FUTURE CB AND FUTURE CBW WHICH ARE IDENTICAL IN SIZE AND LOCATION TO THE COMPONENTS LOCATED IN THE AISLEWAY DIRECTLY ADJACENT TO THIS AISLEWAY. THE CLEAR ACCESS SPACE SHALL EXTEND TO A HEIGHT OF 12" ABOVE THE REMAINING ROOM CLEAR ACCESS SPACE SUCH THAT A FUTURE CHILLED BEAM COULD BE INSTALLED IN THIS LOCATION WITHOUT THE RELOCATION OF ANY OTHER INSTALLED COMPONENTS. PLEASE DO NOT SEND ANY RFIS IN ABOUT THIS PLAN NOTE.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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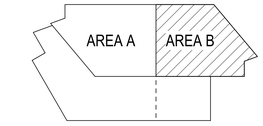

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

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DUCTWORK PLAN - LEVEL 5 - AREA A

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X00	PLAN NOTES
240	PROVIDE A WYE OR TAP AS INDICATED WITH A SEALED CAP THE SIZE OF THE FUTURE FHEV. COORDINATE WITH ALL TRADES SUCH THE THE FUTURE DUCT ROUTING ILLUSTRATED AND FUTURE FHEV IN AN ACCESSIBLE LOCATION MAY BE INSTALLED WITHOUT HAVING TO RELOCATE ANY OTHER TRADE'S EQUIPMENT NOR HANGERS.
241	PROVIDE 4" WELDED STAINLESS EXHAUST DUCT DOWN FLUSH WITH WALL BEHIND THE GLASSWARE WASHER. TERMINATE DUCT OPEN-ENDED 4" FROM THE WASHER DISCHARGE (SEE FINAL PROCESSED WASHER SUBMITTAL). INSTALL AN ELBOW ON THE WASHER DISCHARGE AND ORIENT THE ELBOW SUCH THAT IT BLOWS INTO THE OPEN-ENDED DUCT. COORDINATE WITH ALL TRADES TO ROUTE DUCT DROP WITHIN THE WALL. BALANCE TO 50 CFM.
252	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
253	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE OVERHEAD SERVICE COLUMN AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE OVERHEAD SERVICE COLUMN).

X00	PLAN NOTES
254	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE DIFFUSER ON THE OTHER SIDE OF THE ISLAND AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE CENTER OF THE CLOUD CEILING).
255	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AWAY FROM THE BACK OF THE FUME HOOD AND ONE SLOT OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION (TOWARDS THE BACK OF THE FUME HOOD).
256	COORDINATE CLOSELY WITH THE TRADES PROVIDING THE PERMANENT WINCH SYSTEM / LOWERING TOOL / ELECTRICAL DISCONNECT WHICH IS LOCATED ON THE THIRD FLOOR SHEET A123B. PROVIDE CONTROLLER CABLING / WIRING FOR THE DSF WHICH IS COMPATIBLE WITH THE WINCH LOWERING SYSTEM SUCH THAT THE CONTROLLER CABLE IS ABLE TO BE EXTENDED AND AUTOMATICALLY RETRACTED WHEN THE DSF IS WINCHED DOWN TO IT'S LOWEST FINAL POSITION.
299	COORDINATE ACCESS TO DUCT STATIC PRESSURE SENSOR.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

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AREA A AREA B

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PETER KOJAN LANDGREN
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 5 - AREA B

DATE
BSA PROJECT NO. 00360481

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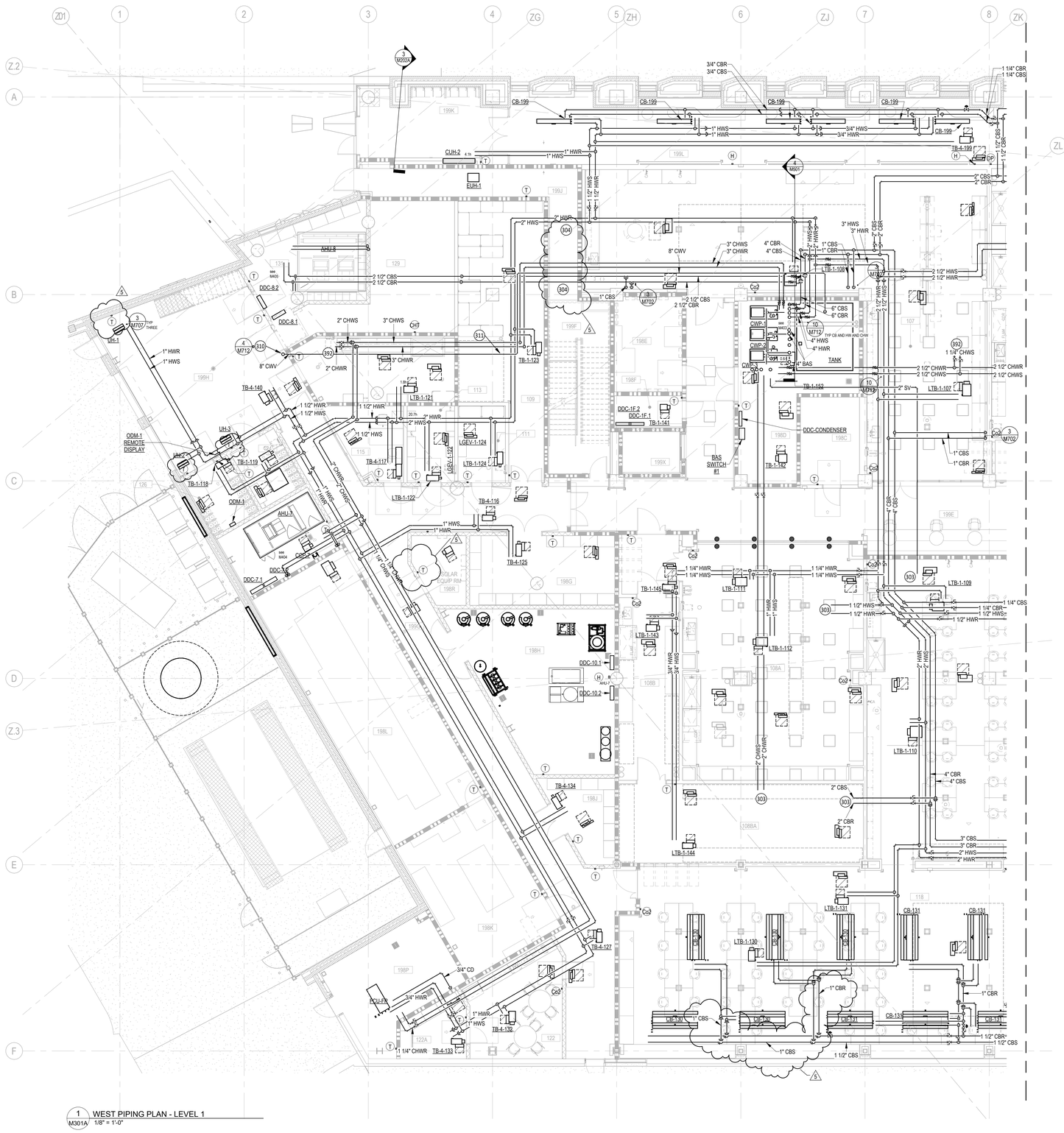

1 M301A WEST PIPING PLAN - LEVEL 1
1/8" = 1'-0"

PLAN NOTES

X00	
303	PROVIDE A THREADED CAP ON THE END OF THE PIPE AND LABEL THE PIPING.
304	COORDINATE WITH ALL TRADES SUCH THAT THIS PIPING PASSES ABOVE THE "RATED LID" OF THIS HALLWAY/STAIR EXTENSION SUCH THAT NO PORTION OF THE PIPE OR PIPE HANGER IS PASSING THROUGH TWO HOUR FIRE RATED CONSTRUCTION.
310	TANK VENT UP THROUGH LOW ROOF. 90 DEGREE ELBOW DOWN WITH TOP OF ELBOW AT 4'-6" ABOVE ROOF MEMBRANE. SEE STEAM VENT (SNV) DETAIL FOR OTHER CONSTRUCTION REQUIREMENTS (SUPPORT, PAINT, STAINLESS HOOD FLASHING, ETC.) NOT NOTED IN THIS NOTE.
311	SLOPE TANK VENT BACK TO TANK SO THAT THERE ARE NO LOW POINTS TO FILL WITH WATER.
392	PROVIDE A THREADED NIPPLE IN THE VALVE WITH A THREADED CAP ON THE END OF THE NIPPLE. INSULATE THE PIPE/NIPPLE/CAP AND LABEL THE PIPING.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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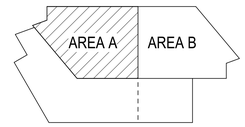

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAKE
REGISTERED
No. PE19500446
STATE OF INDIANA

PIPING PLAN - LEVEL 1 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M301A

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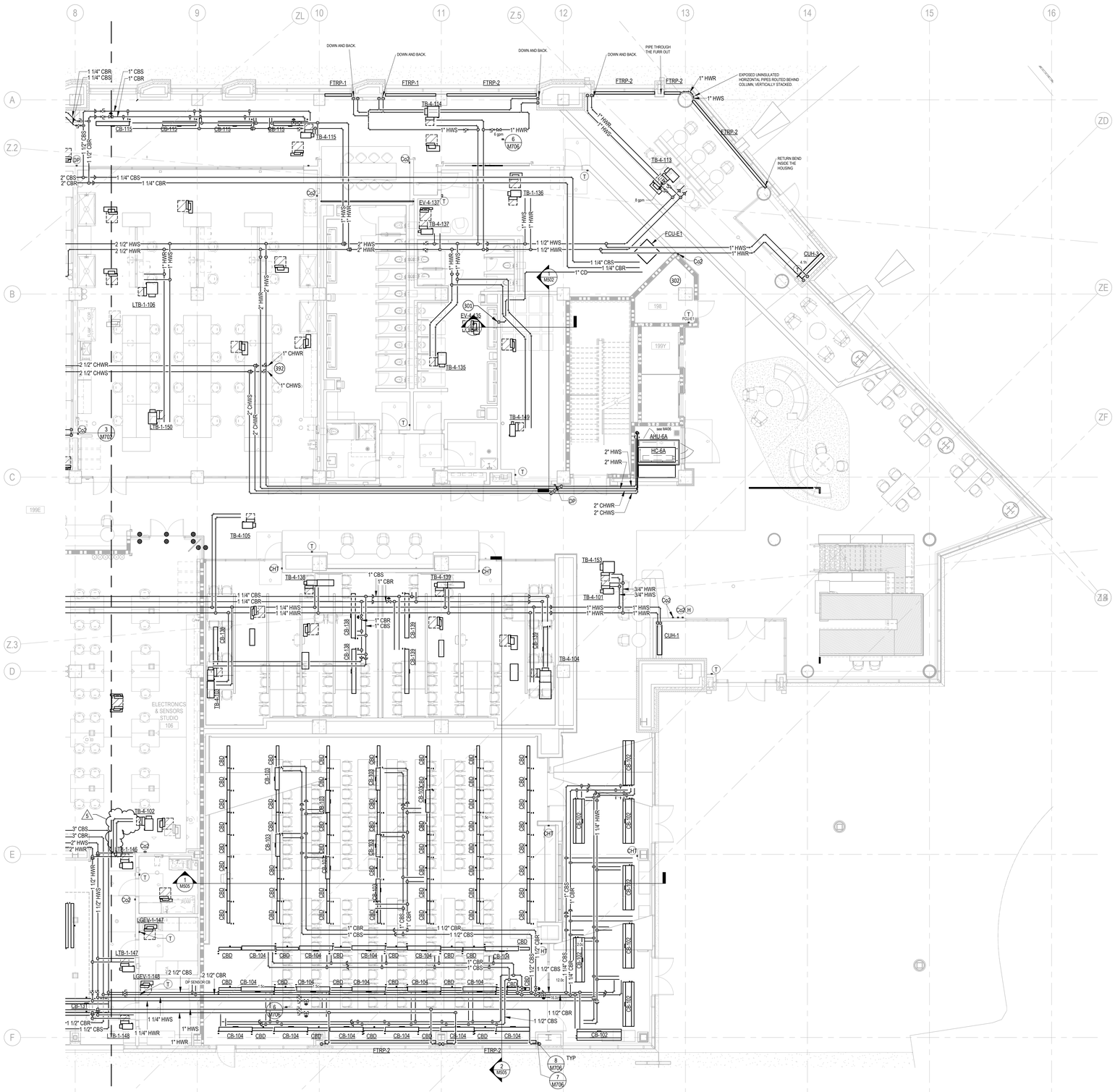

1 M301B EAST PIPING PLAN - LEVEL 1
1/8" = 1'-0"

X00	PLAN NOTES
301	ROUTE CD DOWN INTO WALL. TIE CD INTO THE TAILPIECE OF THE SINK AT A POINT ABOVE THE P TRAP. PROVIDE A THREADED CLEANOUT AT THE WALL JUST BEFORE THE PIPE TURNS DOWN INTO THE WALL. SLOPE HORIZONTAL PIPE TO DRAIN.
302	NO PIPING TO BE ROUTED ABOVE ELEVATOR CONTROL ROOM 198
392	PROVIDE A THREADED NIPPLE IN THE VALVE WITH A THREADED CAP ON THE END OF THE NIPPLE. INSULATE THE PIPE/NIPPLE/CAP AND LABEL THE PIPING.

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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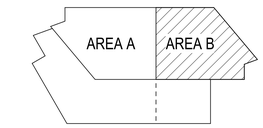

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

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PETER HOGAN LANDON REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING PLAN - LEVEL 1 - AREA B

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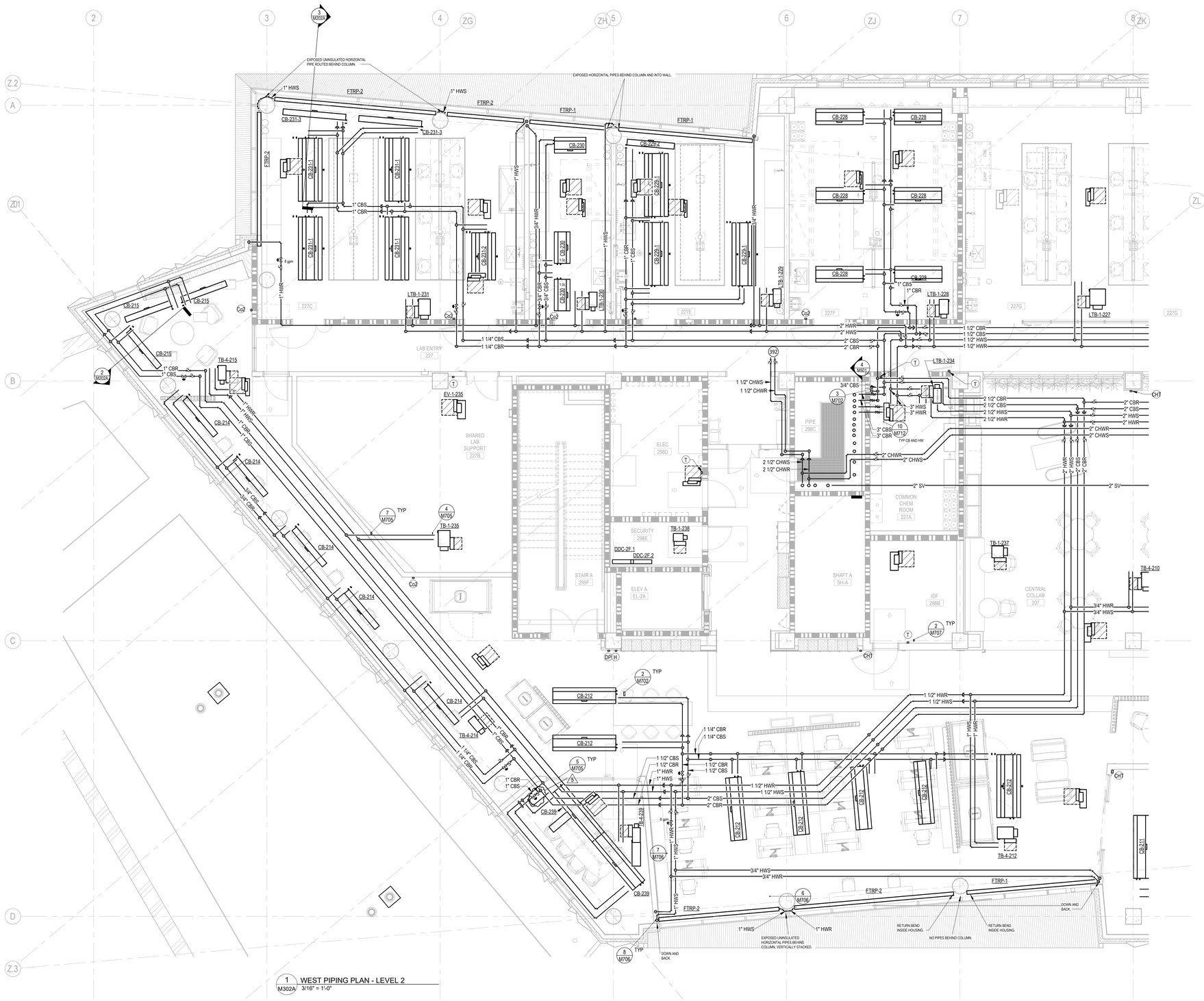

1 M302A WEST PIPING PLAN - LEVEL 2
3/16" = 1'-0"

X00	PLAN NOTES
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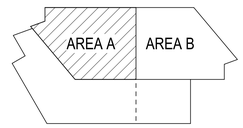

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PIPING PLAN - LEVEL 2 - AREA A

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X00 PLAN NOTES

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1 M302B EAST PIPING PLAN - LEVEL 2
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AREA A | AREA B

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PIPING PLAN - LEVEL 2 - AREA B

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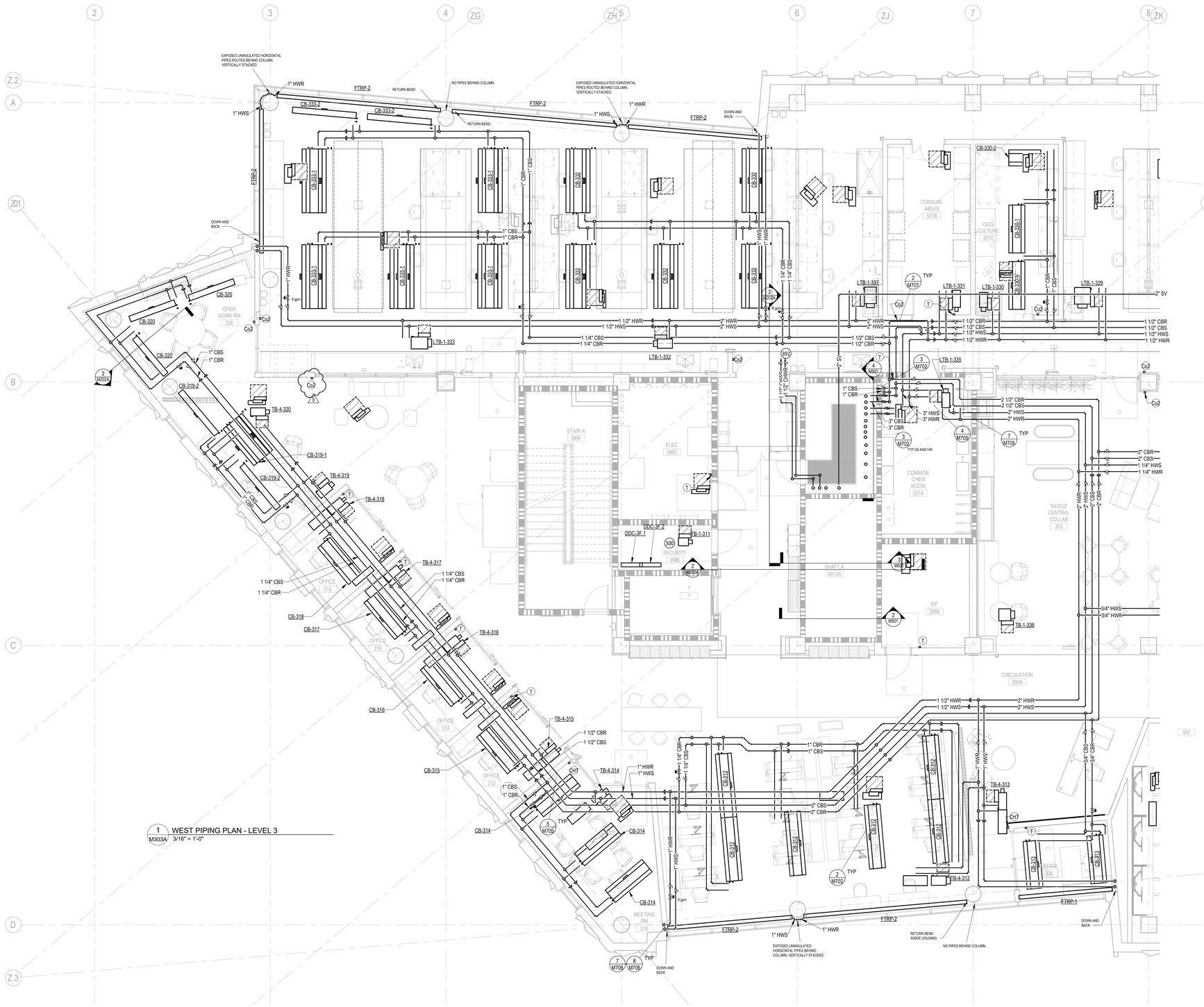
X00	PLAN NOTES
300	PRIOR TO ROUGHING IN CONDUIT FOR ANY BAS PANELS INTO THIS ROOM SUBMIT AN RFI WHICH INCLUDES A DIMENSIONED SKETCH OF THIS ROOM WITH ALL WALL MOUNTED DEVICES ILLUSTRATED. INCLUDE ON THE SKETCH BAS PANELS, SECURITY PANELS, FIRE ALARM PANELS, AND OTHER PANELS WHICH WILL BE WALL MOUNTED, INDICATING THEIR DOOR SWINGS AND CLEARANCE REQUIREMENTS OF EACH PANEL. INCLUDE ALL POWER AND DATA OUTLETS AND ANY ELECTRICAL DISCONNECTS ON THE SKETCH. INCLUDE ALL CONTRACTOR FURNISHED ITEMS WHICH ARE WALL MOUNTED WITHIN THIS ROOM ON THE SKETCH. PROVIDE IN THE RFI WRITTEN CONFIRMATION FROM THE IU PROJECT MANAGER THAT NEITHER THE IULAB OPERATIONAL PERSONNEL NOR THE IULAB TENANTS HAVE PLANS TO MOUNT ANY WALL MOUNTED PANELS NOR OTHER DEVICES WITHIN THIS ROOM.
392	PROVIDE A THREADED NIPPLE IN THE VALVE WITH A THREADED CAP ON THE END OF THE NIPPLE. INSULATE THE PIPE/NIPPLE/CAP AND LABEL THE PIPING.



1 M303A WEST PIPING PLAN - LEVEL 3
3/16" = 1'-0"

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

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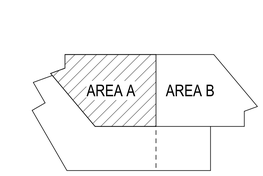
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LANGKOW
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

PIPING PLAN - LEVEL 3 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M303A

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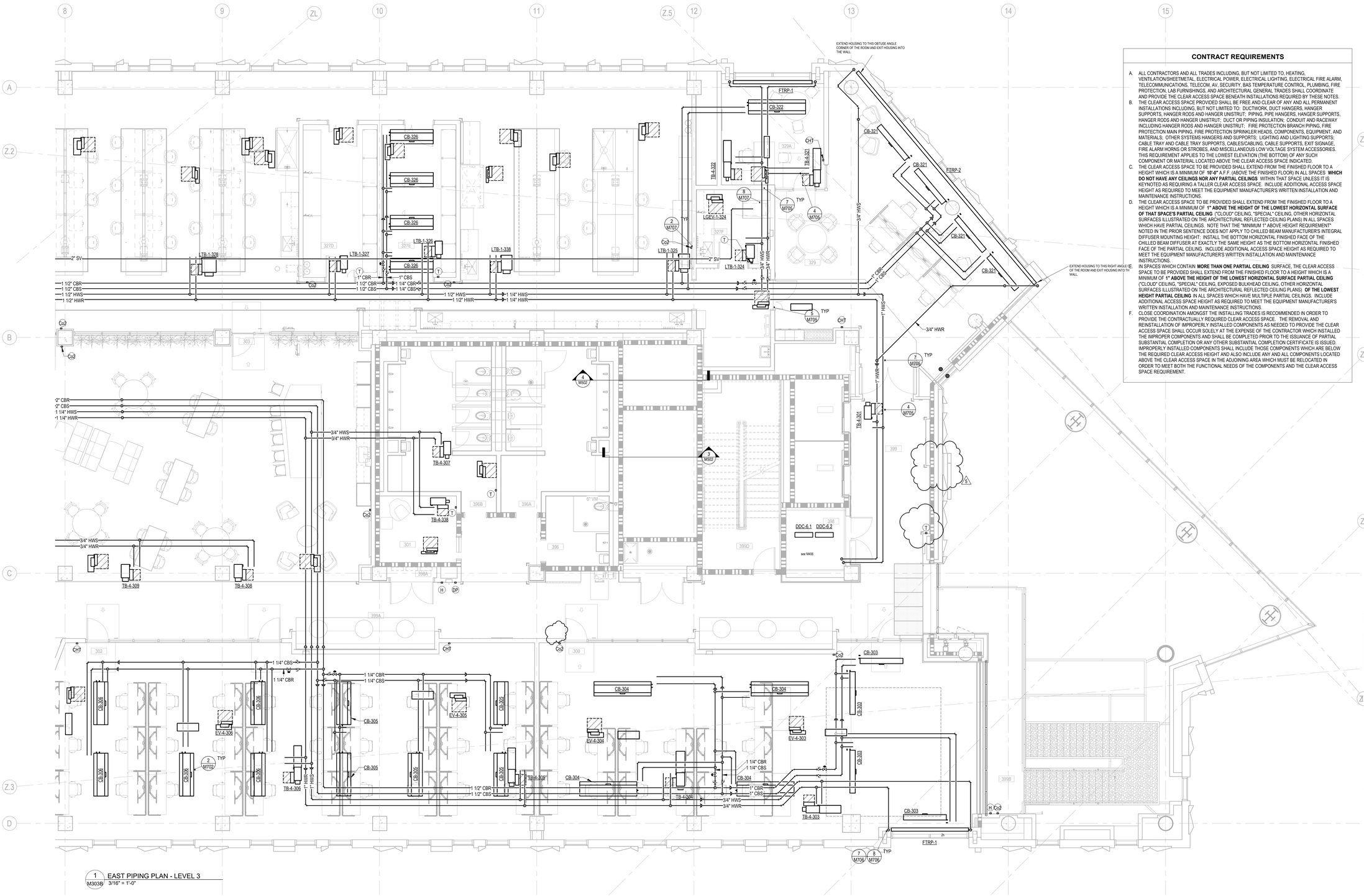
X00 PLAN NOTES



1 M303B EAST PIPING PLAN - LEVEL 3
3/16" = 1'-0"

CONTRACT REQUIREMENTS

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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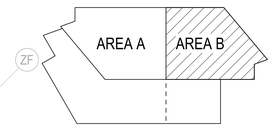

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

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PETER HOGAN LANGSAM REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING PLAN - LEVEL 3 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M303B

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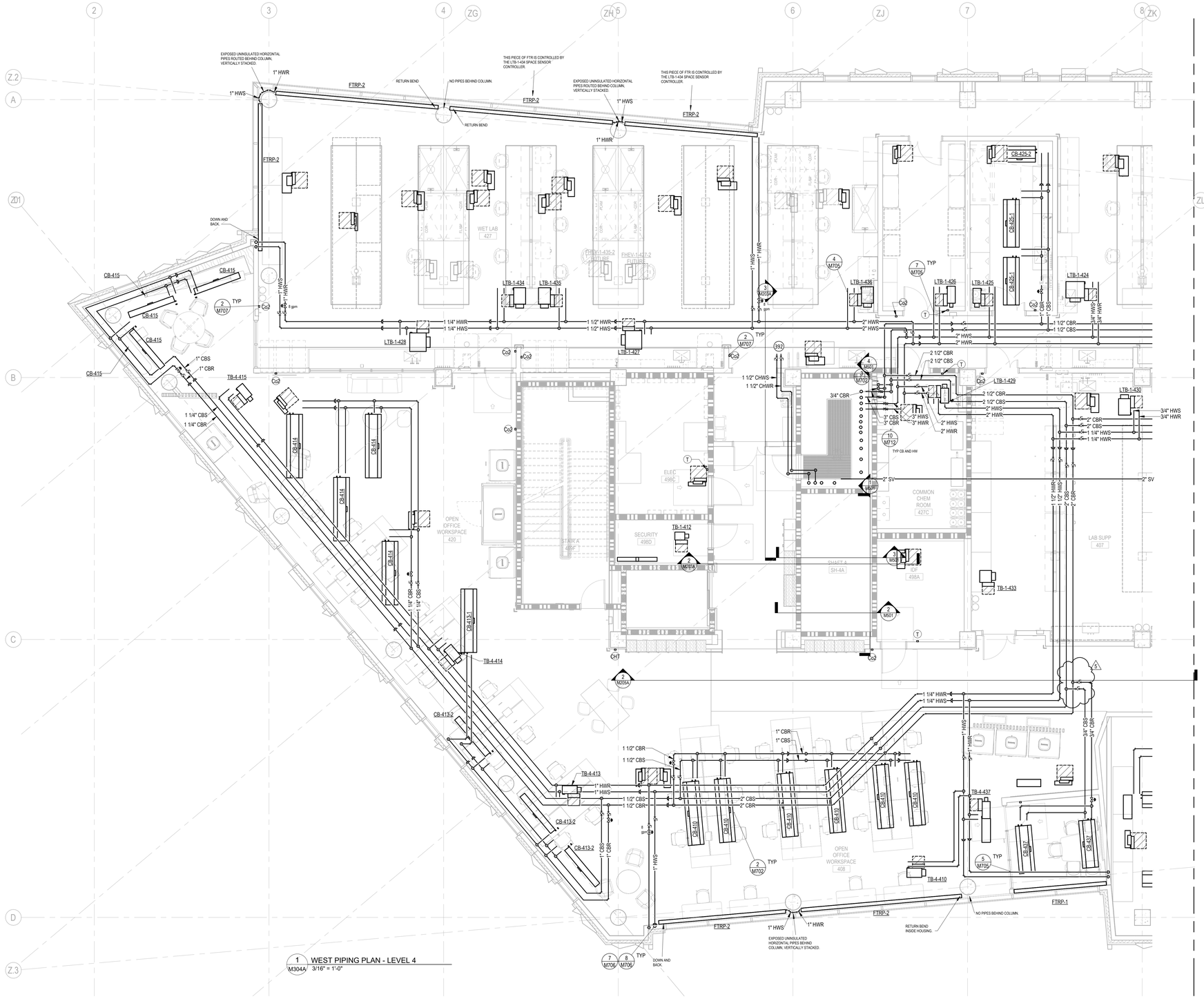
X00	PLAN NOTES
392	PROVIDE A THREADED NIPPLE IN THE VALVE WITH A THREADED CAP ON THE END OF THE NIPPLE. INSULATE THE PIPE/NIPPLE/CAP AND LABEL THE PIPING.



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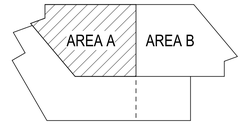

KEYPLAN
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PIPING PLAN - LEVEL 4 - AREA A

DATE **REF: SHEET INDEX**

BSA PROJECT NO. **00360481**

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X00 PLAN NOTES

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

JEREMY LANGSTON REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING PLAN - LEVEL 4 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M304B

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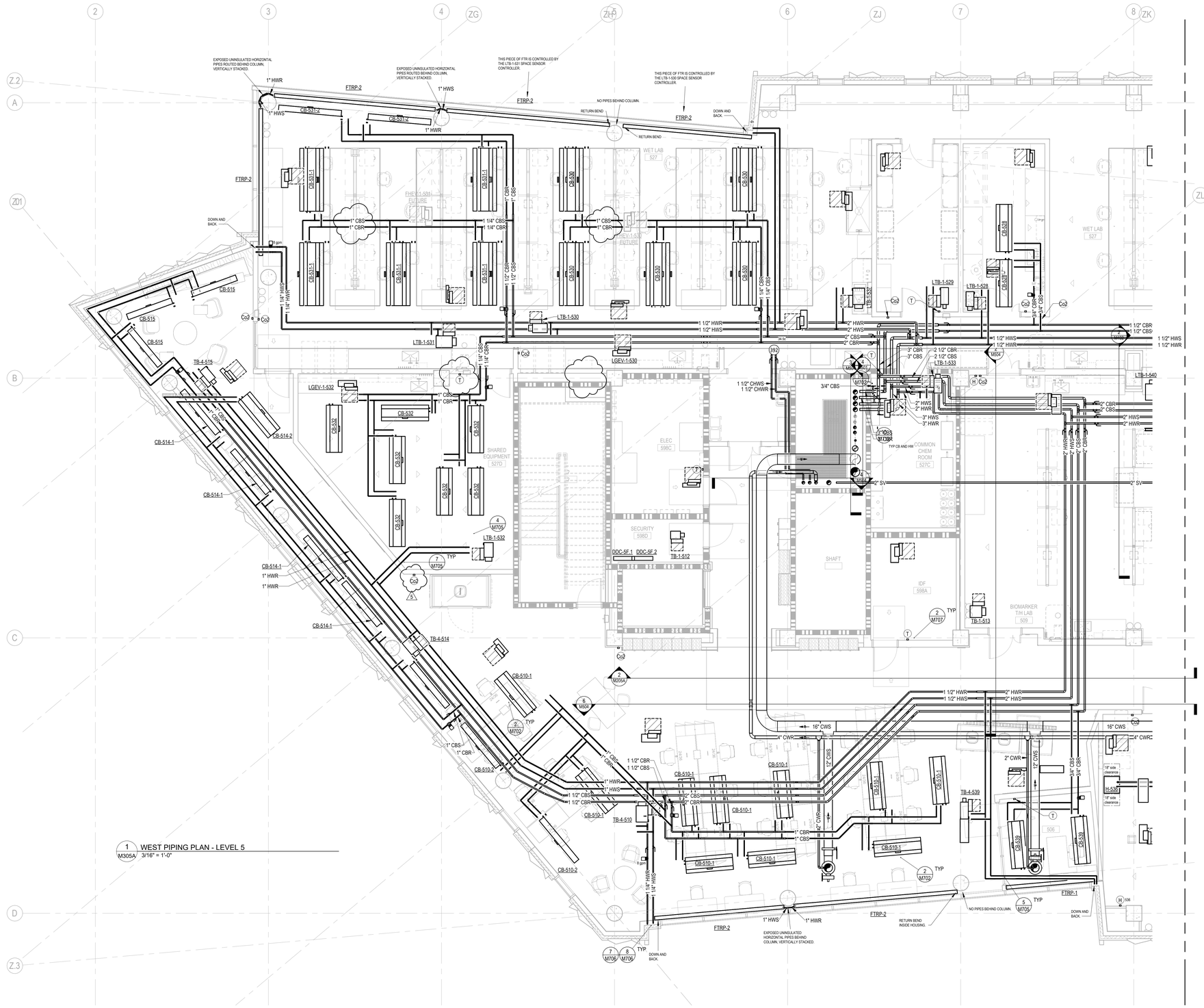
X00	PLAN NOTES
392	PROVIDE A THREADED NIPPLE IN THE VALVE WITH A THREADED CAP ON THE END OF THE NIPPLE. INSULATE THE PIPE/NIPPLE/CAP AND LABEL THE PIPING.



CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO, HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL COORDINATE AND PROVIDE THE CLEAR ACCESS SPACE BENEATH INSTALLATIONS REQUIRED BY THESE NOTES.

B. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS**. WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS SPACE. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

D. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE OF THAT SPACE'S PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) IN ALL SPACES WHICH HAVE PARTIAL CEILINGS. NOTE THAT THE "MINIMUM 1" ABOVE HEIGHT REQUIREMENT" NOTED IN THE PRIOR SENTENCE DOES NOT APPLY TO CHILLED BEAM MANUFACTURER'S INTEGRAL DIFFUSER MOUNTING HEIGHT: INSTALL THE BOTTOM HORIZONTAL FINISHED FACE OF THE CHILLED BEAM DIFFUSER AT EXACTLY THE SAME HEIGHT AS THE BOTTOM HORIZONTAL FINISHED FACE OF THE PARTIAL CEILING. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

E. IN SPACES WHICH CONTAIN **MORE THAN ONE PARTIAL CEILING** SURFACE, THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, EXPOSED BULKHEAD CEILING, OTHER HORIZONTAL SURFACES ILLUSTRATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS) **OF THE LOWEST HEIGHT PARTIAL CEILING** IN ALL SPACES WHICH HAVE MULTIPLE PARTIAL CEILINGS. INCLUDE ADDITIONAL ACCESS SPACE HEIGHT AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

F. CLOSE COORDINATION AMONGST THE INSTALLING TRADES IS RECOMMENDED IN ORDER TO PROVIDE THE CONTRACTUALLY REQUIRED CLEAR ACCESS SPACE. THE REMOVAL AND REINSTALLATION OF IMPROPERLY INSTALLED COMPONENTS AS NEEDED TO PROVIDE THE CLEAR ACCESS SPACE SHALL OCCUR SOLELY AT THE EXPENSE OF THE CONTRACTOR WHICH INSTALLED THE IMPROPER COMPONENTS AND SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF PARTIAL SUBSTANTIAL COMPLETION OR ANY OTHER SUBSTANTIAL COMPLETION CERTIFICATE IS ISSUED. IMPROPERLY INSTALLED COMPONENTS SHALL INCLUDE THOSE COMPONENTS WHICH ARE BELOW THE REQUIRED CLEAR ACCESS HEIGHT AND ALSO INCLUDE ANY AND ALL COMPONENTS LOCATED ABOVE THE CLEAR ACCESS SPACE IN THE ADJOINING AREA WHICH MUST BE RELOCATED IN ORDER TO MEET BOTH THE FUNCTIONAL NEEDS OF THE COMPONENTS AND THE CLEAR ACCESS SPACE REQUIREMENT.

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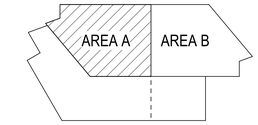

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PETER HOGAN LINDQUIST REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING PLAN - LEVEL 5 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M305A

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X00	PLAN NOTES
350	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE UP THROUGH THE PENTHOUSE ROOF. COORDINATE SUCH THAT THE VM PIPE HAS AT LEAST THREE ELBOWS IN IT AND IS ROUTED SO THAT IT DOES NOT GET IN THE WAY OF ANY REQUIRED ACCESS IN THE PENTHOUSE. COMPLETE THE PENTHOUSE BIM COORDINATION FOR AN AREA TWENTY FEET IN EVERY DIRECTION FROM THE SIXTH FLOOR PENETRATION BEFORE ACTUALLY CONSTRUCTING THE PENETRATION. DIV 23 TO PROVIDE SLEEVE PENETRATION DETAIL FOR THEIR PIPE.

CONTRACT REQUIREMENTS

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1 M305B EAST PIPING PLAN - LEVEL 5
3/16" = 1'-0"

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PIPING PLAN - LEVEL 5 - AREA B

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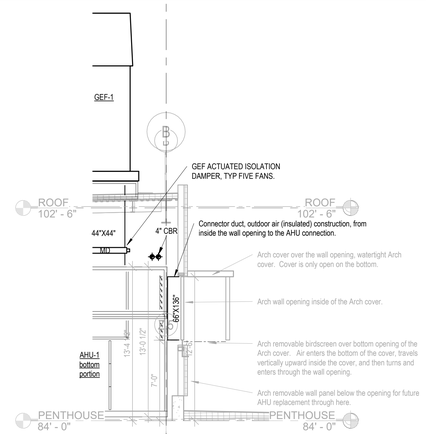


PLAN NOTES

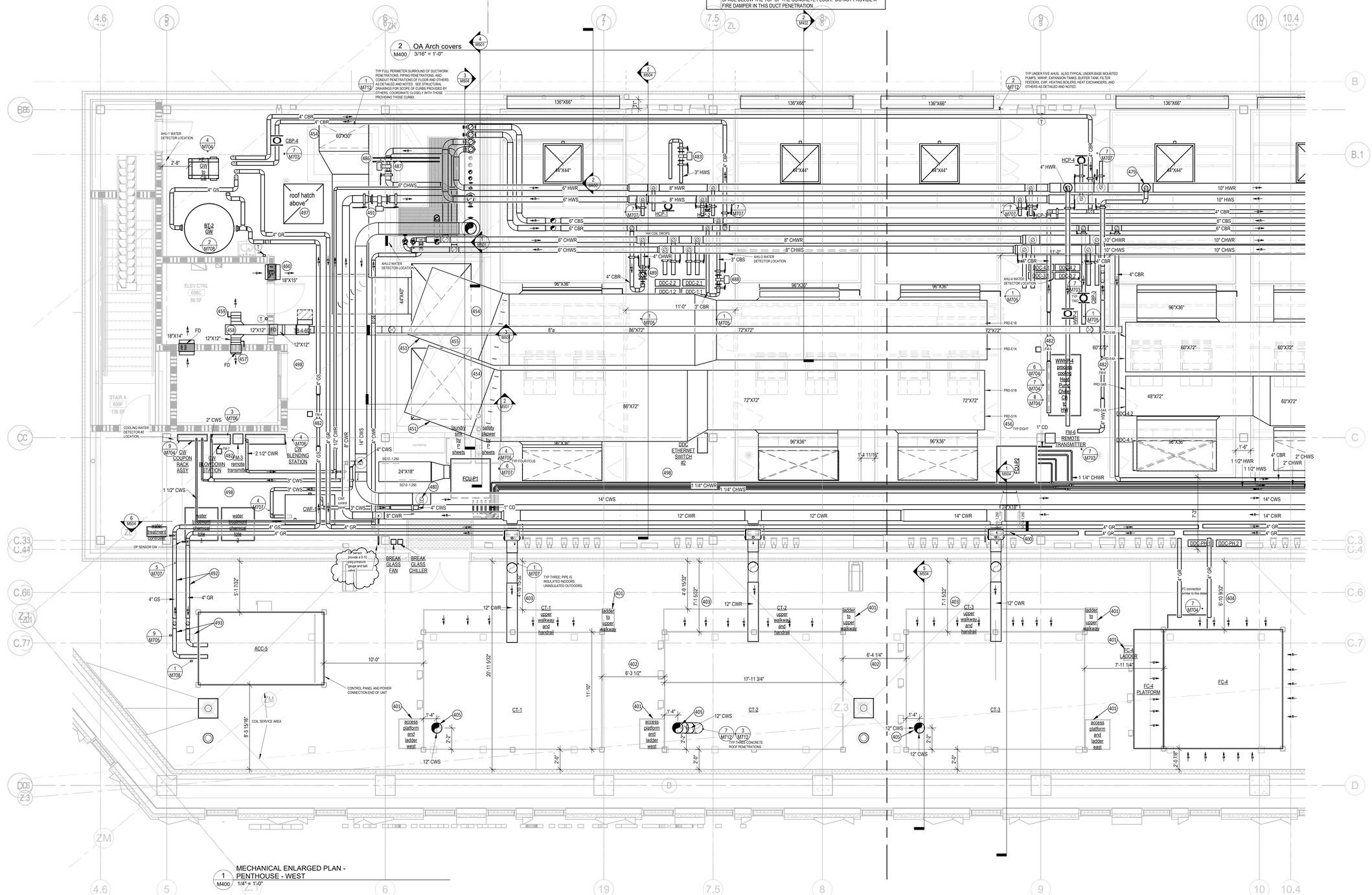
X00	
400	PROVIDE 4" LONG FLANGE CLEANOUT ON THE END OF THE 4" CWR RETURN PIPE TANK. PROVIDE A BALL VALVE AND 0-10 PSIG PRESSURE GAUGE IN THIS PIPE WHICH IS VISIBLE FROM THE FLOOR.
401	COORDINATE LADDER LOCATION WITH STRUCTURAL STEEL. PASS TO CONTRACTOR MISCELLANEOUS STEEL TO BRACE THE BOTTOM OF THE LADDER BACK TO THE STRUCTURAL STEEL. COORDINATE AND MODIFY LADDER SUCH THAT THE FIRST STEP UP FROM THE ROOF MEMBRANE IS BETWEEN 8" AND 18" ABOVE THE ROOF MEMBRANE.
402	COORDINATE CT LOCATION WITH STRUCTURAL STEEL AND THE FINAL EQUIPMENT SUBMITTALS TO ACHIEVE A MINIMUM OF 6'-0" OF CLEAR SPACE BETWEEN THE TWO SOLID END FACES OF THE TWO NEAREST CT.
403	COORDINATE CT LOCATION WITH STRUCTURAL STEEL AND THE FINAL EQUIPMENT SUBMITTALS TO ACHIEVE A MINIMUM OF 7'-0" OF CLEAR SPACE BETWEEN THE SOLID PENTHOUSE WALL FACE AND THE NEAREST EDGE OF THE CT BASE.
404	COORDINATE FC LOCATION WITH STRUCTURAL STEEL AND THE FINAL EQUIPMENT SUBMITTALS TO ACHIEVE A MINIMUM OF 6'-10" OF CLEAR SPACE BETWEEN THE SOLID PENTHOUSE WALL FACE AND THE NEAREST EDGE OF THE FC BASE.
405	COORDINATE CT COLD WATER BASIN CONNECTION LOCATION WITH STRUCTURAL STEEL AND CONCRETE BASED ON THE FINAL EQUIPMENT SUBMITTALS.
451	PROVIDE TURNING VANES IN THE FITTING FROM HORIZONTAL TO VERTICAL THEN TWIST ROTATE THE VERTICAL RISER TO GET BACK SQUARE.
454	AT EACH PENTHOUSE FLOOR DUCT PENETRATION PROVIDE CLOSURE PIECES ON EACH OF THE FOUR SIDES OF THE PERIMETER OF EACH DUCT. CLOSURE PIECES SHALL BE GALVANIZED ANGLE WITH THE HORIZONTAL LEG AT LEAST 4" LONG AND THE VERTICAL LEG AT LEAST 3" LONG. ATTACH THE HORIZONTAL LEG OF THE ANGLE TO THE CONCRETE FLOOR OPENING AND CONTINUOUS CAULK THE LEG OF THE ANGLE TO THE FLOOR ON ALL FOUR SIDES. ATTACH THE VERTICAL LEG OF THE ANGLE TO THE DUCTWORK (IF UNINSULATED) OR TO THE DUCTWORK INSULATION AND CONTINUOUS CAULK ON ALL FOUR SIDES. COORDINATE WITH TRADES INSTALLING THE SURROUND CURB SUCH THAT THERE IS ADEQUATE SPACE FOR THE HORIZONTAL LEG TO ATTACH TO THE FLOOR WITH FASTENERS. CUSTOMIZE THE CLOSURE PIECE ANGLES AT THE DUCT SUPPORTS SUCH THAT THE FINISHED ASSEMBLY IS ESSENTIALLY AN AIRTIGHT CLOSURE SEGREGATING THE PENTHOUSE SPACE ABOVE THE FLOOR FROM THE SPACE BELOW THE TOP OF THE CONCRETE FLOOR. DO NOT PROVIDE A FIRE DAMPER IN THIS DUCT PENETRATION.

PLAN NOTES

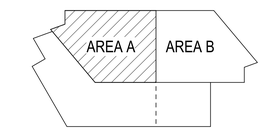
X00	
455	AT EACH PENTHOUSE LEVEL DUCT PENETRATION WHERE THE CONCRETE IS NOT UP CLOSE TO THE DUCT EDGE, PROVIDE 1/4" STEEL PLATE CLOSURE PIECES ON EACH OF THE FOUR SIDES OF THE PERIMETER OF EACH DUCT. THEN PROVIDE THE ANGLE CLOSURE PIECES TO SEAL OFF THE STEEL PLATE. ANGLE CLOSURE PIECES SHALL BE GALVANIZED ANGLE WITH THE HORIZONTAL LEG AT LEAST 4" LONG AND THE VERTICAL LEG AT LEAST 3" LONG. ATTACH THE HORIZONTAL LEG OF THE ANGLE TO THE STEEL PLATE AND CONTINUOUS CAULK THE LEG OF THE ANGLE TO THE STEEL PLATE ON ALL FOUR SIDES. ATTACH THE VERTICAL LEG OF THE ANGLE TO THE DUCTWORK (IF UNINSULATED) OR TO THE DUCTWORK INSULATION AND CONTINUOUS CAULK ON ALL FOUR SIDES. COORDINATE WITH TRADES INSTALLING THE SURROUND CURB SUCH THAT THERE IS ADEQUATE SPACE FOR THE HORIZONTAL LEG TO ATTACH TO THE FLOOR WITH FASTENERS. CUSTOMIZE THE CLOSURE PIECE ANGLES AT THE DUCT SUPPORTS SUCH THAT THE FINISHED ASSEMBLY IS ESSENTIALLY AN AIRTIGHT CLOSURE SEGREGATING THE PENTHOUSE SPACE ABOVE THE FLOOR FROM THE SPACE BELOW THE TOP OF THE CONCRETE FLOOR. DO NOT PROVIDE A FIRE DAMPER IN THIS DUCT PENETRATION.
456	LOCATE AND INSTALL EACH PRESSURE RELIEF DOOR ON THE SIDE OF THE DUCT SUCH THAT PERSONNEL ACCESS FROM A FLOOR MOUNTED STEP LADDER IS MAINTAINED TO BE ABLE TO CLOSE THE PRESSURE RELIEF DOOR WITH A HAND. COORDINATE AND LOCATE THE PRESSURE RELIEF DOORS SUCH THAT A DIRECT LIINE OF SIGHT WHILE STANDING ON THE FLOOR TO THE PRESSURE RELIEF DOOR IS MAINTAINED.
457	MOUNT BOTTOM OF SUPPLY DUCT NO LOWER THAN 9'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE AND ACCESSIBLE FROM INSIDE THE CONTROLLER ROOM.
458	MOUNT TOP OF SUPPLY DUCT NO LOWER THAN 10'-6" AFF. NO GRILLE ON END OF DUCT.
459	BALANCE TO ACHIEVE 150 CFM AT MAX AIRFLOW.
460	MOUNT TOP OF TRANSFER DUCT NO MORE THAN 12" BELOW THE BOTTOM OF THE STRUCTURAL SLAB ABOVE. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLES ON ENDS OF DUCT, FIRE DAMPER LINKS ARE VISIBLE AND ACCESSIBLE FROM INSIDE THE CONTROLLER ROOM.
479	PROVIDE A MINIMUM SEVEN LINEAL ALONG PIPE CENTERLINE DOWNSTREAM OF WHERE THE WATER TO THE WWHP IS DRAWN OUT AND WHERE THE WATER IS PUT BACK INTO THE MAIN.

PLAN NOTES

X00	
480	PROVIDE A MINIMUM SEVEN LINEAL ALONG PIPE CENTERLINE DOWNSTREAM OF WHERE THE WATER TO THE CWF IS DRAWN OUT AND WHERE THE WATER IS PUT BACK INTO THE MAIN.
482	PROVIDE A MINIMUM OF FIVE PIPE DIAMETERS STRAIGHT METER SIZE PIPE UPSTREAM OF THE METER AND A MINIMUM OF THREE PIPE DIAMETERS STRAIGHT METER SIZE PIPE DOWNSTREAM OF THE METER.
483	HW SYSTEM BYPASS VALVE. PROVIDE REDUCERS FROM THE LINE SIZE SHOWN TO THE VALVE SIZE.
486	HW SYSTEM DP SENSOR. PROVIDE 1" BALL VALVES AT THE HEADERS. SEE DETAIL.
487	CHW SYSTEM BYPASS VALVE. PROVIDE REDUCERS FROM THE LINE SIZE SHOWN TO THE VALVE SIZE. LOCATE CONTROL VALVE AND ISOLATION VALVES TO BE NOT OVER THE HOLE IN THE FLOOR.
488	CB SYSTEM BYPASS VALVE. PROVIDE REDUCERS FROM THE LINE SIZE SHOWN TO THE VALVE SIZE.
489	CB SYSTEM CHECK VALVE AND TWO ISOLATION VALVES.
491	CW SYSTEM BYPASS VALVE. PROVIDE REDUCERS FROM THE LINE SIZE SHOWN TO THE VALVE SIZE. LOCATE CONTROL VALVE AND ISOLATION VALVES TO BE NOT OVER THE HOLE IN THE FLOOR.
492	PROVIDE A MINIMUM BOTTOM OF PIPE ELEVATION OF 13'-0" ABOVE THE ROOF MEMBRANE.
493	PROVIDE GALVANIZED PIPE SUPPORT FROM PIPING BACK TO ACC-5 STRUCTURE; COORDINATE WITH STRUCTURAL TRADES.
497	SEE SHEET MPETFP1 FOR COORDINATION AND ACCESS REQUIREMENTS WHICH APPLY TO ALL INSTALLATIONS ON THIS SHEET. COORDINATE WITH ALL TRADES TO MEET THE SHEET MPETFP1 REQUIREMENTS. COORDINATE WITH ALL TRADES SUCH THAT NO DUCTWORK NOR PIPING NOR CONDUIT IS ROUTED BELOW THE ROOF ACCESS HATCH, NOR EITHIN 12" OF THE PERIMETER EDGE OF THE ROOF ACCESS HATCH.
498	SEE SHEET MPETFP1 FOR COORDINATION AND ACCESS REQUIREMENTS WHICH APPLY TO ALL INSTALLATIONS ON THIS SHEET. COORDINATE WITH ALL TRADES TO MEET THE SHEET MPETFP1 REQUIREMENTS. COORDINATE WITH ALL TRADES SUCH THAT NO DUCTWORK NOR PIPING IS ROUTED ABOVE ELECTRICAL PANELBOARDS.



1 M400 MECHANICAL ENLARGED PLAN - PENTHOUSE - WEST
1/4" = 1'-0"



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ENLARGED PENTHOUSE PLAN (WEST)

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M400

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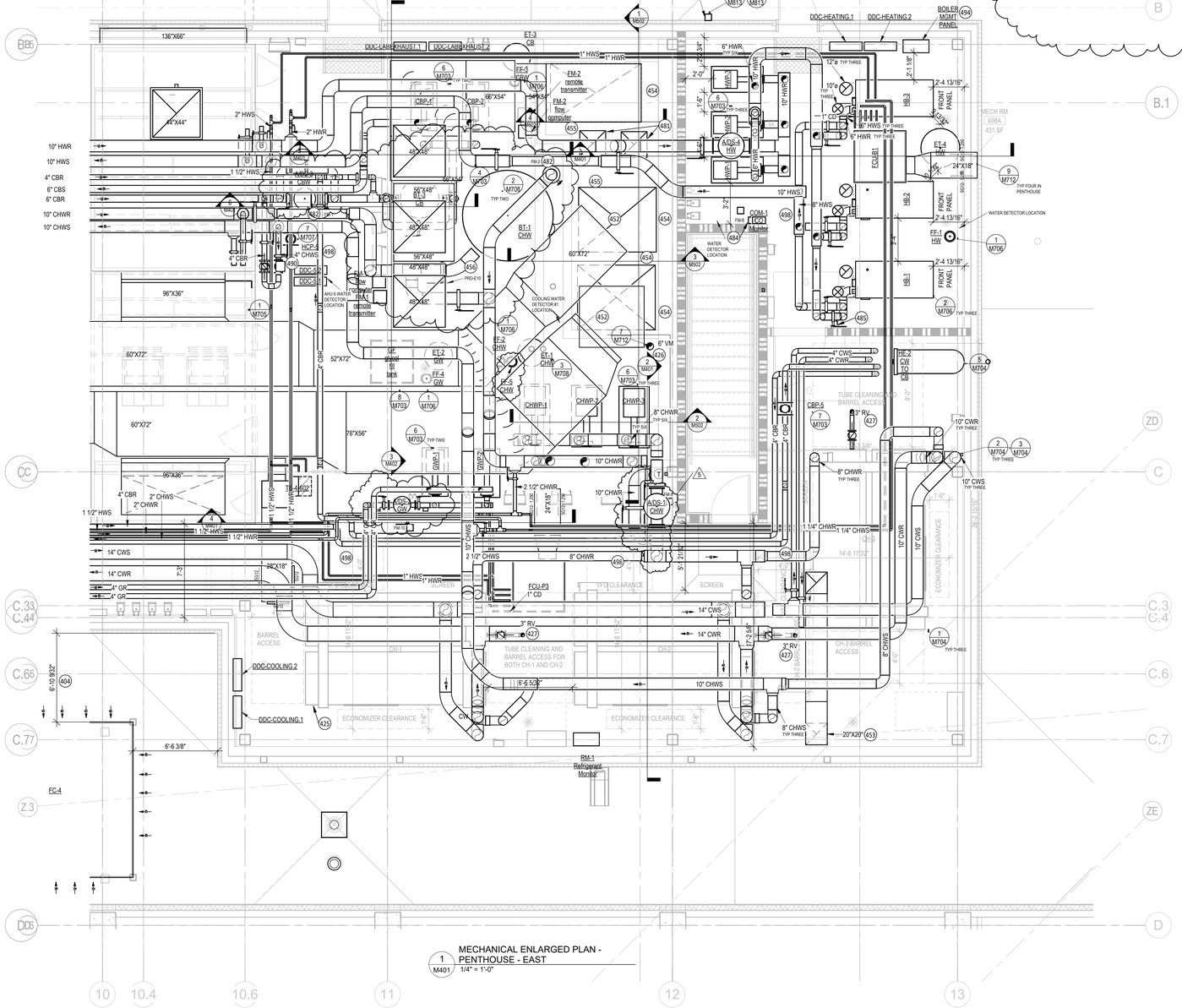
404	COORDINATE FC LOCATION WITH STRUCTURAL STEEL AND THE FINAL EQUIPMENT SUBMITTALS TO ACHIEVE A MINIMUM OF 6'-10" OF CLEAR SPACE BETWEEN THE SOLID PENTHOUSE WALL FACE AND THE NEAREST EDGE OF THE FC BASE.
425	COORDINATE THE CHILLER LOCATION WITH THE CHILLER SUBMITTAL AND PROVIDE REQUIRED ELECTRICAL CLEARANCES. TYP THREE CHILLERS.
426	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE UP THROUGH THE PENTHOUSE ROOF. COORDINATE SUCH THAT THE VM PIPE HAS AT LEAST THREE ELBOWS IN IT AND IS ROUTED SO THAT IT DOES NOT GET IN THE WAY OF ANY REQUIRED ACCESS IN THE PENTHOUSE. DIV 23 TO PROVIDE SLEEVE PENETRATION DETAIL FOR THEIR PIPE.
427	COORDINATE WITH ALL TRADES CONCERNING THE REFRIGERANT VENT PIPING AND SUPPORTS WHICH ROUTE UP THROUGH THE PENTHOUSE ROOF. ATTACH THE RUPTUREGUARD TO THE CHILLER FLANGE, PROVIDE MIN 12" LONG SECTION OF 3" RV HORIZONTAL PIPING ON THE RUPTUREGUARD DISCHARGE, TEE, AND 18" LONG DRIP LEG BENEATH THE TEE. PROVIDE RUPTUREGUARD DRAIN LINE TIE IN TO MIDPOINT ON THE DRIP LEG WITH A 1/4" SHRADER DRAIN VALVE ON THE BOTTOM OF THE DRIP LEG. PROVIDE A FLANGE 12" UP FROM THE TEE IN THE VERTICAL RISE UP FROM THE TEE AND PROVIDE PURGE EXHAUST LINE TIE-IN TO THE VERTICAL RISE ABOVE THE FLANGE. INSTALL RUPTUREGUARD, PRESSURE GAUGE, PRESSURE SWITCH AND OTHER LOOSE COMPONENTS PER CHILLER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

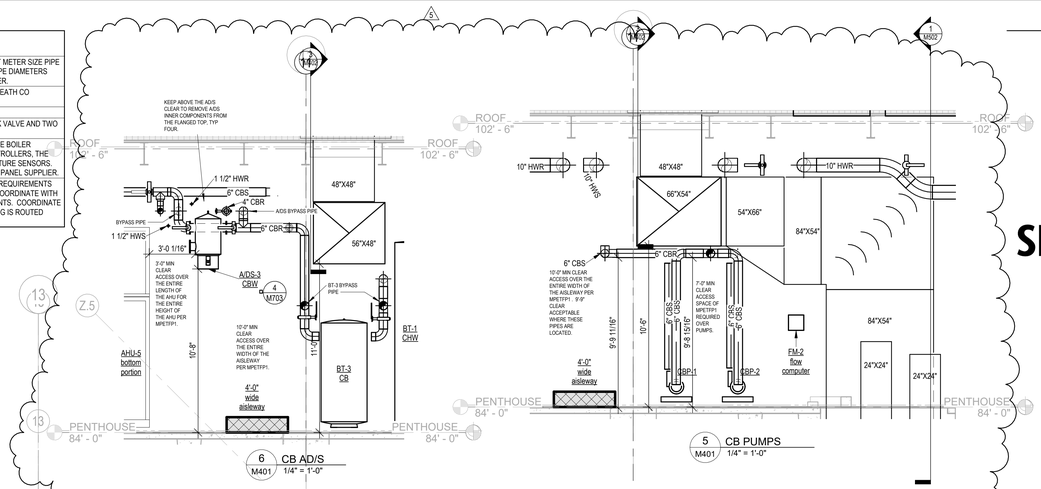
X00	PLAN NOTES
452	PROVIDE TURNING VANES IN THE FITTING FROM HORIZONTAL TO VERTICAL THEN TWIST ROTATE THE VERTICAL RISER TO GET BACK SQUARE.
453	PROVIDE LOW EXHAUST DUCT DOWN TO 6" AFF, CAPPED ON THE BOTTOM. PROVIDE EG7 GRILLE ON THREE FACES OF THE DUCT, WITH BOTTOM OF THE 12" SIDE OF THE GRILLE AT 12" AFF. NO VOLUME DAMPERS REQUIRED.
454	AT EACH PENTHOUSE FLOOR DUCT PENETRATION PROVIDE CLOSURE PIECES ON EACH OF THE FOUR SIDES OF THE PERIMETER OF EACH DUCT. CLOSURE PIECES SHALL BE GALVANIZED ANGLE WITH THE HORIZONTAL LEG AT LEAST 4" LONG AND THE VERTICAL LEG AT LEAST 3" LONG. ATTACH THE HORIZONTAL LEG OF THE ANGLE TO THE CONCRETE FLOOR OPENING AND CONTINUOUS CAULK THE LEG OF THE ANGLE TO THE FLOOR ON ALL FOUR SIDES. ATTACH THE VERTICAL LEG OF THE ANGLE TO THE DUCTWORK (IF UNINSULATED) OR TO THE DUCTWORK INSULATION AND CONTINUOUS CAULK ON ALL FOUR SIDES. COORDINATE WITH TRADES INSTALLING THE SURROUND CURB SUCH THAT THERE IS ADEQUATE SPACE FOR THE HORIZONTAL LEG TO ATTACH TO THE FLOOR WITH FASTENERS. CUSTOMIZE THE CLOSURE PIECE ANGLES AT THE DUCT SUPPORTS SUCH THAT THE FINISHED ASSEMBLY IS ESSENTIALLY AN AIRTIGHT CLOSURE SEGREGATING THE PENTHOUSE SPACE ABOVE THE FLOOR FROM THE SPACE BELOW THE TOP OF THE CONCRETE FLOOR. DO NOT PROVIDE A FIRE DAMPER IN THIS DUCT PENETRATION.

X00	PLAN NOTES
455	AT EACH PENTHOUSE LEVEL DUCT PENETRATION WHERE THE CONCRETE IS NOT UP CLOSE TO THE DUCT EDGE, PROVIDE 1/4" STEEL PLATE CLOSURE PIECES ON EACH OF THE FOUR SIDES OF THE PERIMETER OF EACH DUCT. THEN PROVIDE THE ANGLE CLOSURE PIECES TO SEAL OFF THE STEEL PLATE. ANGLE CLOSURE PIECES SHALL BE GALVANIZED ANGLE WITH THE HORIZONTAL LEG AT LEAST 4" LONG AND THE VERTICAL LEG AT LEAST 3" LONG. ATTACH THE HORIZONTAL LEG OF THE ANGLE TO THE STEEL PLATE AND CONTINUOUS CAULK THE LEG OF THE ANGLE TO THE STEEL PLATE ON ALL FOUR SIDES. ATTACH THE VERTICAL LEG OF THE ANGLE TO THE DUCTWORK (IF UNINSULATED) OR TO THE DUCTWORK INSULATION AND CONTINUOUS CAULK ON ALL FOUR SIDES. COORDINATE WITH TRADES INSTALLING THE SURROUND CURB SUCH THAT THERE IS ADEQUATE SPACE FOR THE HORIZONTAL LEG TO ATTACH TO THE FLOOR WITH FASTENERS. CUSTOMIZE THE CLOSURE PIECE ANGLES AT THE DUCT SUPPORTS SUCH THAT THE FINISHED ASSEMBLY IS ESSENTIALLY AN AIRTIGHT CLOSURE SEGREGATING THE PENTHOUSE SPACE ABOVE THE FLOOR FROM THE SPACE BELOW THE TOP OF THE CONCRETE FLOOR. DO NOT PROVIDE A FIRE DAMPER IN THIS DUCT PENETRATION.
456	LOCATE AND INSTALL EACH PRESSURE RELIEF DOOR ON THE SIDE OF THE DUCT SUCH THAT PERSONNEL ACCESS FROM A FLOOR MOUNTED STEP LADDER IS MAINTAINED TO BE ABLE TO CLOSE THE PRESSURE RELIEF DOOR WITH A HAND. COORDINATE AND LOCATE THE PRESSURE RELIEF DOORS SUCH THAT A DIRECT LIINE OF SIGHT WHILE STANDING ON THE FLOOR TO THE PRESSURE RELIEF DOOR IS MAINTAINED.
481	CONSTRUCT THE "LABORATORY SPECIAL/EQUIPMENT EXHAUST" DUCT RISERS WITH THE SAME MATERIALS AND METHODS AS THE "LABORATORY FUME HOOD EXHAUST" DUCT SYSTEM.

X00	PLAN NOTES
482	PROVIDE A MINIMUM OF FIVE PIPE DIAMETERS STRAIGHT METER SIZE PIPE UPSTREAM OF THE METER AND A MINIMUM OF THREE PIPE DIAMETERS STRAIGHT METER SIZE PIPE DOWNSTREAM OF THE METER.
484	WATER DETECTOR ANCHORED TO FLOOR. LOCATE BENEATH CO MONITOR.
485	BOILER EMERGENCY SHUTDOWN SWITCH.
490	CB SYSTEM TEMPERATURE CONTROL VALVE AND CHECK VALVE AND TWO ISOLATION VALVES.
494	CIC TO PROVIDE ALL CONDUIT AND WIRING BETWEEN THE BOILER MANAGEMENT PANEL AND THE INDIVIDUAL BOILER CONTROLLERS, THE BOILER ISOLATION VALVES, AND THE HEADER TEMPERATURE SENSORS. COORDINATE CLOSELY WITH THE BOILER MANAGEMENT PANEL SUPPLIER.
498	SEE SHEET MPETFP1 FOR COORDINATION AND ACCESS REQUIREMENTS WHICH APPLY TO ALL INSTALLATIONS ON THIS SHEET. COORDINATE WITH ALL TRADES TO MEET THE SHEET MPETFP1 REQUIREMENTS. COORDINATE WITH ALL TRADES SUCH THAT NO DUCTWORK NOR PIPING IS ROUTED ABOVE ELECTRICAL PANELBOARDS.

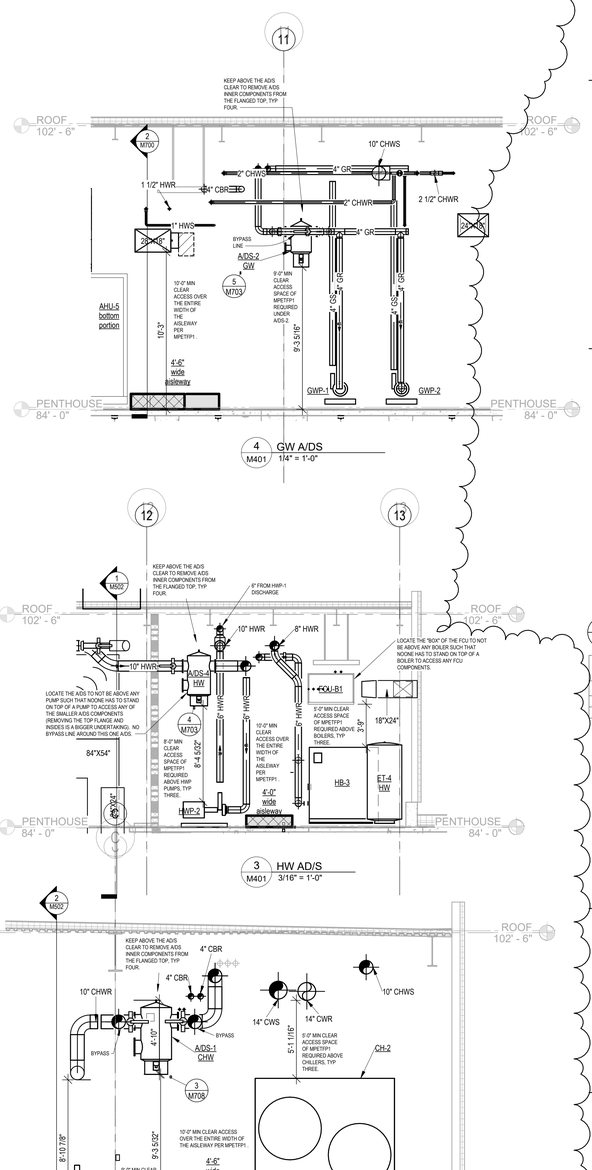


1 M401 MECHANICAL ENLARGED PLAN - PENTHOUSE - EAST 1/4" = 1'-0"



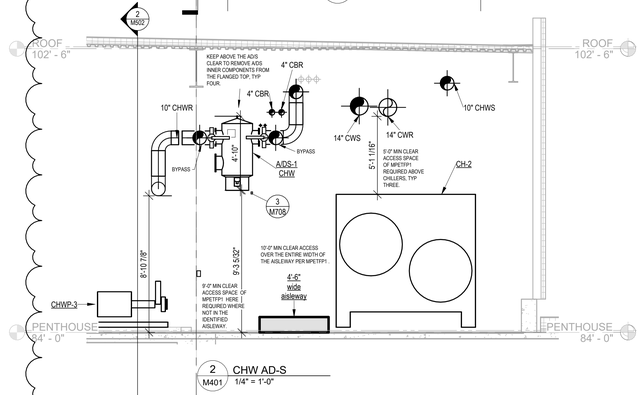
6 M401 CB A/D/S 1/4" = 1'-0"

5 M401 CB PUMPS 1/4" = 1'-0"

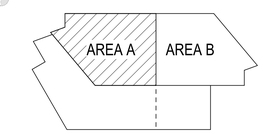


4 M401 GW A/DS 1/4" = 1'-0"

3 M401 HW A/D/S 3/16" = 1'-0"



2 M401 CHW AD-S 1/4" = 1'-0"



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CLIENT PROJECT NO. - 20250072

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PETER HOGAN LAWSON REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

ENLARGED PENTHOUSE PLAN (EAST)

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

M401

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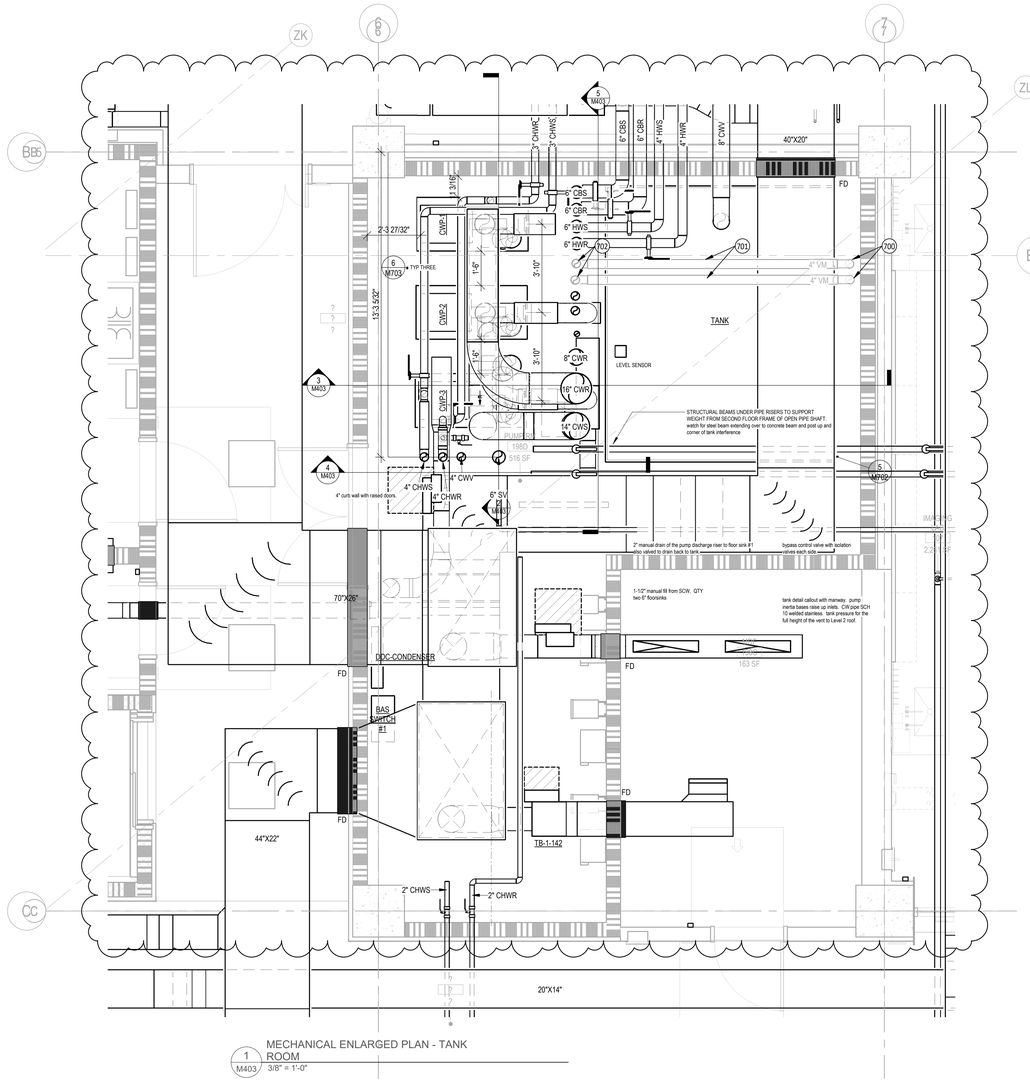
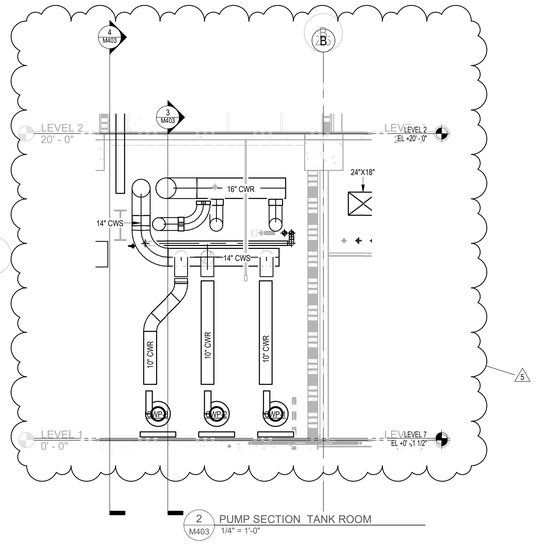
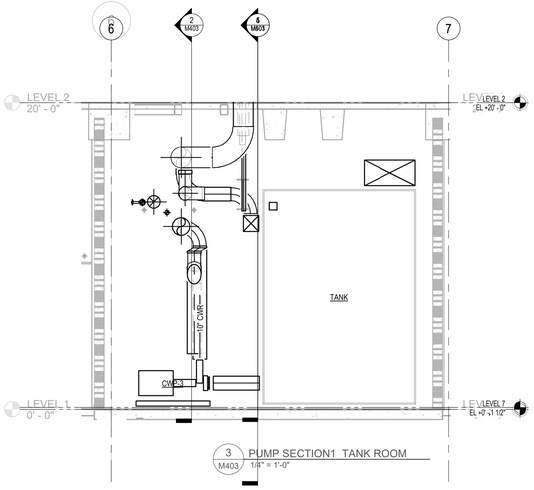


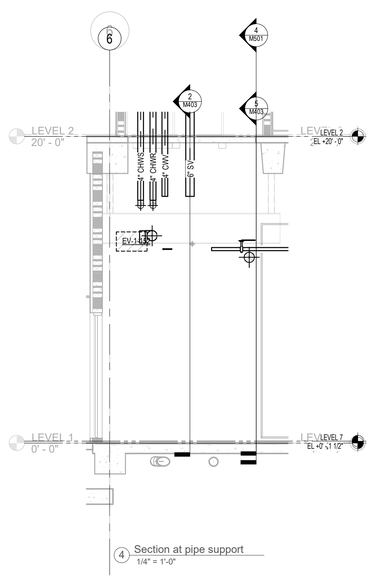
1 M403 MECHANICAL ENLARGED PLAN - TANK ROOM
3/8" = 1'-0"



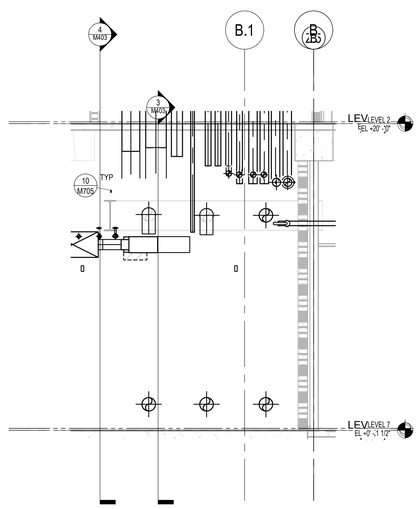
2 M403 PUMP SECTION TANK ROOM
1/4" = 1'-0"



3 M403 PUMP SECTION1 TANK ROOM
1/4" = 1'-0"



4 Section at pipe support
1/4" = 1'-0"



5 section at pipe support2
1/4" = 1'-0"

X00	PLAN NOTES
700	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE BETWEEN THE TANK AND THE WALL DOWN INTO THE SUBFLOOR.
701	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE ABOVE THE TANK.
702	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE UP THROUGH THE PENTHOUSE ROOF.

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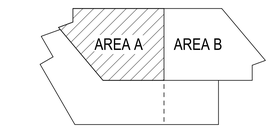

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MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
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PETER HOGAN LAFFERTY
REGISTERED
No.
PE19500446
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ENLARGED TANK ROOM PLAN

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M403

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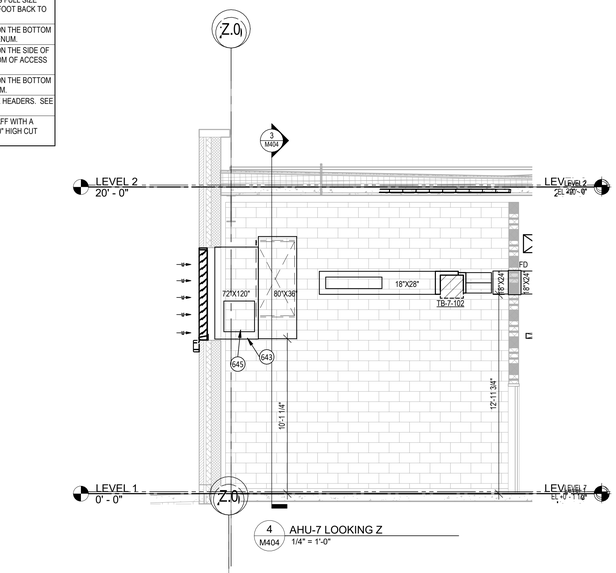
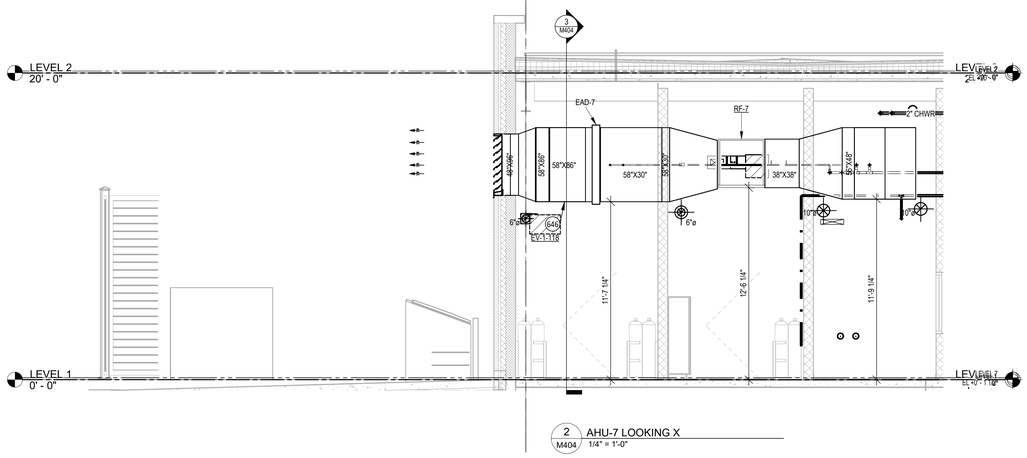
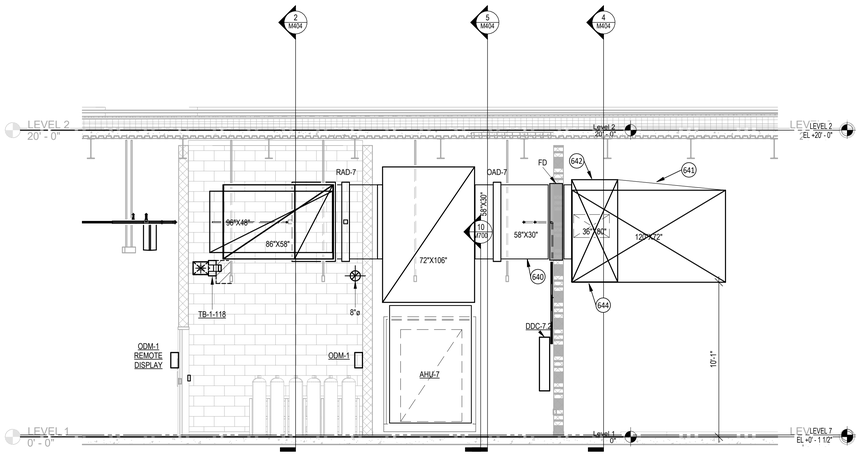
X00	PLAN NOTES
640	24"x24" INSULATED REMOVABLE ACCESS PANEL LOCATED ON THE BOTTOM OF THE OUTDOOR AIR DUCT.
641	CUSTOM FAB TAPERED DUCT PIECE WHICH IS 30" WIDE x 80" HIGH ON THE NORTH END AND CONNECTS TO THE CORNER OF THE FULL SIZE DUCT PIECE. FABRICATE AFTER ALL ELECTRICAL EQUIPMENT IS INSTALLED SUCH THAT THERE IS A MINIMUM 2'-3" HORIZONTAL DISTANCE BETWEEN THE SIDE OF THE DUCTWORK (BEFORE INSULATION) AND AN EXTENSION UP FROM THE VERTICAL FACE OF THE ELECTRICAL EQUIPMENT. BOTTOM OF THE TAPERED DUCT PIECE IS MINIMUM 10'-6" AFF.
642	80" HIGH X 30" WIDE x 36" LONG FULL SIZE DUCT PIECE BEFORE THE TAPERED DUCT PIECE.
643	LOUVER BACKING PLENUM: 120" WIDE x 72" HIGH x 24" LONG FULL SIZE BEHIND THE LOUVER. BOTTOM OF DUCT SLOPED 1/2" PER FOOT BACK TO THE LOUVER.
644	24"x24" INSULATED REMOVABLE ACCESS PANEL LOCATED ON THE BOTTOM OF THE RECTANGULAR PORTION OF THE OUTDOOR AIR PLENUM.
645	24"x24" INSULATED REMOVABLE ACCESS PANEL LOCATED ON THE SIDE OF THE RECTANGULAR PORTION OF THE PLENUM. WITH BOTTOM OF ACCESS PANEL 6" ABOVE THE BOTTOM OF THE PLENUM.
646	24"x24" INSULATED REMOVABLE ACCESS PANEL LOCATED ON THE BOTTOM OF THE RECTANGULAR PORTION OF THE RELIEF AIR PLENUM.
647	HW SYSTEM DP SENSOR. PROVIDE 1" BALL VALVES AT THE HEADERS. SEE DETAIL.
648	PROVIDE TB DISCHARGE DUCT (WITH BOD AT LEAST 12'-0" AFF WITH A SOLID END ON THE DISCHARGE DUCT) WITH A 12" LONG x 10" HIGH CUT OPENING ON THE SIDE AWAY FROM THE WALL.



4 AHU-7 LOOKING Z
M404 1/4" = 1'-0"



2 AHU-7 LOOKING X
M404 1/4" = 1'-0"



3 AHU-7 LOOKING Y
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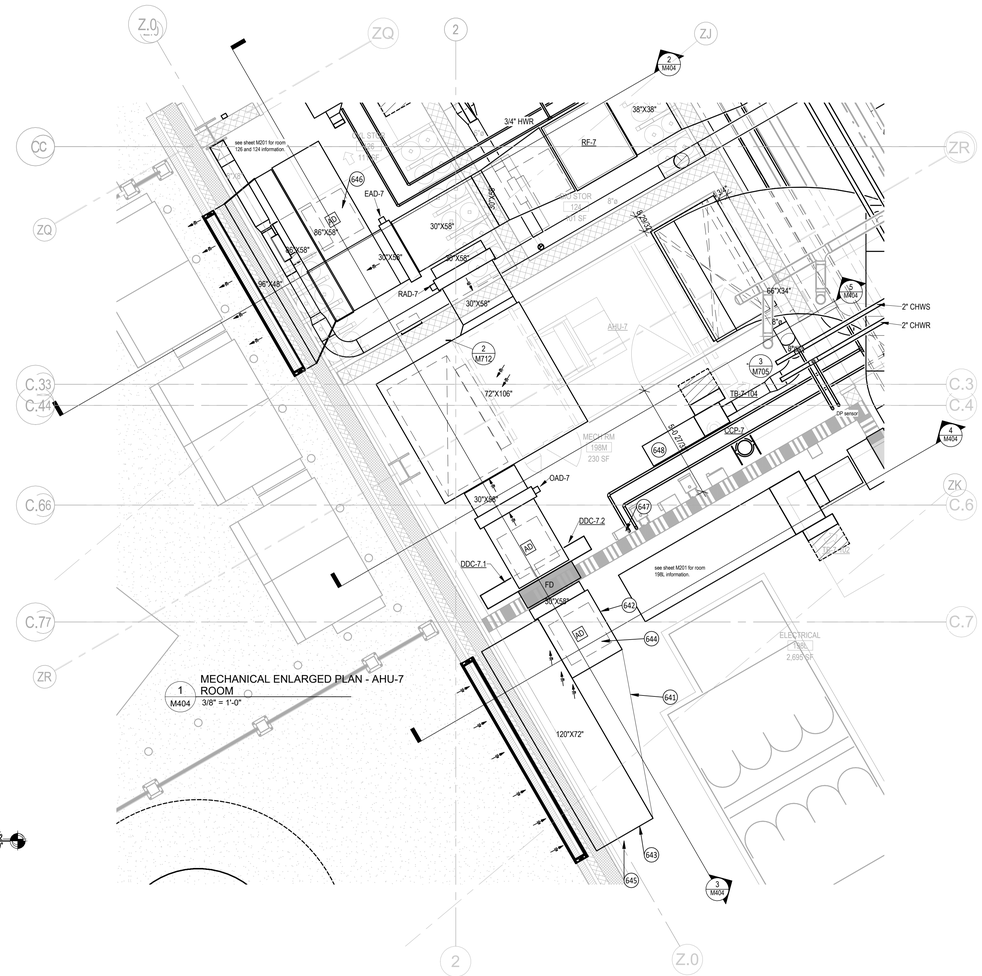
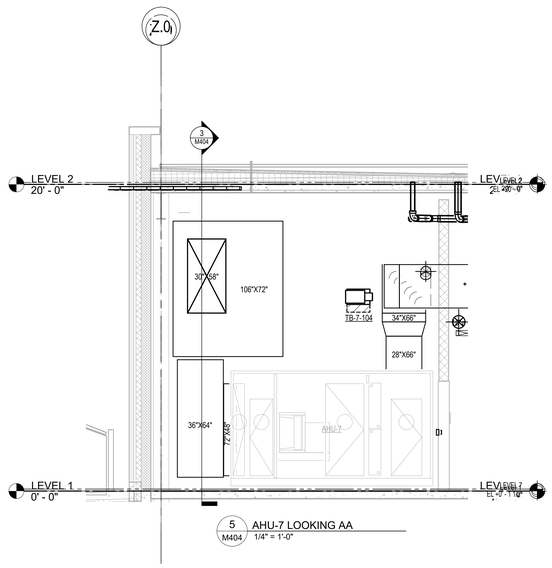


1 MECHANICAL ENLARGED PLAN - AHU-7 ROOM
M404 3/8" = 1'-0"



5 AHU-7 LOOKING AA
M404 1/4" = 1'-0"

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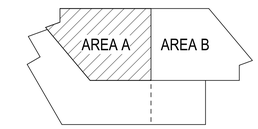

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REGISTERED
No. PE19500446
STATE OF
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ENLARGED AHU-7 ROOMS PLAN

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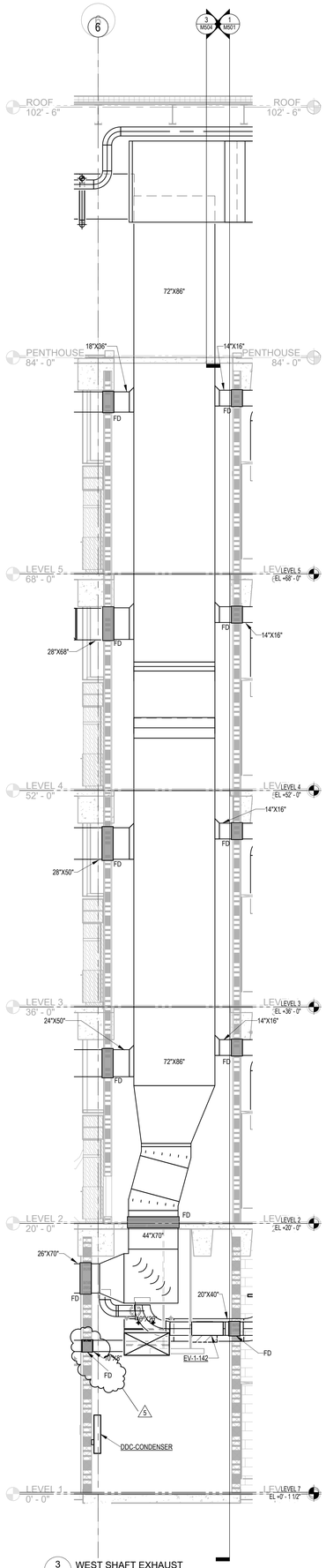
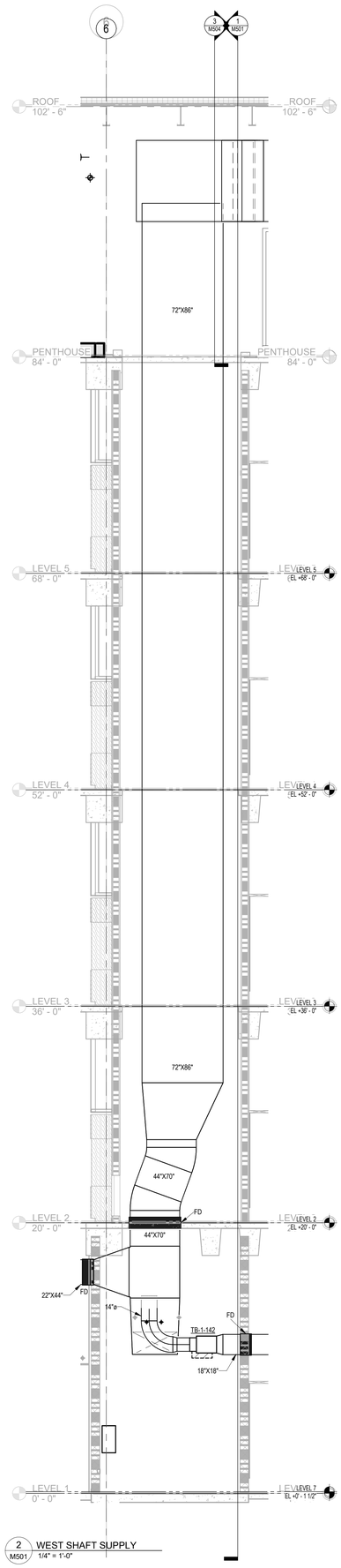
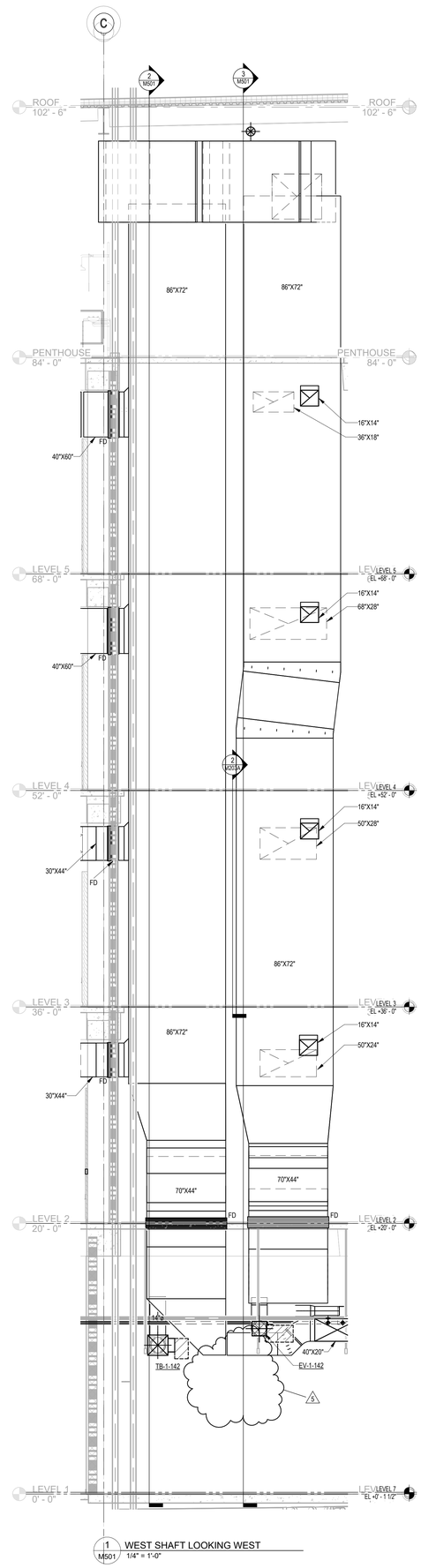


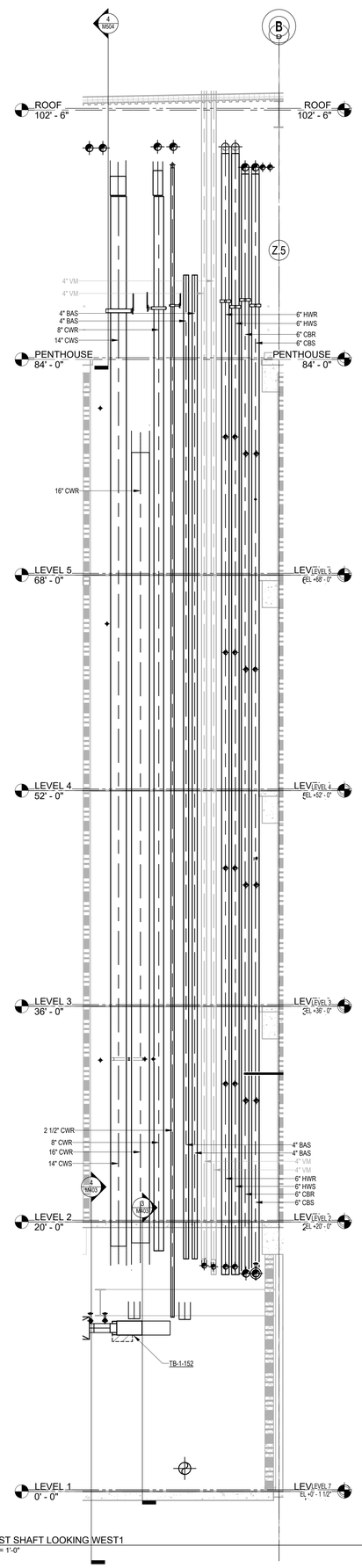
3 M501 WEST SHAFT EXHAUST
1/4" = 1'-0"



2 M501 WEST SHAFT SUPPLY
1/4" = 1'-0"



1 M501 WEST SHAFT LOOKING WEST
1/4" = 1'-0"



4 M501 WEST SHAFT LOOKING WEST1
1/4" = 1'-0"

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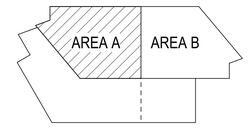

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SHAFTS (WEST) SECTIONS

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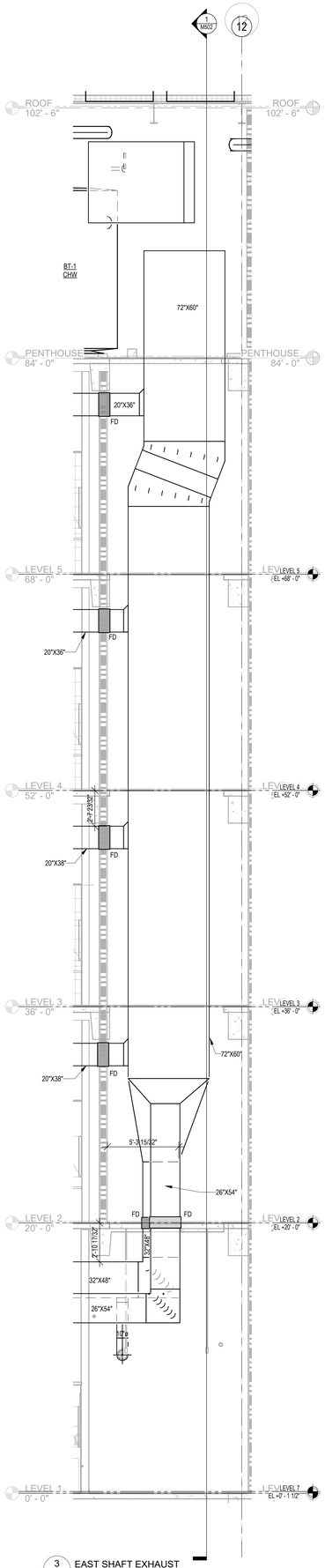

3 M502 EAST SHAFT EXHAUST
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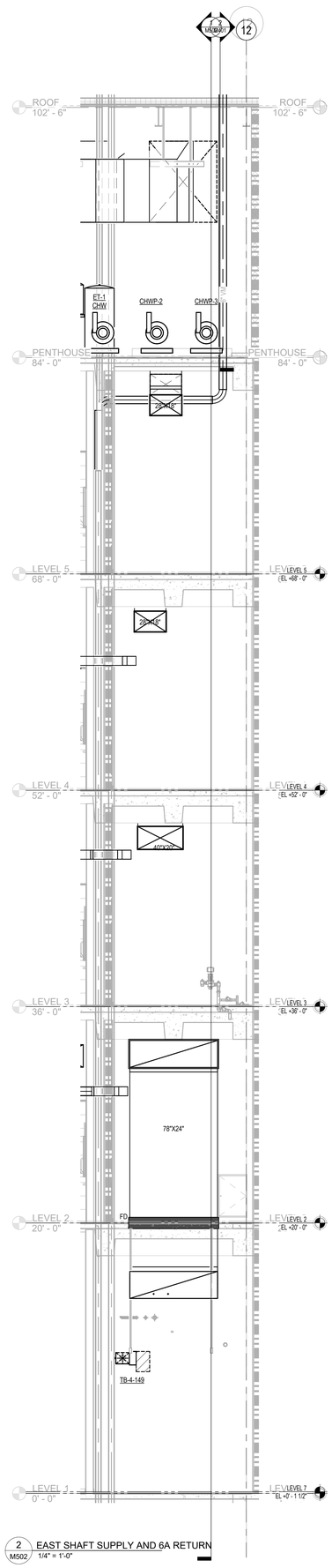
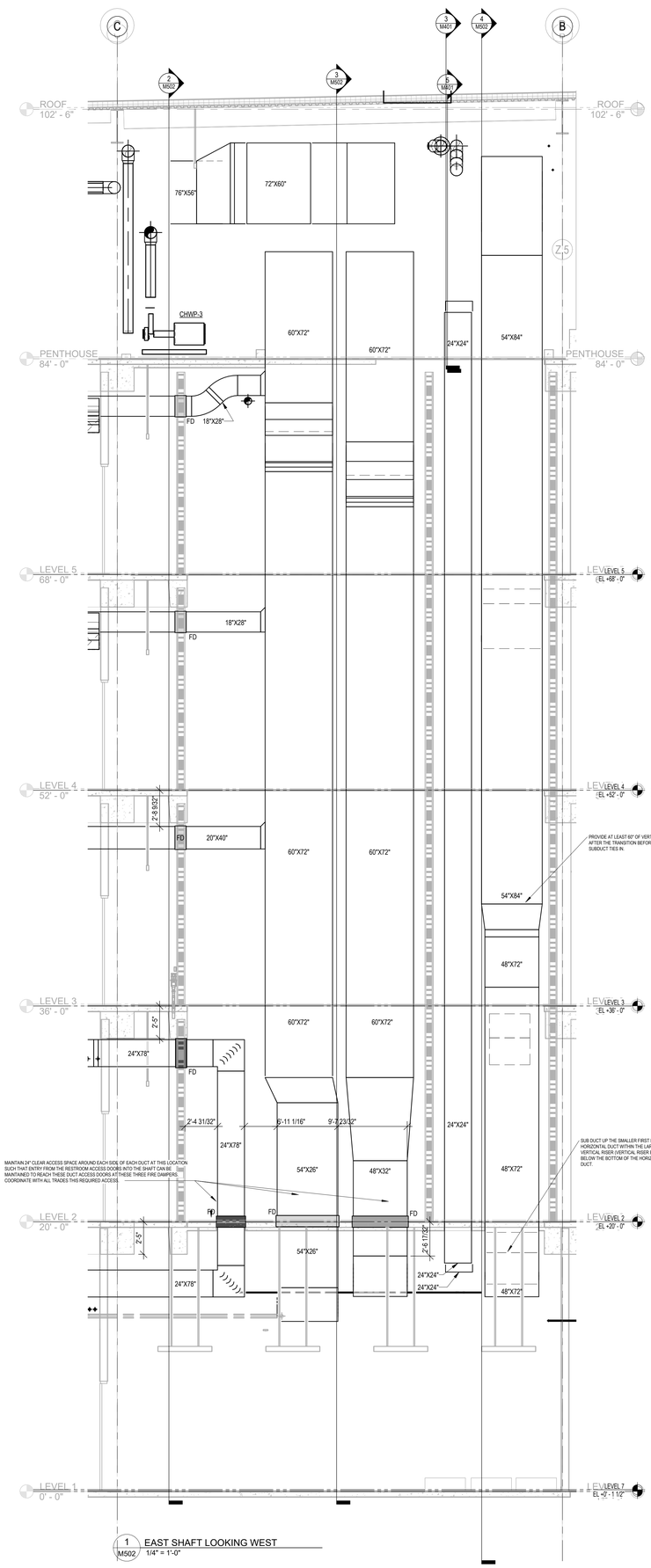


2 M502 EAST SHAFT SUPPLY AND 6A RETURN
1/4" = 1'-0"



1 M502 EAST SHAFT LOOKING WEST
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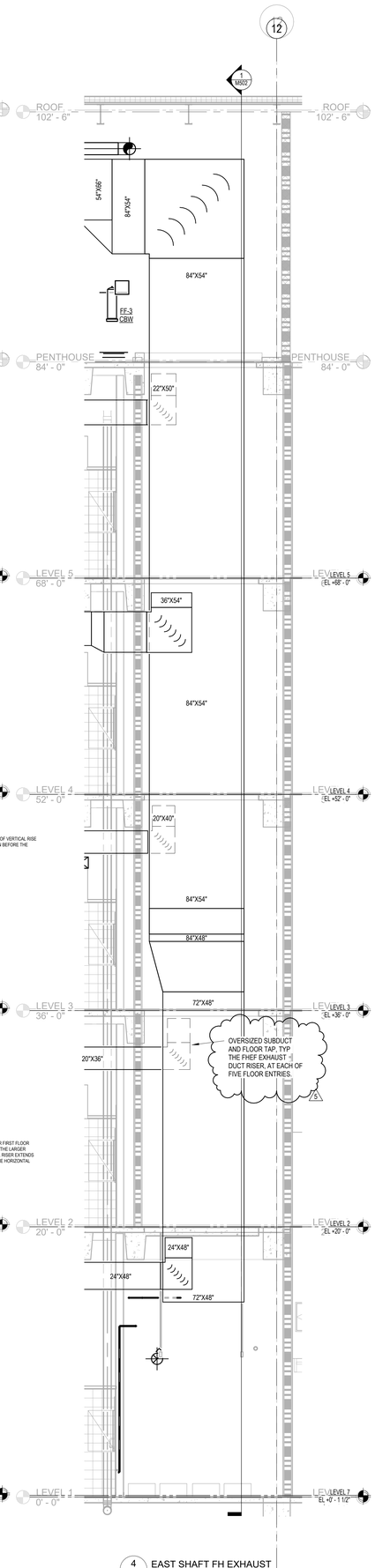

4 M502 EAST SHAFT FH EXHAUST
1/4" = 1'-0"

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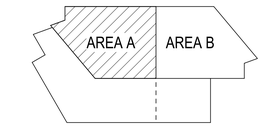
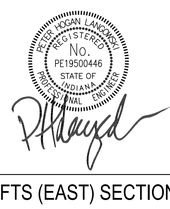


KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



SHAFTS (EAST) SECTIONS

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M502

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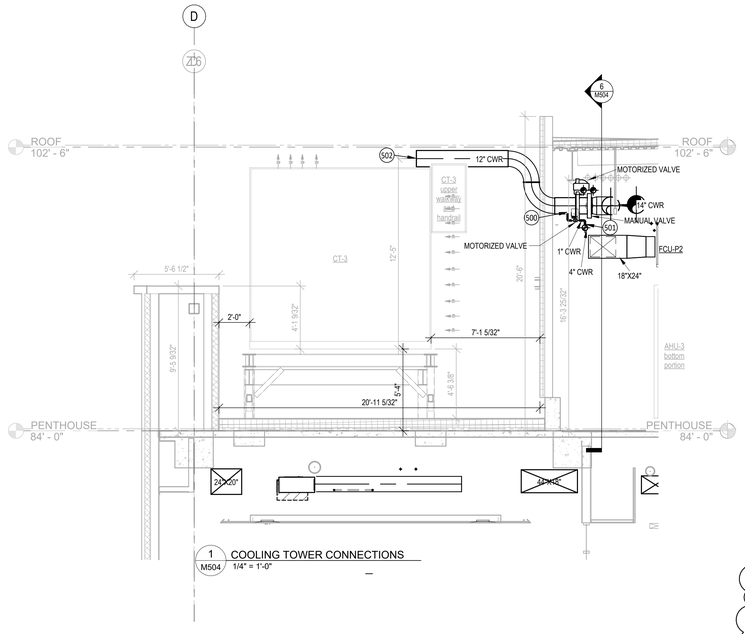
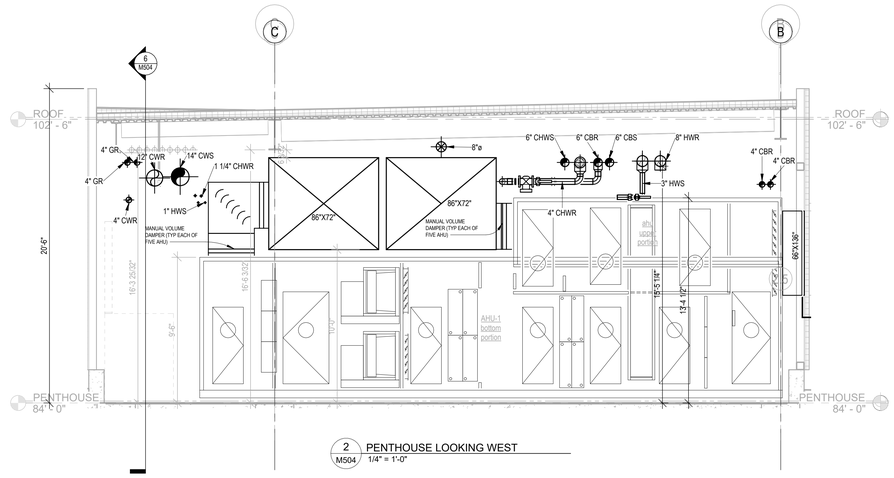
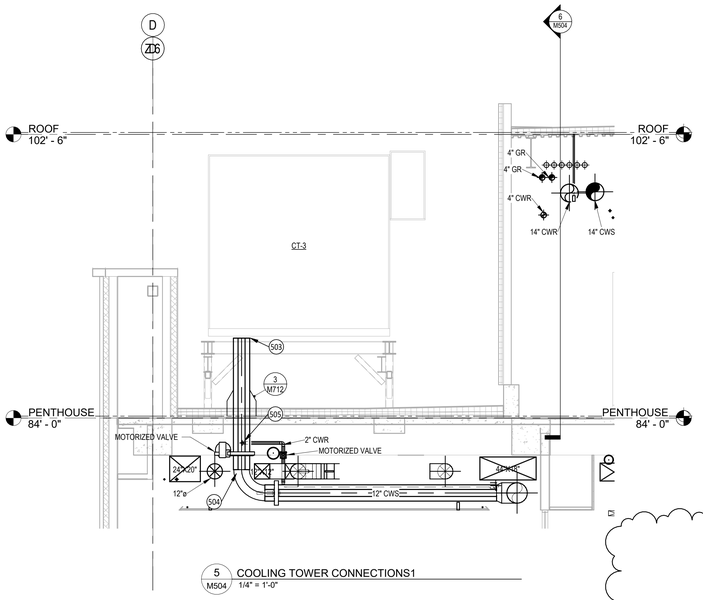


1 M504 COOLING TOWER CONNECTIONS
1/4" = 1'-0"

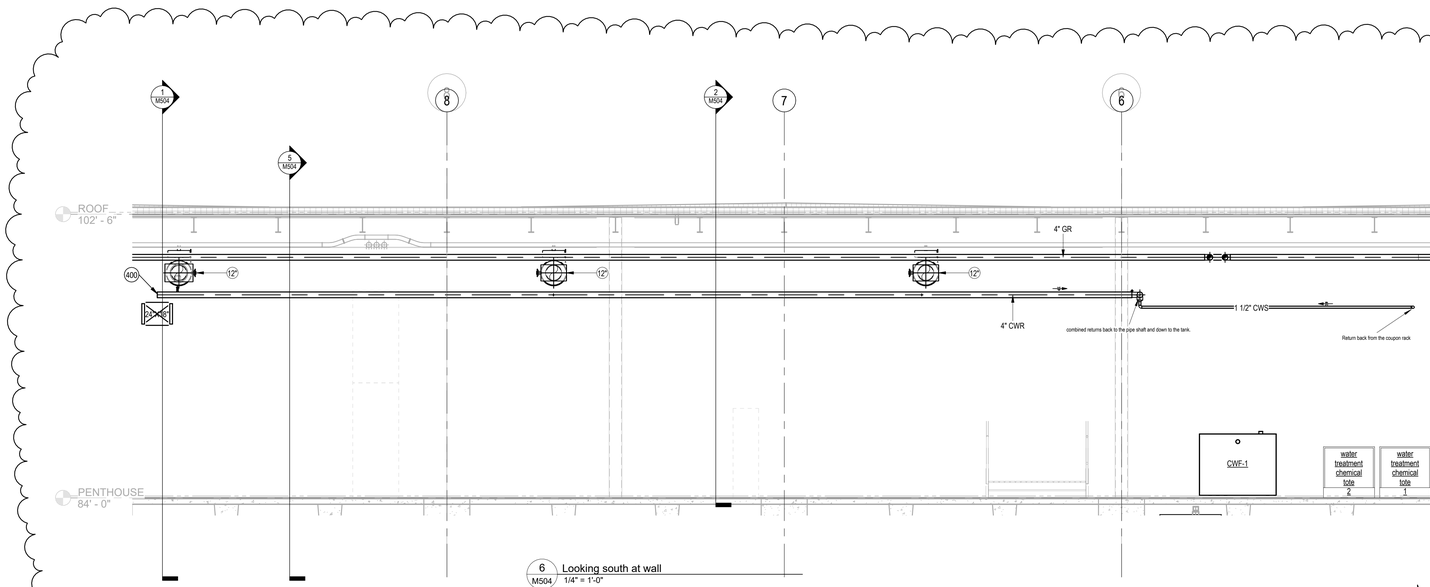


2 M504 PENTHOUSE LOOKING WEST
1/4" = 1'-0"

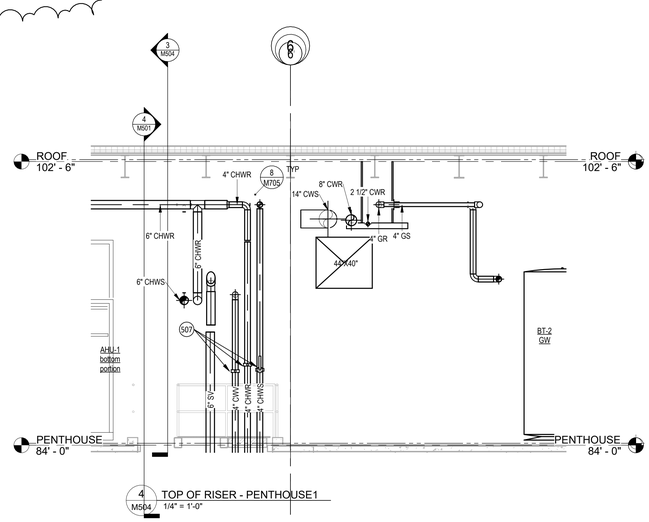
X00	PLAN NOTES
400	PROVIDE A BLIND FLANGE CLEANOUT ON THE END OF THE 4" CWR RETURN TO TANK. PROVIDE A BALL VALVE AND 0-10 PSIG PRESSURE GAUGE IN THIS PIPE WHICH IS VISIBLE FROM THE FLOOR.
500	CONNECT THE SHUTDOWN BLEED PIPE TO THE BOTTOM OF THE CWR SUCH THAT ALL WATER IN THE LARGE PIPE DRAINS OUT IN THE WINTER TO REDUCE PIPE FREEZING RISK. PROVIDE A TWO UNIONS IN THE PIPE SUCH THAT THE CONTROL VALVE CAN BE REMOVED AND CLEANED. PROVIDE AT LEAST TWO ELBOWS IN THE PIPE. TYP ALL THREE CT.
501	CONNECT THE SHUTDOWN BLEED PIPE TO THE TOP OF THE CWR DRAIN BACK TO TANK SUCH THAT THERE IS AT LEAST 5" OF VERTICAL HEIGHT IN THE INITIAL RISE UP. TYP ALL THREE CT.
502	CONNECT TO MANUAL BALANCE VALVE FURNISHED BY CT MANUFACTURER WITH MANUFACTURER'S RECOMMENDED GASKET. TYP ALL THREE CT.
503	CONNECT TO CT WITH FLANGE AND GASKET PER CT MANUFACTURER WRITTEN INSTALLATION INSTRUCTIONS. TYP ALL THREE CT.
504	SUPPORT PIPING ADJOINING ELBOW TO MINIMIZE WEIGHT TRANSFERRED TO CT COLD WATER BASIN PER CT MANUFACTURER WRITTEN INSTALLATION INSTRUCTIONS. TYP ALL THREE CT.
505	CONNECT THE SHUTDOWN BLEED PIPE TO THE CWS PIPE ABOVE THE BIG PIPE MAIN CONTROL VALVE AND BELOW THE ROOF DECK. PROVIDE A TWO UNIONS IN THE PIPE SUCH THAT THE CONTROL VALVE CAN BE REMOVED AND CLEANED. TYP ALL THREE CT.
506	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE THROUGH THE PENTHOUSE ROOF.
507	PROVIDE A BUTTERFLY VALVE WITH MANUAL GEAR DRIVE HANDWHEEL APPROX 4'-0" AFF FOR THIS PIPE RISER. PROVIDE A BALL VALVE AND PREESURE GAUGE APPROX 5'-0" AFF JUST ABOVE THE BUTTERFLY.
508	PROVIDE A JUNCTION BOX ON THE 4" DIAMETER BAS CONDUIT APPROX 4'-0" AFF FOR EASE OF ADDITION OF FUTURE CABLING. CONTINUE THE BAS CONDUIT TO THE PENTHOUSE DDC PANELS IN A CONDUIT (SMALLER THAN 4" DIAMETER) WHICH IS UPSIZED FOR TWO FUTURE CABLES.
509	PROVIDE A 1-1/2" BALL VALVE NEAR THE TOP OF THE PIPE RISE WITH A CAPPED THREADED NIPPLE IN THE VALVE OUTLET TO FUNCTION AS A HIGH POINT MANUAL AIR VENT. TYPICAL EACH HYDRONIC PIPE RISER.



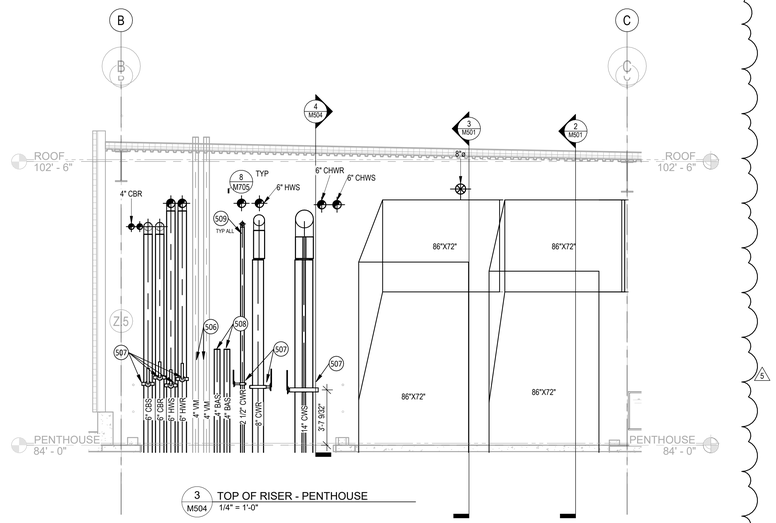
5 M504 COOLING TOWER CONNECTIONS1
1/4" = 1'-0"



6 M504 Looking south at wall
1/4" = 1'-0"



4 M504 TOP OF RISER - PENTHOUSE1
1/4" = 1'-0"



3 M504 TOP OF RISER - PENTHOUSE
1/4" = 1'-0"

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER KEGAN LANGONI
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

PENTHOUSE SECTIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M504

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STEAM INJECTION HUMIDIFIER SCHEDULE

TAG / ROOM	AIRFLOW	MIN. CAPACITY (3)	DUCT SIZE (1) (2)	MAX INPUT KW AT 480 / 3 PHASE	DESIGN REFERENCE	REFERENCE ROOM CONDITIONS	ADDITIONAL NOTES
H-502 / 504	1625	40 PPH	24" wide x 18"tall	16 kW	DRISTEEM RX-48-1 w/ ULTRASORB	34% RH at 75 degF	NOTE 4
H-509 / 504	1765	42 PPH	24" wide x 18"tall	16 kW	DRISTEEM RX-48-1 w/ ULTRASORB	34% RH at 75 degF	NOTE 4
H-536 / 504	1740	42 PPH	24" wide x 18"tall	16 kW	DRISTEEM RX-48-1 w/ ULTRASORB	34% RH at 75 degF	NOTE 4
H-534 / 509	2260	72 PPH	28" wide x 18"tall	25 kW	DRISTEEM RX-75-1 w/ ULTRASORB	44% RH at 75 degF	NOTE 4
H-540 / 509	2120	70 PPH	28" wide x 18"tall	25 kW	DRISTEEM RX-75-1 w/ ULTRASORB	44% RH at 75 degF	NOTE 4

SCHEDULE NOTES:

1. PROVIDE VERTICAL TUBE DISPERSION GRID WITH TUBE QUANTITY, TUBE SIZE, HEADER SIZE, AND TUBE SPACING PER THE MANUFACTURER. TUBES SHALL BE INSULATED. THE GRID SHALL NOT REQUIRE MECHANICAL STEAM TRAPS (SEE PIPING DETAIL). THE GRID SHALL BE SIZED SUCH THAT THE VELOCITY THROUGH THE GROSS AREA OF THE GRID AT THE SCHEDULED MAXIMUM AIRFLOW IS NO HIGHER THAN 900 FPM AND THE AIRFLOW PRESSURE DROP IS NO MORE THAN 0.10" W.G.. STAINLESS MATERIALS SHALL BE PROVIDED ON ALL PARTS IN DIRECT CONTACT WITH THE AIR PASSING THROUGH THE GRID AND THE GRID ENCLOSURE. HEADERS LOCATED OUTSIDE OF THE DUCTWORK.

2. PROVIDE A MAXIMUM CALCULATED ABSORPTION (AND NON-WETTING) DISTANCE OF 16" BASED ON AN ENTERING AIR TEMPERATURE OF 55 DEGF DB AND 45 DEGF WB. PROVIDE A GRID SIZE SUCH THAT THE SCHEDULED STEAM CAPACITY (FULLY ABSORBED INTO THE DISCHARGE AIR) PRODUCES A LEAVING AIR TEMPERATURE NO GREATER THAN 58.0 DEGF DB.

3. SCHEDULED VALUE IS THE CAPACITY OF STEAM ABSORBED BY THE AIRSTREAM AT HUMIDIFIER MAXIMUM OUTPUT. THE UNIT SHALL BE CONFIGURED TO PROVIDE A CONTROLLABLE STEADY-STATE STEAM OUTPUT OF 1.0 PPH SUCH THAT THE OUTPUT DOES NOT VARY OUTSIDE A MINIMUM OF 0.5 PPH AND A MAXIMUM OF 1.5 PPH WHILE AT THAT CONTROLLED CONDITION. THIS STEADY-STATE CONDITION SHALL BE CONTROLLABLE FOR A PERIOD OF 24 HOURS STRAIGHT WITHOUT EXCEEDING 1.5 PPH NOR DIMINISHING BELOW 0.5 PPH AT ANYTIME WITHIN THAT 24 HOUR PERIOD. THE UNIT SHALL BE OUTFITTED WITH SOLID STATE RELAY MODULATING DEVICES AND A CONTROLLER WHICH MODULATES THE STEAM OUTPUT OF THE UNIT TO ACHIEVE THE REQUIRED LOW END CONTROLLABILITY.

4. PROVIDE ALL INTERCONNECTING POWER AND CONTROL WIRING REQUIRED FROM THE PANEL TO THE DISTRIBUTION MANIFOLD AND THE FILL VALVES AND DRAIN VALVES AND OTHER FEATURES COMPLETE . PROVIDE ELECTRIC DP AIRFLOW SWITCH (NOT SAIL TYPE SWITCH). PROVIDE MANUFACTURER'S FLOOR STAND. PROVIDE FOR RO / DI WATER MAKEUP.

BOILER SCHEDULE

TAG	NG INPUT (MBH) (NOTE 1)	MIN OUTPUT (MBH) (NOTE 3)	MAXIMUM MCA (NOTE 2)	VOLT/ PHASE	DESIGN REFERENCE	NOTES
HB-1	4,000	3,840	12	460/3	AERCO BENCHMARK-4000	NOTES 4 & 5 & 6.
HB-2	4,000	3,840	12	460/3	AERCO BENCHMARK-4000	NOTES 4 & 5 & 6.
HB-3	4,000	3,840	12	460/3	AERCO BENCHMARK-4000	NOTES 4 & 5 & 6.

SCHEDULE NOTES:
NOTE 1: EXPECTED NATURAL GAS PRESSURE PROVIDED BY THE BUILDING PIPING AT THE CONNECTION TO THE BOILER PIPING: MINIMUM 4" W.G., MAXIMUM 14" W.G.. BOILER MANUFACTURER TO PROVIDE NG PRESSURE REGULATORS AS REQUIRED.

NOTE 2: MAXIMUM MCA (IN AMPS) AT 460 VAC IS THE MINIMUM MAIN POWER WIRE SIZE THAT THE MANUFACTURER REQUIRES FOR THE SINGLE POINT POWER CONNECTION OF THE ASSEMBLY. THE MANUFACTURER'S REQUIRED WIRE SIZE AMPACITY SHALL BE NO GREATER THAN THAT SCHEDULED. THE MANUFACTURER SHALL ACCOUNT FOR WIRE HEATING, CURRENT DRAW, AGING OF COMPONENTS, AND ANTICIPATED FAULTS PER NFPA 70.

NOTE 3: AHRI HYDRONICS INSTITUTE BTS-2000 RATING (180 DEGF OUTLET AND 80 DEGF INLET).

NOTE 4: PROVIDE BOILER MANUFACTURER'S INDIVIDUAL CONDENSATE NEUTRALIZATION ASSEMBLY AND DRAIN TRAP AT EACH INDIVIDUAL BOILER.

NOTE 5: ASSEMBLY SHALL INCLUDE SKID MOUNTED ITEMS: BOILER, COMBUSTION BLOWER AND MOTOR, BURNER CONTROLLER WITH FLAME DETECTION AND TEMPERATURE SAFETIES, MANUAL VALVES (VESSEL DRAIN), BOILER VESSEL SAFETY RELIEF VALVE(S), MANUAL RESET LOW WATER LEVEL CUTOUT, AUXILIARY LOW WATER CUTOUT, PRESSURE GAUGES (SUPPLY AND RETURN WATER), GAS INLET MANUAL VALVE, WATER INLET MANUAL VALVE, NG TRAIN (VENTLESS).

NOTE 6: PROVIDE A SINGLE EXTERNAL BOILER MASTER CONTROLLER AND SEQUENCER FOR THE PROJECT, DESIGNATED THE **BOILER MANAGEMENT PANEL** , TO CONTROL THIS BOILER'S INDIVIDUAL BOILER CONTROLLER. BOILER MANAGEMENT PANEL SHALL BE SUITABLE FOR 120VAC POWER SOURCE INPUT.

EXPANSION TANK SCHEDULE

TAG	SYSTEM SERVED	APPROX. SYSTEM VOL (GAL.)	SYSTEM TEMP RANGE (F)		PRV FILL PRESS AT TANK (PSIG)	PRESSURE RANGE (PSIG)		MIN ACCEPTANCE TANK VOL (GAL.)	DESIGN REFERENCE	NOTES
			MIN	MAX		RELIEF VALVE SETTING	MAX. DESIGN AT TANK			
ET-1	CHILLED WATER	6,000	40	100	50	125	110	75	WESSELS NLA 300	
ET-2	GLYCOL WATER	2,000	40	100	50	125	110	75	WESSELS NLA 300	35% PROPYLENE GLYCOL
ET-3	CB WATER	3,500	40	100	50	125	110	50	WESSELS NLA 200	
ET-4	HEATING WATER	4,000	60	185	50	125	110	250	WESSELS NLA 1000	

HEAT EXCHANGER (PLATE AND FRAME) SCHEDULE

TAG	COLD SIDE					HOT SIDE					CONNECTION SIZE (ANSI FLANGE)		DESIGN REFERENCE		NOTES
	FLUID	GPM	MAX. PSID	ENT. TEMP (°F)	LV. TEMP (°F)	FLUID	GPM	MAX. PSID	ENT. TEMP (°F)	LV. TEMP (°F)	HOT. (IN.)	COLD (IN.)	MANUFACTURER	MODEL	
HE-1	35% PG	165	10.0	42.0	55.0	WATER	250	6.0	66.0	58.0	4	4	B&G	AP55	NOTE ONE

NOTES:

1. MINIMUM DESIGN WORKING PRESSURE OF 150 PSIG AT 150 DEGF. PROVIDE MANUFACTURER'S 1" THICK ENCAPSULATED BLANKET INSULATION SURROUND. PROVIDE MANUFACTURER'S STRAINERS OF THE MESH SIZE RECOMMENDED IN WRITING BY THE MANUFACTURER TO BE INSTALLED EXTERIOR OF THE HEAT EXCHANGER ON THE COLD SIDE INLET AND THE HOT SIDE INLET.

AIR-DIRT SEPARATOR SCHEDULE

TAG	SYSTEM SERVED	NOMINAL CAP. (GPM)	MAX CAP. (GPM) (1)	MIN CONNECTION FLANGE SIZE	MAX. P.D. (FT. HD) (2)	DESIGN REFERENCE	NOTES
A/DS-1	CHILLED WATER	1,800	2,300	10"	4	B&G CRS	NOTE 3
A/DS-2	GLYCOL WATER	200	240	4"	2	B&G CRS	NOTE 3
A/DS-3	CB WATER	400	550	6"	3	B&G CRS	NOTE 3
A/DS-4	HEATING WATER	1,000	1,500	10"	3	B&G CRS	NOTE 3

SCHEDULE NOTES:
NOTE 1: PROVIDE A UNIT SUITABLE FOR THE SPECIFIED AIR REMOVAL AND DIRT REMOVAL AT THE MAXIMUM CAPACITY FLOWRATE SCHEDULED BASED ON THE MANUFACTURER'S WRITTEN SUBMITTAL INFORMATION.

NOTE 2: MAXIMUM CLEAN UNIT PRESSURE DROP AT THE NOMINAL CAPACITY FLOWRATE SCHEDULED BASED ON THE MANUFACTURER'S WRITTEN SUBMITTAL INFORMATION.

NOTE 3: PROVIDE A REMOVAL FLANGED HEAD OPENING TO ACCESS AND REMOVE INNER COMPONENTS.

BUFFER TANK SCHEDULE

TAG	SYSTEM	MIN. CAPACITY	FLANGE SIZES	DESIGN REFERENCE	NOTES
BT-1	CHW	3,000 GALLON	10"	TACO BTH3000	1
BT-2	GW	1,500 GALLON	4"	TACO BTH1500	1
BT-3	CB	300 GALLON	6"	CEMLINE V300CWB	1

NOTES:

1. PROVIDE FACTORY INSULATION AND INSULATION JACKET AND LEG STANDS.

HYDRONIC FINNED TUBE RADIATION SCHEDULE

TAG	ENCLOSURE STYLE	ROWS	TUBE SIZE (IN.)	MINIMUM CAPACITY (BTU/h) PER LINEAL FOOT ACTIVE FIN LENGTH	GPM	DESIGN REFERENCE	NOTES
FTRP-1	PEDESTAL	1	0.75	500	2.0	VULCAN DURA-VANE II JDVP4	1, 2, 3, 4, 5
FTRP-2	PEDESTAL	1	1.0	500	4.0	VULCAN DURA-VANE II JDVP4	1, 2, 3, 4, 6

SCHEDULES NOTES:
NOTE 1: SEE PLANS FOR ENCLOSURE LENGTH; FIELD VERIFY ADJOINING SURFACES DURING CONSTRUCTION PRIOR TO ORDERING HOUSING LENGTH. FIELD VERIFY ENCLOSURE LENGTH AND GENERAL TRADES CONFIGURATION OF ADJOINING CONSTRUCTION. ENCLOSURE SHALL SPAN FROM WALL TO WALL WITH A MAXIMUM 1/16" GAP BETWEEN THE ENCLOSURE END/PIECE/ENDCAP AND THE FINISHED WALL(S), UNLESS NOTED OTHERWISE ON THE PLANS. MINIMUM ACTIVE FINNED LENGTH SHALL BE THE INSTALLED ENCLOSURE LENGTH MINUS AT MOST A 4" LONG BARE SECTION AT EACH END OF THE ENCLOSURE FOR PIPING CONNECTIONS AND A MAXIMUM 4" LONG BARE PIPE SECTION EVERY 8' OF ENCLOSURE LENGTH FOR ASSEMBLY PURPOSES (SO YES, THE FINNED ELEMENTS ARE LOCATED IN AREAS WHERE THERE IS NOT VISION GLAZING DIRECTLY ABOVE THEM).

NOTE 2: AVERAGE WATER TEMPERATURE 140 DEGF, ENTERING AIR TEMPERATURE 65 DEGF. MINIMUM 4"X4" FIN SIZE, MINIMUM 44 FINS PER FOOT. 7" TALL AND MAXIMUM 5.5" WIDE ENCLOSURE HOUSING WITH PEDESTALS SIZED FOR A 4" OPEN AIR HEIGHT BENEATH THE OPEN BOTTOM OF ENCLOSURE.

NOTE 3: SURFACE MOUNTED PEDESTAL FINNED TUBE LENGTH SAME AS THE ENCLOSURE LENGTH (SEE SPECIFICATION FOR MAXIMUM 4" UNFINNED CONNECTION END LENGTHS AND MULTI-SEGMENT UNFINNED JOINING LENGTHS) WITH A FLAT TOP. PROVIDE PENCIL PROOF CONTINUOUS OUTLET ALUMINUM BAR GRILLE (NOT STAMPED METAL LOUVERS) WITH STRAIGHT VANES (ZERO DEGREE DEFLECTION) AND CLEAR ANODIZED FINISH THE ENTIRE LENGTH OF THE ENCLOSURE. PROVIDE MINIMUM 14 GAUGE ENCLOSURE WITH FULL METAL BACKSIDE, OVERLAPPING ACCESSORIES, SLIP JOINTED FLUSH END CAPS AT EACH END (LESS THAN 1/16" GAP TO ADJOINING PERPENDICULAR WALL). PROVIDE TEMPERATURE RATED PLASTIC SLIDE SHOES TO MOUNT RETURN PIPE INSIDE OF THE ENCLOSURE ABOVE THE FINS IN THE LOCATIONS THIS IS REQUIRED. ANCHOR THE ENCLOSURE PEDESTAL TO THE CONCRETE FLOOR WITH A MINIMUM OF TWO FASTENERS WITH A PEDESTAL EVERY 24" ON CENTER MAXIMUM AND PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

NOTE 4: ALL VISIBLE ENCLOSURE COMPONENTS ARE TO BE MANUFACTURER'S STANDARD BEIGE COLOR BAKED ENAMEL UNLESS NOTED OTHERWISE IN THE SUBMITTAL REVIEW. OUTLET GRILLE AND FLOOR SUPPORT PEDESTAL BRACKETS ARE TO BE CUSTOM ANODIZED ALUMINUM COLOR TO MATCH CURTAINWALL MULLION COLOR FOR ALL LOCATIONS. PROVIDE IN BID FOR ALL LOCATIONS TO HAVE ALL VISIBLE ENCLOSURE COMPONENTS CUSTOM ANODIZED ALUMINUM COLOR TO MATCH CURTAINWALL MULLION WITH DETERMINATION OF ACTUAL LOCATIONS FROM THE SUBMITTAL REVIEW (DIFFERENT LOCATIONS IN THE BUILDING MAY BE DIFFERENT COLORS). PROVIDE COLOR SAMPLES SUBMITTAL DIRECTLY TO THE ARCHITECT MAKING THE FINISH DECISION FOR SUBMITTAL PROCESSING.

NOTE 5: PROVIDE 3/4" RUNOUT PIPE SIZE TO ONE INDIVIDUAL PIECE OF FINNED TUBE RADIATION UNLESS NOTED OTHERWISE. PROVIDE 1" RUNOUT PIPE SIZE TO A PIPE WHICH SERVES TWO INDIVIDUAL PIECES OF FINNED TUBE RADIATION UNLESS NOTED OTHERWISE.

NOTE 6: PROVIDE 1" RUNOUT PIPE SIZE TO THE INDIVIDUAL PIECE OF FINNED TUBE RADIATION UNLESS NOTED OTHERWISE.

PUMP SCHEDULE

TAG	CAPACITY	DUTY POINT MAX BHP	MINIMUM MOTOR HP (NOTE 1)	VOLT / PHASE	PUMP STYLE / MINIMUM INLET SIZE	DESIGN REFERENCE	NOTES
CWP-1	1265 GPM @ 130 FT TDH	51	60 HP	460 / 3	END SUCTION / 6"	B&G e-1510 : 5GB	
CWP-2	1265 GPM @ 130 FT TDH	51	60 HP	460 / 3	END SUCTION / 6"	B&G e-1510 : 5GB	
CWP-3	1265 GPM @ 130 FT TDH	51	60 HP	460 / 3	END SUCTION / 6"	B&G e-1510 : 5GB	
CBP-1	500 GPM @ 90 FT TDH	14.1	15 HP	460 / 3	END SUCTION / 4"	B&G e-1510 : 3EB	
CBP-2	500 GPM @ 90 FT TDH	14.1	15 HP	460 / 3	END SUCTION / 4"	B&G e-1510 : 3EB	
GWP-1	165 GPM @ 75 FT TDH	5	7.5 HP	460 / 3	END SUCTION / 2.5"	B&G e-1510 : 2BD	
GWP-2	165 GPM @ 75 FT TDH	5	7.5 HP	460 / 3	END SUCTION / 2.5"	B&G e-1510 : 2BD	
CHWP-1	900 GPM @ 110 FT TDH	35	40 HP	460 / 3	END SUCTION / 5"	B&G e-1510 : 4GC	
CHWP-2	900 GPM @ 110 FT TDH	35	40 HP	460 / 3	END SUCTION / 5"	B&G e-1510 : 4GC	
CHWP-3	900 GPM @ 110 FT TDH	35	40 HP	460 / 3	END SUCTION / 5"	B&G e-1510 : 4GC	
HWP-1	500 GPM @ 110 FT TDH	19	25 HP	460 / 3	END SUCTION / 4"	B&G e-1510 : 3GB	
HWP-2	500 GPM @ 110 FT TDH	19	25 HP	460 / 3	END SUCTION / 4"	B&G e-1510 : 3GB	
HWP-3	500 GPM @ 110 FT TDH	19	25 HP	460 / 3	END SUCTION / 4"	B&G e-1510 : 3GB	
HCP-1	90 GPM @ 25 FT TDH	1.0	1.5 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	
HCP-2	90 GPM @ 25 FT TDH	1.0	1.5 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	
HCP-3	90 GPM @ 25 FT TDH	1.0	1.5 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	
HCP-4	90 GPM @ 25 FT TDH	1.0	1.5 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	
HCP-5	90 GPM @ 25 FT TDH	1.0	1.5 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	
CCP-7	40 GPM @ 35 FT TDH	1.0	2 HP	460 / 3	INLINE / 1.5"	B&G e-80 : 1.5x1.5x9.5B	
CBP-3	135 GPM @ 40 FT TDH	2.0	3 HP	460 / 3	INLINE / 2.5"	B&G e-80 : 2.5x2.5x7B	FOR WWHP
CBP-4	250 GPM @ 40 FT TDH	3.9	5 HP	460 / 3	INLINE / 3"	B&G e-80 : 3x3x9.5C	FOR HE-1 GW to CB
CBP-5	250 GPM @ 40 FT TDH	3.9	5 HP	460 / 3	INLINE / 3"	B&G e-80 : 3x3x9.5C	FOR HE-2 CW to CB
HWP-4	200 GPM @ 40 FT TDH	3	5 HP	460 / 3	INLINE / 3"	B&G e-80 : 3x3x7C	FOR WWHP

SCHEDULE NOTES:
1. DO NOT PROVIDE 3600 RPM MOTORS UNLESS SPECIFICALLY INDICATED.

SCHEDULED FLOW METERS, OXYGEN DEPLETION MONITORS, CO MONITORS, LEVEL SENSORS AND REFRIGERANT MONITORS ARE PROVIDED (FURNISHED AND INSTALLED COMPLETE) BY THE PIPE INSTALLATION TRADES.
FLOW METERS, OXYGEN DEPLETION MONITORS, CO MONITORS, LEVEL SENSORS AND REFRIGERANT MONITORS ARE NOT FURNISHED BY THE CONTROL SUPPLIER NOR INSTALLED BY THE CIC. REFER TO CONTROL SUPPLIER DRAWINGS FOR INTEGRATION REQUIRMENTS TO THE BAS.

LEVEL SENSOR SCHEDULE

TAG	DESIGN REFERENCE	ADDITIONAL NOTES
LC-1	ENDRESS & HAUSER WATERPILOT FMX11	(1) (2) (3) (4)

SCHEDULE NOTES:

1. HYDROSTATIC LEVEL PRESSURE SENSOR ADJUSTABLE LENGTH SENSING PROBE WITH PROTECTION CAP, AS FURNISHED BY WARRICK OR E&H. PROVIDE MOUNTING FLANGE (FOR MOUNTING TO TANK FLANGE), OVERVOLTAGE PROTECTION, 120VAC TO 24VDC POWER TRANSFORMER, IP66 TERMINATION BOX (MOUNTED ON TOP OF THE MOUNTING FLANGE), SUSPENSION CLAMP (MOUNTED BELOW THE MOUNTING FLANGE)

2. SET FAILSAFE MODE FOR PROBE CONDITION, SENSOR FAULT, AND POWER FAILURE TO TURN OFF PUMPS. ADJUST SIGNAL SENSITIVITY WITH SYSTEM IN OPERATION TO AVOID NUISANCE INDICATIONS.

3. GROUND UNIT IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

4. PROVIDE A STILLING PIPE WHICH IS OPEN ON BOTH ENDS, MINIMUM 4" DIAMETER PIPE, SCH 40 PVC. INSTALL STILLING PIPE LOCATED WITH BOTTOM 12" ABOVE SUMP FLOOR AND TOP LOCATED 12" BELOW SUMP LID. ATTACH BOTH ENDS OF THE STILLING PIPE TO THE SUMP WALL WITH STAINLESS CLAMPS, RODS, AND HARDWARE. SUSPEND SENSOR AT THE CENTERLINE OF THE STILLING PIPE.

CO MONITOR SCHEDULE

TAG	DESIGN REFERENCE	ADDITIONAL NOTES
COM-1	BELIMO 22G02	NOTES ONE & TWO

SCHEDULE NOTES:

1. PROVIDE MONITOR MOUNTED AT 5'-0" AFF.

2. UNIT MOUNTED STROBE AND 85 dB HORN, WALL-MOUNT ENCLOSURE, ANALOG OUTPUT, ONE RELAY, 120VAC TO 24VDC POWER TRANSFORMER.

3. PROVIDE MANUFACTURER AUTHORIZED STARTUP PERSONNEL TO SET ALARMS AND TRAIN OWNER'S PERSONNEL ON SITE.

(5)

OXYGEN DEPLETION MONITOR SCHEDULE

TAG	DESIGN REFERENCE	ADDITIONAL NOTES
ODM-1	PUREAIRE TX-1100	NOTES ONE & TWO

SCHEDULE NOTES:

1. PROVIDE WALL MOUNTING BRACKETS, 120VAC TO 24VDC POWER TRANSFORMER, MOUNTED AT 5'-0" AFF. PROVIDE REMOTE DIGITAL DISPLAY AND MOUNT REMOTE DISPLAY WHERE NOTED. PROVIDE RED STROBE MOUNTED DIRECTLY ABOVE MONITOR AT 5'-0" AFF (DISABLE HORN).

2. PROVIDE WIRING AND RIGID CONDUIT BETWEEN MONITOR, REMOTE DISPLAY, AND HORN. PROVIDE MANUFACTURER AUTHORIZED STARTUP PERSONNEL TO SET ALARMS AND TRAIN OWNER'S PERSONNEL ON SITE.

REFRIGERANT MONITOR SCHEDULE

TAG	DESIGN REFERENCE	ADDITIONAL NOTES
RM-1	MSA CHILLGARD LE	NOTES ONE & TWO & THREE

SCHEDULE NOTES:

1. PROVIDE MONITOR MOUNTED AT 5'-0" AFF. PROVIDE THREE REMOTE SENSING POINTS MOUNTED AT 1'-0" AFF, WITHIN 48" OF THE CONNECTOR END OF EACH CHILLER.

2. PROVIDE WIRING AND RIGID CONDUIT BETWEEN MONITOR AND REMOTE SENSING LOCATIONS. PROVIDE MANUFACTURER AUTHORIZED STARTUP PERSONNEL TO SET ALARMS AND TRAIN OWNER'S PERSONNEL ON SITE.

3. 120V MODEL WITH UNIT MOUNTED STROBE AND 85 dB HORN.

(5)

MAGNETIC FLOW METER SCHEDULE

TAG	SERVICE	PIPE MAIN SIZE / METER FLANGE SIZE	MAXIMUM OF THE FLOW RANGE LOWER SETTING (GPM) (4)	DESIGN REFERENCE	ADDITIONAL NOTES
FM-1	CHILLED WATER	10" / 8"	100	ABB: PROCESS MASTER FEP632 AND FET632 REMOTE MOUNT TRANSMITTER	(1) (5) (6) (7) (10)
FM-2	HEATING WATER	10" / 8"	100	ABB: PROCESS MASTER FEP632 AND FET632 REMOTE MOUNT TRANSMITTER	(1) (2) (5) (6) (7) (10)
FM-3	CT MAKEUP WATER	2.5" / 1.5"	5	ABB: PROCESS MASTER FEP632 AND FET632 REMOTE MOUNT TRANSMITTER	(1) (3) (10)
FM-4	GLYCOL WATER	4" / 3"	20	ABB: PROCESS MASTER FEP631	(9)
FM-5	WWHP: CB	4" / 3"	20	ABB: PROCESS MASTER FEP631	(9)
FM-6	WWHP: HW	4" / 3"	20	ABB: PROCESS MASTER FEP632 AND FET632 REMOTE MOUNT TRANSMITTER	(1) (2) (9)
FM-7	CT BLOWDOWN WATER	2" / 1.5"	5	BADGER: M2000	(8) (10)
FM-8	HW MAKEUP WATER	1" / 0.5"	0.25	BADGER: M2000	(8) (10)
FM-9	CHW MAKEUP WATER	1" / 0.5"	0.25	BADGER: M2000	(8) (10)
FM-10	CB MAKEUP WATER	1" / 0.5"	0.25	BADGER: M2000	(8) (10)

SCHEDULE NOTES:

1. PROVIDE REMOTE TRANSMITTER, MOUNTED AT 5'-0" AFF (NOT ABOVE, BELOW, NOR ADJACENT TO THE METER). +/- 0.3% OF MEASURED VALUE ACCURACY OPTION. PROVIDE WIRING AND SOLID EMT CONDUIT COMPLETE BETWEEN METER, REMOTE TRANSMITTER, TEMPERATURE SENSORS, AND THE FLOW COMPUTER. PROVIDE A 1" MINIMUM CONDUIT BETWEEN COMPONENTS DEDICATED TO METERING WIRES AND CABLES; LABEL THE CONDUIT "METERING" IT'S ENTIRE LENGTH. PROVIDE MODBUS OUTPUT FOR TWO ANALOG SIGNALS FOR THE REMOTE TRANSMITTERS SCHEDULED TO BE CONNECTED TO THE ION SYSTEM.

2. PROVIDE METER COMPONENTS SUITABLE FOR OPERATION AT 200 DEGREE FAHRENHEIT WATER TEMPERATURE.

3. PROVIDE FLOW METERS AND ACCESSORIES AS MANUFACTURED BY ABB OR KROHNE OR BADGER M2000 MODBUS. 120V POWER SUPPLY. MINIMUM ACCURACY AND REPEATABILITY OF +/- 1.0% OVER A FLOW RANGE OF 1 TO 30 FEET PER SECOND. PROVIDE THREADED CONNECTIONS AND GROUNDING KIT. RS485/MODBUS CARD, TWO ANALOG OUTPUTS (OUTPUT OF VOLUME RATE UTILIZED BY THE BAS). PROVIDE ANALOG OUTPUT TERMINATION POINT (0-10V OR 4-20 mA, CONFIRM WITH THE BAS CONTROL SUPPLIER) FOR USE AS A BAS CONTROL HARDWIRED INPUT. CONDUIT AND WIRING FROM THE REMOTE TRANSMITTER TO THE BAS IS PROVIDED BY THE CIC.

4. SENSOR FLOW RANGE LOWER END SETTING OF THE MEASURING RANGE SHALL BE NO HIGHER THAN THIS SCHEDULED VALUE.

5. PROVIDE METER MANUFACTURER'S PAIR OF TEMPERATURE SENSORS AND THERMOWELLS FOR THIS METER. INSTALL SENSORS IN THERMOWELLS, WITH ONE SENSOR DOWNSTREAM OF THE METER (OUTSIDE OF THE STRAIGHT PIPE DIAMETERS) AND THE OTHER SENSOR ON THE OPPOSITE PIPE LINE. SENSORS SHALL BE: MATCHED PAIR RTDS, "ULTRA PRECISION" TYPE, 100 OHM PLATINUM OR 1000 OHM NICKEL WITH ACCURACY +/- 0.1% RESISTANCE TOLERANCE.

6. PROVIDE FLOW METERS AND ACCESSORIES AS MANUFACTURED BY ABB OR KROHNE. 120V POWER SUPPLY. MINIMUM ACCURACY AND REPEATABILITY OF +/- 1.0% OVER A FLOW RANGE OF 1 TO 30 FEET PER SECOND. PROVIDE FLANGED CONNECTIONS AND MATING FLANGE GROUNDING KIT.

7. PROVIDE FLOW COMPUTER FOR THIS METER: KESSLER-ELLIS PRODUCTS (KEP), MODEL ES-749L11N-ET, LCD DISPLAY (EXTENDED TEMPERATURE), 120V WITH INTERNAL LINE FILTER CAPACITOR, RS485/MODBUS CARD, TWO ANALOG OUTPUTS (ONE ANALOG OUTPUT OF VOLUME RATE UTILIZED BY THE BAS). CAPABLE OF MONITORING AND RECORDING: DEMAND RATE, FLOW RATE, TOTALIZED FLOW READING, TOTALIZED DEMAND READING, AND TEMPERATURES. CAPABLE OF PERFORMING TEMPERATURE AND FLOW RATE COMPENSATION WITH NON-VOLATILE MEMORY STORAGE AND MODBUS COMMUNICATION. PROVIDE MODEL MS811 NEMA 4 WALL MOUNT ENCLOSURE AND COMPUTER ASSEMBLED BY KEP. CONDUIT AND WIRING FROM THE FLOW COMPUTER TO THE BAS IS PROVIDED BY THE CIC.

8. PROVIDE FLOW METERS AND ACCESSORIES AS MANUFACTURED BY ABB OR KROHNE OR BADGER M2000 MODBUS. 120V POWER SUPPLY. MINIMUM ACCURACY AND REPEATABILITY OF +/- 1.0% OVER A FLOW RANGE OF 1 TO 30 FEET PER SECOND. PROVIDE THREADED CONNECTIONS AND GROUNDING KIT. RS485/MODBUS CARD, ONE ANALOG OUTPUT (OUTPUT OF VOLUME RATE UTILIZED BY THE ION); NO CONNECTION TO THE BAS.

9. PROVIDE FLOW METERS AND ACCESSORIES AS MANUFACTURED BY ABB OR KROHNE. 120V POWER SUPPLY. MINIMUM ACCURACY AND REPEATABILITY OF +/- 1.0% OVER A FLOW RANGE OF 1 TO 30 FEET PER SECOND. PROVIDE FLANGED CONNECTIONS AND MATING FLANGE GROUNDING KIT. CONDUIT AND WIRING FROM THE METER TO THE BAS IS PROVIDED BY THE CIC.

10. THIS METER WILL BE CONNECTED TO THE ION SYSTEM; COORDINATE WITH DIV. 26 TRADESPEOPLE REGARDING WHERE THEY ARE TO LAND THEIR ION SYSTEM WIRES AND PROVIDE THE METER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS TO THE DIV. 26 TRADESPEOPLE FOR THE SIGNAL WIRE TYPE AND OTHER APPLICABLE INSTALLATION REQUIREMENTS. PROVIDE TWO HOURS OF METER TECHNICIAN TIME AND TWO HOURS OF FLOW COMPUTER TECHNICIAN TIME TO PROVIDE SET UP AND STARTUP OF THE METERING SIGNAL ON THE ION SYSTEM AND TO CONFIRM THE ACCURACY OF THE METER SIGNAL AS READ AT THE ION SYSTEM.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

EQUIPMENT SCHEDULES - PIPING RELATED

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M602

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HYDRONIC HEATING COIL SCHEDULE

TAG	TOTAL MAX. CFM	MIN TOTAL MBH	MAX. FACE VELOCITY (FPM)	MAX. S.P. DROP (IN W.G.)	COIL QTY (NOTE 2)	MIN ROWS	MIN/MAX FINS PER IN.	TOTAL GPM (NOTE 1)	EAT	LAT (NOTE 3)	NOTES
HC-6A	10,500	200	750	0.65	ONE	2	8 / 11	20	70.0 FDB	87.0 FDB	
HC-6B	10,500	200	750	0.65	ONE	2	8 / 11	20	70.0 FDB	87.0 FDB	

SCHEDULE NOTES:
NOTE 1: HEATING WATER 130.00 EWT. CIRCUIT FOR MAXIMUM 25 FEET TDH PRESSURE DROP. CIRCUIT HEATING COILS FOR 2.0 TO 4.0 FPS.

NOTE 2: SCHEDULED PERFORMANCE IS THE COMBINED TOTAL OF THE COIL BANK COMPOSED OF THE QUANTITY OF COILS LISTED IN THIS COLUMN. ALL COILS IN THE BANK SHALL BE THE SAME SIZE WITH THE FLOWS DISTRIBUTED EVENLY AMONGST THE COILS. COIL FINNED LENGTH AND HEIGHT AS DETERMINED BY COIL MANUFACTURER TO MEET SPECIFIED PERFORMANCE.

NOTE 3: REQUIRED LEAVING AIR TEMPERATURES FOR HEATING COILS SHALL BE AT LEAST THAT SCHEDULED.

FLUID COOLER SCHEDULE

TAG	CAPACITY	FAN MOTOR / PUMP MOTOR	DESIGN REFERENCE	NOTES
FC-4	200 GPM (1)	40 HP / 5 HP	MARLEY DTW1212	NOTE TWO

SCHEDULE NOTES:

1. COOL SOLUTION OF 35% PG FROM 73.0 TO 63.0 WITH 59.0 FWB CONDITIONS. UNIT SUITABLE FOR DRY COOLING (NO BASIN WATER) AND WET COOLING.

2. STAINLESS CASING, FRAMING, COLLECTION BASIN AND STRUCTURE. STAINLESS STEEL TUBE BUNDLES. BASIN MAKEUP FLOAT VALVE AND 12 kW HEAT TRACE WITH BASIN HEATER CONTROLLER. ACCESS PLATFORM, SAFETY CAGE AND LADDERS.

ELECTRIC UNIT HEATER SCHEDULE

TAG	CAPACITY	VOLTS/ PHASE	DESIGN REFERENCE	NOTES
EUH-1	1,500 W	120 / 1	QMARK QCH1151F	NOTES ONE & TWO

SCHEDULE NOTES:

1. SURFACE MOUNTED HEATER WITH VERTICAL DISCHARGE. PROVIDE SURFACE MOUNTING BACKBOX HARDWARE SUITABLE FOR INSTALLATION ON FIRE RATED CEILING. PROVIDE MANUFACTURER'S SINGLE POLE 120V THERMOSTAT REMOTE (WALL) MOUNTED, BUILT-IN POWER ON/OFF SWITCH, THERMAL CUTOUT, FAN DELAY.

2. WALL MOUNT THE EUH THERMOSTAT AT 8'-9" AFF DIRECTLY ABOVE THE BAS SPACE SENSOR. ADJUST THE THERMOSTAT SUCH THAT THE EUH TURNS ON WHEN THE BAS SENSOR READS 68.0 DEGF.

CABINET UNIT HEATER SCHEDULE

TAG	CAPACITY		FAN (NOTE TWO)			DESIGN REFERENCE	NOTES
	MIN CFM / GPM (NOTE ONE)	MIN BTU/H	VOLTS/ PHASE	MIN. HP	MAX. WATTS		
CUH-1	625 CFM / 4.1 GPM	60,000	120/1	1/4	165	TRANE FORCE-FLO MODEL N SIZE 08	NOTES THREE AND FOUR
CUH-2	625 CFM / 4.1 GPM	60,000	120/1	1/4	165	TRANE FORCE-FLO MODEL N SIZE 08	NOTES THREE AND FOUR
CUH-3	625 CFM / 4.1 GPM	60,000	120/1	1/4	165	TRANE FORCE-FLO MODEL N SIZE 08	NOTES THREE AND FOUR

SCHEDULE NOTES:
NOTE 1: RATING AT 180.00 EWT; 70 FDB EAT. HIGH SPEED SETTING WITH ZERO ESP AND CLEAN FILTER.

NOTE 2: PROVIDE UNIT MOUNTED AND WIRED NON-FUSED DISCONNECT SWITCH WITH THERMAL OVERLOAD FOR EACH CUH. MAX BHP IS WITH CLEAN FILTER. DIRECT DRIVE MOTOR WITH UNIT-MOUNTED MANUAL THREE SPEED ADJUSTMENT CONTROLLER.

NOTE 3: RECESSED WALL MOUNTED WITH FLOOR SUPPORT (WITH PEDESTAL LEVELING FEET). FRONT FACE (NEAR THE TOP OF THE FRONT FACE) AIR INLET AND FRONT FACE (NEAR THE BOTTOM OF THE FRONT FACE) HORIZONTAL DISCHARGE AIR OUTLET (SOMETIMES CALLED "INVERTED AIRFLOW"). ANODIZED ALUMINUM BAR TYPE INLET GRILLE AND ALUMINUM BAR TYPE SUPPLY DISCHARGE GRILLE. INTERNALLY INSULATED UNIT CABINET, 1" THICK MERV 8 FILTER, AND KEYED ACCESS PANEL AND ACCESS DOOR.

NOTE 4: FULLY ENCLOSED (WITH FINISHED BACKPLATE) CABINET WITH FACTORY FINISH OF ALL EXPOSED PARTS. MANUFACTURER STANDARD COLOR POWDER COAT BAKED ENAMEL FINISH SELECTIONS. SUBMIT COLOR CHART AND COLOR SAMPLES DIRECTLY TO THE ARCHITECT FOR EXPOSED OCCUPIED APPLICATION VISIBLE FROM ALL SIDES THROUGH GLASS WALLS. MAXIMUM 68" LONG (INCLUDING A PIPING ACCESS EXTENSION) BY MAXIMUM 10.25" DEEP CABINET.

SHELL AND TUBE HEAT EXCHANGER SCHEDULE

TAG	TUBES - WATER (CB) (1)					SHELL - WATER (CW)					MAXIMUM OVERALL LENGTH (IN.) (3)	DESIGN REFERENCE		NOTES
	GPM	MAX. PRESSURE DROP	ENT. TEMP (°F)	LV. TEMP (°F)	FOULING FACTOR	GPM	MAX. PRESSURE DROP	ENT. TEMP (°F)	LV. TEMP (°F)	FOULING FACTOR		MANUFACTURER	MODEL	
HE-2	250	2.0 PSID	66.0	58.0	0.0005	200	0.5 PSID	43.0	53.0	0.0012	66	B&G	QWU-204-410	NOTE TWO

NOTES:

1. 0.75" OUTSIDE DIAMETER 90 / 10 CUPRONICKEL TUBE, 18 BWG.

2. 4" FLANGED WATER INLET AND 4" FLANGED WATER WATER OUTLET CONNECTIONS (SPECIAL ORDER AS NECESSARY). 3/4" DRAIN FITTING AND 3/4" VENT FITTING. PROVIDE SADDLE CRADLES FOR MOUNTING ON BUILT UP STAND.

3. MAXIMUM OVERALL LENGTH INCLUDES THE TUBE CONNECTION HEAD (WITH TUBESIDE CONNECTION PERPENDICULAR TO THE TUBES) AND IS APPROXIMATELY 20" LONGER THAN THE TUBE LENGTH. PROVIDE A FOUR PASS HEAT EXCHANGER.

WWHP SCHEDULE

TAG	UNIT PERFORMANCE RATINGS (1)		OPERATING PARAMETERS (7)						
	MINIMUM NOMINAL COOLING TONS	MAXIMUM FULL LOAD INPUT (kW/TON)	THERMAL PERFORMANCE	MINIMUM EVAPORATOR FLOWRATE (GPM)	MINIMUM CONDENSER FLOWRATE (GPM)	REFRIGERANT	ELECTRICAL CONNECTION (3)		DESIGN REFERENCE	NOTES
							MAXIMUM MCA (AT 460V)	VOLT / PHASE		
WWHP-4	60	1.10	(2)	95 (6)	95 (6)	R-513A OR R-454B OR R-32	115 AMPS (4)	460 / 3	CARRIER 30MPW	NOTE 5

SCHEDULE NOTES:
1. SUBMITTAL SHALL PRESENT MINIMUM NOMINAL COOLING (EVAPORATOR) TONNAGE PERFORMANCE AT SCHEDULED THERMAL PERFORMANCE OPERATING CONDITIONS. PROVIDE NO GREATER THAN THE MAXIMUM SCHEDULED THERMAL PERFORMANCE EVAPORATOR LOAD kW PER TON (OF EVAPORATOR REFRIGERATION 12,000 Btu/h).

2. EVAPORATOR COOLING IS THE PRIMARY OPERATING MODE. EVAPORATOR: approx 64.0 EWT / 52.00 LWT FOR 125 GPM AND AN 0.00010 degF*ft2*h/Btu FOULING FACTOR WITH A MAXIMUM PRESSURE DROP OF 20 FEET TDH OF CORROSION INHIBITED WATER. CONDENSER: 110.00 EWT / APPROX. 122.00 LWT FOR 150 GPM AND A 0.00010 degF*ft2*h/Btu FOULING FACTOR WITH A MAXIMUM PRESSURE DROP OF 20 FEET TDH OF CORROSION INHIBITED WATER.

3. PROVIDE ONE SINGLE POINT POWER FEED WITH NON-FUSED DISCONNECT. PROVIDE INDIVIDUAL CIRCUIT BREAKERS FOR EACH COMPRESSOR.

4. MAXIMUM MCA (IN AMPS) AT 460 VAC IS THE MINIMUM MAIN POWER WIRE SIZE THAT THE MANUFACTURER REQUIRES FOR THE SINGLE POINT POWER CONNECTION OF THE ASSEMBLY. THE MANUFACTURER'S REQUIRED WIRE SIZE AMPACITY SHALL BE NO GREATER THAN THAT SCHEDULED. THE MANUFACTURER SHALL ACCOUNT FOR WIRE HEATING, CURRENT DRAW, AGING OF COMPONENTS, AND ANTICIPATED FAULTS PER NFPA 70.

5. MANUFACTURER SHALL PROVIDE: RESTRAINED SPRING VIBRATION ISOLATORS; EVAPORATOR COLD SURFACE (EVAPORATOR HOUSING, COMPRESSOR, SUCTION PIPING) INSULATION (MINIMUM 0.75" THICK ELASTOMERIC); AND EXTERNALTO THE ASSEMBLY FLANGED WYE OR BASKET STRAINERS FOR THE CONDENSER INLET AND THE EVAPORATOR INLET OF THE MESH SIZE RECOMMENDED BY THE CHILLER MANUFACTURER. PROVIDE MANUFACTURER'S REQUIRED FLOW SWITCH/SENSORS ON THE EVAPORATOR AND THE CONDENSER.

6. PROVIDE DESIGNED TUBE ARRANGEMENT, HEADER PIPING, HEADER BYPASS PIPING, CONTROL VALVING, AND OPERATING SENSORS AND CONTROLS WHICH WILL ALLOW FOR THE OVERALL UNIT FLOWRATES TO BE REDUCED DOWN TO AT LEAST AS LOW AS THE MINIMUM FLOWRATE SCHEDULED WHILE OPERATING WITH THE EVAPORATOR TEMPERATURES AND CONDENSER TEMPERATURES SCHEDULED FOR THERMAL PERFORMANCE.

7. PROVIDE VFD POWERING OR HOT GAS BYPASS ON AT LEAST ONE OF THE UNIT'S COMPRESSORS AND PROVIDE OTHER CAPACITY CONTROL MEASURES SUITABLE FOR OPERATION DOWN TO **35%** OF THE SCHEDULED OVERALL UNIT EVAPORATOR WATER TEMPERATURE DIFFERENCE AT THE UNIT'S SCHEDULED OVERALL UNIT MINIMUM FLOWRATES WITH AN ENTERING CONDENSER WATER TEMPERATURE OF 110 DEGF AND A ENTERING EVAPORATER WATER TEMPERATURE OF 64 DEGF. PROVIDE STARTUP PROGRAMMING SUCH THAT THE VFD POWERED (OR HOT GAS BYPASS EQUIPPED) REFRIGERANT CIRCUIT IS "FIRST ON / LAST OFF".

AIR COOLED CHILLER SCHEDULE

TAG	UNIT PERFORMANCE RATINGS			OPERATING PARAMETERS							
	MINIMUM NOMINAL TONS (1)	MAXIMUM FULL LOAD INPUT (kW/tonR)	MAXIMUM IPLV (BTU/(W-hr))	THERMAL PERFORMANCE	REFRIGERANT	MINIMUM EVAPORATOR FLOWRATE (GPM)	CONDENSER EAT (degF)	ELECTRICAL CONNECTION (3)		DESIGN REFERENCES	NOTES
								MAXIMUM MCA (AT 460V)	VOLT / PHASE		
ACC-5	90	1.26	17.0	(2)	R-32	125 (6)	100 (7)	185 AMPS (4)	460 / 3	CARRIER 30RC	NOTE 5

SCHEDULE NOTES:
1. NOMINAL CATALOG RATING AT AHRI 550/590 STANDARD RATING CONDITIONS. SUBMITTAL SHALL DENOTE THE MINIMUM TONNAGE PERFORMANCE AT THE SCHEDULED THERMAL PERFORMANCE OPERATING CONDITIONS. PROVIDE NO GREATER THAN THE MAXIMUM SCHEDULED THERMAL PERFORMANCE EVAPORATOR LOAD kW PER TON (OF EVAPORATOR REFRIGERATION 12,000 Btu/h) WHILE OPERATING AT THE SCHEDULED WATER TEMPERATURES AND AIR TEMPERATURE. PROVIDE NO GREATER THAN THE AHRI 550/590 MAXIMUM IPLV RATING USING THE AHRI LOAD PROFILE FOR THE 75%/50%/25% CONDITIONS WHILE OPERATING AT THE AHRI STANDARD WATER TEMPERATURES.

2. EVAPORATOR PERFORMANCE: 54.00 EWT/42.00 LWT FOR 165 GPM AND AN 0.00010 degF*ft2*h/Btu FOULING FACTOR WITH A MAXIMUM PRESSURE DROP OF 20 FEET TDH OF CORROSION INHIBITED WATER AND 35% PROPYLENE GLYCOL.

3. PROVIDE ONE SINGLE POINT POWER CONNECTION WITH NON-FUSED DISCONNECT SWITCH. PROVIDE INDIVIDUAL COMPRESSOR CIRCUIT BREAKERS.

4. MAXIMUM MCA (IN AMPS) AT 460 VAC IS THE MINIMUM MAIN POWER WIRE SIZE THAT THE MANUFACTURER REQUIRES FOR THE SINGLE POINT POWER CONNECTION OF THE ASSEMBLY. THE MANUFACTURER'S REQUIRED WIRE SIZE AMPACITY SHALL BE NO GREATER THAN THAT SCHEDULED. THE MANUFACTURER SHALL ACCOUNT FOR WIRE HEATING, CURRENT DRAW, AGING OF COMPONENTS, AND ANTICIPATED FAULTS PER NFPA 70.

5. CHILLER MANUFACTURER SHALL PROVIDE: RESTRAINTED SPRING VIBRATION ISOLATORS; EVAPORATOR COLD SURFACE (EVAPORATOR SHELL, SUCTION PIPING, COMPRESSOR INLET, EVAPORATOR PIPING CONNECTION HEAD) INSULATION (MINIMUM 0.75" THICK ELASTOMERIC); HAIL GUARDS; 115V CONVENIENCE OUTLET POWERED FROM THE CHILLER TRANSFORMER, AND REFRIGERANT SUCTION SHUTOFF VALVES. PROVIDE WYE STRAINER WITH CHILLER MANUFACTURER'S REQUIRED STRAINER MESH SIZE.

6. PROVIDE A TUBE ARRANGEMENT, OTHER DESIGN FEATURES, AND OPERATING CONTROLS WHICH WILL ALLOW FOR THE CHILLER FLOWRATES TO BE REDUCED DOWN TO AT LEAST AS LOW AS THE MINIMUM EVAPORATOR FLOWRATE SCHEDULED WHILE OPERATING WITH THE EVAPORATOR INLET AND OUTLET TEMPERATURES SCHEDULED. PROVIDE CAPACITY CONTROLS WHICH WILL ALLOW FOR THE CHILLER DELIVERED CAPACITY TO BE REDUCED DOWN TO AT LEAST 25% OF THE MAXIMUM SCHEDULED CAPACITY WHILE OPERATING WITH THE EVAPORATOR INLET TEMPERATURES SCHEDULED. PROVIDE A MINIMUM OF FOUR DISTINCT CAPACITY CONTROL STEPS AND AT LEAST TWO INDEPENDENT REFRIGERANT CIRCUITS..

7. PROVIDE UNIT FEATURES AND CONTROLS SUITABLE FOR ACHIEVING FULL SCHEDULED EVAPORATOR LOAD AT A LOW AMBIENT MINIMUM OPERATING OUTDOOR AIR TEMPERATURE OF -20 degF. PROVIDE HIGH AMBIENT OPERATING CONTROL (AT REDUCED EVAPORATOR CAPACITY) TO 120 degF AMBIENT AIR TEMPERATURE.

COOLING WATER FILTRATION SYSTEM SCHEDULE

TAG	FILTER CAPACITY	MIN PUMP HP	MIN MEDIA CAPACITY (FT3)	DESIGN REFERENCE	NOTES
CWF-1	98 GPM	3	4	LAKOS TBX-0100-SRV	NOTES ONE & TWO

SCHEDULE NOTES:
1. FACTORY ASSEMBLED PACKAGED SKID CONTAINING: ACCESSIBLE CENTRIFUGAL SEPARATOR VESSEL RATED FOR 50 PSIG OPERATING PRESSURE WITH 3" FLANGED CONNECTIONS; PUMP WITH STRAINER AND ISOLATION VALVES; PUMP MOTOR STARTER AND RUN HOURMETER; PUMP AUTOMATIC OPERATING CONTROLS; DIFFERENTIAL PRESSURE SWITCH AND BACKWASHING INDICATION HOA; BAS ON/OFF INTERFACE TO OPERATE SKID PUMP WHENEVER COOLING TOWERS ARE OPERATING; BAS DP INTERFACE TO INDICATE FILTER CHANGE NEEDED.

2. SEPARATOR RATED FOR 98% SINGLE PASS REMOVAL OF 2.6 SPECIFIC GRAVITY 74 MICRON SIZED PARTICLES. SINGLE BAG FILTER HOUSING, 25 MICRON REMOVAL EFFICIENCY BAG FILTER, NOMINAL 16.5" LONG BY 7" DIAMETER POLYPROPYLENE BAG. SWING BOLT OR BAND CLAMP FILTER HOUSING (NOT THREADED).

HYDRONIC UNIT HEATER SCHEDULE

TAG	CAPACITY (NOTE ONE)		FAN (NOTE TWO)		DESIGN REFERENCE	NOTES
	MIN CFM / GPM	MIN BTU/H	VOLTS/ PHASE	HP		
UH-1	1,500 CFM / 4.7 GPM	34,700	120/1	1/12	TRANE S-108	NOTE THREE
UH-2	1,500 CFM / 4.7 GPM	34,700	120/1	1/12	TRANE S-108	NOTE THREE
UH-3	1,500 CFM / 4.7 GPM	34,700	120/1	1/12	TRANE S-108	NOTE THREE

SCHEDULE NOTES:
NOTE 1: LISTED CAPACITIES ARE BASED ON 130°F ENTERING WATER, 60°F ENTERING AIR, AND 30" WATER-SIDE TEMPERATURE DROP. HIGH SPEED FAN SETTING WITH ZERO ESP. SUBMITTAL SHALL INCLUDE ADDITIONAL PERFORMANCE REPORT WITH OUTPUT CAPACITY INDICATED AT 150°F EWT, 60°F ENTERING AIR, AND 30" WATER-SIDE TEMPERATURE DROP.

NOTE 2: PROVIDE UNIT MOUNTED AND WIRED NON-FUSED DISCONNECT SWITCH WITH THERMAL OVERLOAD. DIRECT DRIVE TOTALLY ENCLOSED MOTOR WITH UNIT-MOUNTED MANUAL THREE SPEED ADJUSTMENT CONTROLLER.

NOTE 3: HORIZONTAL DISCHARGE PROPELLER FAN WITH ADJUSTABLE DISCHARGE (BOTH INDEPENDENT HORIZONTAL ADJUSTMENT AND INDEPENDENT DVVERTICAL ADJUSTMENT) LOUVERS AND FAN GUARD. CABINET WITH FACTORY FINISH OF ALL EXPOSED PARTS. MANUFACTURER STANDARD COLOR POWDER COAT BAKED ENAMEL FINISH SELECTIONS. SUBMIT COLOR CHART AND COLOR SAMPLES DIRECTLY TO THE ARCHITECT.

FAN COIL UNIT SCHEDULE

TAG	SUPPLY FAN CFM / EXTERNAL STATIC PRESSURE (NOTE TWO)	COOLING MIN. SENSIBLE CAPACITY		HEATING MIN. CAPACITY (BTU/H / GPM) (NOTE ONE)	SUPPLY FAN MOTOR					DESIGN REFERENCE	NOTES
		(BTU/H / GPM) (NOTE ONE UNO)	MIN. ROWS		MIN. HP	RPM	VOLTAGE / PHASE	FLA	MOCP		
FCU-E1	1,000 / 0.60"	23,500 / 4.1 (NOTE SIX)	EIGHT	COOLING ONLY	1.0	1750	120/1	10.7	15	IEC HDY12	(3) (5)
FCU-FP	600 / 0.40"	14,000 / 2.5	SIX	18,000 / 2.0	0.5	1750	120/1	6.4	15	IEC HDY10	(3) (5)
FCU-B1	2,500 / 0.40"	66,000 / 14.0	EIGHT	82,800 / 7.5	1.5	1750	480/3	4.4	15	IEC HBD30	(4)
FCU-P1	2,500 / 0.40"	66,000 / 14.0	EIGHT	82,800 / 7.5	1.5	1750	480/3	4.4	15	IEC HBD30	(4)
FCU-P2	2,500 / 0.40"	66,000 / 14.0	EIGHT	82,800 / 7.5	1.5	1750	480/3	4.4	15	IEC HBD30	(4)
FCU-P3	2,500 / 0.40"	66,000 / 14.0	EIGHT	82,800 / 7.5	1.5	1750	480/3	4.4	15	IEC HBD30	(4)

SCHEDULE NOTES:
NOTE 1: 45.00 EWT; 58.00 LWT MINIMUM; 75 FDB / 62 FWB EAT COOLING; 130 EWT / APPROX 100 LWT (65 FDB EAT HEATING). NET THERMAL COOLING PERFORMANCE SHALL ACCOUNT FOR FAN HEAT.

NOTE 2: ESP TO ACCOUNT FOR DUCTWORK AND FILTER LOADING. CLEAN FILTER PRESSURE DROP IS NOT INCLUDED IN ESP.

NOTE 3: DIRECT DRIVE EC MOTOR WITH UNIT-MOUNTED MANUAL SPEED ADJUSTMENT CONTROLLER.

NOTE 4: BELT DRIVE WITH ADJUSTABLE SHEAVES. FULLY ENCLOSED CABINET WITH WHITE POWDER COAT FINISH FOR EXPOSED OCCUPIED APPLICATION; BAR TYPE RETURN GRILLE WITH MERV 8 FILTER AND FILTER ACCESS.

NOTE 5: HORIZONTAL CONCEALED UNIT WITH DUCTED FRONT DISCHARGE AND REAR RETURN, 1" MERV 8 FILTERS, THREE SPEED FAN SWITCH AND SINGLE POINT POWER CONNECTION.

NOTE 6: 58.00 EWT; 68.00 LWT MINIMUM; 75 FDB / 62 FWB EAT COOLING. NET THERMAL COOLING PERFORMANCE SHALL ACCOUNT FOR FAN HEAT.

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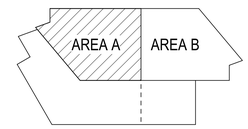
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

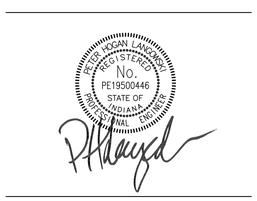
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



EQUIPMENT SCHEDULES - PIPING RELATED

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

M603

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SOUND ATTENUATOR SCHEDULE (AHU-6) (1)

TAG	AIRFLOW (CFM)	MAX VELOCITY (FPM) (3)	MIN DIMENSIONS (IN.) W	H	L	MAX APD (IN W.G.) (4)	MIN DYNAMIC INSERTION LOSS (IN DB) REQUIRED FOR GIVEN OCTAVE BAND (2) 63 HZ	125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	8000HZ	DESIGN REFERENCE MFG	MODEL
SA-6A-R	10,500	- 975	24	78	36	0.15	9	10	13	13	18	19	17	11	VIBRO-ACOUSTICS	RFL-LV-F1
SA-6A-S	10,500	+ 750	30	78	36	0.15	7	9	12	12	17	23	18	11	VIBRO-ACOUSTICS	RFL-LV-F1
SA-6B-R	10,500	- 750	30	78	36	0.15	9	10	13	13	18	19	17	11	VIBRO-ACOUSTICS	RFL-LV-F1
SA-6B-S	10,500	+ 975	24	78	36	0.15	7	9	12	12	17	23	18	11	VIBRO-ACOUSTICS	RFL-LV-F1

SCHEDULE NOTES:
NOTE 1: DUCT MOUNTED SOUND ATTENUATOR FURNISHED BY SHEETMETAL TRADES; PROVIDED BY THE 233300 AIR DUCT ACCESSORIES SPECIFICATION.

NOTE 2: INSERTION LOSS PERFORMANCE IS SCHEDULED IN THESE EIGHT COLUMNS AT EITHER +750 FPM (FOR POSITIVE SCHEDULED "FORWARD FLOW" VELOCITIES) OR -750 FPM (FOR NEGATIVE SCHEDULED "REVERSE FLOW" VELOCITIES) RATHER THAN THE ACTUAL VELOCITY SCHEDULED FOR EASE OF SELECTION AND SUBMISSION. THE INSERTION LOSSES AT THE ACTUAL VELOCITY SCHEDULED SHALL THEREFORE BE SLIGHTLY DIFFERENT THAN THESE SCHEDULED MINIMUM INSERTION LOSS VALUES.

NOTE 3: VELOCITY SCHEDULED IS THE GROSS VELOCITY AT THE ENTERING FACE OF THE SOUND ATTENUATOR ASSEMBLY, THE SCHEDULED AIRFLOW THROUGH THE "DUCT CONNECTION SIZE", INCLUSIVE OF THE OUTER CASING AND THE INNER BAFFLE DIVIDERS.

NOTE 4: MAXIMUM AIR PRESSURE DROP LISTED IS AT THE NOMINAL 750 FPM ENTERING VELOCITY WITH THE ASTM E477 FIVE DIAMETERS OF STRAIGHT INLET CONDITIONS STRAIGHT EXIT CONDITIONS RATHER THAN THE ACTUAL VELOCITY SCHEDULED FOR EASE OF SELECTION AND SUBMISSION. THE AIR PRESSURE DROP AT THE ACTUAL VELOCITY SCHEDULED SHALL THEREFORE BE SLIGHTLY DIFFERENT THAN THESE SCHEDULED MAXIMUM AIR PRESSURE DROP VALUES.

SOUND ATTENUATOR (DUCT MOUNTED AT TERMINAL UNITS) SCHEDULE (4)

TAG	AIRFLOW (1) (CFM)	MAX VELOCITY (FPM) (2)	MIN DIMENSIONS (IN.) (3) WIDTH	HEIGHT	LENGTH	MAX APD (IN W.G.)	MIN DYNAMIC INSERTION LOSS (IN DB) REQUIRED FOR GIVEN OCTAVE BAND 63 HZ	125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	8000HZ	OTHER NOTES	DESIGN REFERENCE MFG	MODEL
SA-1 (MANY)	VARIES BY TERMINAL UNIT	750	VARIES	VARIES	36	0.15	7	9	12	12	17	23	18	11	NOTE 4	VIBRO-ACOUSTICS	RFL-LV-F1
SA-2 (MANY)	VARIES BY TERMINAL UNIT	750	VARIES	VARIES	36	0.15	7	6	10	16	21	26	17	8	NOTE 4	VIBRO-ACOUSTICS	RFL-LV-F5

SCHEDULE NOTES:
1: FOR EACH SUPPLY DUCT SOUND ATTENUATOR NOTED ON THE DRAWINGS UTILIZE THE SCHEDULED MAXIMUM COOLING CFM AS THE AIRFLOW TO RATE THE SOUND ATTENUATOR AT. FOR EACH EXHAUST DUCT SOUND ATTENUATOR NOTED ON THE DRAWINGS UTILIZE THE SCHEDULED MAXIMUM CFM AS THE AIRFLOW TO RATE THE SOUND ATTENUATOR AT.
2. INSERTION LOSSES SCHEDULED ARE FOR THE VELOCITY SCHEDULED. THE ACTUAL MAXIMUM VELOCITY FOR A GIVEN ARRANGEMENT OF TERMINAL UNIT (AND TERMINAL UNIT SUPPLIED HEATING COIL) DISCHARGE SIZE WILL VARY SOMEWHAT FROM THE VELOCITY SCHEDULED HERE.
3. UTILIZE THE SUPPLY TERMINAL UNIT SUBMITTAL SIZES FOR THE ACTUAL WIDTH AND ACTUAL HEIGHT THE SUPPLY DUCT MOUNTED SOUND ATTENUATOR. UTILIZE THE EXHAUST DUCTWORK SHEETMETAL SUBMITTAL SIZES FOR THE ACTUAL WIDTH AND ACTUAL HEIGHT THE EXHAUST DUCT MOUNTED SOUND ATTENUATOR. THE LENGTH OF THE DUCT MOUNTED SOUND ATTENUATOR IS TO BE NO LESS THAN THE LENGTH SCHEDULED HERE.
4. DUCT MOUNTED SOUND ATTENUATORS ARE SPECIFIED IN SECTION 233300 (THEY ARE NOT PROPOSED TO BE PROVIDED BY THE 233600 MANUFACTURERS). UTILIZE A "FILM-LINED" CONSTRUCTION FEATURE BETWEEN THE AIRSTREAM AND THE ATTENUATING MATERIAL FOR BOTH SUPPLY DUCTWORK AND EXHAUST DUCTWORK APPLICATIONS.

INDUCED DILUTION EXHAUST FAN SCHEDULE

TAG	FAN CAPACITY (NOTE 2)	MAX BHP (NOTE 1)	MIN MOTOR HP	VOLT/ PHASE	MIN WHEEL DIA (IN.)	MAX FAN RPM (NOTE 3)	MAX Hz AT DUTY	DESIGN REFERENCE	NOTES
GEF-1	25,000 CFM @ 4.5" ESP	35.0	40	480/3	N/A	1,600	68	GREENHECK VEKTOR-MD-36	NOTES 4 AND 6 AND 9
GEF-2	25,000 CFM @ 4.5" ESP	35.0	40	480/3	N/A	1,600	68	GREENHECK VEKTOR-MD-36	NOTES 4 AND 6 AND 9
GEF-3	25,000 CFM @ 4.5" ESP	35.0	40	480/3	N/A	1,600	68	GREENHECK VEKTOR-MD-36	NOTES 4 AND 6 AND 9
GEF-4	25,000 CFM @ 4.5" ESP	35.0	40	480/3	N/A	1,600	68	GREENHECK VEKTOR-MD-36	NOTES 4 AND 7 AND 9
GEF-5	25,000 CFM @ 4.5" ESP	35.0	40	480/3	N/A	1,600	68	GREENHECK VEKTOR-MD-36	NOTES 4 AND 7 AND 9
FHEF-10A	21,100 CFM @ 4.5" ESP	37.0	40	480/3	N/A	2,000	65	GREENHECK VEKTOR-MD-30	NOTES 4 AND 5 AND 8
FHEF-10B	21,100 CFM @ 4.5" ESP	37.0	40	480/3	N/A	2,000	65	GREENHECK VEKTOR-MD-30	NOTES 4 AND 5 AND 8
FHEF-10C	21,100 CFM @ 4.5" ESP	37.0	40	480/3	N/A	2,000	65	GREENHECK VEKTOR-MD-30	NOTES 4 AND 5 AND 8

SCHEDULE NOTES:
NOTE 1: MAX BHP INCLUDES BOTH START-UP HP AND STEADY-STATE OPERATING HP.

NOTE 2: EXTERNAL STATIC PRESSURE (ESP) IS THE EXTERNAL STATIC PRESSURE REQUIRED AT THE DUCT CONNECTION TO THE FAN MANUFACTURER'S INLET PLENUM. THE FAN MANUFACTURER SHALL DESIGN INTERNAL FEATURES AND DUCT CONNECTION DETAILS, INCLUDING ACCOUNTING FOR ISOLATION DAMPER PRESSURE DROP AND SOUND ATTENUATION PRESSURE DROPS AND DISCHARGE NOZZLE/STACK PRESSURE DROPS AND FAN SYSTEM EFFECTS, SUCH THAT THE EXTERNAL STATIC PRESSURE SCHEDULED CAN BE PHYSICALLY ACHIEVED FOR THE FAN AT THE SCHEDULED MAXIMUM DUCT CONNECTION AIRFLOW..

NOTE 3: THE FAN CLASS SELECTED SHALL BE NO LESS THAN THAT SCHEDULED. IN ADDITION TO THAT MINIMUM REQUIREMENT, THE NEXT HIGHER FAN CLASS SHALL BE PROVIDED IF THE MAXIMUM SPEED OF THE SCHEDULED FAN CLASS FOR THE SELECTED MANUFACTURER IS NOT AT LEAST 200 RPM GREATER THAN THE SCHEDULED DUTY POINT MAX FAN SPEED OF THE SUBMITTED FAN.

NOTE 4: PROVIDE A TOTAL AIRFLOW MOVING THROUGH THE FAN WHEEL OF THE SCHEDULED CFM FAN CAPACITY AT THE SCHEDULED ESP (WITH BYPASS AIR DAMPER FULLY CLOSED). PROVIDE A MINIMUM INDUCED AIRFLOW OF APPROXIMATELY EQUAL TO THE FAN CFM THROUGH THE WINDBAND AT THIS CONDITION (SUCH THAT THE TOTAL AIRFLOW THROUGH THE WINDBAND IS APPROXIMATELY TWICE THE SCHEDULED FAN AIRFLOW).

NOTE 5: DIRECT DRIVE ARRANGEMENT, FAN CLASS II, 1770 RPM MOTOR, NEMA 3R UNIT MOUNTED DISCONNECT.

NOTE 6: PROVIDE SOUND ATTENUATION AS REQUIRED SUCH THAT THE MAXIMUM OUTLET SOUND POWER LEVELS OF A SINGLE FAN OPERATING DO NOT EXCEED 92 dB AT 63 HZ, 94 dB AT 125 HZ, 95 dB AT 250 HZ, 91 dB AT 500 HZ, 89 dB AT 1000 HZ, 90 AT 2000 HZ, AND 85 AT 4000 HZ. MAXIMUM HEIGHT OF FAN ASSEMBLY SHALL BE NO MORE THAN 17'-0" ABOVE THE BOTTOM OF THE ROOF CURB. PROVIDE THE FAN MANUFACTURER'S ROOF CURB. THERE IS NO BYPASS AIR DAMPER OR PLENUM FOR THIS FAN. PROVIDE A MINIMUM FAN NOZZLE OUTLET VELOCITY OF 4,250 FPM. SHIP THE FAN MANUFACTURER'S STANDARD ISOLATION DAMPER AND ACTUATOR LOOSE FOR FIELD INSTALLATION BY THE SHEETMETAL TRADES IN THE DUCTWORK WITHIN THE PENTHOUSE DIRECTLY BELOW THE FAN. INSTALL THE DUCTWORK WITHIN THE ROOF CURB UP TO THE FLANGE ON THE BOTTOM OF THE FAN INLET AND GASKET SEAL THE PERIMETER OF THE CONNECTION IN ACCORDANCE WITH THE FAN MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. PROVIDE A LOCATION TO DRAIN WATER COLLECTING WITHIN THE ROOF CURB.

NOTE 7: PROVIDE SOUND ATTENUATION AS REQUIRED SUCH THAT THE MAXIMUM OUTLET SOUND POWER LEVELS OF A SINGLE FAN OPERATING DO NOT EXCEED 92 dB AT 63 HZ, 94 dB AT 125 HZ, 95 dB AT 250 HZ, 91 dB AT 500 HZ, 89 dB AT 1000 HZ, 90 AT 2000 HZ, AND 85 AT 4000 HZ. MAXIMUM HEIGHT OF FAN ASSEMBLY SHALL BE NO MORE THAN 17'-0" ABOVE THE BOTTOM OF THE ROOF CURB. PROVIDE THE FAN MANUFACTURER'S ROOF CURB. THERE IS NO BYPASS AIR DAMPER OR PLENUM FOR THIS FAN. PROVIDE A MINIMUM FAN NOZZLE OUTLET VELOCITY OF 3,000 FPM. SHIP THE FAN MANUFACTURER'S STANDARD ISOLATION DAMPER AND ACTUATOR LOOSE FOR FIELD INSTALLATION BY THE SHEETMETAL TRADES IN THE DUCTWORK WITHIN THE PENTHOUSE DIRECTLY BELOW THE FAN. INSTALL THE DUCTWORK WITHIN THE ROOF CURB UP TO THE FLANGE ON THE BOTTOM OF THE FAN INLET AND GASKET SEAL THE PERIMETER OF THE CONNECTION IN ACCORDANCE WITH THE FAN MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. PROVIDE A LOCATION TO DRAIN WATER COLLECTING WITHIN THE ROOF CURB.

NOTE 8: PROVIDE SOUND ATTENUATION AS REQUIRED SUCH THAT THE MAXIMUM OUTLET SOUND POWER LEVELS OF A SINGLE FAN OPERATING DO NOT EXCEED 94 dB AT 63 HZ, 93 dB AT 125 HZ, 96 dB AT 250 HZ, 93 dB AT 500 HZ, 91 dB AT 1000 HZ, 91 AT 2000 HZ, AND 89 AT 4000 HZ. MAXIMUM HEIGHT OF FAN ASSEMBLY SHALL BE NO MORE THAN 21'-0" ABOVE THE BOTTOM OF THE 18" TALL ROOF CURB AND NO LESS THAN 19'-0" ABOVE THE BOTTOM OF THE ROOF CURB (PROVIDE UP TO 36" TALL CURB AS NEEDED TO MEET MINIMUM HEIGHT). PROVIDE FAN MANUFACTURERS INLET PLENUM AND FAN MANUFACTURER'S ROOF CURB. PROVIDE A SINGLE CURB AND PLENUM FOR MULTIPLE FAN ASSEMBLIES. PROVIDE A MINIMUM FAN NOZZLE OUTLET VELOCITY OF 5,000 FPM. PROVIDE THE FAN MANUFACTURER'S STANDARD ISOLATION DAMPER AND ACTUATOR INSTALLED WITHIN THE INLET PLENUM DIRECTLY BELOW THE FAN.

NOTE 9: DIRECT DRIVE ARRANGEMENT, FAN CLASS II, 1170 RPM MOTOR, NEMA 3R UNIT MOUNTED DISCONNECT.

INLINE FAN SCHEDULE

TAG	CAPACITY	MAX BHP (NOTE 1)	MIN MOTOR HP (NOTE 2)	VOLT/ PHASE	MIN WHEEL DIA (IN.)	MAX RPM (NOTE 3)	MAX Hz AT DUTY	DESIGN REFERENCE	NOTES
RF-1	11,500 CFM @ 1.0" ESP	4.0	5	460 / 3	24"	1160	60	GREENHECK SQ-24	NOTE 4

SCHEDULE NOTES:
NOTE 1: MAX BHP INCLUDES BOTH START-UP HP AND STEADY-STATE OPERATING HP.

NOTE 2: PROVIDE TEFC MOTOR, INVERTER RATED, CERAMIC BEARINGS, AND SHAFT GROUNDING PER SPEC 230513.

NOTE 3: THE FAN SPEED SELECTED SHALL BE NO MORE THAN THAT SCHEDULED HERE.

NOTE 4: DIRECT DRIVE MIXED FLOW FAN, JUNCTION BOX MOUNTED AND WIRED, 2" DEFLECTION SPRING HANGERS.

DESTRATIFICATION FAN SCHEDULE

TAG	CAPACITY	MAX BHP (NOTE 1)	MIN MOTOR HP (NOTE 2)	VOLT/ PHASE	MIN WHEEL DIA (IN.)	MAX RPM (NOTE 3)	MAX Hz AT DUTY	DESIGN REFERENCE	NOTES
DSF-11	85,000 CFM	1.9	2.0	460 / 3	144"	130	60	BAF 12' POWERFOIL X4	NOTE 4
DSF-12	85,000 CFM	1.9	2.0	460 / 3	144"	130	60	BAF 12' POWERFOIL X4	NOTE 4

SCHEDULE NOTES:
NOTE 1: MAX BHP INCLUDES BOTH START-UP HP AND STEADY-STATE OPERATING HP.

NOTE 2: PROVIDE INTEGRATED GEARBOX AND MOTOR SPEED CONTROL.

NOTE 3: THE FAN SPEED SELECTED SHALL BE NO MORE THAN THAT SCHEDULED HERE.

NOTE 4: DIRECT DRIVE PROPELLER FAN, UPPER MOUNT HOUSING WITH 24" LONG EXTENSION TUBE, OSHA PROTECTIVE DOUBLE SAFETY CABLE SYSTEM, PROPELLER GUARD, HUB SAFETY CLIP. PROVIDE FAN SPEED CONTROLLER, REMOTE MOUNTED, WITH LCD DISPLAY AND TOUCHSCREEN. PROVIDE CUSTOM COLOR FAN BLADES AND FAN HUB WITH NO LOGOS OR OTHER TEXT VISIBLE FROM BELOW. PROVIDE ALL FEATURES REQUIRED FOR THE PERMANENT WINCH LOWERING SYSTEM INCLUDING ELECTRICAL INTERFACES AND CONTROLLER CABLING SYSTEM.

HVAC POWER VENTILATOR SCHEDULE

TAG	DESCRIPTION	CAPACITY (NOTE 4)	MAX BHP (NOTE 1)	MIN MOTOR HP (NOTE 2)	VOLT/ PHASE	MIN WHEEL DIA (IN.)	MAX RPM (NOTE 3)	MOTOR RPM	DESIGN REFERENCE	NOTES
REF-11	DIRECT DRIVE CENTRIFUGAL FAN	3,500 CFM @ 0.75" ESP	1.2	2	208 / 1	16	1,500	1,725	GREENHECK G-160-VG	(5) (6) (7) (8)

SCHEDULE NOTES:
NOTE 1: MAX BHP INCLUDES BOTH START-UP HP AND STEADY-STATE OPERATING HP.

NOTE 2: DIRECT DRIVE TEFC FAN WITH ELECTRONICALLY COMMUTATED MOTOR (ECM). PROVIDE PERMANENT DIAL ON MOTOR CONTROLLER FOR MANUAL BALANCING.

NOTE 3: THE FAN SPEED SELECTED SHALL BE NO MORE THAN THAT SCHEDULED HERE. IN ADDITION TO THAT MINIMUM REQUIREMENT, THE NEXT HIGHER FAN CLASS SHALL BE PROVIDED IF THE MAXIMUM SPEED OF THE SCHEDULED FAN CLASS FOR THE SELECTED MANUFACTURER IS NOT AT LEAST 200 RPM GREATER THAN THE SCHEDULED DUTY POINT FAN SPEED OF THE SUBMITTED FAN.

NOTE 4: ESTIMATED MAXIMUM TOTAL EXTERNAL STATIC PRESSURE (ESP) IS AN ESTIMATE OF ONLY THE EXTERNAL STATIC PRESSURE REQUIRED AT THE CONNECTION POINT OF THE ASSEMBLY. THE FAN MANUFACTURER SHALL ALLOW FOR PRESSURE LOSSES OF THESE INTERNAL FEATURES (ISOLATION DAMPER, FAN MOUNTING) AND DESIGN THE INTERNAL FEATURES AND MOUNTING CONNECTION DETAILS AND SELECT THE DAMPER SUCH THAT THE EXTERNAL STATIC PRESSURE SCHEDULED CAN BE ACHIEVED FOR THE FAN AT THE SCHEDULED MAXIMUM AIRFLOW. PROVIDE IN THE BID TO FURNISH FANS WITH NO LESS THAN THE ESTIMATED EXTERNAL STATIC PRESSURE SCHEDULED.

NOTE 5: FAN MANUFACTURER SHALL PROVIDE UNIT-MOUNTED NEMA-3R TOGGLE-TYPE DISCONNECT SWITCH SIZED FOR THE APPLICATION.

NOTE 6: FAN SHALL BE DESIGNED FOR ROOF-MOUNTING APPLICATION AND SHALL BE SECURED TO STRUCTURE WITH MANUFACTURER-PROVIDED CURB. CURB SHALL INCLUDE 1 IN. THICK, 3 LB. DENSITY INSULATION (R-4.3) WITH METAL LINER AND A DAMPER TRAY. CURB HEIGHT SHALL BE 18 INCHES MINIMUM. CURB SHALL INCLUDE A DAMPER TRAY FOR MOUNTING FAN MANUFACTURER-PROVIDED MOTORIZED ISOLATION DAMPER. DAMPER TRAY SHALL BE APPROXIMATELY 10 IN. BY 10 IN.

NOTE 7: PROVIDE THE FAN MANUFACTURER MOTORIZED CONTROL DAMPER AND ELECTRIC ACTUATOR INSTALLED IN DAMPER TRAY IN FAN CURB. FAN SHALL BE PROVIDED WITH A HINGED CURB CAP WITH CABLES FOR DAMPER ACCESS. PROVIDE END SWITCH FOR DAMPER OPERATION TO PREVENT FAN FROM ENERGIZING UNTIL DAMPER IS PROVEN OPEN. PROVIDE ACTUATOR VOLTAGE AND APPROPRIATE STEP DOWN TRANSFORMER FOR ACTUATOR POWER FROM THE FAN MOTOR CONTROLLER AND WIRE COMPLETE.

NOTE 8: STAINLESS STEEL BIRD SCREEN WITH MIN 85% NOMINAL FREE AREA.

CHILLED BEAM SCHEDULE

TAG	QTY PER ZONE	PRIMARY AIR CFM PER UNIT	UNIT SIZE (L x W x MAX H) (IN)	COOLING DATA MIN. SENSIBLE CAPACITY (BTU/H)	COOLING DATA GPM PER UNIT	DESIGN REFERENCE MANUFACTURER	DESIGN REFERENCE MODEL	NOTES
CB-102	8	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	NOTE 6
CB-103	8	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	NOTE 1
CB-104	16	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	NOTE 2
CB-105	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-115	4	110 CFM	72x9x14	3780	1.5	DADANCO	ACB30	NOTE 7
CB-130	5	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-131	5	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-138	3	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	NOTE 4
CB-139	3	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	NOTE 4
CB-199	6	100 CFM	72x9x14	3150	1.5	DADANCO	ACB30	NOTE 3
CB-203-1	2	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	
CB-203-2	4	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-205-1	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-205-2	5	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	NOTE 5
CB-211	2	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-212	7	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-214	5	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-215	3	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-217-1	2	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	
CB-217-2	1	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-218	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-224	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-225	3	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-228	6	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-229-1	3	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-229-2	1	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-230	3	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-231-1	4	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-231-2	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-231-3	2	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	
CB-239	2	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-303	4	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-304	4	150 CFM	72x24x12	5290	2	DADANCO	ACB20	
CB-305	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-306	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-312	6	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-313	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-314	3	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-315	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-316	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-317	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-318	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-319-1	1	110 CFM	96x24x12	3780	1.5	DADANCO	ACB20	
CB-319-2	2	115 CFM	84x9x14	4230	1.75	DADANCO	ACB30	
CB-320	3	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-321	4	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-322	1	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-326	4	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-330-1	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-330-2	1	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-332	5	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-333-1	5	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-333-2	2	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	
CB-402	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-403	3	100 CFM	96x24x12	3650	1.5	DADANCO	ACB20	
CB-407	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-409	5	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-410	6	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-413-1	1	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-413-2	3	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-414	4	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-415	3	100 CFM	72x9x14	3780	1.5	DADANCO	ACB30	
CB-416	4	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-417	1	150 CFM	96x24x12	5290	2.0	DADANCO	ACB20	
CB-421	4	110 CFM	96x24x12	3780	1.5	DADANCO	ACB20	
CB-425-1	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-425-2	1	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-437	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-503	4	100 CFM	96x24x12	3650	1.5	DADANCO	ACB20	
CB-506	6	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-507	2	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-508	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-510-1	10	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-510-2	3	115 CFM	84x9x14	4230	1.75	DADANCO	ACB30	
CB-514-1	4	115 CFM	84x9x14	4230	1.75	DADANCO	ACB30	
CB-514-2	1	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-515	3	100 CFM	72x9x14	3650	1.5	DADANCO	ACB30	
CB-517	1	150 CFM	72x24x12	5290	2	DADANCO	ACB20	
CB-518	1	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-519	1	100 CFM	48x24x12	2560	1.0	DADANCO	ACB20	
CB-520	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-524	4	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-528	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-530	5	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-531-1	5	150 CFM	96x24x12	5290	2	DADANCO	ACB20	
CB-531-2	2	135 CFM	96x9x14	5020	2.0	DADANCO	ACB30	
CB-532	7	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
CB-539	2	110 CFM	72x24x12	3780	1.5	DADANCO	ACB20	
Grand total: 303								

SCHEDULE GENERAL NOTES (APPLIES TO ALL ENTRIES IN CHILLED BEAM SCHEDULES):
A. DUCT RUNOUT SIZE TO CHILLED BEAM SHALL MATCH THE CB INLET SIZE SCHEDULED HERE. CB INLET SHALL BE LOCATED ON THE SIDE (NOT THE TOP) OF THE CB FOR THE 24" WIDE CB (REFERENCE ACB20) AND THE BACK/SIDE (NOT THE TOP NOR THE END) FOR THE 9" WIDE CB (REFERENCE ACB30). CB INLET SIZE SHALL BE 6" ROUND FOR SCHEDULED PRIMARY AIRFLOWS BETWEEN 75 CFM AND 160 CFM. CB INLET SIZE SHALL BE 8" ROUND FOR SCHEDULED PRIMARY AIRFLOWS UP THROUGH 74 CFM. ROUND DUCTWORK MAY BE USED IN LIEU OF OVAL. PROVIDE TRANSITION TO CB INLET SIZE PER DETAIL.

B. MAXIMUM AIRSIDE PRESSURE DROP OF THE CB SHALL BE 0.60 IN. W.G. AT SCHEDULED AIRFLOW. MAXIMUM WATERSIDE PRESSURE DROP SHALL BE 10 FT. MAXIMUM NC LEVEL (INCLUDING A MAXIMUM OF 6 dB OF ROOM ATTENUATION) FOR THE SINGLE CB SHALL BE 25 NC.

C. EACH TEMPERATURE CONTROL ZONE DENOTES A GROUPING OF INDIVIDUAL CHILLED BEAMS (QUANTITY AS SCHEDULED) WHICH ARE PIPED TOGETHER AND CONTROLLED BY A SINGLE HYDRONIC CONTROL VALVE.

D. PIPE SUBMAIN SIZE TO CHILLED BEAMS WITHIN A ZONE SHALL BE 3/4" FOR PIPES WHERE THE CB SERVED TOTAL 0.0 GPM - 3.2 GPM; AND 1" FOR FOR PIPES WHERE THE CB SERVED TOTAL 3.3 GPM - 7.0 GPM; AND 1-1/4" FOR PIPES WHERE THE CB SERVED TOTAL 7.1 GPM - 13.0 GPM UNLESS SPECIFICALLY NOTED OTHERWISE ON PLANS TO BE LARGER SIZE. PIPE RUNOUT SIZE TO INDIVIDUAL CHILLED BEAMS FROM THE SUBMAIN SHALL BE 3/4" UNLESS NOTED OTHERWISE.

E. PROVIDE THERMAL PERFORMANCE SUBMITTAL INFORMATION FOR EACH ZONE WHICH MEETS THE MINIMUM SENSIBLE COOLING SCHEDULED:
1. WITH EACH CHILLED BEAM AT ITS PRIMARY AIRFLOW, 54.0 DEGFDB AND 52.0 DEGFWB EAT (50.5 DEGFDP).
2. WITH EACH CHILLED BEAM AT IT'S SCHEDULED CB WATER FLOW, 58.0 DEGF EWT.
3. WITH THE RETURN AIR ENTERING THE CHILLED BEAM AT 74.0 DEGFDB AND 63.7 DEGFWB EAT (57.4% RH) TO PROVIDE THE SUMMERTIME SCHEDULED MINIMUM SENSIBLE COOLING.

THE MINIMUM SENSIBLE COOLING

ALL TB ARE FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

AHU-1/2/3 TERMINAL BOX SCHEDULE

TAG	CFM COOLING MAX	CFM MIN	CFM HEATING MAX	UNIT INLET SIZE (IN)	HOT WATER HEATING COIL GPM	NOTES
TB-1-118	100	100	100	4"	0.6	
TB-1-119	75	75	75	4"	0.6	
TB-1-123	260	200	200	6"	0.6	
TB-1-136	580	200	200	9"	0.6	
TB-1-145	250	250	250	5"	0.6	
TB-1-152	480	60	60	8"	0.6	
TB-1-235	1,440	150	150	12"	0.6	
TB-1-402	550	200	450	8"	1.1	
TB-1-406	640	125	290	9"	0.7	
TB-1-407	550	200	450	8"	1.1	
TB-1-408	610	100	230	9"	0.6	
TB-1-409	550	200	415	8"	1.0	
TB-1-506	660	200	300	9"	0.8	

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ALL LTB ARE FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

AHU-1/2/3 LAB TERMINAL BOX SCHEDULE

TAG	CFM COOLING MAX	CFM HEATING MAX	UNIT INLET SIZE (IN)	HOT WATER HEATING COIL GPM	NOTES
LTB-1-106	2,085	2,085	14"	5.3	
LTB-1-107	1,125	585	12"	1.5	
LTB-1-108	1,965	1,220	14"	3.1	
LTB-1-109	1,420	835	12"	2.1	
LTB-1-110	1,785	1,110	14"	2.8	
LTB-1-111	965	610	12"	1.5	
LTB-1-112	1,495	1,495	12"	3.8	
LTB-1-121	700	700	9"	1.8	
LTB-1-122	75	75	4"	0.6	
LTB-1-124	75	75	4"	0.6	
LTB-1-130	750	400	9"	1.0	
LTB-1-131	750	400	9"	1.0	
LTB-1-143	710	710	9"	1.8	
LTB-1-144	480	300	8"	0.8	
LTB-1-146	700	700	9"	1.8	
LTB-1-147	155	45	5"	0.6	
LTB-1-148	470	80	8"	0.6	
LTB-1-150	1,375	1,375	12"	3.5	
LTB-1-219	135	90	6"	0.6	
LTB-1-220	750	750	9"	1.9	
LTB-1-221	900	250	10"	0.6	
LTB-1-223	350	105	7"	0.6	
LTB-1-224	300	140	6"	0.6	
LTB-1-225	300	170	6"	0.6	
LTB-1-226	1,255	430	12"	1.1	
LTB-1-227	1,690	665	14"	1.7	
LTB-1-228	660	430	9"	1.1	
LTB-1-229	550	395	8"	1.0	
LTB-1-230	300	155	6"	0.6	
LTB-1-231	980	660	12"	1.7	
LTB-1-232	425	425	7"	1.1	
LTB-1-234	350	350	7"	0.9	
LTB-1-324	650	90	9"	0.6	
LTB-1-325	1,220	745	12"	1.9	
LTB-1-326	440	180	7"	0.6	
LTB-1-327	260	180	6"	0.6	
LTB-1-328	1,660	875	14"	2.2	
LTB-1-329	1,525	610	14"	1.5	
LTB-1-330	320	130	7"	0.6	
LTB-1-331	220	60	5"	0.6	
LTB-1-332	750	750	9"	1.9	
LTB-1-333	1,020	945	12"	2.4	
LTB-1-335	350	350	7"	0.9	
LTB-1-337	1,210	525	12"	1.3	
LTB-1-338	1,210	885	12"	2.2	
LTB-1-405	1,220	725	12"	1.8	
LTB-1-419	580	90	9"	0.6	
LTB-1-420	1,405	1,405	12"	3.5	
LTB-1-421	440	180	7"	0.6	
LTB-1-422	300	180	6"	0.6	
LTB-1-423	2,105	2,105	16"	5.3	
LTB-1-424	2,130	1,005	16"	2.5	
LTB-1-425	320	130	7"	0.6	
LTB-1-426	215	180	5"	0.6	
LTB-1-427	2,145	2,145	16"	5.4	
LTB-1-428	2,275	1,665	16"	4.2	
LTB-1-429	350	350	7"	0.9	
LTB-1-430	1,220	725	12"	1.8	
LTB-1-431	390	245	7"	0.6	
LTB-1-434	1,405	1,405	12"	3.5	
LTB-1-435	1,480	1,480	12"	3.7	
LTB-1-436	1,395	1,395	12"	3.5	
LTB-1-437	2,285	2,285	16"	5.8	
LTB-1-502	1,625	1,000	14"	2.5	
LTB-1-507	200	115	5"	0.6	
LTB-1-508	220	120	5"	0.6	
LTB-1-509	1,765	1,000	14"	2.5	
LTB-1-521	2,300	585	16"	1.5	
LTB-1-522	585	90	9"	0.6	
LTB-1-523	1,240	480	12"	1.2	
LTB-1-524	440	180	7"	0.6	
LTB-1-526	2,305	615	16"	1.5	
LTB-1-528	320	180	7"	0.6	
LTB-1-529	225	180	5"	0.6	
LTB-1-530	750	750	9"	1.9	
LTB-1-531	1,020	1,020	12"	2.6	
LTB-1-532	770	490	10"	1.2	
LTB-1-533	350	350	7"	1.1	
LTB-1-534	2,260	725	16"	1.8	
LTB-1-535	410	255	7"	0.6	
LTB-1-536	1,740	1,075	14"	3.5	
LTB-1-537	1,045	435	12"	1.1	
LTB-1-538	1,180	505	12"	1.3	
LTB-1-540	2,120	725	16"	1.8	

ALL TB ARE FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

AHU-4/5 TERMINAL BOX SCHEDULE

TAG	CFM COOLING MAX	CFM MIN	CFM HEATING MAX	UNIT INLET SIZE (IN)	HOT WATER HEATING COIL GPM	NOTES
TB-4-101	400	365	365	7"	0.8	
TB-4-102	1,200	600	1,200	12"	3.6	
TB-4-103	880	240	240	10"	0.6	
TB-4-104	1,760	350	1,295	14"	3.5	
TB-4-105	620	300	300	9"	0.9	
TB-4-113	1,305	455	455	12"	1.2	
TB-4-114	1,340	400	730	14"	2.0	
TB-4-115	440	150	440	7"	1.5	
TB-4-116	400	120	120	7"	0.6	
TB-4-117	75	35	35	4"	0.6	
TB-4-125	200	30	30	5"	0.6	
TB-4-127	500	150	150	8"	0.6	
TB-4-132	570	205	205	9"	0.6	
TB-4-133	380	160	160	7"	0.6	
TB-4-134	50	50	50	4"	0.6	
TB-4-135	975	975	975	12"	2.6	
TB-4-137	100	30	30	4"	0.6	
TB-4-138	405	100	100	7"	0.6	
TB-4-139	405	100	405	7"	1.5	
TB-4-140	600	100	600	9"	2.0	
TB-4-149	200	100	100	5"	0.6	
TB-4-153	2,000	0	2,000	14"	5.2	
TB-4-199	600	400	600	9"	2.0	
TB-4-201	400	130	130	7"	0.6	
TB-4-203	710	200	565	9"	1.5	
TB-4-204	300	300	300	6"	0.8	
TB-4-205	1,050	350	1,050	12"	2.5	
TB-4-206	140	40	40	4"	0.6	
TB-4-208	210	10	10	5"	0.6	
TB-4-209	880	175	175	10"	0.6	
TB-4-210	880	175	175	10"	0.6	
TB-4-211	300	240	240	6"	0.6	
TB-4-212	1,050	315	1,050	12"	2.7	
TB-4-214	500	175	440	8"	1.5	
TB-4-215	300	220	220	6"	0.7	
TB-4-216	155	60	60	5"	0.6	
TB-4-217	370	120	120	7"	0.6	
TB-4-218	220	215	215	5"	0.7	
TB-4-236	100	30	30	4"	0.6	
TB-4-238	125	10	10	4"	0.6	
TB-4-239	300	230	230	6"	0.7	
TB-4-240	2,000	0	2,000	14"	5.2	
TB-4-301	400	90	90	7"	0.6	
TB-4-303	400	100	255	7"	0.8	
TB-4-304	600	100	215	9"	0.7	
TB-4-305	550	100	285	8"	0.9	
TB-4-306	550	100	285	8"	0.9	
TB-4-307	300	300	300	6"	0.8	
TB-4-308	780	115	115	10"	0.6	
TB-4-309	780	115	115	10"	0.6	
TB-4-312	900	225	835	10"	2.8	
TB-4-313	220	135	135	5"	0.6	
TB-4-314	300	250	250	6"	0.7	
TB-4-315	110	75	75	4"	0.6	
TB-4-316	110	75	75	4"	0.6	
TB-4-317	110	75	75	4"	0.6	
TB-4-318	110	80	80	4"	0.6	
TB-4-319	340	150	305	7"	1.0	
TB-4-320	300	100	300	6"	0.9	
TB-4-321	400	220	220	7"	0.7	
TB-4-322	150	50	150	4"	0.6	
TB-4-338	100	30	30	4"	0.6	
TB-4-401	300	110	110	6"	0.6	
TB-4-403	300	100	175	6"	0.6	
TB-4-404	300	300	300	6"	0.8	
TB-4-410	900	150	885	10"	2.3	
TB-4-413	450	100	425	7"	1.4	
TB-4-414	600	125	400	9"	1.4	
TB-4-415	300	100	250	6"	0.8	
TB-4-416	400	220	220	7"	0.7	
TB-4-417	150	150	150	4"	0.6	
TB-4-434	100	30	30	4"	0.6	
TB-4-437	200	75	75	5"	0.6	
TB-4-439	100	25	25	6"	0.6	
TB-4-501	400	250	250	7"	0.6	
TB-4-503	400	150	270	7"	0.7	
TB-4-504	300	300	300	6"	0.8	
TB-4-505	100	30	30	4"	0.6	
TB-4-510	1,480	300	1,060	12"	3.5	
TB-4-514	570	125	450	9"	1.5	
TB-4-515	300	100	270	6"	0.9	
TB-4-516	175	55	55	5"	0.6	
TB-4-517	150	50	150	4"	0.6	
TB-4-518	100	50	100	4"	0.6	
TB-4-519	100	50	100	4"	0.6	
TB-4-520	220	50	160	5"	0.6	
TB-4-539	220	50	185	5"	0.6	
TB-4-541	100	25	25	6"	0.7	
TB-4-602	3,200	3,200	3,200	16"	10	

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1 provide a 24"x16" inset TB here.

ALL TB ARE FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

TERMINAL BOX COOLING ONLY SCHEDULE

TAG	CFM MAX	CFM MIN	UNIT INLET SIZE (IN)	NOTES
TB-1-141	600	150	8"	
TB-1-142	1,360	120	12"	
TB-1-237	1,360	120	12"	
TB-1-238	300	150	6"	
TB-1-311	300	150	6"	
TB-1-336	1,360	120	12"	
TB-1-412	300	150	6"	
TB-1-433	1,360	0	12"	
TB-1-512	300	150	6"	
TB-1-513	1,360	0	12"	
TB-4-601	430	0	8"	
TB-7-101	300	50	8"	
TB-7-102	2,800	200	16"	
TB-7-103	600	50	10"	
TB-7-104	150	10	6"	

AIR TERMINAL UNIT LEGEND: TB- **A-FXX**
TB: TERMINAL BOX. A SINGLE DUCT VARIABLE AIR VOLUME UNIT WHICH DOES NOT CONTAIN A HEATING COIL.

WHERE "**A**" IS THE AHU NUMBER (A=1 FOR AHU-1/2/3 AND A=4 FOR AHU-4/5) WHICH SERVES THE TERMINAL BOX.

WHERE "**F**" IS THE LEVEL/FLOOR (1,2,3,4,5) WHICH THE TERMINAL BOX IS LOCATED

WHERE "**XX**" ARE SEQUENTIAL IDENTIFYING NUMBERS FOR THE INDIVIDUAL TERMINAL BOXES (01-99). THESE ARE NOT THE ROOM NUMBERS. SEQUENTIAL NUMBERS DO NOT START OVER FOR TBS WITHOUT HEATING COILS (CONTINUE WITH SINGLE TB NUMBERING LIST)

EXAMPLE: THE THIRD TERMINAL BOX SERVING A PORTION OF A SPACE ON THE SECOND FLOOR WHICH IS FED BY AHU-1 WOULD BE: TB-1-203.

AIR TERMINAL UNIT LEGEND: TB- **A-FXX**
TB: TERMINAL BOX. A SINGLE DUCT VARIABLE AIR VOLUME UNIT WITH A HYDRONIC HEATING COIL.

WHERE "**A**" IS THE AHU NUMBER (A=1 FOR AHU-1/2/3 AND A=4 FOR AHU-4/5) WHICH SERVES THE TERMINAL BOX.

WHERE "**F**" IS THE LEVEL/FLOOR (1,2,3,4,5) WHICH THE TERMINAL BOX IS LOCATED

WHERE "**XX**" ARE SEQUENTIAL IDENTIFYING NUMBERS FOR THE INDIVIDUAL TERMINAL BOXES (01-99). THESE ARE NOT THE ROOM NUMBERS.

EXAMPLE: THE FOURTEENTH TERMINAL BOX SERVING A PORTION OF A SPACE ON THE FOURTH FLOOR WHICH IS FED BY AHU-4 WOULD BE: TB-4-414.

SCHEDULE GENERAL NOTES (APPLY TO ALL ENTRIES IN TB SCHEDULES AND LTB SCHEDULES):

A. DUCT RUNOUT SIZE TO TERMINAL BOX SHALL BE 2" LARGER THAN SCHEDULED INLET SIZE UNLESS NOTED OTHERWISE ON PLANS TO BE LARGER. PROVIDE TRANSITION TO INLET SIZE PER DETAIL.
B. DISCHARGE DUCT SIZE SHALL BE EQUAL TO TERMINAL BOX OUTLET SIZE UNLESS NOTED OTHERWISE ON PLANS. PROVIDE DUCT TRANSITIONS AS NECESSARY.
C. MAXIMUM AIRSIDE PRESSURE DROP SHALL BE 0.50 IN. W.G. AT HIGHEST SCHEDULED AIRFLOW, INCLUDING TERMINAL BOX AND HEATING COIL, UNLESS NOTED OTHERWISE. INCREASE SIZE OF TERMINAL BOX CASING AND COIL IF AIRSIDE PRESSURE DROP IS ABOVE THE MAXIMUM.
D. MAXIMUM WATERSIDE PRESSURE DROP SHALL BE 7 FT., UNLESS NOTED OTHERWISE.
E. SIZE HEATING COIL BASED ON HEATING MAXIMUM AIRFLOW UNLESS NOTED OTHERWISE. SUBMIT HEATING PERFORMANCE (LWT, LAT, BTU/HR., AND WATERSIDE PRESSURE DROP) AT MAXIMUM HEATING AIRFLOW AND COIL GPM SCHEDULED.
   1. PROVIDE MINIMUM TWO ROW COILS FOR ALL TERMINAL UNITS (PROVIDE ADDITIONAL COIL ROWS FOR TERMINAL UNITS WHICH REQUIRE ADDITIONAL HEATING CAPACITY TO MEET THE SCHEDULED PERFORMANCE WHERE A SPECIFIC MINIMUM BTU/H PERFORMANCE IS SCHEDULED FOR A SPECIFIC COIL).
   2. FOR ALL COILS, PROVIDE A LEAVING AIR TEMPERATURE OF AT LEAST 75.0 DEGF AT THE HEATING MAXIMUM AIRFLOW, WITH 130 DEGF EWT AND 54 DEGF EAT.
F. PIPE RUNOUT SIZE TO TERMINAL BOX COIL SHALL BE 3/4" FOR COILS WITH 0.0 - 3.2 GPM AND 1" FOR COILS WITH 3.3 - 7.0 GPM UNLESS NOTED OTHERWISE ON PLANS.
G. PROVIDE FACTORY CALIBRATION OF CONTROLLER MINIMUM AND MAXIMUM SETTINGS. SEE CONTROL SCHEMATICS AND SPECIFICATIONS.
H. PROVIDE THERMAL PERFORMANCE (LWT, LAT, BTU/H) SUBMITTAL INFORMATION FOR EACH HEATING COIL:
   1. AT THE MINIMUM AIRFLOW, WITH 130 DEGF EWT AND 54 DEGF EAT.
   2. AT THE HEATING MAXIMUM AIRFLOW, WITH 130 DEGF EWT AND 54 DEGF EAT.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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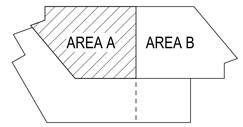
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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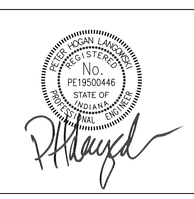
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



TERMINAL UNIT SCHEDULES (SUPPLY)

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

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ALL EV ARE AIRFLOW CONTROL VALVES FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

EXHAUST VALVE SCHEDULE

TAG	CFM MAX	CFM MIN	UNIT INLET SIZE (IN)	NOTES
EV-1-118	150	150	6	
EV-1-119	125	125	6	
EV-1-123	160	100	6	
EV-1-136	580	200	8	
EV-1-141	500	50	8	
EV-1-142	1285	45	12	
EV-1-145	50	50	6	
EV-1-152	480	60	8	
EV-1-235	1440	150	12	
EV-1-237	1285	45	12	
EV-1-238	200	50	6	
EV-1-311	200	50	6	
EV-1-336	1285	120	12	
EV-1-402	400	50	8	
EV-1-406	635	125	8	
EV-1-407	400	50	8	
EV-1-408	610	100	8	
EV-1-409	400	50	8	
EV-1-412	200	50	6	
EV-1-433	1285	45	12	
EV-1-506	460	50	8	
EV-1-512	200	50	6	
EV-1-513	1285	45	12	
EV-4-102	800	200	10	
EV-4-103	680	150	8	
EV-4-104	1560	150	14	
EV-4-113	1055	525	10	
EV-4-114	1260	150	12	
EV-4-115	300	20	6	
EV-4-116	300	20	6	
EV-4-117	75	50	4	
EV-4-125	200	50	6	
EV-4-127	300	20	6	
EV-4-132	470	150	8	
EV-4-133	330	110	6	
EV-4-134	50	50	4	
EV-4-135	1150	1150	12	
EV-4-137	100	30	4	
EV-4-138	305	20	6	
EV-4-139	305	20	6	
EV-4-140	305	20	6	
EV-4-149	150	50	6	
EV-4-199	300	100	6	
EV-4-203	525	100	10	
EV-4-204	525	525	8	
EV-4-205	525	150	10	
EV-4-206	140	40	4	
EV-4-208	210	30	6	
EV-4-209	780	75	10	
EV-4-210	780	75	10	
EV-4-211	200	140	6	
EV-4-212	900	75	10	
EV-4-214	400	75	8	
EV-4-215	200	120	6	
EV-4-217	270	30	6	
EV-4-218	170	150	6	
EV-4-236	100	30	4	
EV-4-238	125	10	4	
EV-4-239	250	185	6	
EV-4-303	350	50	6	
EV-4-304	550	50	8	
EV-4-305	550	100	8	
EV-4-306	1050	100	10	
EV-4-307	525	525	8	
EV-4-308	525	525	10	
EV-4-309	775	145	10	
EV-4-312	775	100	10	
EV-4-313	170	85	6	
EV-4-314	250	205	6	
EV-4-315	110	75	4	
EV-4-316	110	75	4	
EV-4-317	110	75	4	
EV-4-318	110	80	4	
EV-4-319	240	50	6	
EV-4-320	250	50	6	
EV-4-321	325	185	6	
EV-4-322	150	50	4	
EV-4-337	100	30	4	
EV-4-403	250	50	6	
EV-4-404	525	525	8	
EV-4-412	550	150	10	
EV-4-413	400	100	8	
EV-4-414	550	125	8	
EV-4-415	300	100	6	
EV-4-416	325	145	8	
EV-4-417	100	100	4	
EV-4-434	100	30	4	
EV-4-438	200	145	6	
EV-4-439	100	25	4	
EV-4-503	1050	150	10	
EV-4-504	525	525	8	
EV-4-505	180	30	4	
EV-4-510	1380	200	12	
EV-4-514	570	125	8	
EV-4-515	250	50	6	
EV-4-516	175	85	6	
EV-4-517	125	25	4	
EV-4-518	75	25	4	
EV-4-519	75	25	4	
EV-4-520	150	35	4	
EV-4-539	170	25	4	
EV-4-541	100	25	4	

EXHAUST VALVE LEGEND: EV- **A-FXX**
EV: A BLADE DAMPER STYLE VARIABLE AIR VOLUME UNIT.

WHERE "**A**" IS THE GEF NUMBER (1 FOR GEF-1/2/3 AND 4 FOR GEF-4/5) WHICH SERVES THE EV.

WHERE "**F**" IS THE LEVEL/FLOOR (1,2,3,4,5) WHICH THE EV IS LOCATED

WHERE "**XX**" ARE SEQUENTIAL IDENTIFYING NUMBERS FOR THE INDIVIDUAL TERMINAL BOXES (01-99). THESE ARE NOT THE ROOM NUMBERS.

EXAMPLE: THE THIRD EV SERVING A PORTION OF A SPACE ON THE THIRD FLOOR WHICH IS FED BY GEF-1 WOULD BE: EV-1-303. THE "XX" PART OF THE NAME WOULD MATCH THE "XX" PART OF THE EV WHICH SERVES THE SAME SPACE.

SCHEDULE GENERAL NOTES (APPLY TO ALL ENTRIES IN EV SCHEDULES):
A. DUCT RUNOUT SIZE TO THE EXHAUST VALVE INLET SHALL BE 2" LARGER THAN THE ACTUAL FURNISHED EXHAUST VALVE INLET SIZE UNLESS NOTED OTHERWISE ON PLANS TO BE LARGER. PROVIDE TRANSITION TO INLET SIZE PER DETAIL.
B. DISCHARGE DUCT SIZE SHALL BE EQUAL TO EXHAUST VALVE OUTLET SIZE UNLESS NOTED OTHERWISE ON PLANS. PROVIDE DUCT TRANSITIONS AS NECESSARY TO FURTHER DOWNSTREAM DUCT SIZES NOTED ON THE PLANS TO BE LARGER.
C. MAXIMUM AIRSIDE PRESSURE DROP SHALL BE 0.20 IN. W.G. AT HIGHEST SCHEDULED AIRFLOW,
D. PROVIDE FACTORY CALIBRATION OF CONTROLLER MINIMUM AND MAXIMUM SETTINGS. SEE CONTROL SCHEMATICS AND SPECIFICATIONS.

ALL LGEV ARE AIRFLOW CONTROL VALVES FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

LAB GENERAL EXHAUST VALVE SCHEDULE

TAG	CFM MAX	UNIT INLET SIZE (IN)	NOTES
LGEV-1-106	665	8	
LGEV-1-107	1210	12	
LGEV-1-108	2050	14	
LGEV-1-109	1230	12	
LGEV-1-110	1665	14	
LGEV-1-111	1015	10	
LGEV-1-112	525	8	
LGEV-1-121	250	8	
LGEV-1-122	125	6	
LGEV-1-124	125	6	
LGEV-1-130	750	9	
LGEV-1-131	750	9	
LGEV-1-143	480	8	
LGEV-1-144	480	8	
LGEV-1-146	200	6	
LGEV-1-147	105	8	
LGEV-1-148	420	8	
LGEV-1-150	1245	12	
LGEV-1-219	135	8	
LGEV-1-220	565	8	
LGEV-1-221	900	10	
LGEV-1-223	350	8	
LGEV-1-224	300	8	
LGEV-1-225	310	8	
LGEV-1-226	1065	10	
LGEV-1-227	1460	12	
LGEV-1-228	670	8	
LGEV-1-229	560	8	
LGEV-1-230	310	8	
LGEV-1-231	750	9	
LGEV-1-234	350	8	
LGEV-1-324	650	8	
LGEV-1-325	1095	10	
LGEV-1-326	440	8	
LGEV-1-327	260	8	
LGEV-1-328	1405	12	
LGEV-1-329	1535	12	
LGEV-1-330	270	8	
LGEV-1-331	220	8	
LGEV-1-332	760	10	
LGEV-1-333	1030	10	
LGEV-1-335	350	8	
LGEV-1-337	1010	10	
LGEV-1-338	1145	12	
LGEV-1-405	1220	12	
LGEV-1-419	580	8	
LGEV-1-420	660	10	
LGEV-1-421	440	8	
LGEV-1-422	300	7	
LGEV-1-423	660	10	
LGEV-1-424	1865	14	
LGEV-1-425	270	6	
LGEV-1-426	215	6	
LGEV-1-427	1250	12	
LGEV-1-428	2010	14	
LGEV-1-429	350	8	
LGEV-1-430	1070	12	
LGEV-1-431	390	8	
LGEV-1-434	690	10	
LGEV-1-435	605	10	
LGEV-1-436	1155	12	
LGEV-1-437	1445	12	
LGEV-1-502	750	12	
LGEV-1-507	200	6	
LGEV-1-508	220	6	
LGEV-1-509	1690	12	
LGEV-1-521	2385	14	
LGEV-1-522	585	8	
LGEV-1-523	1315	10	
LGEV-1-524	440	8	
LGEV-1-526	2365	14	
LGEV-1-528	270	6	
LGEV-1-529	225	6	
LGEV-1-530	760	8	
LGEV-1-531	1030	10	
LGEV-1-532	770	9	
LGEV-1-533	350	8	
LGEV-1-534	2110	14	
LGEV-1-535	270	6	
LGEV-1-536	1665	12	
LGEV-1-537	1045	10	
LGEV-1-538	980	10	
LGEV-1-540	1970	14	

LAB EXHAUST VALVE LEGEND: LGEV- **A-FXX** AND LEEV-**A-FXX**
EV: A BLADE DAMPER STYLE VARIABLE AIR VOLUME UNIT.

WHERE "**A**" IS THE GEF NUMBER (1 FOR GEF-1/2/3) WHICH SERVES THE EV.

WHERE "**F**" IS THE LEVEL/FLOOR (1,2,3,4,5) WHICH THE EV IS LOCATED

WHERE "**XX**" ARE SEQUENTIAL IDENTIFYING NUMBERS FOR THE INDIVIDUAL LAB TERMINAL BOXES (01-99) WHICH THESE LGEV AND LEEV ARE ASSOCIATED WITH. THESE ARE NOT THE ROOM NUMBERS.

EXAMPLE: THE LGEV SERVING A LAB ZONE ON THE THIRD FLOOR WHICH IS FED BY LTB-1-309 WOULD BE: LGEV-1-309. THE "XX" PART OF THE EV NAME WOULD MATCH THE "XX" PART OF THE LTB WHICH SERVES THE SAME SPACE.

SCHEDULE GENERAL NOTES (APPLY TO ALL LGEV ENTRIES IN LGEV SCHEDULES):
A. DUCT RUNOUT SIZE TO THE EXHAUST VALVE INLET SHALL BE 2" LARGER THAN THE ACTUAL FURNISHED EXHAUST VALVE INLET SIZE UNLESS NOTED OTHERWISE ON PLANS TO BE LARGER. PROVIDE TRANSITION TO INLET SIZE PER DETAIL.
B. DISCHARGE DUCT SIZE SHALL BE EQUAL TO EXHAUST VALVE OUTLET SIZE UNLESS NOTED OTHERWISE ON PLANS. PROVIDE DUCT TRANSITIONS AS NECESSARY TO FURTHER DOWNSTREAM DUCT SIZES NOTED ON THE PLANS TO BE LARGER.
C. MAXIMUM AIRSIDE PRESSURE DROP SHALL BE 0.20 IN. W.G. AT HIGHEST SCHEDULED AIRFLOW,
D. PROVIDE FACTORY CALIBRATION OF CONTROLLER MINIMUM AND MAXIMUM SETTINGS. SEE CONTROL SCHEMATICS AND SPECIFICATIONS.

ALL LEEV ARE AIRFLOW CONTROL VALVES FURNISHED IN THE 233600 SPECIFICATION AND ARE FURNISHED BY THE SHEETMETAL TRADES.

LAB EQUIPMENT EXHAUST VALVE SCHEDULE

TAG	UNIT INLET SIZE (IN)	NOTES
LEEV-1-107	4	
LEEV-1-108	4	
LEEV-1-109	4	
LEEV-1-110	6	
LEEV-1-112	4	
LEEV-1-220	4	
LEEV-1-225	4	
LEEV-1-226	4	
LEEV-1-227	6	
LEEV-1-228	4	
LEEV-1-229	4	
LEEV-1-230	4	
LEEV-1-231	6	
LEEV-1-328	6	
LEEV-1-329	4	
LEEV-1-330	4	
LEEV-1-332	4	
LEEV-1-333	4	
LEEV-1-338	4	
LEEV-1-424	6	
LEEV-1-428	4	
LEEV-1-437	4	
LEEV-1-509	10	
LEEV-1-521	4	
LEEV-1-526	4	
LEEV-1-528	4	
LEEV-1-529	4	
LEEV-1-531	4	
LEEV-1-536	10	
LEEV-1-537	10	

SCHEDULE GENERAL NOTES (APPLY TO ALL LEEV ENTRIES IN LEEV SCHEDULES):
A. DUCT RUNOUT SIZE TO THE EXHAUST VALVE INLET SHALL BE SAME SIZE AS THE ACTUAL FURNISHED EXHAUST VALVE INLET SIZE UNLESS NOTED OTHERWISE ON PLANS TO BE LARGER. PROVIDE TRANSITION TO INLET SIZE AS REQUIRED.
B. DISCHARGE DUCT SIZE SHALL BE EQUAL TO EXHAUST VALVE OUTLET SIZE UNLESS NOTED OTHERWISE ON PLANS. PROVIDE DUCT TRANSITIONS AS NECESSARY TO FURTHER DOWNSTREAM DUCT SIZES NOTED ON THE PLANS TO BE LARGER.
C. MAXIMUM AIRSIDE PRESSURE DROP SHALL BE 0.20 IN. W.G. AT HIGHEST SCHEDULED AIRFLOW,
D. PROVIDE FACTORY CALIBRATION OF CONTROLLER MINIMUM AND MAXIMUM SETTINGS. SEE CONTROL SCHEMATICS AND SPECIFICATIONS.

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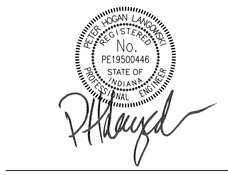

TERMINAL UNIT SCHEDULES (EXHAUST)

DATE	**REF: SHEET INDEX**
BSA PROJECT NO.	**00360481**

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TAB SCHEDULE	
TASK	**NOTES**
FUME HOOD SETUP	TELEPHONE THE ENGINEER EVERY DAY WHILE ON SITE DOING THE 230593 "LABORATORIES" SECTION WORK FOR INITIAL FUME HOOD SETUP. ATTEND THE CERTIFICATION CONFERENCE OF 230595. SEE SPECIFICATION 230595 "CERTIFICATION OF FUME HOODS" AND COORDINATE THAT SCOPE OF WORK WITH THIS TAB AGENT.
LAB CONTROLS SETUP	SEE SIEMENS CONTROL DRAWINGS AND SHEET M808 FOR LAB CONTROLS SETUP AND COORDINATE THAT SCOPE OF WORK WITH THIS TAB AGENT (WHERE YOU WILL COORDINATE WITH THE BAS CONTROL SUPPLIER VENDOR AS WELL AS THE CONTROL INSTALLATION CONTRACTOR). TELEPHONE THE ENGINEER EVERY DAY WHILE ON SITE DOING THIS WORK.
FUME HOOD CERTIFICATION TESTING SUPPORT	RETURN TO THE JOBSITE ON THE DAY OF THE FIRST CERTIFICATION AND ACCOMPANY THE FUME HOOD CERTIFIER (230595) AND CHECK FACE VELOCITIES AGAIN PRIOR TO THE CERTIFIER BEGINNING THEIR WORK; NOTIFYING THE BAS CONTROL SUPPLIER OF ANY DISCREPANCIES. PROVIDE FOR VELGRID MEASURING OF FUME HOOD FACE VELOCITY AS WELL AS PROVIDE SECOND TESTING METHOD MATCHING THE METHODS USED BY IU EH&S FOR MEASURING FACE VELOCITY WHEN THEY APPLY THEIR ANNUAL STICKERS. PERFORM AND RECORD BOTH METHODS AT EACH FUME HOOD. COORDINATE BETWEEN THE TWO DIFFERENT METHODS AND COMPARE TO THE EH&S RESULTS AND INVOLVE THE ENGINEER OF RECORD IN THE DISCUSSION. WHEN THE FIRST WET LAB AND FUME HOOD IS CERTIFIED AND READY TO TURN BACK TO THE OCCUPANTS, ATTEND IN PERSON THE VERY FIRST EH&S TESTING OF THE FIRST FUME HOOD TO VERIFY THEIR METHODS AND "CALIBRATE" THE TWO METHODS OF MEASURING FACE VELOCITY (DON'T WAIT UNTIL ALL TWENTY FOUR FUME HOODS AND LABS HAVE BEEN SET UP).
SUPPLEMENTAL EQUIPMENT TESTING	CHILLERS AND WWHP: CREATE A TAB REPORT FOR EACH. RECORD DIFFERENTIAL PRESSURE AND FLOWRATE ON BOTH BARRELS WHEN OPERATING AT THE NORMAL SETPOINTS AND BOTH BARREL CONTROL VALVE POSITIONS (AND THE DDC SIGNAL) AND THE FLOWMETER READINGS. COOLING TOWERS: CREATE A TAB REPORT FOR EACH COOLING TOWER. RECORD RUNNING VFD AMPS, VOLTS, AND KW AT 60HZ, AT 30HZ, AND AT 18HZ. RECORD HOT DECK OPERATING WATER HEIGHT AND TOWER CONTROL VALVE POSITION (AND DDC SIGNAL) WHEN OPERATING AT THE CW HEADER DIFFERENTIAL PRESSURE SETPOINT. PROVIDE ADDITIONAL TESTING FOR EACH OF THE THREE FHEF FANS, MEASURING FAN AIRFLOW AND BYPASS AIR DAMPER AIRFLOW FOR USE IN CONTROLS SETUP (SEE SHEET M807 AND SIEMENS DRAWINGS). PROVIDE READINGS OF ALL THE CONNECTED SYSTEM AIR VALVE % OPEN POSITIONS (LEEV, LGEV, AND FHEV) AT TWO DIFFERENT DUCT STATIC PRESSURE SETPOINTS. INCLUDE THE ENGINEER OF RECORD IN THESE DISCUSSIONS PRIOR TO BEGINNING TESTING AND THEN PRIOR TO RECOMMENDING STATIC PRESSURE SETPOINTS.
STANDARD TAB	STANDARD TAB WORK IS AS SPECIFIED IN 230593 AND ALSO THAT NOTED ON THE DRAWING SHEETS. ADDITIONAL "SPECIAL" TAB WORK IS NOTED ABOVE FOR YOUR BIDDING INFORMATION. PLEASE SEE THE 230593 SPEC FOR THE "ADDITIONAL SCOPE" AND TELEPHONE THE ENGINEER PRIOR TO BEGINNING ANY OF THESE ITEMS: FOR EXHAUST AIR SYSTEMS, FULL AIRFLOW TESTING, AND BUILDING PRESSURIZATION TESTING.

5

PRESSURE RELIEF DOOR SCHEDULE (1)

TAG	SYSTEM	SYSTEM AIRFLOW (CFM)	RELIEF AIRFLOW (CFM)	RELIEF SETTING (INCHES W.G.)	OPEN DIRECTION	SIZE (INCHES)	REFERENCE	ADDITIONAL NOTES
PRD-S1A	AHU-1 / 2 / 3	90,000	16,000	+5"	OUT	24X24	GREENHECK PRAD	-
PRD-S1B	AHU-1 / 2 / 3	-	16,000	+5"	OUT	24X24	GREENHECK PRAD	-
PRD-S4A	AHU-4 / 5	50,000	16,000	+5"	OUT	24X24	GREENHECK PRAD	-
PRD-S4B	AHU-4 / 5	-	16,000	+5"	OUT	24X24	GREENHECK PRAD	-
PRD-S6A	AHU-6A	9,000	3,000	+5"	OUT	12X12	GREENHECK PRAD	-
PRD-S6B	AHU-6B	9,000	3,000	+5"	OUT	12X12	GREENHECK PRAD	-
PRD-R6A	AHU-6A	9,000	3,000	-4"	IN	12X12	GREENHECK VRAD	-
PRD-R6B	AHU-6B	9,000	3,000	-4"	IN	12X12	GREENHECK VRAD	-
PRD-E1A	GEF-1 / 2 / 3	90,000	16,000	-5"	IN	24X24	GREENHECK VRAD	-
PRD-E1B	GEF-1 / 2 / 3	-	16,000	-5"	IN	24X24	GREENHECK VRAD	-
PRD-E4A	GEF-4/ 5	50,000	16,000	-5"	IN	24X24	GREENHECK VRAD	-
PRD-E4B	GEF-4/ 5	-	16,000	-5"	IN	24X24	GREENHECK VRAD	-
PRD-E10	FHEF-10A/ 10B / 10C	42,200	16,000	-5"	IN	24X24	GREENHECK VRAD	-

NOTES:

1. LOCATE AND INSTALL PRESSURE RELIEF DOORS SUCH THAT PERSONNEL ACCESS FROM A FLOOR MOUNTED STEP LADDER IS MAINTAINED TO BE ABLE TO CLOSE THE PRESSURE RELIEF DOOR. COORDINATE AND LOCATE THE PRESSURE RELIEF DOORS SUCH THAT A DIRECT LINE OF SIGHT WHILE STANDING ON THE FLOOR TO THE PRESSURE RELIEF DOOR IS PROVIDED (SO THAT SOMEONE STANDING ON THE FLOOR - NOT ON THE LADDER - CAN SEE THAT IT IS OPEN).

CONTROL DAMPERS SCHEDULED BELOW ARE PROVIDED (PURCHASED, FURNISHED, AND INSTALLED INTO THE DUCTWORK COMPLETE) BY THE SHEETMETAL DUCTWORK INSTALLATION TRADES.
CONTROL DAMPERS ARE NOT FURNISHED BY THE CONTROL SUPPLIER NOR ARE THE CONTROL DAMPERS INSTALLED BY THE CIC.
DAMPER ACTUATORS (NONE ARE ILLUSTRATED ON THIS SHEET) ARE FURNISHED BY THE CONTROL SUPPLIER (IF AND ONLY IF THE ACTUATORS ARE INDICATED ON THE CONTROL SUPPLY DRAWING SUBMITTAL).
COORDINATE WITH THE CIC FOR THE OVERALL DUCTWORK INSTALLATION OF DAMPERS TO ALLOW FOR ACCESSIBLE DAMPER ACTUATORS, ACTUATOR BRACKETS, AND ACTUATOR LINKAGES.

SCHEDULED AHU-7 DAMPERS ARE SPECIFIED IN THE 233300 SPEC AND PROVIDED BY THE SHEETMETAL TRADES.

CONTROL DAMPER SCHEDULE

TAG	APPLICATION/TYPE (2)	SPEC 233300 SPEC GRADE	DESIGN FLOW (CFM)	NOTES
OAD-7	MODULATING	(3)	REFER TO SCHEDULED SUPPLY FAN FLOW	(1)
EAD-7	MODULATING	(3)	REFER TO SCHEDULED RETURN FAN FLOW	(1)
RAD-7	MODULATING	(4)	REFER TO SCHEDULED RETURN FAN FLOW	(1)
ZCD-198H	MODULATING	(6)	8,000 CFM	(1)
EAD-11 (AT REF-11)	TWO POSITION	(5)	REFER TO SCHEDULED EXHAUST FAN FLOW	(1)

5

SCHEDULE NOTES:

1. DAMPER SHALL BE FULL SIZE OF DUCTWORK NOTED ON PLANS.
2. COORDINATE CLOSELY WITH THE BAS SUPPLIER FOR DAMPER MOUNTING REQUIREMENTS TO ACHIEVE ACTUATORS/LINKAGES MOUNTING AND ACCESS REQUIREMENTS.
3. THERMALLY INSULATED BLADES AND FRAMES, ALUMINUM - ULTRA LOW LEAKAGE: OUTDOOR AIR SERVICE/EXHAUST AIR SERVICE/RELIEF AIR SERVICE.
4. ALUMINUM - ULTRA LOW LEAKAGE: RETURN AIR SERVICE.
5. DAMPER IS FURNISHED BY FAN MANUFACTURER. THIS DAMPER IS SPECIFIED IN THE 233423 SPEC.
6. ALUMINUM - ULTRA LOW LEAKAGE: SUPPLY AIR SERVICE.

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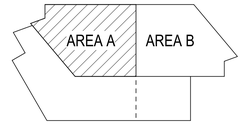
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

AIR DEVICE SCHEDULES

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

M608

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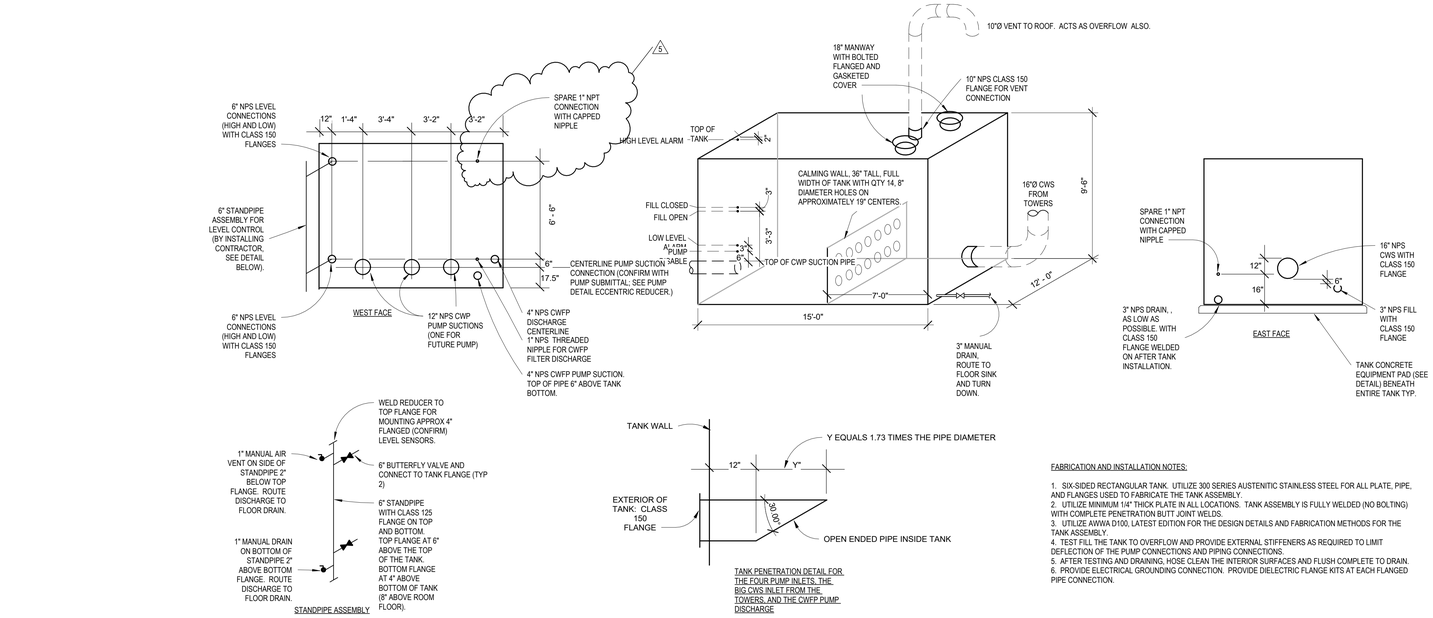
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/MECH-20250072-IULAB_R24-rvt

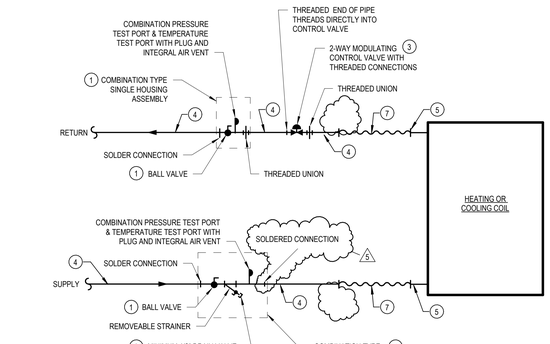


TANK PENETRATION DETAIL FOR THE FOUR PUMP INLETS, THE BIG CWS INLET FROM THE TOWERS, AND THE CWFP PUMP DISCHARGE

FABRICATION AND INSTALLATION NOTES:

1. SIX-SIDED RECTANGULAR TANK. UTILIZE 300 SERIES AUSTENITIC STAINLESS STEEL FOR ALL PLATE, PIPE, AND FLANGES USED TO FABRICATE THE TANK ASSEMBLY.
2. UTILIZE MINIMUM 1/4" THICK PLATE IN ALL LOCATIONS. TANK ASSEMBLY IS FULLY WELDED (NO BOLTING) WITH COMPLETE PENETRATION BUTT JOINT WELDS.
3. UTILIZE AWWA D100, LATEST EDITION FOR THE DESIGN DETAILS AND FABRICATION METHODS FOR THE TANK ASSEMBLY.
4. TEST FILL THE TANK TO OVERFLOW AND PROVIDE EXTERNAL STIFFENERS AS REQUIRED TO LIMIT DEFLECTION OF THE PUMP CONNECTIONS AND PIPING CONNECTIONS.
5. AFTER TESTING AND DRAINING, HOSE CLEAN THE INTERIOR SURFACES AND FLUSH COMPLETE TO DRAIN.
6. PROVIDE ELECTRICAL GROUNDING CONNECTION. PROVIDE DIELECTRIC FLANGE KITS AT EACH FLANGED PIPE CONNECTION.

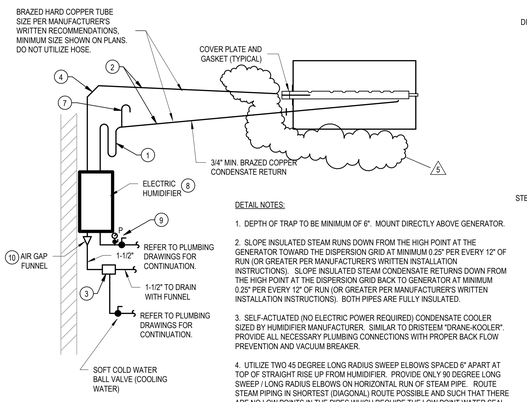
5 M702 CONDENSER WATER TANK DETAIL
NO SCALE



DETAIL NOTES:

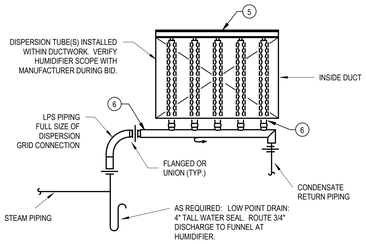
1. PROVIDE VALVE HANDLE EXTENSION SUITABLE FOR 1.5" THICK INSULATION THICKNESS. PROVIDE THE MANUFACTURER'S INSULATION OPTION ON THE COMBINATION TYPE SINGLE HOUSING ASSEMBLY.
2. INSTALL DRAIN AT LOWEST POINT IN THE SUPPLY PIPING SUCH THAT IT IS LOWER THAN THE AIR VENT ON THE RETURN PIPING.
3. INSTALL CONTROL VALVE SO THAT STEM IS ORIENTED VERTICAL TO THE FLOOR.
4. PROVIDE THIS PIPING SEGMENT AT FULL PIPING RUNOUT SIZE AS NOTED AND/OR SCHEDULED. PIPING SHALL BE NO SMALLER THAN 3/4" SIZE.
5. SOLDER CONNECTION AT COIL (PROVIDE REDUCER AS REQUIRED TO TRANSITION TO COIL CONNECTION SIZE).
6. NOT USED.
7. PROVIDE A 12" LONG HOSE CONNECTOR (STAINLESS STEEL BRAID HOSE, MINIMUM 350 PSIG OPERATING PRESSURE, WASHERLESS (METAL TO METAL) HOSE FITTINGS, JIC SWIVEL END TO ALLOW FOR TENSION FREE ADJUSTMENT OF CHILLED BEAM HEIGHT, 32 DEGF TO 210 EGF. OPERATING TEMPERATURE RANGE, 3/4" HOSE OUTER DIAMETER SIZE. EXTERNALLY INSULATE HOSE WITH INSULATION THAT IS THE SAME THICKNESS AS HYDRONIC PIPING WOULD RECIEVE. HOSES ARE REQUIRED, "HARD-PIPING" IS NOT ACCEPTABLE.

1 M702 CHILLED BEAM COIL PIPING CONNECTION DETAIL (SINGLE BEAM PER ZONE)
NO SCALE



DETAIL NOTES:

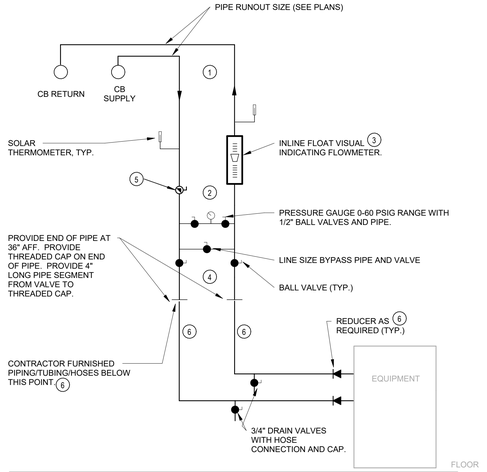
1. DEPTH OF TRAP TO BE MINIMUM OF 6". MOUNT DIRECTLY ABOVE GENERATOR.
2. SLOPE INSULATED STEAM RUNS DOWN FROM THE HIGH POINT AT THE GENERATOR TOWARD THE DISPERSION GRID AT MINIMUM 0.25" PER EVERY 12" OF RUN (OR GREATER PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS). SLOPE INSULATED STEAM CONDENSATE RETURNS DOWN FROM THE HIGH POINT AT THE DISPERSION GRID BACK TO GENERATOR AT MINIMUM 0.25" PER EVERY 12" OF RUN (OR GREATER PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS). BOTH PIPES ARE FULLY INSULATED.
3. SELF-ACTUATED (NO ELECTRIC POWER REQUIRED) CONDENSATE COOLER SIZED BY HUMIDIFIER MANUFACTURER. SIMILAR TO DRISTEEM "DRANE-KOOLER". PROVIDE ALL NECESSARY PLUMBING CONNECTIONS WITH PROPER BACK FLOW PREVENTION AND VACUUM BREAKER.
4. UTILIZE TWO 45 DEGREE LONG RADIUS SWEEP ELBOWS SPACED 6" APART AT TOP OF STRAIGHT RISE UP FROM HUMIDIFIER. PROVIDE ONLY 90 DEGREE LONG SWEEP / LONG RADIUS ELBOWS ON HORIZONTAL RUN OF STEAM PIPE. ROUTE STEAM PIPING IN SHORTEST (DIAGONAL) ROUTE POSSIBLE AND SUCH THAT THERE ARE NO LOW POINTS IN THE PIPES WHICH REQUIRE THE LOW POINT WATER SEAL AND DRAIN PIPE. STEAM PIPING IS BRAZED TYPE L COPPER.



DETAIL NOTES (CONTINUED):

5. DISPERSION TUBES SHALL BE MOUNTED WITH STAINLESS HARDWARE. LOCATION OF DISPERSION TUBES, BLANKING PLATES, ETC. ARE AS REQUIRED TO MEET SCHEDULED PERFORMANCE. PROVIDE VERTICAL TUBES UNLESS SCHEDULED AS HORIZONTAL.
6. SEAL DUCTWORK PENETRATIONS AIRTIGHT AND WATERTIGHT, TYPICAL.
7. PROVIDE AN AIR VENT PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
8. PROVIDE MANUFACTURER'S FLOOR MOUNTING STAND.
9. 3/4" PUREWATER BALL VALVE (MAKEUP WATER), UNIONS, AND 0-100 PSIG PRESSURE GAUGE.
10. ROUTE TANK DRAIN FROM DRAIN VALVE AND SKIMMER CONNECTION INTO THE FUNNEL. UNIONS ON ALL PIPING CONNECTIONS.

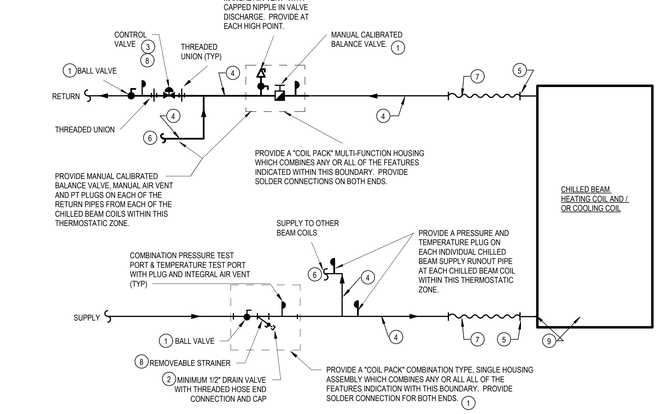
4 M702 STEAM HUMIDIFIER PIPING (DUCT MOUNTED) LOW PRESSURE DISPERSION GRID DETAIL
NO SCALE



DETAIL NOTES:

1. PROVIDE PIPE DROP PIPING SIZE AND PIPE DROP COMPONENTS SIZE AS THE SAME SIZE AS THE PIPE RUNOUT SIZE NOTED ON THE PLANS. PROVIDE 3/4" SIZE IF NO PIPE RUNOUT SIZE IS NOTED ON PLANS. TIE INTO THE TOP OF THE SUPPLY HEADER AND THE TOP OF THE RETURN HEADER.
2. MOUNT ALL COMPONENTS ILLUSTRATED ON THIS DETAIL BETWEEN 42" AFF AND 66" AFF UNLESS NOTED OTHERWISE ON THE PLANS. PROVIDE MINIMUM TWO PIPE SUPPORTS ON EACH PIPE RUNNING DOWN THE WALL. LOCATE PIPE DROPS WITHIN 6" OF ARCHITECTURAL WALLS.
3. DIRECT READING IN-LINE VARIABLE AREA FLOW METER: MACHINED ACRYLIC BODY, +/-2% FULL SCALE ACCURACY, SUITABLE FOR 100 PSIG AT 150 DEGF, 1" PVC FNPT END CONNECTIONS, SIMILAR TO BROOKS MODEL 2540. FLOW RANGE OF 0.5-5 GPM. PROVIDE REDUCERS AT CONNECTION TO PIPING. ORIENT FLOW METER VERTICALLY, READABLE WITH PERSON STANDING ON THE FLOOR.
4. THREE WEEKS PRIOR TO INSTALLATION, OF PIPING, CONFIRM WITH THE OWNER THE LATEST PROPOSED EQUIPMENT ARRANGEMENT AND LOCATE THE PIPE DROP AS DIRECTED BY THE OWNER. ADJUST HEIGHT AND LOCATION OF THE PIPE DROP AS DIRECTED BY THE OWNER.
5. INLINE NEEDLE VALVE SIMILAR TO PARKER HANNIFIN U SERIES (3/4" FNPT, STAINLESS BODY, BLUNT STEM (Cv 1.82), PTFE PACKING) UTILIZED AS A MANUAL BALANCE DEVICE. INITIALLY BALANCE TO 3.0 GPM.
6. FINAL CONNECTION TO EQUIPMENT IS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION MANUAL. OBTAIN EQUIPMENT WRITTEN INSTALLATION MANUAL DIRECTLY FROM THE OWNER.

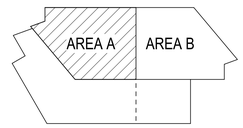
3 M702 COOLING WATER PIPE DROP DETAIL
1/8" = 1'-0"



DETAIL NOTES:

1. PROVIDE VALVE HANDLE EXTENSION SUITABLE FOR 1.5" THICK INSULATION THICKNESS. PROVIDE THE MANUFACTURER'S INSULATION OPTION ON THE COMBINATION TYPE SINGLE HOUSING ASSEMBLY.
2. INSTALL DRAIN AT LOWEST POINT IN THE SUPPLY PIPING SUCH THAT IT IS LOWER THAN THE AIR VENT ON THE RETURN PIPING.
3. INSTALL CONTROL VALVE SO THAT STEM IS ORIENTED VERTICAL TO THE FLOOR.
4. PROVIDE THIS PIPING SEGMENT AT FULL PIPING RUNOUT SIZE AS NOTED AND/OR SCHEDULED. PIPING SHALL BE NO SMALLER THAN 3/4" SIZE.
5. SOLDER CONNECTION AT COIL (PROVIDE REDUCER AS REQUIRED TO TRANSITION TO COIL CONNECTION SIZE).
6. TO/FROM OTHER CHILLED BEAMS SERVING THIS SAME THERMOSTATIC ZONE.
7. PROVIDE A 12" LONG (MAXIMUM LENGTH 12", MINIMUM LENGTH 12") HOSE CONNECTOR (STAINLESS STEEL BRAID HOSE, MINIMUM 350 PSIG OPERATING PRESSURE, WASHERLESS (METAL TO METAL) HOSE FITTINGS, JIC SWIVEL END TO ALLOW FOR TENSION FREE ADJUSTMENT OF CHILLED BEAM HEIGHT, 32 DEGF TO 210 DEGF OPERATING TEMPERATURE RANGE, 3/4" HOSE OUTER DIAMETER SIZE. EXTERNALLY INSULATE HOSE WITH INSULATION THAT IS THE SAME THICKNESS AS HYDRONIC PIPING WOULD RECEIVE. HOSE CONNECTORS ARE REQUIRED, "HARD-PIPING" IS NOT ACCEPTABLE.
8. WHERE MULTIPLE CHILLED BEAMS ARE PIPED TOGETHER FOR A SINGLE THERMOSTATIC CONTROL ZONE THERE IS JUST A SINGLE CONTROL VALVE AND A SINGLE STRAINER.
9. INSULATE EXPOSED METAL AT COIL CONNECTIONS. INSULATE COIL RETURN BENDS.

2 M702 CHILLED BEAM COIL PIPING CONNECTION (MULTIPLE BEAMS PER ZONE)
NO SCALE



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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LANGHORST REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING RELATED DETAILS

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M702

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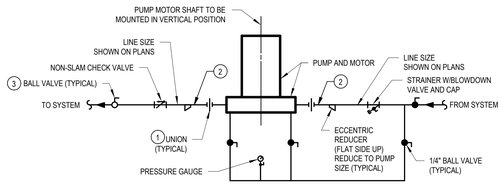
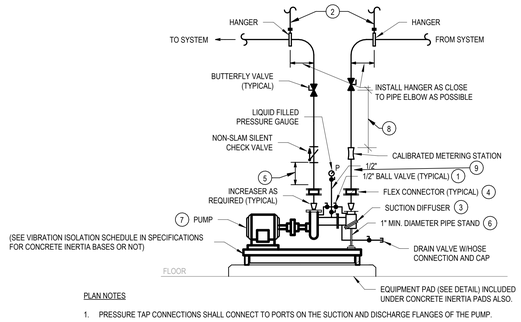


PLAN NOTES:

1. UNIONS ARE NOT REQUIRED WHEN PUMP IS CONNECTED TO PIPING WITH FLANGE CONNECTIONS.
2. SUPPORT WITH SPRING HANGERS EACH SIDE AS CLOSE TO PUMP AS POSSIBLE.
3. FOR PIPE SIZES OVER 2", BUTTERFLY VALVES SHALL BE USED IN LIEU OF BALL VALVES.

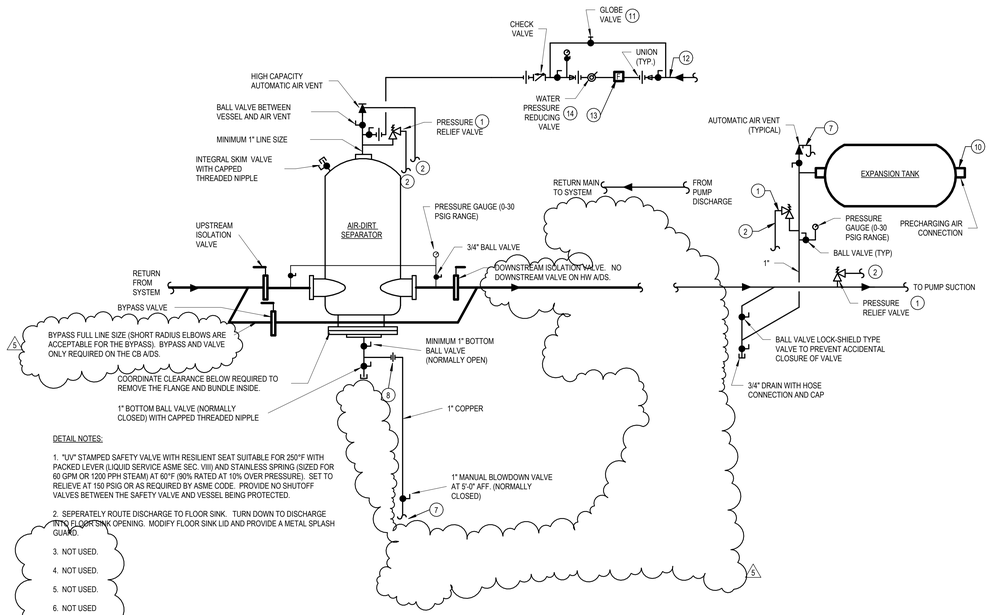
7 M703 IN-LINE PUMP PIPING DETAIL
NO SCALE



PLAN NOTES

1. PRESSURE TAP CONNECTIONS SHALL CONNECT TO PORTS ON THE SUCTION AND DISCHARGE FLANGES OF THE PUMP.
2. PROVIDE SPRING ISOLATOR HANGERS FOR THE FIRST 3 HANGERS IN EACH DIRECTION.
3. CONFIRM SPECIFIED SUCTION DIFFUSER STRAINER AND ALLOW FOR STRAINER REMOVAL.
4. CONFIRM USAGE OF STAINLESS AND RUBBER FLEXIBLE CONNECTORS BY SYSTEM WITH THE SPECIFICATIONS. PROVIDE COMPONENTS FULL SIZE OF PIPE DROP NOTED ON PLANS DOWN THROUGH THE FLEX CONNECTOR..
5. MAINTAIN MINIMUM THREE FEET BETWEEN FLEX CONNECTOR AND CHECK VALVE.
6. WHERE INERTIA BASES ARE PROVIDED, PIPE STAND IS TO BE ANCHORED TO THE INERTIA BASE.
7. ALIGN PUMP AND GROUT IN ACCORDANCE WITH SPECIFICATIONS. INSULATE PUMP HOUSING AND COMPONENTS IN ACCORDANCE WITH SPECIFICATIONS.
8. MAINTAIN MINIMUM THREE FEET OR FIVE PIPE DIAMETERS (WHICHEVER IS LARGER) BETWEEN THE SHUTOFF VALVE AND THE CALIBRATED METERING STATION.
9. MAINTAIN A MINIMUM OF 12" BETWEEN THE METERING STATION AND THE FLEX CONNECTOR.

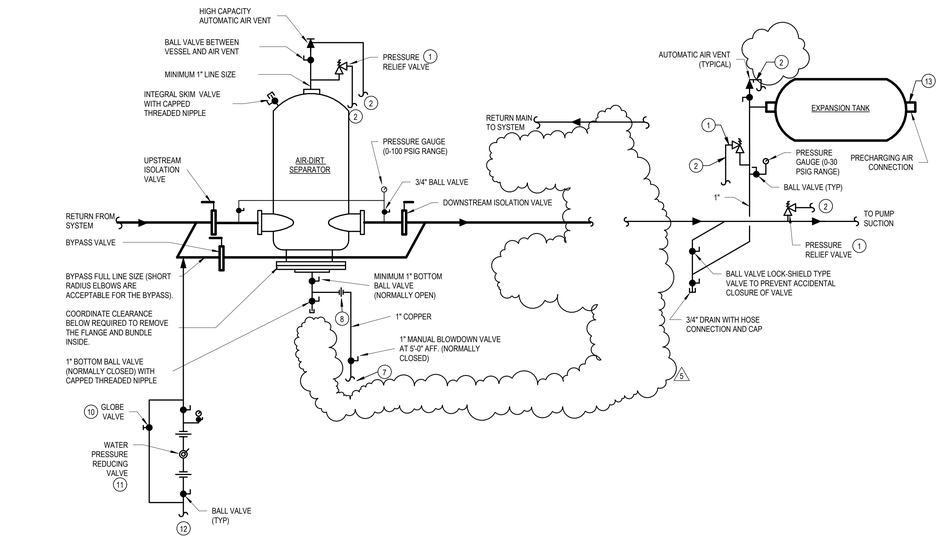
6 M703 BASE-MOUNTED VFC-DRIVEN CENTRIFUGAL PUMP PIPING DETAIL
NO SCALE



DETAIL NOTES:

1. "UV" STAMPED SAFETY VALVE WITH RESILIENT SEAT SUITABLE FOR 250°F WITH PACKED LEVER (LIQUID SERVICE ASME SEC. VIII) AND STAINLESS SPRING (SIZED FOR 60 GPM OR 1200 PPH STEAM) AT 60°F (90% RATED AT 10% OVER PRESSURE). SET TO RELIEVE AT 150 PSIG OR AS REQUIRED BY ASME CODE. PROVIDE NO SHUTOFF VALVES BETWEEN THE SAFETY VALVE AND VESSEL BEING PROTECTED.
2. SEPERATELY ROUTE DISCHARGE TO FLOOR SINK. TURN DOWN TO DISCHARGE INTO FLOOR SINK OPENING. MODIFY FLOOR SINK LID AND PROVIDE A METAL SPLASH GUARD.
3. NOT USED.
4. NOT USED.
5. NOT USED.
6. NOT USED
7. EXTEND LINE SIZE TO FLOOR SINK AND TURN DOWN TO DISCHARGE INTO FLOOR SINK OPENING. MODIFY FLOOR SINK LID AND PROVIDE A METAL SPLASH GUARD.
8. PROVIDE THREADED UNIONS TO ALLOW FOR AIR-DIRT SEPARATOR FLANGE REMOVAL AND BUNDLE INNARDS REMOVAL, TYPICAL.
9. NOT USED.
10. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL. FLOOR MOUNT LOCATE TANK AS NOTED ON PLANS; PROVIDE A CONCRETE EQUIPMENT PAD BENEATH THE TANK AND RESTRAIN/ANCHOR THE TANK TO THE PAD.
11. BYPASS TO BE SAME SIZE AS MAKEUP LINE, 1" MINIMUM.
12. SOFT WATER MAKEUP, SEE PLUMBING DRAWINGS.
13. FLOWMETER, SEE FLOW METER SCHEDULE.
14. ADJUSTMENT RANGE SHALL BE TANK PRECHARGE PLUS OR MINUS 10 PSIG.

4 M703 AIR-DIRT SEPARATOR (CB & HW) AND EXPANSION TANK DETAIL
NO SCALE



DETAIL NOTES:

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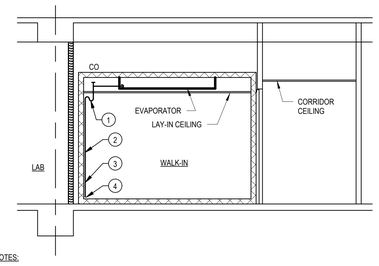
2. SEPERATELY ROUTE DISCHARGE BACK TO GLYCOL FEED TANK. PROVIDE A FUNNEL TO COLLECT VARIOUS PIPES AND DISCHARGE INTO TANK OPENING. MODIFY TANK LID AND PROVIDE A METAL SPLASH GUARD.
3. NOT USED.
4. NOT USED.
5. NOT USED.
6. NOT USED.
7. EXTEND LINE SIZE TO FLOOR SINK AND TURN DOWN TO DISCHARGE INTO FLOOR SINK OPENING. MODIFY FLOOR SINK LID AND PROVIDE A METAL SPLASH GUARD.
8. PROVIDE THREADED UNIONS TO ALLOW FOR AIR-DIRT SEPARATOR FLANGE REMOVAL AND BUNDLE INNARDS REMOVAL, TYPICAL.
9. NOT USED.
10. BYPASS TO BE SAME SIZE AS MAKE-UP LINE, 1" MINIMUM.
11. ADJUSTMENT RANGE SHALL BE TANK PRECHARGE PLUS OR MINUS 10 PSIG.
12. FROM PRE-MIX GLYCOL FEEDER.
13. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL. FLOOR MOUNT LOCATE TANK AS NOTED ON PLANS; PROVIDE A CONCRETE EQUIPMENT PAD BENEATH THE TANK AND RESTRAIN/ANCHOR THE TANK TO THE PAD.

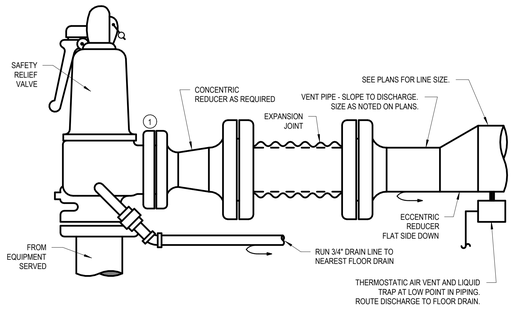
5 M703 AIR-DIRT SEPARATOR (GW) AND EXPANSION TANK DETAIL
NO SCALE



PLAN NOTES:

1. P TRAP, 3" DEPTH, WITH CLEANOUTS AS NOTED.
2. CONDENSATE DRAIN, 1" MINIMUM (BY MC), RUN TIGHT TO WALL, SUPPORT AT TWO POINTS OFF WALL. COORDINATE LOCATION WITH SHELVING AND OTHER ITEMS TO BE INSTALLED IN COLD ROOM. COORDINATE PENETRATIONS, SUPPORTS, AND ROUTING WITH COLD ROOM MANUFACTURER. UTILIZE ALUMINUM HANGING MATERIALS INSIDE THE COLD ROOM.
3. SEAL COLD ROOM PENETRATION AIRTIGHT PER COLD ROOM MANUFACTURER'S WRITTEN REQUIREMENTS.
4. DISCHARGE INTO FLOOR DRAIN 1" ABOVE RIM HEIGHT.

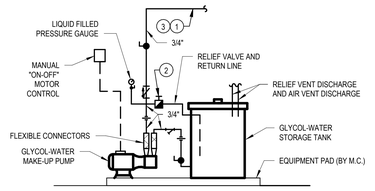
1 M703 WALK-IN COLD ROOM DETAIL
NO SCALE



PLAN NOTES:

1. USE UNIONS FOR THREADED PIPE.

2 M703 SAFETY RELIEF VALVE DISCHARGE PIPING DETAIL
NO SCALE



PLAN NOTES:

1. CONNECT TO SUCTION SIDE OF PUMPS.
2. SET REGULATING VALVE TO MAINTAIN MAKE-UP PRESSURE 15 PSIG ABOVE HIGHEST SYSTEM PRV SETTING.
3. MAKE-UP PIPING SYSTEM DOES NOT REQUIRE ANY INSULATION.

8 M703 INDIRECT MAKE-UP FOR GLYCOL WATER SYSTEMS PIPING DETAIL
NO SCALE

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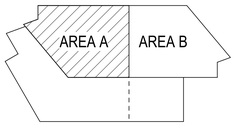

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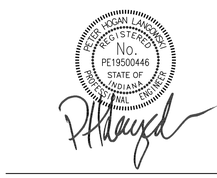

PIPING RELATED DETAILS

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M703

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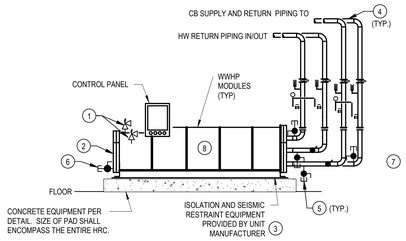


DETAIL NOTES:

1. ROUTE REFRIGERANT RELIEF VENTS TO THE EXTERIOR OF BUILDING. INSTALL FLEXIBLE CONNECTOR FULL SIZE OF CHILLER CONNECTION. INSTALL 12" LONG DRIP LEG FULL SIZE OF PIPE ON DOWNSTREAM SIDE OF FLEX CONNECTOR. INSTALL 1/2" BALL VALVE WITH CAPPED NIPPLE AND 1/4" CAPPED REFRIGERANT SCHRAEDER VALVE FOR REFRIGERANT RECOVERY IN BOTTOM OF DRIP LEG. SUPPORT REFRIGERANT RELIEF PIPE FROM FLOOR IMMEDIATELY DOWNSTREAM OF FLEXIBLE . CONFIRM WITH YOUR BID THE QUANTITY OF REFRIGERANT RELIEF VALVES EACH PROPOSED MANUFACTURER FURNISHES AND PROVIDE IN YOUR BID TO ROUTE EACH RELIEF VALVE INDIVIDUALLY TO THE EXTERIOR OF THE BUILDING.

2. INSTALL AND WIRE PRESSURE SENSORS, TEMPERATURE SENSORS, FLOW SWITCHES, ETC. FURNISHED BY THE WWHP MANUFACTURER IN THE LOCATIONS REQUIRED BY THE HRC MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

3. INSTALL WWHP MANUFACTURER'S ANCHOR BOLT DETAIL IN EQUIPMENT PAD POUR. SEE WWHP MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

4. SUPPORT WEIGHT OF PIPE DROP AT ELBOW IN VERTICAL RISE SO AS TO NOT INDUCE STRAIN ON WWHP CONNECTIONS. COORDINATE VERTICAL PIPE DROP LOCATIONS OF THE EVAPORATOR CONNECTION DETAIL AND THE CONDENSER CONNECTION DETAIL AS REQUIRED TO MAINTAIN ALL THE REQUIRED WWHP MAINTENANCE ACCESS AS DEFINED IN THE WWHP MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

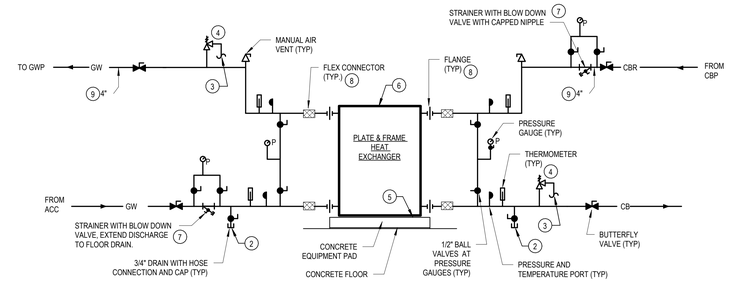
5. SEE CONDENSER CONNECTION DETAIL AND EVAPORATOR CONNECTION DETAIL.

6. EVAPORATOR PIPE HEADER DRAIN VALVE AND CONDENSER PIPE HEADER DRAIN VALVES WITH CAPPED THREADED NIPPLES ON OPPOSITE END OF CHILLER.

7. COORDINATE WITH ALL TRADES TO MAINTAIN TUBE PULL AREA AS DESCRIBED IN THE MANUFACTURER'S WRITEN INSTALLATION INSTRUCTIONS CLEAR OF ALL INSTALLATIONS BY ALL TRADES.

8. INSULATE CONNECTION COUPLINGS BETWEEN HEADERS, HEADER BYPASS PIPING, AND UNIT INTERNAL HEADERS IN ACCORDANCE WITH THE CHILLED WATER PIPE INSULATION SPECIFICATION. INSTALL INTERNAL COMMUNICATION / CONTROL CABLING BETWEEN WWHP MODULES AND THE WWHP CONTROL PANEL WITHIN EMT.

6 M704 WWHP ARRANGEMENT DETAIL
NO SCALE



DETAIL NOTES:

1. NOT USED.

2. INSTALL AT LOWEST POINT IN PIPING.

3. ROUTE SRV DISCHARGE DOWN TO FLOOR AND TERMINATE 3" AFF POINTING DOWN.

4. "UV" STAMPED WATER PRESSURE RELIEF VALVE MUST BE LOCATED WITH NO VALVE BETWEEN IT AND THE HEAT EXCHANGER. PIPE DISCHARGE DOWN TO 6" AFF. "UV" STAMPED SAFETY VALVE WITH VITON SEAT SUITABLE FOR 250°F WITH PACKED LEVER (LIQUID SERVICE ASME SEC. VIII) AND STAINLESS SPRING SIZED FOR 40 GPM WATER (90% RATED LIQUID AT 10%). SET TO RELIEVE AT 150 PSIG.

5. ANCHOR HEAT EXCHANGER TO EQUIPMENT PAD (SEE SCHEDULE).

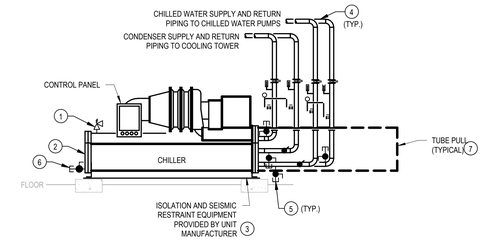
6. COORDINATE INSULATION OF HEAT EXCHANGER FOR REMOVEABILITY AND PLATE ADJUSTMENT.

7. PROVIDE STRAINER MESH SIZE PER THE HEAT EXCHANGER MANUFACTURER'S WRITTEN REQUIREMENTS.

8. PROVIDE FLEXIBLE CONNECTORS ONLY AS SPECIFICALLY REQUIRED BY THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. RIGID PIPING CONNECTIONS ARE PREFERRED.

9. PROVIDE ALL COMPONENTS FULL SIZE OF PIPING DROP NOTED AND REDUCE AT HEAT EXCHANGER AS REQUIRED, TYPICAL.

4 M704 HEAT EXCHANGER (HE-1) DETAIL
NO SCALE



DETAIL NOTES:

1. ROUTE REFRIGERANT RELIEF VENTS TO THE EXTERIOR OF BUILDING. INSTALL 1/2" BALL VALVE WITH CAPPED NIPPLE AND 1/4" CAPPED REFRIGERANT SCHRAEDER VALVE FOR REFRIGERANT RECOVERY IN BOTTOM OF DRIP LEG.

2. INSTALL AND WIRE PRESSURE SENSORS, TEMPERATURE SENSORS, FLOW SWITCHES, ETC. FURNISHED BY THE CHILLER MANUFACTURER.

3. INSTALL CHILLER MANUFACTURER'S ANCHOR BOLT DETAIL IN FLOOR POUR WITH PIPE, STEEL PLATE, AND BOLT EMBEDDED WITHIN THE FOUNDATION. SEE CHILLER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

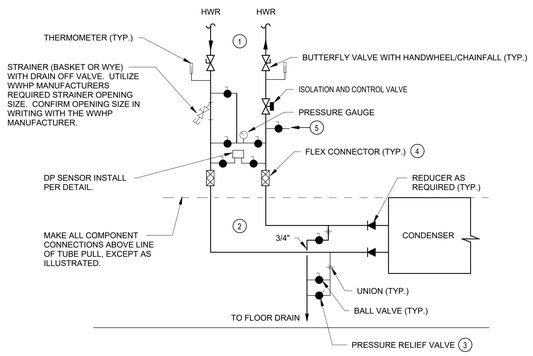
4. SUPPORT WEIGHT OF PIPE DROP AT ELBOW IN VERTICAL RISE SO AS TO NOT INDUCE STRAIN ON CHILLER CONNECTIONS. COORDINATE VERTICAL PIPE DROP LOCATIONS OF THE EVAPORATOR CONNECTION DETAIL AND THE CONDENSER CONNECTION DETAIL AS REQUIRED TO MAINTAIN ALL THE REQUIRED CHILLER MAINTENANCE ACCESS AS DEFINED IN THE CHILLER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. VERTICAL PIPE DROPS FOR CHILLERS WITH MARINE WATERBOXES SHALL BE LOCATED TO ALLOW FOR FULL OPENING OF THE WATERBOX.

5. SEE CONDENSER CONNECTION DETAIL AND EVAPORATOR CONNECTION DETAIL.

6. EVAPORATOR BARREL DRAIN VALVE AND CONDENSER BARREL DRAIN VALVES WITH CAPPED THREADED NIPPLES ON OPPOSITE END OF CHILLER.

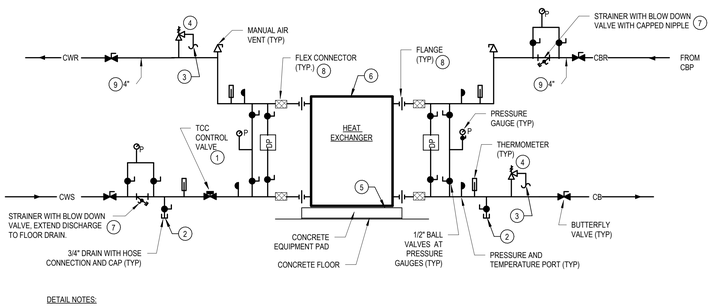
7. COORDINATE WITH ALL TRADES TO MAINTAIN TUBE PULL AREA AS DESCRIBED IN THE MANUFACTURER'S WRITEN INSTALLATION INSTRUCTIONS CLEAR OF ALL INSTALLATIONS BY ALL TRADES.

1 M704 CHILLER ARRANGEMENT DETAIL
NO SCALE



NOTE:
1. PROVIDE ALL PIPE COMPONENTS IN THE SIZE NOTED FOR THE PIPE DROP ON THE PLANS.
2. PROVIDE REMOVABLE FLANGED SPOOL PIECES AS REQUIRED TO REMOVE THE HEADS FROM THIS END OF THE CHILLER.
3. WATERSIDE RELIEF VALVE DISCHARGE, ELBOW DOWN AND ROUTE TO FLOOR DRAIN. EACH BUNDLE SHALL HAVE A 125 PSIG RELIEF VALVE ON THE PIPE SIDE.
4. LOCATE STAINLESS STEEL FLEX CONNECTORS ABOVE LINE OF TUBE PULL. THE FLEX CONNECTOR LOWER FLANGE SHALL BE ABOVE THE LINE OF THE TUBE PULL.
5. CAPPED 3/4" BALL VALVE ON RETURN SIDE PIPE DROP TO ACT AS MANUAL AIR VENT. LOCATE AS HIGH AS POSSIBLE, JUST BELOW THE VALVE.

7 M704 WWHP CONDENSER PIPING DETAIL
NO SCALE



DETAIL NOTES:

1. INSTALL VALVE SO THAT STEM IS VERTICAL. TYPICAL ALL CONTROL VALVES.

2. INSTALL AT LOWEST POINT IN PIPING.

3. ROUTE SRV DISCHARGE DOWN TO FLOOR AND TERMINATE 3" AFF POINTING DOWN.

4. "UV" STAMPED WATER PRESSURE RELIEF VALVE MUST BE LOCATED WITH NO VALVE BETWEEN IT AND THE HEAT EXCHANGER. PIPE DISCHARGE DOWN TO 6" AFF. "UV" STAMPED SAFETY VALVE WITH VITON SEAT SUITABLE FOR 250°F WITH PACKED LEVER (LIQUID SERVICE ASME SEC. VIII) AND STAINLESS SPRING SIZED FOR 40 GPM WATER (90% RATED LIQUID AT 10%). SET TO RELIEVE AT 150 PSIG.

5. ANCHOR HEAT EXCHANGER TO EQUIPMENT PAD (SEE SCHEDULE).

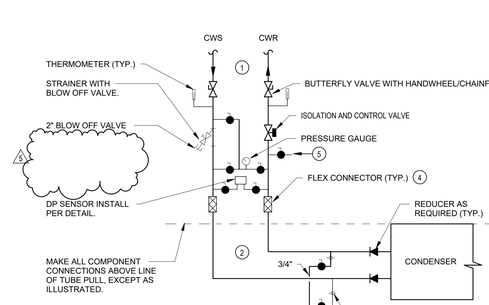
6. COORDINATE INSULATION OF HEAT EXCHANGER FOR TUBE BUNDLE REMOVEABILITY.

7. PROVIDE STRAINER MESH SIZE PER THE HEAT EXCHANGER MANUFACTURER'S WRITTEN REQUIREMENTS.

8. PROVIDE FLEXIBLE CONNECTORS ONLY AS SPECIFICALLY REQUIRED BY THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. RIGID PIPING CONNECTIONS ARE PREFERRED.

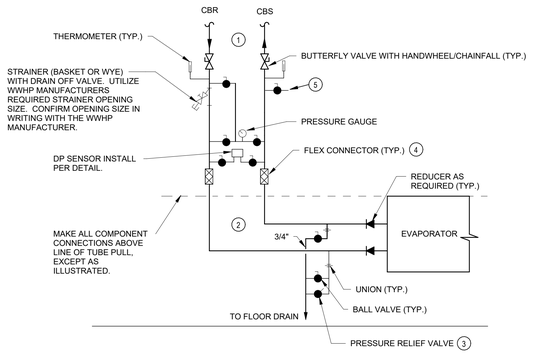
9. PROVIDE ALL COMPONENTS FULL SIZE OF PIPING DROP NOTED AND REDUCE AT HEAT EXCHANGER AS REQUIRED, TYPICAL.

5 M704 HEAT EXCHANGER (HE-2 CW TO CB) DETAIL
NO SCALE



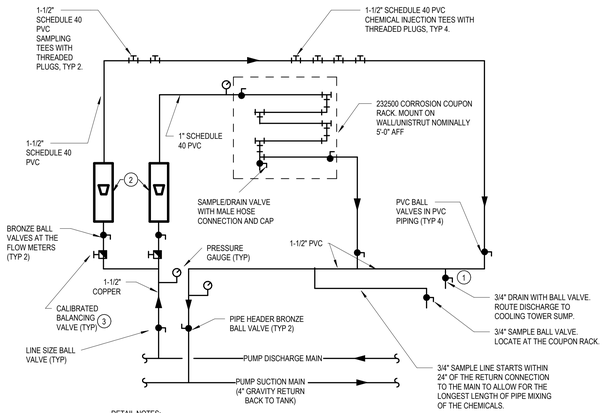
NOTE:
1. PROVIDE ALL PIPE COMPONENTS IN THE SIZE NOTED FOR THE PIPE DROP ON THE PLANS.
2. PROVIDE REMOVABLE FLANGED SPOOL PIECES AS REQUIRED TO REMOVE THE HEADS FROM THIS END OF THE CHILLER.
3. WATERSIDE RELIEF VALVE DISCHARGE, ELBOW DOWN AND ROUTE TO FLOOR DRAIN. EACH BUNDLE SHALL HAVE A 175 PSIG RELIEF VALVE ON THE PIPE SIDE.
4. LOCATE SPHERICAL RUBBER FLEX CONNECTORS ABOVE LINE OF TUBE PULL. THE FLEX CONNECTOR LOWER FLANGE SHALL BE ABOVE THE LINE OF THE TUBE PULL.
5. CAPPED 3/4" BALL VALVE ON RETURN SIDE PIPE DROP TO ACT AS MANUAL AIR VENT. LOCATE AS HIGH AS POSSIBLE, JUST BELOW THE VALVE.

2 M704 CHILLER CONDENSER PIPING DETAIL
NO SCALE



NOTE:
1. PROVIDE ALL PIPE COMPONENTS IN THE SIZE NOTED FOR THE PIPE DROP ON THE PLANS.
2. PROVIDE REMOVABLE FLANGED SPOOL PIECES AS REQUIRED TO REMOVE THE HEADS FROM THIS END OF THE CHILLER.
3. WATERSIDE RELIEF VALVE DISCHARGE, ELBOW DOWN AND ROUTE TO FLOOR DRAIN. EACH BUNDLE SHALL HAVE A 175 PSIG RELIEF VALVE ON THE PIPE SIDE.
4. LOCATE SPHERICAL RUBBER FLEX CONNECTORS ABOVE LINE OF TUBE PULL. THE FLEX CONNECTOR LOWER FLANGE SHALL BE ABOVE THE LINE OF THE TUBE PULL.
5. CAPPED 3/4" BALL VALVE ON LEAVING SIDE PIPE DROP TO ACT AS MANUAL AIR VENT. LOCATE AS HIGH AS POSSIBLE, JUST BELOW THE VALVE.

8 M704 WWHP EVAPORATOR PIPING DETAIL
NO SCALE



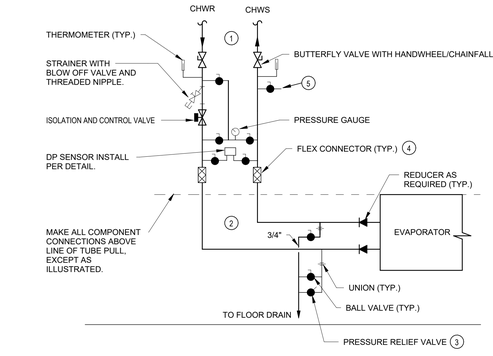
DETAIL NOTES:

1. LOCATE ALL VALVES LESS THAN 6'-0" AFF, ADJACENT TO EQUIPMENT, TYPICAL, EXCEPT FOR THE TWO UP HIGH ON THE MAINS.

2. DIRECT READING FLOW METER: BRASS BODY, +/-2% FULL SCALE ACCURACY, SUITABLE FOR 240 DEGF, NPTF CONNECTIONS, SIMILAR TO HEDLAND H3500 SERIES. PROVIDE 1-10 GPM SCALE FOR COUPON RACK, 1" PORTS, H783B-010. PROVIDE 3-30 GPM SCALE FOR SAMPLING STREAM, 1-1/2" PORTS, H883B-010. ORIENT FLOW METER VERTICALLY, READABLE STANDING ON THE FLOOR.

3. TAB TO SET UP CALIBRATED BALANCE VALVES AT 6 GPM COUPON RACK AND 20 GPM SAMPLING STREAM. 232500 TO FINE TUNE ADJUST BALANCE VALVES TO ACHIEVE 232500 FLOW RATES.

9 M704 SAMPLING STREAM WITH COUPON RACK PIPING DETAIL
NO SCALE



NOTE:
1. PROVIDE ALL PIPE COMPONENTS IN THE SIZE NOTED FOR THE PIPE DROP ON THE PLANS.
2. PROVIDE REMOVABLE FLANGED SPOOL PIECES AS REQUIRED TO REMOVE THE HEADS FROM THIS END OF THE CHILLER.
3. WATERSIDE RELIEF VALVE DISCHARGE, ELBOW DOWN AND ROUTE TO FLOOR DRAIN. EACH BUNDLE SHALL HAVE A 175 PSIG RELIEF VALVE ON THE PIPE SIDE.
4. LOCATE SPHERICAL RUBBER FLEX CONNECTORS ABOVE LINE OF TUBE PULL. THE FLEX CONNECTOR LOWER FLANGE SHALL BE ABOVE THE LINE OF THE TUBE PULL.
5. CAPPED 3/4" BALL VALVE ON LEAVING SIDE PIPE DROP TO ACT AS MANUAL AIR VENT. LOCATE AS HIGH AS POSSIBLE, JUST BELOW THE VALVE.

3 M704 CHILLER EVAPORATOR PIPING DETAIL
NO SCALE

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SUITE 1700
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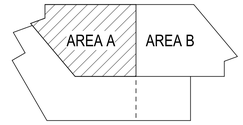
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

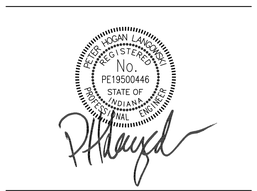
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



PIPING RELATED DETAILS

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

M704

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4/16/2026 1:43:10 PM
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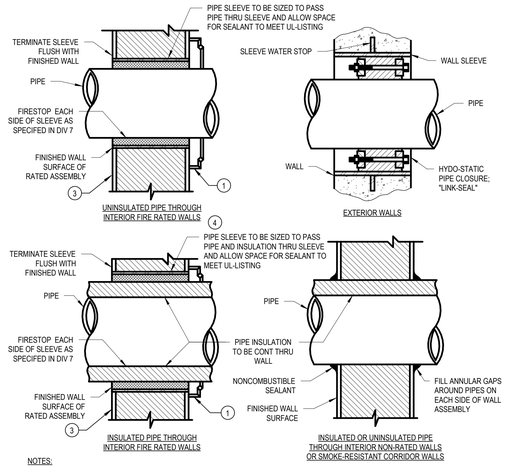
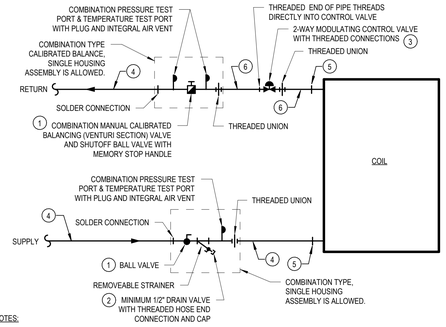


NOTES:

1. PROVIDE ESCUTCHEON PLATE FLUSH AGAINST WALL AND OF SIZE TO COMPLETELY COVER OPENING IN EXPOSED AREAS ONLY.
2. SEE SPECIFICATION SECTIONS FOR FURTHER REQUIREMENTS INCLUDING FLOOR SLEEVES.
3. LOCATE FIRESTOP LABEL ON EACH SIDE OF PENETRATION SO THAT IT IS VISIBLE FROM AN ACCESSIBLE LOCATION ABOVE CEILING.
4. INCLUDES FIRE WALLS, FIRE BARRIERS, SMOKE BARRIERS, AND FIRE PARTITIONS.

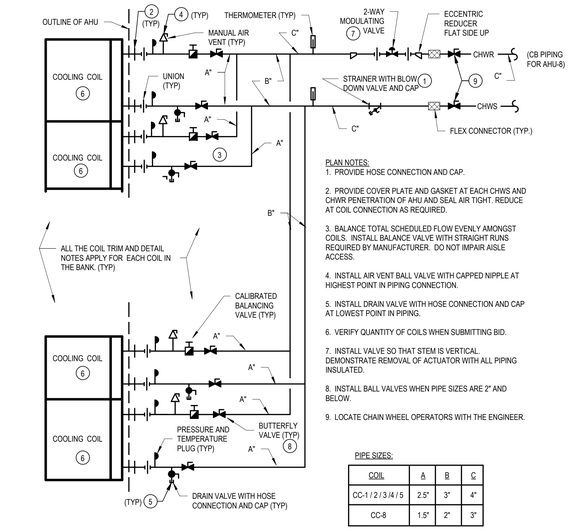
7 M705 PIPE PENETRATION DETAILS
NO SCALE



DETAIL NOTES:

1. PROVIDE VALVE HANDLE EXTENSION SUITABLE FOR 1.5" THICK INSULATION THICKNESS ON CHILLED WATER APPLICATIONS AND A MANUFACTURER'S INSULATION OPTION ON THE COMBINATION TYPE SINGLE HOUSING ASSEMBLY.
2. INSTALL DRAIN AT LOWEST POINT IN THE SUPPLY PIPING SUCH THAT IT IS LOWER THAN THE AIR VENT ON THE RETURN PIPING.
3. INSTALL MODULATING VALVE SO THAT STEM IS VERTICAL.
4. PROVIDE THIS PIPING SEGMENT AT FULL PIPING RUNOUT SIZE AS NOTED AND/OR SCHEDULED. PIPING SHALL BE NO SMALLER THAN 3/4" SIZE.
5. SOLDER CONNECTION AT COIL (PROVIDE REDUCER AS REQUIRED TO TRANSITION TO COIL CONNECTION SIZE).
6. PROVIDE THIS PIPING SEGMENT AT FULL PIPING RUNOUT SIZE AS NOTED AND/OR SCHEDULED. PIPING SHALL BE NO SMALLER THAN 3/4" SIZE UNLESS THE SCHEDULED COIL GPM IS LESS THAN 2.0 GPM, IN WHICH CASE THE PIPE SIZE MAY BE 1/2" AT INSTALLER'S OPTION.

4 M705 COIL PIPING DETAIL WITH COMBINATION TYPE HOUSINGS
NO SCALE



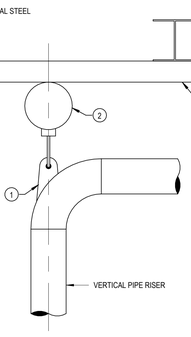
PLAN NOTES:

1. PROVIDE HOSE CONNECTION AND CAP.
2. PROVIDE COVER PLATE AND GASKET AT EACH CHWS AND CHWR PENETRATION OF AHU AND SEAL AIR TIGHT. REDUCE AT COIL CONNECTION AS REQUIRED.
3. BALANCE TOTAL SCHEDULED FLOW EVENLY AMONGST COILS. INSTALL BALANCE VALVE WITH STRAIGHT RUNS REQUIRED BY MANUFACTURER. DO NOT IMPAIR AISLE ACCESS.
4. INSTALL AIR VENT BALL VALVE WITH CAPPED NIPPLE AT HIGHEST POINT IN PIPING CONNECTION.
5. INSTALL DRAIN VALVE WITH HOSE CONNECTION AND CAP AT LOWEST POINT IN PIPING.
6. VERIFY QUANTITY OF COILS WHEN SUBMITTING BID.
7. INSTALL VALVE SO THAT STEM IS VERTICAL. DEMONSTRATE REMOVAL OF ACTUATOR WITH ALL PIPING INSULATED.
8. INSTALL BALL VALVES WHEN PIPE SIZES ARE 2" AND BELOW.
9. LOCATE CHAIN WHEEL OPERATORS WITH THE ENGINEER.

PIPE SIZES:

COIL	A	B	C
CC-1 / 2 / 3 /4 / 5	2.5"	3"	4"
CC-8	1.5"	2"	3"

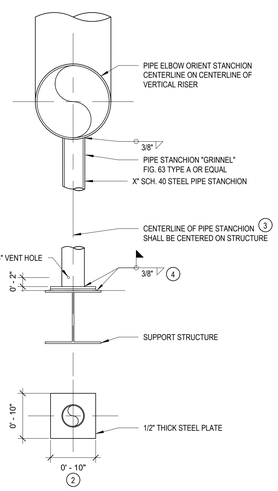
1 M705 COIL CC-1/2/3/4/5/8 CHILLED WATER PIPING DETAIL
NO SCALE



DETAIL NOTES:

1. WELDED LUG, SIMILAR TO ANVIL FIGURE 55L. INSULATE LUG AND ROD AND PROVIDE VAPOR BARRIER FOR CHILLED WATER RISERS.
2. CONSTANT FORCE SUPPORT SPRING HANGER, STANDARD FINISH MSS SP-69 AND SP-58 TYPE 54. SIMILAR TO ANVIL MODEL R, FIGURE 81-H, TYPES A, B, C, OR D. FACTORY CALIBRATE EACH HANGER FOR A 1,000 POUND VERTICAL LOAD. PIPES EXPAND VERTICALLY UPWARD WHEN HEATED. 8" SV: CONSTANT FORCE SPRING HANGER SUITABLE FOR MINIMUM 2.5" OF TOTAL TRAVEL. 6" HWH, 8"CHW, 6" HR: CONSTANT FORCE SPRING HANGER SUITABLE FOR MINIMUM 1.5" OF TOTAL TRAVEL. 3" SV: CONSTANT FORCE SPRING HANGER SUITABLE FOR MINIMUM 2.0" OF TOTAL TRAVEL.
3. HANGER SUPPORT STEEL (TWO STEEL HANGER SUPPORTS SPANNING BETWEEN BUILDING STRUCTURE ARE REQUIRED FOR EACH CONSTANT FORCE SPRING HANGER. CONFIRM BIDDING SCOPE OF PARTIES PROVIDING HANGER SUPPORT STEEL WITH THE PROJECT MANUAL.) SUITABLE FOR 150% OF THE CONSTANT FORCE SPRING HANGER LOAD. IN NORMAL OPERATION THE WEIGHT OF THE WATER FILLED PIPE IS SUPPORTED BY THE PIPE RISER BOTTOM SUPPORT IN THE BASEMENT AND THE CONSTANT SUPPORT SPRING HANGER PULLING UPWARD ON THE PIPE RISER TO ADDITIONALLY SUPPORT AND GUIDE THE VERTICAL PIPE MOVEMENT AT THE PIPE RISER TOP CONNECTION.

8 M705 PIPE RISER TOP CONNECTION DETAIL
1/8" = 1'-0"

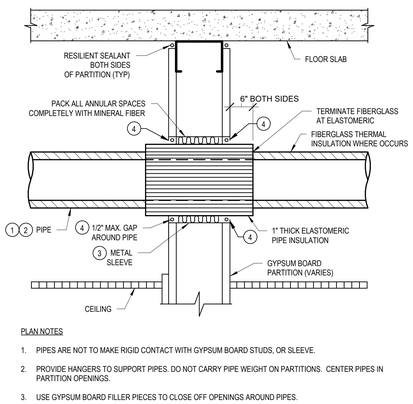


PIPE SIZE (NPS)	X (NPS)
4"	3"
6"	4"
8"	4"
10", 12"	6"
14"	8"
16"	8"

DETAIL NOTES:

1. PRIME AND PAINT SUPPORT AND BASE.
2. EXTEND 10" DIMENSION ON SMALLER WELDED PIPES SUCH THAT ATTACHMENT TO SUPPORT STRUCTURE IS AT LEAST 40 LINEAR INCHES.
3. INSULATE PIPE STANCHION DOWN TO THE STRUCTURE THE SAME AS THE PIPE ITSELF.
4. WHERE THE WIDTH OF THE W FLANGE IS NOT AS WIDE AS THE BOTTOM PLATE, THE PLATE CAN OVERHAND THE W FLANGE AND BE WELDED ON THE UNDERSIDE.

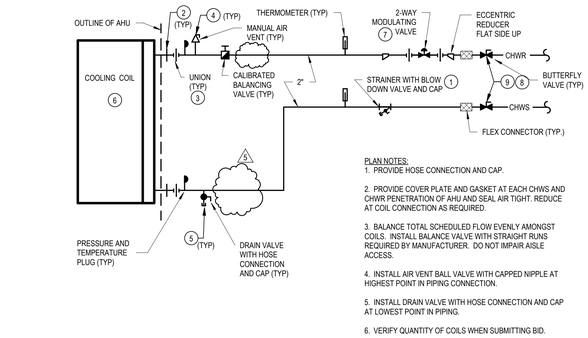
10 M705 PIPE RISER BOTTOM SUPPORT DETAIL
1/8" = 1'-0"



PLAN NOTES

1. PIPES ARE NOT TO MAKE RIGID CONTACT WITH GYPSUM BOARD STUDS, OR SLEEVE.
2. PROVIDE HANGERS TO SUPPORT PIPES. DO NOT CARRY PIPE WEIGHT ON PARTITIONS. CENTER PIPES IN PARTITION OPENINGS.
3. USE GYPSUM BOARD FILLER PIECES TO CLOSE OFF OPENINGS AROUND PIPES.
4. SEAL ALL PENETRATIONS WITH NON-HARDENING ACOUSTICAL RESILIENT SEALANT TO CLOSE GAPS AIRTIGHT ON BOTH SIDES.
5. UTILIZE INSULATION THROUGH WALL ON UNINSULATED PIPE AND CONDUIT ALSO.

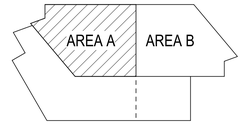
PIPE AND CONDUIT THROUGH GYPSUM BOARD UNRATED ACOUSTICALLY SENSITIVE WALL PENETRATION DETAIL
5 M705 NO SCALE



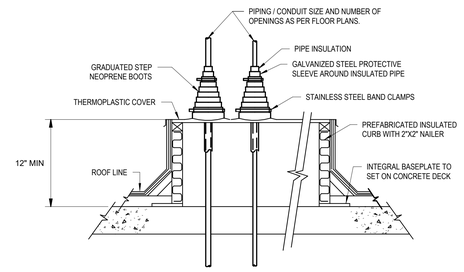
PLAN NOTES:

1. PROVIDE HOSE CONNECTION AND CAP.
2. PROVIDE COVER PLATE AND GASKET AT EACH CHWS AND CHWR PENETRATION OF AHU AND SEAL AIR TIGHT. REDUCE AT COIL CONNECTION AS REQUIRED.
3. BALANCE TOTAL SCHEDULED FLOW EVENLY AMONGST COILS. INSTALL BALANCE VALVE WITH STRAIGHT RUNS REQUIRED BY MANUFACTURER. DO NOT IMPAIR AISLE ACCESS.
4. INSTALL AIR VENT BALL VALVE WITH CAPPED NIPPLE AT HIGHEST POINT IN PIPING CONNECTION.
5. INSTALL DRAIN VALVE WITH HOSE CONNECTION AND CAP AT LOWEST POINT IN PIPING.
6. VERIFY QUANTITY OF COILS WHEN SUBMITTING BID.
7. INSTALL VALVE SO THAT STEM IS VERTICAL. DEMONSTRATE REMOVAL OF ACTUATOR WITH ALL PIPING INSULATED.
8. INSTALL BALL VALVES WHEN PIPE SIZES ARE 2" AND BELOW.
9. LOCATE CHAIN WHEEL OPERATORS (FOR SIZES SPECIFIED) WITH THE ENGINEER.

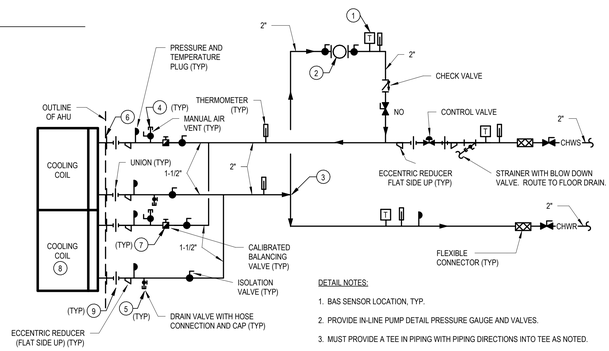
2 M705 COIL CC-6A / 6B CHILLED WATER PIPING DETAIL
NO SCALE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH



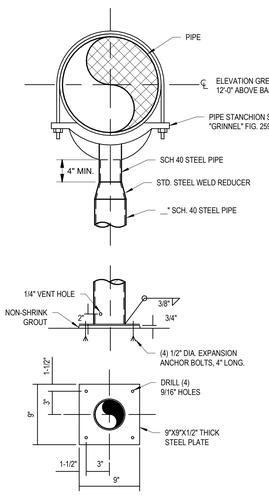
6 M705 PIPE CURB ASSEMBLY DETAIL
NO SCALE



DETAIL NOTES:

1. BAS SENSOR LOCATION, TYP.
2. PROVIDE IN-LINE PUMP DETAIL PRESSURE GAUGE AND VALVES.
3. MUST PROVIDE A TEE IN PIPING WITH PIPING DIRECTIONS INTO TEE AS NOTED.
4. INSTALL 1/2" AIR VENT WITH CAPPED NIPPLE AT HIGHEST POINT IN PIPING CONNECTION TO EACH COIL.
5. INSTALL 1/2" DRAIN VALVE WITH CAPPED NIPPLE AT LOWEST POINT IN PIPING FROM EACH COIL.
6. PROVIDE COVER PLATE AND GASKET AT EACH CHWS AND CHWR PENETRATION OF AHU AND SEAL AIR TIGHT.
7. BALANCE TOTAL SCHEDULED FLOW EVENLY AMONGST COILS PER AHU MANUFACTURER'S REQUIREMENTS. INSTALL BALANCE VALVE WITH STRAIGHT RUNS REQUIRED BY MANUFACTURER.
8. VERIFY QUANTITY OF COILS WHEN SUBMITTING BID.
9. PROVIDE BRONZE COUPLINGS BETWEEN COIL PIPING CONNECTION AND HEATING WATER PIPING. PROVIDE UNION FOR THREADED CONNECTIONS AND FLANGES FOR LARGER CONNECTION SIZES.

3 M705 PUMPED COOLING COIL CC-7 PIPING DETAIL
NO SCALE



PIPE SIZE (NPS)	HEIGHT ABOVE BASE (FT)	X (NPS)
LESS THAN 12"	LESS THAN 12'-0"	3"
LESS THAN 12"	12'-0" TO 24'-0"	4"
12" TO 18"	LESS THAN 12'-0"	4"
12" TO 18"	12'-0" TO 24'-0"	6"

NOTES

1. PRIME AND PAINT SUPPORT TO MATCH PIPING.
2. INSTALL CENTERED ON PLAIN CONCRETE PIER, 24" DIAMETER, 5'-0" DEEP. TOP OF CONCRETE 4" ABOVE FINISHED GRADE UNLESS NOTED OTHERWISE ON DRAWINGS.

9 M705 PIPE SUPPORT AND BASE DETAIL
NO SCALE

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

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MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PIPING RELATED DETAILS

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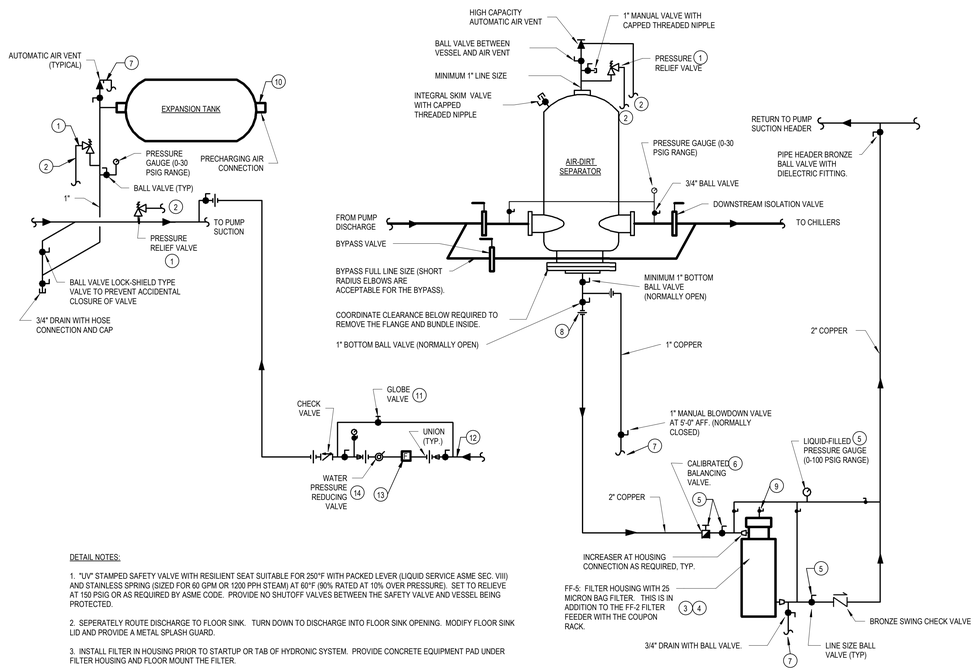
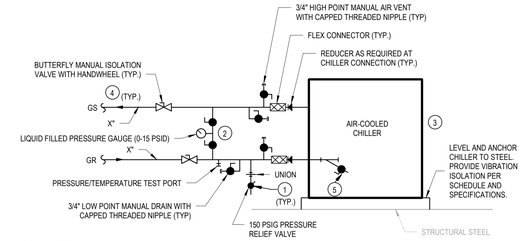


DETAIL NOTES:

1. "UV" STAMPED SAFETY VALVE WITH RESILIENT SEAT SUITABLE FOR 250°F WITH PACKED LEVER (LIQUID SERVICE ASME SEC. VIII) AND STAINLESS SPRING (SIZED FOR 60 GPM OR 1200 PPH STEAM) AT 60°F (90% RATED AT 10% OVER PRESSURE). SET TO RELIEVE AT 150 PSIG OR AS REQUIRED BY ASME CODE. PROVIDE NO SHUTOFF VALVES BETWEEN THE SAFETY VALVE AND VESSEL BEING PROTECTED.
2. SEPERATELY ROUTE DISCHARGE TO FLOOR SINK. TURN DOWN TO DISCHARGE INTO FLOOR SINK OPENING. MODIFY FLOOR SINK LID AND PROVIDE A METAL SPLASH GUARD.
3. INSTALL FILTER IN HOUSING PRIOR TO STARTUP OR TAB OF HYDRONIC SYSTEM. PROVIDE CONCRETE EQUIPMENT PAD UNDER FILTER HOUSING AND FLOOR MOUNT THE FILTER.
4. PROVIDE SPARE FILTERS IN MANUFACTURER'S ORIGINAL PACKAGING. ATTACH SPARE FILTER PACKAGE TO HOUSING SUPPORT.
5. LOCATE VALVES AND GAUGES LESS THAN 6'-0" AFF, ADJACENT TO EQUIPMENT.
6. BALANCE TO 30 GPM AT THE TYPICAL OPERATING SYSTEM DIFFERENTIAL PRESSURE (MINIMUM 10 PSID BETWEEN HEADERS).
7. EXTEND LINE SIZE TO FLOOR SINK AND TURN DOWN TO DISCHARGE INTO FLOOR SINK OPENING. MODIFY FLOOR SINK LID AND PROVIDE A METAL SPLASH GUARD.
8. PROVIDE THREADED UNIONS TO ALLOW FOR AIR-DIRT SEPARATOR FLANGE REMOVAL AND BUNDLE INNARDS REMOVAL, TYPICAL.
9. FILTER HOUSING MANUAL AIR VENT BALL VALVE.
10. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL. FLOOR MOUNT LOCATE TANK AS NOTED ON PLANS; PROVIDE A CONCRETE EQUIPMENT PAD BENEATH THE TANK AND RESTRAIN/ANCHOR THE TANK TO THE PAD.
11. BYPASS TO BE SAME SIZE AS MAKEUP LINE, 1" MINIMUM.
12. SOFT WATER MAKEUP, SEE PLUMBING DRAWINGS.
13. FLOWMETER, SEE FLOW METER SCHEDULE.
14. ADJUSTMENT RANGE SHALL BE TANK PRECHARGE PLUS OR MINUS 10 PSIG.

3 M708 AIR-DIRT SEPARATOR (CHW) AND EXPANSION TANK DETAIL
NO SCALE

CHILLER TAG	PIPE SIZE X"
ACC-5	4"

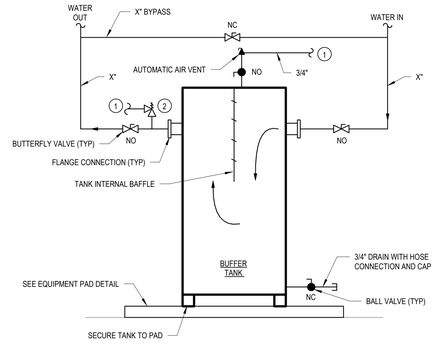


DETAIL NOTES:

1. LOCATE COMPONENTS TO NOT BE SUSCEPTIBLE TO DAMAGE. LOCATE COMPONENTS UNDERNEATH/WITHIN CHILLER HOUSING IF IT IS READILY ACCESSIBLE AND THERE IS ENOUGH ROOM INSIDE THE HOUSING.
2. INSTALL AND WIRE COMPLETE THE PRESSURE SENSORS, TEMPERATURE SENSORS, FLOW SWITCHES, ETC. FURNISHED BY THE CHILLER MANUFACTURER ON THE CHILLER SIDE OF THE ISOLATION VALVES. INSTALL PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
3. COORDINATE WITH ELECTRICAL TRADES TO ORIENT CHILLER WITH REQUIRED CLEARANCES TO CONTROL PANEL AND POWER CONNECTION. INSTALL PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
4. PROVIDE GALVANIZED PIPE SUPPORT MATERIALS.
5. CHILLER MANUFACTURER'S FURNISHED STRAINER WITH CHILLER MANUFACTURER'S STRAINER MESH SIZE AS RECOMMENDED IN THE WRITTEN INSTALLATION INSTRUCTIONS. PROVIDE BLOW DOWN VALVE WITH CAPPED THREADED NIPPLE.

1 M708 AIR-COOLED CHILLER PIPING DETAIL
NO SCALE

BT TAG	PIPE SIZE X"
BT-1	10"
BT-2	4"
BT-3	6"



DETAIL NOTES:

1. ROUTE DISCHARGE TO FLOOR DRAIN AND TURN DOWN AT DRAIN.
2. "UV" STAMPED SAFETY VALVE WITH RESILIENT SEAT SUITABLE FOR 250°F WITH PACKED LEVER (LIQUID SERVICE ASME SEC. VIII) AND STAINLESS SPRING (SIZED FOR 60 GPM OR 1200 PPH STEAM) AT 60°F (90% RATED AT 10% OVER PRESSURE). SET TO RELIEVE AT 125 PSIG OR AS REQUIRED BY ASME CODE. NO VALVES BETWEEN SAFETY VALVE AND VESSEL BEING PROTECTED.

2 M708 BUFFER TANK DETAIL
NO SCALE

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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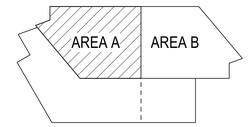

KEYPLAN
PROJECT NORTH
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ISSUED / REVISIONS SCHEDULE

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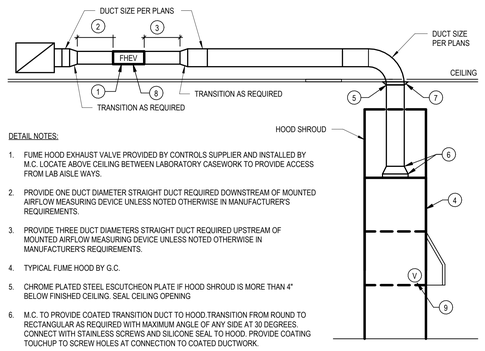
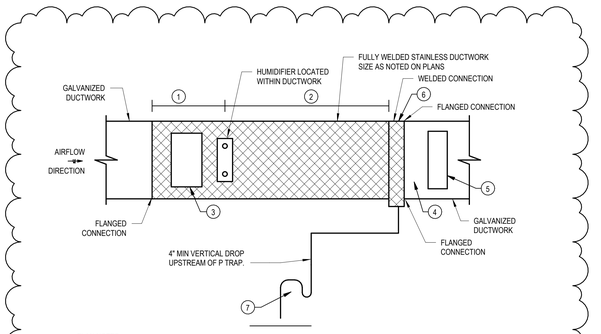


DETAIL NOTES:

1. FUME HOOD EXHAUST VALVE PROVIDED BY CONTROLS SUPPLIER AND INSTALLED BY M.C. LOCATE ABOVE CEILING BETWEEN LABORATORY CASEWORK TO PROVIDE ACCESS FROM LAB AISLE WAYS.
2. PROVIDE ONE DUCT DIAMETER STRAIGHT DUCT REQUIRED DOWNSTREAM OF MOUNTED AIRFLOW MEASURING DEVICE UNLESS NOTED OTHERWISE IN MANUFACTURER'S REQUIREMENTS.
3. PROVIDE THREE DUCT DIAMETERS STRAIGHT DUCT REQUIRED UPSTREAM OF MOUNTED AIRFLOW MEASURING DEVICE UNLESS NOTED OTHERWISE IN MANUFACTURER'S REQUIREMENTS.
4. TYPICAL FUME HOOD BY G.C.
5. CHROME PLATED STEEL ESCUTCHEON PLATE IF HOOD SHROUD IS MORE THAN 4" BELOW FINISHED CEILING. SEAL CEILING OPENING
6. M.C. TO PROVIDE COATED TRANSITION DUCT TO HOOD.TRANSITION FROM ROUND TO RECTANGULAR AS REQUIRED WITH MAXIMUM ANGLE OF ANY SIDE AT 30 DEGREES. CONNECT WITH STAINLESS SCREWS AND SILICONE SEAL TO HOOD. PROVIDE COATING TOUCHUP TO SCREW HOLES AT CONNECTION TO COATED DUCTWORK.
7. SEAL CEILING OPENING AIRTIGHT WITH SILICONE.
8. SEE CONTROLS SUPPLIER DRAWINGS FOR SIZING. PROVIDE FLANGES TO MATCH AS REQUIRED. FASTEN FLANGES IN MINIMUM 6 PLACES AND SILICONE SEAL JOINTS.
9. FACE VELOCITY MONITOR FURNISHED BY CONTROLS SUPPLIER AND INSTALLED BY M.C. COORDINATE INSTALLATION WITH FUME HOOD MANUFACTURER.

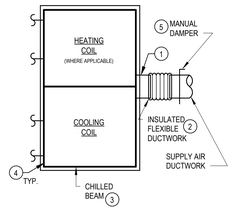
7 / M709 FUME HOOD EXHAUST CONNECTION DETAIL
NO SCALE



PLAN NOTES:

1. 1'-0" MINIMUM LENGTH OF FULLY WELDED STAINLESS DUCTWORK UPSTREAM OF HUMIDIFIER.
2. 5'-0" MINIMUM LENGTH OF LEVEL, STRAIGHT, FULLY WELDED STAINLESS DUCTWORK DOWNSTREAM OF HUMIDIFIER WITH NO TAKEOFFS, TRANSITIONS, OR DUCT PENETRATIONS WITHIN THIS REGION.
3. GALVANIZED STEEL, INSULATED DOUBLE WALL ACCESS DOORS ON ACCESSIBLE SIDE OF DUCT. HEIGHT OF ACCESS DOOR TO BE 2" LESS THAN HEIGHT OF DUCT. INCLUDE VIEWING LENS IN ACCESS DOOR.
4. INSTALL HUMIDIFIER CONTROL DEVICES IN GALVANIZED SECTION PRIOR TO FIRST DUCT TAKEOFF, WITHIN 12" OF END OF STAINLESS DUCT, BETWEEN STAINLESS SECTION AND ACCESS DOOR.
5. GALVANIZED, INSULATED DOUBLE WALL ACCESS DOOR ON ACCESSIBLE SIDE OF DUCT. HEIGHT OF ACCESS DOOR TO BE 2" LESS THAN HEIGHT OF DUCT.
6. 6" LONG SECTION OF WELDED STAINLESS DUCT WHICH IS 3" TALLER THAN THE UPSTREAM SECTION. 3" DEEP POCKET FUNCTIONS AS DRAIN PAN TO COLLECT WATER DURING POTENTIAL HUMIDIFIER MALFUNCTION.
7. INSTALL A 3" DEEP P-TRAP NEAR THE HUMIDIFIER BELOW CEILING. ROUTE THE 3/4" DRAIN AS COPPER CD TO THE NEAREST FLOOR DRAIN. TURN PIPE DOWN WALL AND TERMINATE 2" ABOVE RIM LEVEL OF FLOORDRAIN. LABEL PIPE "HUMIDIFIER MALFUNCTION IF FLOWING".

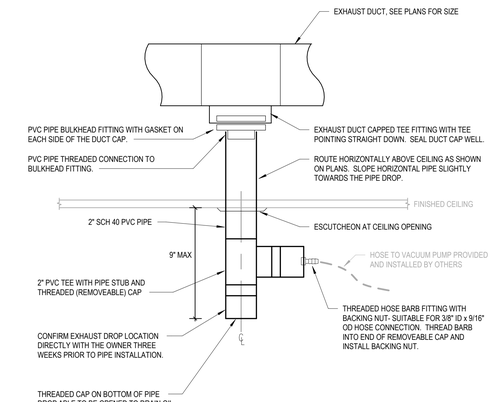
4 / M709 HUMIDIFIER DUCT INSTALLATION WITH DRAIN DETAIL
NO SCALE



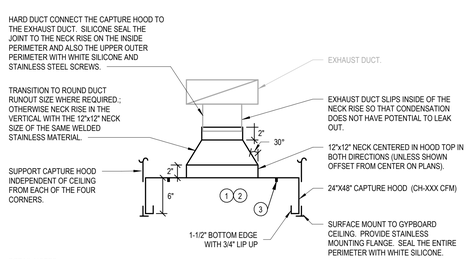
NOTES:

1. INSULATE ALL EXPOSED METAL AT BEAM DUCT INLET.
2. PROVIDE A 4" LENGTH OF INSULATED FLEXIBLE DUCT WHICH WILL ALLOW FOR SLIGHT FINAL BEAM LOCATION ADJUSTMENT. TIE-WRAP FLEX DUCT HELICAL COIL TO ROUND METAL DUCTWORK AND ALSO TO BEAM CONNECTION. PULL FLEX DUCT VAPOR BARRIER OVER THE LOWER TIE-WRAP AND INSTALL A SECOND TIE-WRAP OVER THE VAPOR BARRIER. INSULATE METAL DUCT OVER TOP OF THE SECOND TIE-WRAP AND INSTALL INSULATORS TAPE ON THE EDGES. FLEX DUCT SHALL BE SAME SIZE AS BEAM CONNECTION WITH CHILLED BEAM MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS RECOMMENDATIONS FOR CONVERTING ROUND TO ELLIPTICAL OR OVAL. DUCT RUNOUT SIZE AND VOLUME DAMPER SAME SIZE SHALL BE THE SAME SIZE AS THE BEAM CONNECTION. FOR DUCT RUNOUTS LESS THAN 5'-0" IN LENGTH, OTHERWISE INCREASE RUNOUT SIZE TWO (2) INCHES IN DIAMETER AND REDUCE AT UPSTREAM SIDE OF FLEX DUCT CONNECTOR.
3. THE GENERAL CONTRACTOR TRADES SHALL LOCATE THE BUILDING REBAR IN THE CONCRETE BEAMS PRIOR TO DRILLING HOLES FOR THE SUPPORT ANCHORS. DO NOT CUT REBAR IN ANY CONCRETE BEAMS DURING ANCHOR INSTALLATION. RIGIDLY MOUNT CHILLED BEAM FROM FOUR CORNERS WITH 3/8" ALL-THREAD ROD (WITH +\- 1" ADJUSTMENT INTO CEILING GRID) SUSPENDED DOWN FROM A PIECE OF STRUT. INSTALL THE STRUT PIECE FLUSH TO THE UNDERSIDE OF THE BUILDING STRUCTURE. WHERE THE HANGING RODS WOULD BE MORE THAN 36" LONG, CONSTRUCT A LOWER STRUT FRAME IMMEDIATELY ABOVE THE CHILLED BEAM AND RIGIDLY MOUNT THE LOWER STRUT FROM ON THE RODS HANGING DOWN FROM THE UPPER STRUT. THE LOWER STRUT FRAME SHALL BE ARRANGED SUCH THAT A MINIMUM OF +/- 1" OF ADJUSTMENT (IN EITHER DIRECTION PERPENDICULAR TO BEAM) CAN BE MADE. MAKE FINAL ADJUSTMENT OF THE CHILLED BEAM LOCATION IN THE CEILING GRID AFTER ALL GRID ITEMS AND TILES ARE INSTALLED. FINAL ADJUSTED LOCATION SHALL PUT NO WEIGHT OF THE BEAM ON THE CEILING GRID. UTILIZE THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS LISTED HARDWARE (WASHERS, NUTS) AND PROVIDE AN ADDITIONAL LOCK NUT AT THE BOTTOM END OF THE ROD.
4. INSULATE ALL EXPOSED METAL AT COOLING COIL. INSULATE COOLING COIL RETURN BENDS. INSULATE THE ENTIRE ENTIRE EXTERIOR OF THE CHILLED BEAM CABINET ON TOP AND FOUR FOUR SIDES WITH 1/2" INSULATION WITH VAPOR BARRIER.
5. MANUAL DAMPER SHALL BE LOCATED A MINIMUM OF 48" FROM THE CHILLED BEAM PRIMARY AIR CONNECTION TO ALLOW FLOW TO RESTABILIZE. PROVIDE AN INDIVIDUAL DAMPER FOR EACH INDIVIDUAL CHILLED BEAM UNLESS THERE IS ONLY ONE CHILLED BEAM IN THE ZONE.

1 / M709 CHILLED BEAM ARRANGEMENT DETAIL
NO SCALE



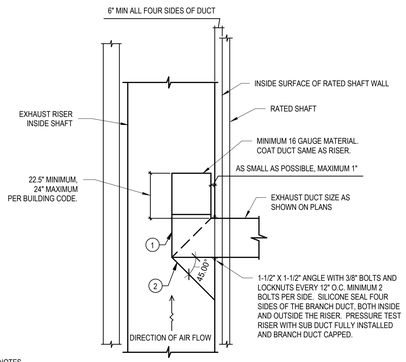
2 / M709 VACUUM PUMP EXHAUST CONNECTION DETAIL
NO SCALE



DETAIL NOTES:

1. FABRICATE ENTIRE HOOD FROM 18 GAUGE TYPE 304 STAINLESS STEEL WITH #4 FINISH ON INTERIOR AS VIEWED FROM BELOW. HEM ALL EDGES AND WELD CORNERS. THOROUGHLY CLEAN EXPOSED INTERIOR SURFACES VISIBLE FROM BELOW CEILING OF ALL FABRICATION MARKINGS AND WELD DISCOLORATIONS.
2. PROVIDE #4 FINISH ON ANY EXTERIOR SURFACES WHICH ARE VISIBLE FROM THE OCCUPIED SPACE IN THE INSTALLED CONDITION.

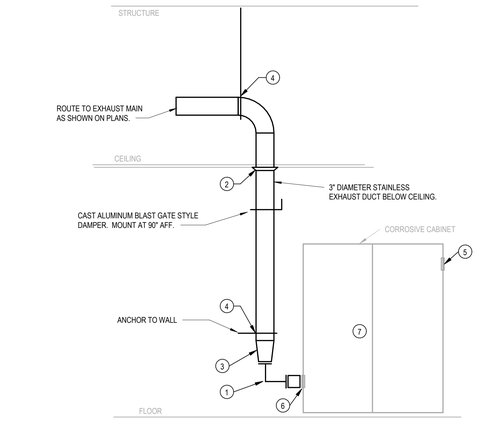
5 / M709 CAPTURE HOOD DETAIL
NO SCALE



PLAN NOTES

1. SQUARE THROAT ELBOW MINIMUM 16 GAUGE WITH VANES LIKE SMACNA 2ND EDITION FIGURE 2-2 TYPE RE2. COAT VANES SAME AS DUCTWORK.
2. AIR DIVERTER FULL WIDTH OF RISER UNLESS NOTED OTHERWISE ON PLANS. ATTACH TO BRANCH DUCT AND THREE RISER SIDEWALLS. CONSTRUCT OF MINIMUM 16 GAUGE MATERIAL AND REINFORCE ON BACKSIDE TO AVOID OILCANNING. COAT DIVERTER SAME AS DUCTWORK.

6 / M709 EXHAUST SUB DUCT DETAIL
NO SCALE



DETAIL NOTES:

1. 2" NPT THREADED STAINLESS STEEL SCHEDULE 40 PIPE ELBOW. CONNECT ELBOW TO THE CORROSIVE CABINET.
2. PROVIDE CHROME PLATED STEEL ESCUTCHEON PLATE AT CEILING PENETRATION.
3. PROVIDE STAINLESS STEEL TRANSITION PIECE FROM 3" DIAMETER DUCT TO 2" FPT PIPE WITH APPROX 30 DEGREE INCLUDED ANGLE. CONNECT TRANSITION PIECE TO PIPE ELBOW.
4. ANCHOR THE DUCT ELBOW WITH A WELDED ANGLE RING APPROX 36" AFF.
5. CORROSIVE STORAGE CABINET HIGHER ELEVATION (UPPER CONNECTION) 2" NPT BUNG - OPEN TO THE ROOM, FUNCTIONS AS AN AIR INLET FOR THE CABINET.
6. CORROSIVE STORAGE CABINET LOWER ELEVATION (LOWER CONNECTION) 2" BUNG. ADJUST DUCTWORK LOCATION BASED ON WHICH SIDE OF THE CABINET THE LOWER (BOTTOM) BUNG IS LOCATED. CONNECT DUCTWORK TO THE LOWER (BOTTOM) BUNG.
7. VERIFY EQUIPMENT LOCATION WITHIN ROOM AND EQUIPMENT DUCT CONNECTION LOCATIONS AND PROPOSED DUCT ROUTING DIRECTLY WITH THE OWNER ONE WEEK PRIOR TO FABRICATING DUCTWORK.

3 / M709 CORROSIVE CABINET EXHAUST CONNECTION DETAIL
NO SCALE

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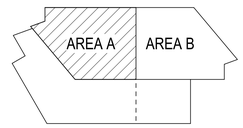

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PETER HOGAN LANGHAM REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

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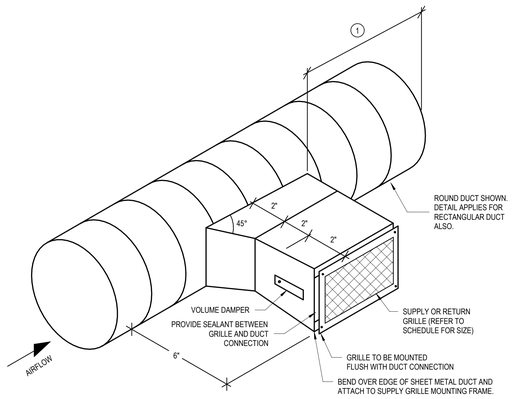
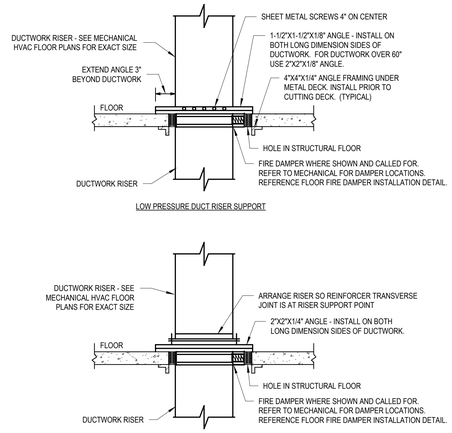


PLAN NOTES

1. MINIMUM 2'-0" FROM END OF DUCT FOR SUPPLY DUCT, MINIMUM 6" FOR RETURN DUCT.

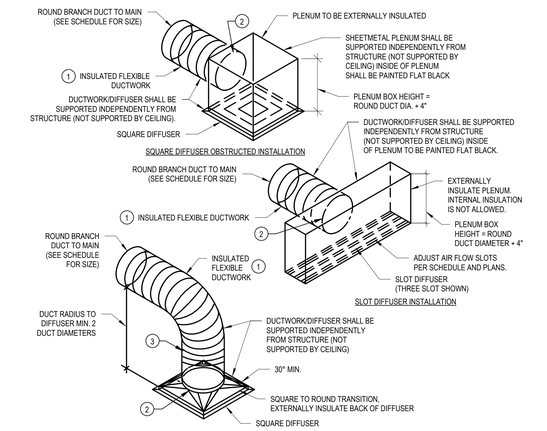
7 M710 EXPOSED DUCT GRILLE DETAIL
NO SCALE



LOW PRESSURE DUCT RISER SUPPORT

MEDIUM AND HIGH PRESSURE DUCT RISER SUPPORT

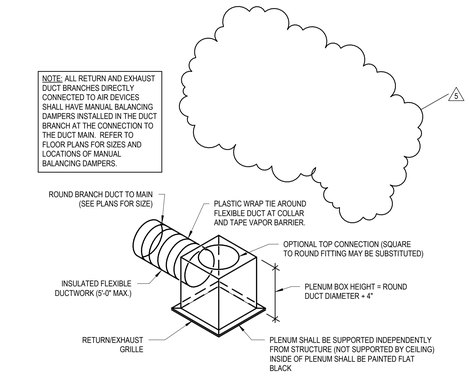
4 M710 DUCTWORK RISER SUPPORT DETAIL
NO SCALE



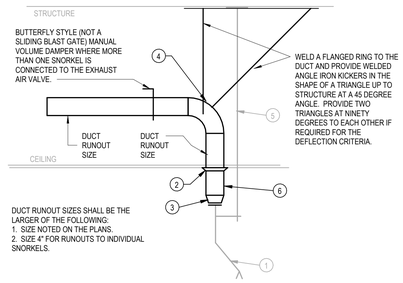
DETAIL NOTES:

1. A MINIMUM OF FOUR (4) FEET LENGTH OF FLEXIBLE DUCT SHALL BE PROVIDED TO EACH DIFFUSER. DUCTWORK SHALL CONTAIN A MININUM OF 180° OF TOTAL BENDING (E.G. 45° BEND + 45° BEND = 180° OF TOTAL BENDING). FLEXIBLE DUCTWORK LENGTH SHALL NOT EXCEED FIVE (5) FEET EXCEPT WHERE SPECIFICALLY NOTED. FLEX DUCT SHALL NOT CONTACT CEILING AND SHALL BE PROPERLY SUPPORTED SO AS TO HAVE NO KINKS. PROVIDE 90 DEGREE RIGID RADIUS FORMING BRACE FOR EACH FLEXIBLE DUCT CONNECTION (SIMILAR TO TITUS FLEX-RIGHT).
2. TIE-WRAP CONNECT FLEX DUCT HELICAL COIL TO ROUND METAL DIFFUSER NECK AND TO ROUND METAL DUCTWORK AT OTHER END OF FLEX DUCT. PULL FLEX DUCT VAPOR BARRIER OVER LOWER TIE-WRAP AND INSTALL SECOND TIE-WRAP OVER THE VAPOR BARRIER. INSULATE METAL DUCT OR DIFFUSER OVER TOP OF SECOND TIE-WRAP AND INSTALL INSULATOR'S TAPE ON EDGES.
3. PROVIDE A MINIMUM OF 18" OF STRAIGHT, VERTICALLY ORIENTED, FLEXIBLE DUCT AT THE DIFFUSER NECK. IF UNABLE TO PROVIDE STRAIGHT DUCT RUN THEN PROVIDE OBSTRUCTED INSTALLATION PLENUM IN ACCORDANCE WITH THIS DETAIL.

1 M710 DIFFUSER DETAIL
NO SCALE



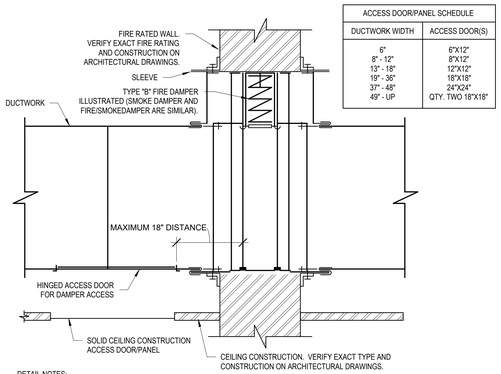
8 M710 RETURN/EXHAUST GRILLE DETAIL
NO SCALE



DETAIL NOTES:

1. SNORKEL PROVIDED BY LAB FURNISHINGS DRAWINGS AND INSTALLED BY THOSE TRADES. COORDINATE WITH THOSE TRADES.
2. PROVIDE CHROME PLATED STEEL ESCUTCHEON PLATE IF SNORKEL CONNECTION POINT IS BELOW FINISHED CEILING.
3. PROVIDE COATED TRANSITION DUCT TO CONNECT TO SNORKEL. TRANSITION FROM ROUND TO ROUND AS REQUIRED WITH MAXIMUM ANGLE OF ANY SIDE AT 30 DEGREES. CONNECT WITH STAINLESS SCREWS AND SILICONE TO SNORKEL. PROVIDE TOUCHUP TO SCREW HOLES AT CONNECTION TO COATED DUCTWORK.
4. ANCHOR THE DUCT ELBOW WITH A WELDED ANGLE RING. THIS SHALL BE A STOUT DUCT ANCHORAGE SUCH THAT THE VERTICAL PORTION OF THE DUCT AT THE DUCT TERMINATION WILL NOT DEFLECT MORE THAN 0.25" WHEN PUSHED WITH A 30 POUND FORCE IN ANY DIRECTION (WITH THE DUCT NOT CONNECTED TO THE SNORKEL).
5. SNORKEL SUPPORT (HORIZONTAL TO WALL OR VERTICAL TO THE STRUCTURE ABOVE) IS BY LAB FURNISHINGS DRAWINGS AND INSTALLED BY THOSE TRADES. COORDINATE WITH THOSE TRADES. THE DUCTWORK SHALL NOT SUPPORT THE SNORKEL.
6. VERIFY EQUIPMENT LOCATION WITHIN ROOM AND EQUIPMENT DUCT CONNECTION LOCATIONS WITH THE OWNER PRIOR TO FABRICATING DUCTWORK.
7. BALANCE INDIVIDUAL SNORKELS TO 65 CFM (FOR SIZE 3" SNORKELS) UNLESS NOTED OTHERWISE.

9 M710 SNORKEL EXHAUST CONNECTION DETAIL
NO SCALE

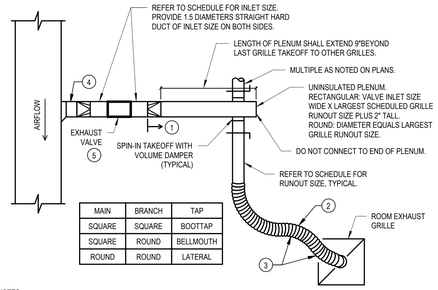


ACCESS DOOR/PANEL SCHEDULE	
DUCTWORK WIDTH	ACCESS DOOR(S)
6"	6"X12"
8" - 12"	8"X12"
13" - 18"	12"X12"
19" - 36"	18"X18"
37" - 48"	24"X24"
49" - UP	QTY. TWO 18"X18"

DETAIL NOTES:

1. FIRE DAMPER INSTALLATION, SMOKE DAMPER INSTALLATION, AND FIRE/SMOKE DAMPER INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND ALL UNDERWRITER'S LABORATORY (UL), FEDERAL, STATE AND LOCAL CODE REQUIREMENTS.
2. FIRE DAMPER RATING, SMOKE DAMPER RATING, AND FIRE/SMOKE DAMPER RATING SHALL MATCH FIRE RATING OF THE RATED CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR RATING.
3. DIVISION 23 CONTRACTOR SHALL FURNISH AND INSTALL A HINGED ACCESS DOOR IN THE DUCTWORK SIZED IN ACCORDANCE WITH THE SCHEDULE AND LOCATED TO PERMIT REPLACEMENT OF FUSIBLE LINK. LABEL FIRE DAMPER ACCESS DOOR WITH "FIRE DAMPER ACCESS" AND SMOKE DAMPER ACCESS DOOR WITH "SMOKE DAMPER ACCESS". PROVIDE ADDITIONAL EXTERNAL DUCT REINFORCEMENT WHERE ACCESS DUCT WAS CUT INTO THE DUCTWORK TO ELIMINATE AIR LEAKAGE.
4. DIVISION 23 CONTRACTOR SHALL FURNISH ACCESS DOOR/PANEL FOR SOLID CEILING CONSTRUCTION IN ACCORDANCE TO DIVISION 8 SPECIFICATION SECTION "ACCESS DOORS AND PANELS". ACCESS DOOR/PANEL LOCATED IN SOLID CEILING CONSTRUCTION SHALL BE NO SMALLER THAN 6" LARGER IN SIZE THAN THE ACCESS DOOR LOCATED IN THE DUCTWORK; MINIMUM 18"X18" SIZE. LOCATION SHALL ALLOW FOR 90 DEGREES OF OPENING OF DUCT ACCESS DOOR.
5. PROVIDE UNIMPEDED ACCESS FOR ACCESS DOOR TO SWING A FULL 90 DEGREES WITHOUT HAVING TO REMOVE OR RELOCATE ANY COMPONENTS (LIGHTS, DIFFUSERS, DAMPER TEST STATIONS, ETC.) NOR REQUIRE TO REMOVE PORTIONS OF THE CEILING GRID.

5 M710 DAMPER ACCESS DOOR AT WALL INSTALLATION DETAIL
NO SCALE

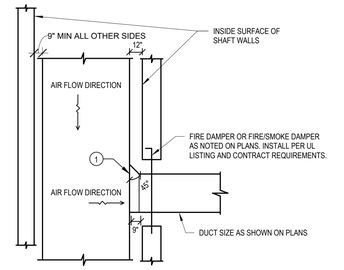


MAIN	BRANCH	TAP
SQUARE	SQUARE	BOOTTAP
SQUARE	ROUND	BELLMOUTH
ROUND	ROUND	LATERAL

PLAN NOTES

1. TRANSITION TO PLENUM SIZE AND CONFIGURATION AS REQUIRED.
2. FLEXIBLE DUCT CONNECTION FROM GRILLE SHALL NOT BE LESS THAN 4'-0" AND SHALL NOT EXCEED 5'-0" UNLESS SHOWN LONGER ON THE DRAWINGS.
3. BENDS SHALL BE MADE WITH NOT LESS THAN ONE DUCT DIAMETER CENTERLINE RADIUS. PROVIDE A MINIMUM OF TWO 90 DEGREE BENDS FOR SOUND ATTENUATION PURPOSES. PROVIDE 90 DEGREE RIGID RADIUS FORMING BRACE FOR EACH FLEXIBLE DUCT CONNECTION (SIMILAR TO TITUS FLEX-RIGHT).
4. REFER TO DRAWINGS FOR RUNOUT SIZE. RUNOUT SIZE IS THE SAME AS EXHAUST VALVE SIZE UNLESS NOTED OTHERWISE.
5. COORDINATE WITH ALL TRADES SUCH THAT MAINTENANCE ACCESS IS ACHIEVED AT COMPLETION OF PROJECT. MAINTENANCE ACCESS IS TO BE PROVIDED SUCH THAT A PERSON WITH 24" ARM LENGTH CAN STAND ON A LADDER WHICH IS RESTING ON THE FLOOR, NOT HAVE TO LEAN AGAINST THE CEILING, AND CAN TOUCH WITH BOTH HANDS AT THE SAME TIME EACH OF THE FOLLOWING COMPONENTS: VOLUME DAMPERS, CONTROL DAMPERS, DAMPER ACTUATORS, AIRFLOW CONTROLLER, TRANSFORMERS, EP SWITCHES, CONTROL AIR PRESSURE GAUGE.

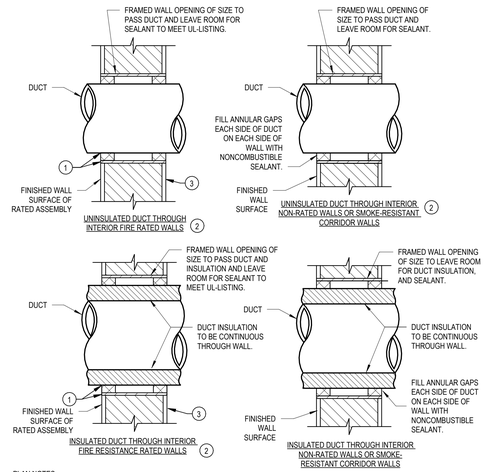
6 M710 EXHAUST VALVE DETAIL
NO SCALE



PLAN NOTES

1. 45 DEGREE ENTRY FITTING. HEIGHT OF FITTING AT RISER SHALL BE 9" TALLER THAN DUCT HEIGHT SHOWN ON PLANS. WIDTH OF FITTING AT RISER SHALL BE 18" WIDER THAN DUCT WIDTH SHOWN ON PLANS OR AS WIDE AS RISER, WHICHEVER IS LESS.

2 M710 DUCT AT SHAFT DETAIL
NO SCALE



PLAN NOTES

1. INSTALL FIRESTOP SYSTEM AS SPECIFIED IN DIVISION 7. INSTALL RETAINING ANGLES AS REQUIRED BY SYSTEM LISTING.
2. INCLUDES FIRE BARRIERS, SMOKE BARRIERS, AND FIRE PARTITIONS AS DEFINED IN THE LOCAL APPLICABLE CODES AND ON THE PLANS.
3. LOCATE FIRESTOP LABEL ON EACH SIDE OF PENETRATION SO THAT IT IS VISIBLE FROM AN ACCESSIBLE LOCATION ABOVE CEILING.

3 M710 DUCT PENETRATION DETAILS
NO SCALE

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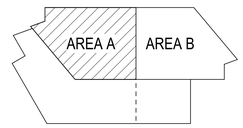
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

DUCTWORK RELATED DETAILS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M710

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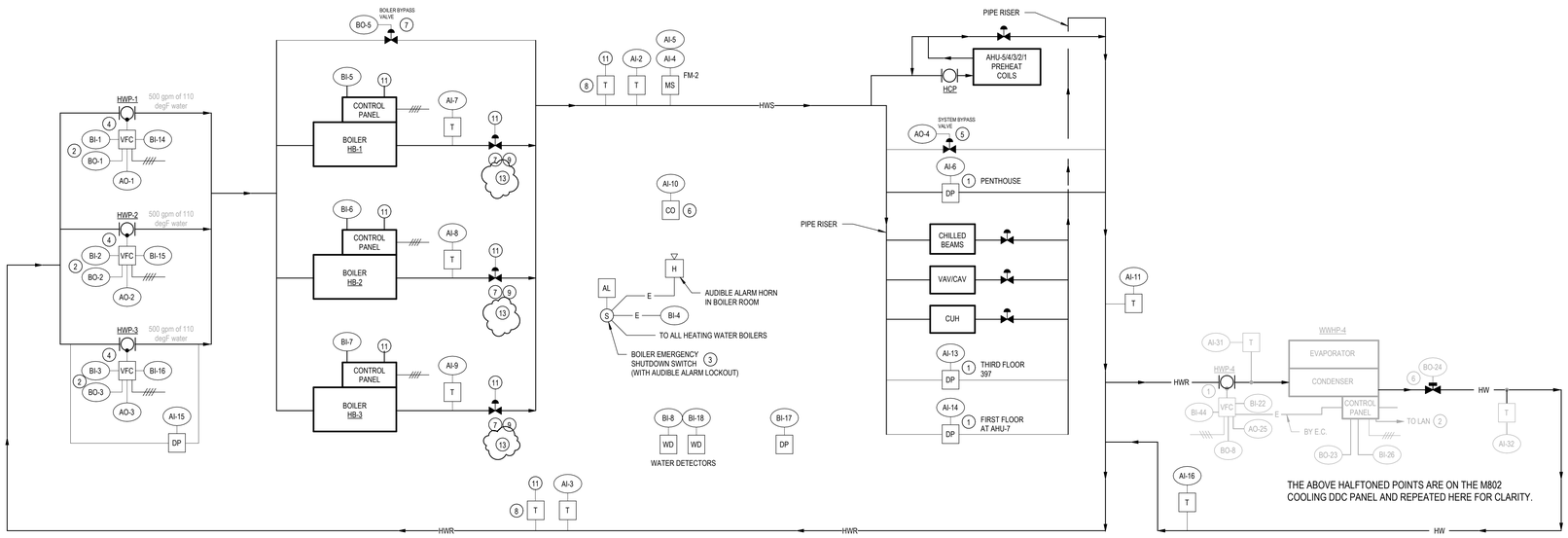
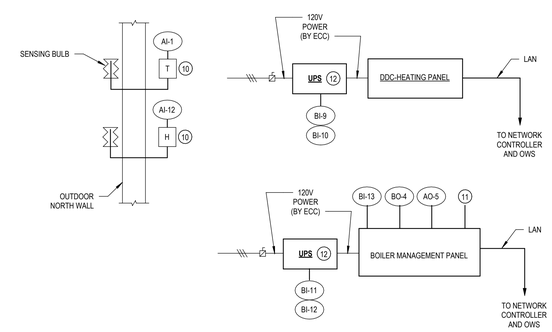


SCHEDULE OF DDC POINTS				
ID	DESCRIPTION	TREND	ALARM	GRAPHIC
AI-1	OUTDOOR TEMPERATURE (LOCAL)	X	X	X
AI-2	SYSTEM HEATING WATER SUPPLY TEMPERATURE	X	X	X
AI-3	BOILER HEATING WATER ENTERING TEMPERATURE	X	X	X
AI-4	SYSTEM HEATING WATER FLOW	X	X	X
AI-5	SYSTEM HEATING WATER CALCULATED LOAD (MBH)	X	X	X
AI-6	SYSTEM DIFFERENTIAL PRESSURE	X	X	X
AI-7	BOILER 1 SUPPLY TEMPERATURE	X	X	X
AI-8	BOILER 2 SUPPLY TEMPERATURE	X	X	X
AI-9	BOILER 3 SUPPLY TEMPERATURE	X	X	X
AI-10	CARBON MONOXIDE LEVEL	X	X	X
AI-11	SYSTEM LOADS HEATING WATER RETURN TEMPERATURE	X	X	X
AI-12	OUTDOOR HUMIDITY (LOCAL)	X	X	X
AI-13	SYSTEM DIFFERENTIAL PRESSURE	X	X	X
AI-14	SYSTEM DIFFERENTIAL PRESSURE	X	X	X
AI-15	PUMP DIFFERENTIAL PRESSURE	X	X	X
AI-16	WWHP CONDENSER WATER LEAVING TEMPERATURE	X	X	X
AO-1	HEATING WATER PUMP HWP-1 VFC	X		X
AO-2	HEATING WATER PUMP HWP-2 VFC	X		X
AO-3	HEATING WATER PUMP HWP-3 VFC	X		X
AO-4	SYSTEM BYPASS VALVE	X		X
AO-5	HWS TEMPERATURE SETPOINT	X		X
BI-1	HEATING WATER PUMP HWP-1 STATUS	X	X	X
BI-2	HEATING WATER PUMP HWP-2 STATUS	X	X	X
BI-3	HEATING WATER PUMP HWP-3 STATUS	X	X	X
BI-4	EMERGENCY BOILER SHUTDOWN	X	X	X
BI-5	BOILER 1 GENERAL ALARM	X	X	X
BI-6	BOILER 2 GENERAL ALARM	X	X	X
BI-7	BOILER 3 GENERAL ALARM	X	X	X
BI-8	BOILER ROOM WATER DETECTOR ALARM	X	X	X
BI-9	UPS LOW BATTERY ALARM	X	X	X
BI-10	LOSS OF POWER ALARM	X	X	X
BI-11	UPS LOW BATTERY ALARM	X	X	X
BI-12	LOSS OF POWER ALARM	X	X	X
BI-13	BOILER MANAGEMENT PANEL ALARM	X	X	X
BI-14	HEATING WATER PUMP HWP-1 FAULT	X	X	X
BI-15	HEATING WATER PUMP HWP-2 FAULT	X	X	X
BI-16	HEATING WATER PUMP HWP-3 FAULT	X	X	X
BI-17	FILTER FEEDER HW DIFFERENTIAL PRESSURE SWITCH	X	X	X
BI-18	BOILER ROOM WATER DETECTOR ALARM	X	X	X
BO-1	HEATING WATER PUMP HWP-1 START-STOP	X	X	X
BO-2	HEATING WATER PUMP HWP-2 START-STOP	X	X	X
BO-3	HEATING WATER PUMP HWP-3 START-STOP	X	X	X
BO-4	HEATING WATER SYSTEM START-STOP	X	X	X
BO-5	BOILER BYPASS VALVE	X	X	X

SETUP ALL TRENDS IN 15 MINUTE INTERVALS AND STORE FOR MINIMUM 45 DAYS.
INCLUDE TRENDS FOR THE ASSOCIATED COMMAND AND/OR SETPOINT IN ADDITION TO POINT LISTED ABOVE.
PROVIDE CHANGE OF VALUE AND INTERVAL TRENDS FOR BI AND BO POINTS.



1 M801 HEATING HOT WATER CONTROL SCHEMATIC
NO SCALE

BAS DDC CONTROLLER SEQUENCE OF OPERATION:

ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST. THE HEATING WATER SYSTEM SHALL OPERATE 8,760 HOURS PER YEAR.

1. ENABLE: THE HEATING HOT WATER SYSTEM IS STARTED FROM DDC PANEL OR FROM COMMAND OF BUILDING AUTOMATION SYSTEM. SYSTEM TO RUN CONTINOUSLY.

2. DISABLE: WHEN SYSTEM IS DISABLED MANUALLY THROUGH THE BUILDING AUTOMATION SYSTEM, BOILERS ARE DISABLED AND PUMPS STOP.

3. BOILERS:
- A. A MINIMUM OF ONE BOILER SHALL ALWAYS BE ENABLED. ALL BOILERS ARE AVAILABLE FOR OPERATION IN NORMAL CONDITIONS.
- B. THE SYSTEM SUPPLY HEATING WATER SET POINT SHALL BE SELECTED BY THE BAS AND FURNISHED AS AN INPUT TO THE BOILER MANAGEMENT PANEL. SET POINT SHALL BE **130°F (ADJ).** RESET HEATING WATER FROM **130°F TO 110°F (ADJ)** AS THE OUTDOOR AIR TEMPERATURE VARIES FROM **40°F** TO **70°F (ADJ).** DURING WARM-UP MODE, WHEN THE OUTDOOR AIR TEMPERATURE IS LESS THAN **30°F (ADJ),** FROM 6:00 A.M. TO 8:00 A.M. MONDAY THROUGH FRIDAY, THE SUPPLY TEMPERATURE SETPOINT SHALL BE **140°F (ADJ)** IF QUANTITY **THREE (ADJ.)** CRITICAL SPACES (MULTIPURPOSE *ROOM 100, ADVANCED WET LAB 108A, AND OPEN WORKSPACE ROOM 412)* ARE BELOW THE SPACE TEMPERATURE HEATING SETPOINT AND THEIR ZONE HEATING VALVES ARE MORE THAN **85% (ADJ)** OPEN.

4. HEATING WATER PUMPS:
- A. HEATING WATER PUMPS SHALL OPERATE IN LEAD, LAG, STANDBY ARRANGEMENT. A MINIMUM OF ONE PUMP SHALL ALWAYS BE ENABLED.
- B. HEATING WATER PUMPS SHALL ROTATE AS THE LEAD PUMP EVERY **750 HOURS (ADJ)**. FAILURE OF ANY PUMP SHALL AUTOMATICALLY START THE NEXT PUMP IN THE OPERATING SEQUENCE.
- C. LAG PUMP STARTS WHEN SYSTEM FLOW EXCEEDS **650** GPM (ADJ) FOR TEN MINUTES (ADJ). LAG PUMP STOPS WHEN SYSTEM FLOW IS LESS THAN **550** GPM (ADJ) FOR 10 MINUTES (ADJ). WHEN MULTIPLE PUMPS ARE OPERATING, PUMPS SHALL RUN AT THE SAME SPEED AND MODULATE FROM **18** TO **60 HZ (ADJ.)** TO MAINTAIN THE *NORMAL PRESSURE CONTROL INPUT*.
- **D.** THE THREE SYSTEM DIFFERENTIAL PRESSURE SENSORS SHALL BE COMPARED AND THE SENSOR THAT IS THE MOST NEEDY (THE SENSOR WHICH IS BELOW IT'S *INDIVIDUAL SENSOR SETPOINT*) SHALL BE USED AS THE *NORMAL PRESSURE CONTROL INPUT* (THE OTHER LESS NEEDY SENSORS WILL BE AT OR ABOVE IT'S *INDIVIDUAL SENSOR SETPOINT* IN THIS CONDITION). THE *INDIVIDUAL SENSOR SETPOINT* OF THE FLOOR LEVEL SENSORS SHALL BE THE DIFFERENTIAL PRESSURE REQUIRED TO MAINTAIN THE SCHEDULED GPM AT THE FLOOR'S COILS AND FINNED TUBE RADIATION (AS MEASURED BY THE TAB AGENT) WITH ALL THE COIL CONTROL VALVES AND FINNED TUBE RADIATION CONTROL VALVES 90% OPEN IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING. THE *INDIVIDUAL SENSOR SETPOINTS* SHALL EACH HAVE THEIR OWN SEPARATE PROGRAMMED ENTRIES. THE *INDIVIDUAL SENSOR SETPOINTS* SHALL BE NO HIGHER THAN **10 PSID (ADJ.).**
- **E.** THE *NORMAL PRESSURE CONTROL INPUT* SHALL BE RESET DOWNWARD BASED ON VALVE POSITION SUCH THAT THE WORST CASE CONTROL VALVE IN THAT FLOOR'S SEGMENT OF THE BUILDING PIPING IS **95% (ADJ)** OPEN BASED ON A TRIM OR RESPOND LOOP OR SIMILAR LOGIC. THE *NORMAL PRESSURE CONTROL INPUT* SHALL BE REDUCED TO NO LOWER THAN **5 PSID (ADJ).** THE MAXIMUM *NORMAL PRESSURE CONTROL INPUT* SHALL BE NO MORE THAN **10 PSID (ADJ).**
- **F.** PUMP DIFFERENTIAL PRESSURE WILL BE ABLE TO BE MANUALLY SELECTED (VIA A PREPROGRAMMED GRAPHICAL SCREEN BUTTON) AS THE *BACKUP PRESSURE CONTROL INPUT*. WHEN THE BACKUP PRESSURE CONTROL BUTTON IS SELECTED, THE *INDIVIDUAL SENSOR SETPOINTS* AND *NORMAL PRESSURE CONTROL INPUT* ARE DISREGARDED AND THE PUMP DIFFERENTIAL PRESSURE SIGNAL UTILIZED IN THEIR PLACE. THE *BACKUP PRESSURE CONTROL INPUT* SHALL BE DETERMINED BY THE TAB AGENT AND WILL BE APPROXIMATELY **30 PSID (ADJ).**

5. HEATING WATER BYPASS VALVE:
- A. THE HEATING WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN THE SYSTEM FLOW RATE ABOVE THE REQUIRED MINIMUM FLOW RATE BASED ON THE OPERATING BOILER(S) AS MEASURED BY SYSTEM FLOW METER. UTILIZE **30 GPM (ADJ)** SET POINT MINIMUM FLOWRATE PER OPERATING BOILER UNLESS CONFIRMED BY BOILER MANUFACTURER TO BE HIGHER.
- B. SYSTEM BYPASS VALVE SHALL ALSO MODULATE OPEN TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE OF **2 PSID (ADJ)** ABOVE EFFECTIVE SYSTEM DIFFERENTIAL SET POINT WHEN A SINGLE OPERABLE PUMP IS AT MINIMUM SPEED. PUMP MINIMUM SPEED SHALL BE 18 HZ UNLESS NOTED OTHERWISE.

6. WWHP:
- A. THE HEATING WATER CONDENSER LEAVING WATER TEMPERATURE SETPOINT FOR THE WWHP SHALL BE **130°F (ADJ.)** AS CONTROLLED BY THE WWHP INTEGRAL CONTROLLER.
- B. WHEN THE WWHP HWP-4 IS OPERATING, IF ALL THREE BOILERS ARE INOPERATIVE (BASED ON WHATEVER BAS INPUT POINTS FROM THE THREE BOILERS THEMSELVES OR THE BOILER MANAGEMENT PANEL OR THE THREE BOILER ISOLATION VALVES ARE AVAILABLE), THEN FULLY OPEN THE BOILER BYPASS VALVE. OTHERWISE FULLY CLOSE THE BOILER BYPASS VALVE.

7. ALARMS:
- A. GENERATE ALARM ANYTIME THE SYSTEM SUPPLY TEMPERATURE DIFFERS FROM SET POINT BY GREATER THAN **10°F (ADJ)** FOR **10 MINUTES (ADJ).**
- B. GENERATE ALARM ANYTIME CARBON MONOXIDE LEVEL IS ABOVE **25 PPM (ADJ)** AND SHUT DOWN BOILERS WHEN LEVEL IS ABOVE **50 PPM (ADJ.)**
- C. MANUAL DEPRESSION OF EMERGENCY BOILER SHUTDOWN SWITCH SHALL SOUND HORN AND DISABLE ALL BOILERS.
- D. GENERATE ALARM ANYTIME WATER IS DETECTED BY THE WATER DETECTOR.
- E. SIGNAL AN ALARM AT THE OWS IF THE BUILDING OUTDOOR TEMPERATURE SENSOR READING IS MORE THAN **5°F (ADJ.)** DIFFERENT THAN THE CAMPUS GLOBAL OUTDOOR AIR TEMPERATURE FOR A PERIOD OF **TEN MINUTES (ADJ.).** IF EITHER SIGNAL IS LOST OR BECOMES UNRELIABLE THEN UTILIZE THE SENSOR CLOSEST TO THE OLD FIVE MINUTE ROLLING AVERAGE OF THE TWO SENSORS UNTIL THE BUILDING SENSOR AND GLOBAL SENSOR ARE WITHIN **5°F (ADJ.)** OF EACH OTHER AGAIN.
- F. GENERATE AN ALARM IF ANY PUMP IS COMMANDED TO START AND STATUS IS NOT SEEN WITHIN **30 SECONDS (ADJ.)**.

SCHEMATIC NOTES:

1. LOCATED AT 90% THROUGH HEATING WATER SYSTEM WHERE SHOWN ON PLAN. HARD WIRED TO HEATING WATER DDC PANEL.

2. NOTE THAT START/STOP SIGNAL, STATUS AND SPEED CONTROL ARE HARD WIRED TO DDC PANEL TO ENSURE OPERATION ON LOSS OF LAN.

3. ECC TO FURNISH AND INSTALL ON WALL OUTSIDE BOILER ROOM, AT EACH LOCATION INDICATED, A BOILER EMERGENCY SHUTDOWN OPERATOR STATION (RED MUSHROOM PUSHBUTTON 2" DIAMETER, MAINTAINED POSITION, TRANSPARENT LIFT LID OVER THE BUTTON). PROVIDE CONTACT BLOCKS AND RELAYS WITHIN A METAL ENCLOSURE AS REQUIRED TO SIMULTANEOUSLY SHUT DOWN MULTIPLE PIECES OF EQUIPMENT IN PARALLEL. CONFIRM NORMALLY OPEN OR NORMALLY CLOSED CONTACTS WITH THE EQUIPMENT MANUFACTURER. PROVIDE CONDUIT AND WIRING HARD WIRED TO ALL OF THE HEATING WATER BOILERS AND THE BOILER MANAGEMENT PANEL AS REQUIRED: LABEL THE CONDUIT "HEATING BOILER SHUTDOWN". PROVIDE MANUAL SILENCE SWITCH AND LARGE WALL MOUNTED EXTERNAL LABEL MOUNTED DIRECTLY ABOVE THE OPERATOR STATION LABELED "HEATING WATER BOILER SHUTDOWN" IN WHITE TEXT ON RED PHENOLIC BACKGROUND. PROVIDE BAS-FURNISHED 120V POWER OR 24V POWER WIRING AND JUMPERS AS REQUIRED. DEPRESSING/PUSHING THE SHUTDOWN BUTTON REMOVES THE CONTROLLER POWER FROM EACH BOILER CONTROLLER AND RENDERS EACH BOILER UNABLE TO OPERATE, SHUTTING THEM DOWN IMMEDIATELY. WIRE THE SHUTDOWN CIRCUIT IN SERIES SUCH THAT DEPRESSING ANY OF THE OPERATOR STATION SHUTDOWN BUTTONS INDICATES A BINARY ALARM ON THE BAS GRAPHICS, SOUNDS THE HORN IN THE ROOM, AND SHUTS DOWN EACH OF THE BOILERS. LAND SHUTDOWN WIRING ONTO EACH BOILER'S BURNER CONTROLLER TERMINAL STRIPS WHICH IS CONNECTED DIRECTLY INTO THAT BOILER'S BURNER LIMIT CIRCUIT (NOT A SINGLE POINT LANDING ONTO THE BOILER MANAGEMENT PANEL WHICH THEN SHUTS DOWN THE INDIVIDUAL BOILERS VIA A CONTROL SIGNAL). DEPRESSING THE SHUTDOWN BUTTON SHALL SHUT DOWN EQUIPMENT WHICH IS RUNNING IN "HAND" WHICH IS NOT CONTROLLED BY THE BOILER MANAGEMENT PANEL. COORDINATE WITH THE BOILER SUPPLIER AND OBTAIN SPECIFIC WRITTEN INSTRUCTIONS.

4. VFC DRIVES FURNISHED, INSTALLED, WIRED AND COMMISSIONED BY EC. VFC SHALL MODULATE BETWEEN THE CONTROLLER EQUIPMENT MANUFACTURER'S REQUIRED SAFE OPERATING MAXIMUM AND MINIMUM SPEED.

5. HEATING WATER SYSTEM BYPASS VALVE SIZED FOR **105** GPM AT **20** PSID. VALVE ACTUATION TO FAIL LAST POSITION UPON LOSS OF POWER.

6. CARBON MONOXIDE DETECTOR LOCATED IN BOILER ROOM. SENSOR FURNISHED BY MC, WIRED TO THE BAS BY THE ECC.

7. BOILER BYPASS VALVE LINE SIZE. VALVE ACTUATION TO FAIL LAST POSITION UPON LOSS OF POWER.

8. HEADER COMMON HEATING WATER SUPPLY SENSOR AND COMMON HEADER HEATING WATER RETURN SENSOR FURNISHED BY BOILER MANUFACTURER AND INSTALLED BY M.C. IN THERMOWELL PROVIDED BY M.C. COORDINATE CLOSELY WITH THE BOILER MANAGEMENT PANEL SUPPLIER.

9. VALVE AND ACTUATOR FURNISHED BY THE ECC. VALVE ACTUATOR CONNECTION TO THE BOILER MANAGEMENT PANEL AND TO THE BAS PROVIDED BY THE CIC. COORDINATE CLOSELY WITH THE BOILER MANAGEMENT PANEL SUPPLIER.

10. LOCAL TEMPERATURE SIGNAL IS HARDWIRED TO THE DDC-HEATING PANEL TO ENSURE OPERATION UPON LOSS OF LAN.

11. CIC TO PROVIDE ALL CONDUIT AND WIRING BETWEEN THE BOILER MANAGEMENT PANEL AND THE INDIVIDUAL BOILER CONTROLLERS, THE BOILER ISOLATION VALVES, AND THE HEADER TEMPERATURE SENSORS. COORDINATE CLOSELY WITH THE BOILER MANAGEMENT PANEL SUPPLIER.

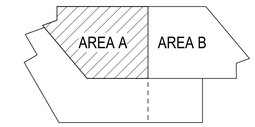
12. UPS SIZED FOR MINIMUM TWO MINUTES OF BACKUP TIME AT FULL LOAD RATING, WITH OVERLOAD AND SHORT CIRCUIT PROTECTION, SEALED MAINTENANCE FREE BATTERIES, AND NEMA TYPE OUTLET POWER RECEPTACLES. UPS MAY BE COMBINED INTO A SINGLE UPS.

13. VALVE ACTUATOR OPEN STATUS CONNECTED TO PUMP 'S VFD PERMISSIVE INPUT.

5

BOILER MANAGEMENT PANEL SEQUENCE
(CONTROL VIA THE BOILER MANAGEMENT PANEL FURNISHED WITH THE BOILER EQUIPMENT):

- A. BOILERS ARE MANUALLY INDEXED FOR AUTOMATIC OPERATION THROUGH INTEGRAL ON-OFF SWITCHES AT THEIR INDIVIDUAL CONTROL PANELS. ALL BOILERS ARE AVAILABLE FOR SERVICE AT ALL TIMES FOR NORMAL OPERATION. ANY BOILER TAKEN OUT OF SERVICE (MANUALLY DEENERGIZED) SHALL BE REMOVED FROM THE CONTROL SEQUENCE AND NOTED ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- B. A MINIMUM OF ONE BOILER SHALL ALWAYS BE ENABLED. BOILER ISOLATION VALVE CONTROL SHALL BE VIA THE BOILER MANAGEMENT PANEL. LEAD BOILER ISOLATION VALVE SHALL BE FULLY OPEN AT ALL TIMES. LAG BOILER(S) ISOLATION VALVE SHALL OPEN WHENEVER A LAG BOILER IS CALLED TO OPERATE. COMMAND CLOSED THE ISOLATION VALVE OF A BOILER TAKEN OUT OF SEQUENCE AFTER A **5 MIN. (ADJ.)** TIME DELAY.
- C. QUANTITY OF BOILERS OPERATING AND THE FIRING RATE SHALL BE DETERMINED BY THE BOILER MANAGEMENT PANEL. MULTIPLE BOILERS SHALL RUN IN LOW FIRE MODE BEFORE MODULATING FIRING RATE TOWARD HIGHER FIRE TO MAINTAIN THE HIGHEST EFFICIENCY POSSIBLE. DISPLAY THE FIRING RATE COMMAND FOR EACH BOILER ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- D. BOILER ROTATION SHALL BE COMMANDED BY THE BOILER MANAGEMENT PANEL. ROTATE BOILER OPERATION WHEN DETERMINING WHICH BOILER TO ENABLE BY ENABLING THE UNIT WITH LEAST AMOUNT OF RUNTIME. WHEN ROTATING BOILERS OUT OF SEQUENCE DISABLE THE BOILER WITH THE MOST RUN-HOURS. DISPLAY BOILER RUN-HOURS AND ON/OFF RUN CYCLES ON THE BOILER MANAGEMENT PANEL GRAPHICS.
- E. THE SYSTEM SUPPLY HEATING WATER SET POINT SHALL BE SELECTED BY THE BAS AND FURNISHED AS AN INPUT TO THE BOILER MANAGEMENT PANEL.
- F. THE BOILER MANAGEMENT PANEL SHALL BE CONFIGURED FOR PARALLEL BOILER OPERATION.



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

THIS TEMPERATURE CONTROL DRAWING IS FOR REFERENCE ONLY AND IS NOT TO BE USED AS A BASIS FOR BIDDING.

REFER TO THE CONTROLS SUPPLIER, SIEMENS BUILDING TECHNOLOGIES, INSTALLATION DRAWINGS, TO BE INCLUDED BY ADDENDUM, FOR THE BIDDING SCOPE OF THE CONTROL INSTALLATION CONTRACT.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAKE NO. PE19500446 REGISTERED STATE OF INDIANA PROFESSIONAL ENGINEER

HEATING SYSTEMS TEMPERATURE CONTROL DIAGRAMS

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

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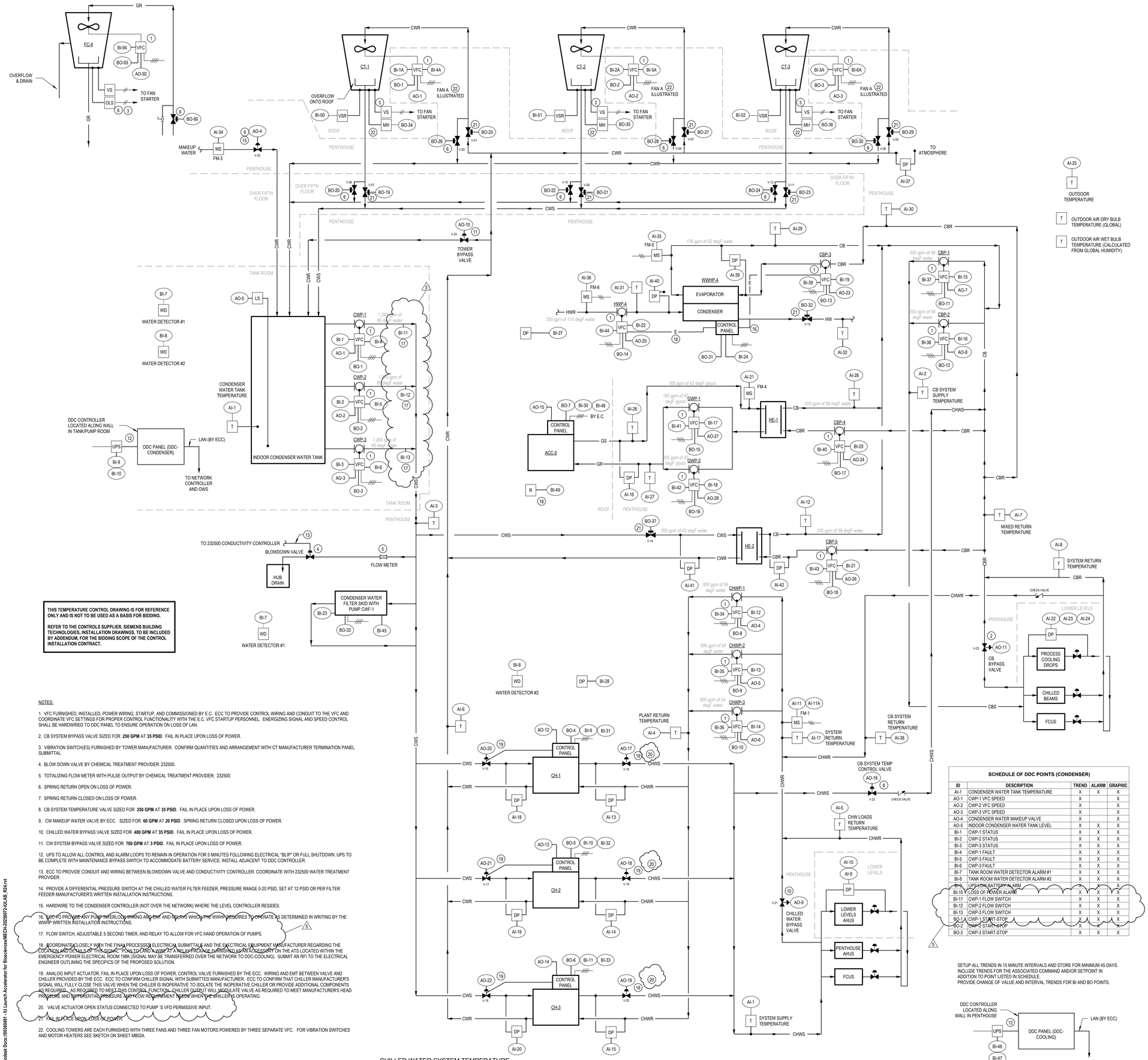

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NOTES:

1. VFC FURNISHED, INSTALLED, POWER WIRING, STARTUP, AND COMMISSIONED BY E.C. ECC TO PROVIDE CONTROL WIRING AND CONDUIT TO THE VFC AND COORDINATE VFC SETTINGS FOR PROPER CONTROL FUNCTIONALITY WITH THE E.C. VFC STARTUP PERSONNEL. ENERGIZING SIGNAL AND SPEED CONTROL SHALL BE HARDWIRED TO DDC PANEL TO ENSURE OPERATION ON LOSS OF LAN.
2. CB SYSTEM BYPASS VALVE SIZED FOR **250 GPM** AT **35 PSID**. FAIL IN PLACE UPON LOSS OF POWER.
3. VIBRATION SWITCH(ES) FURNISHED BY TOWER MANUFACTURER. CONFIRM QUANTITIES AND ARRANGEMENT WITH CT MANUFACTURER TERMINATION PANEL SUBMITTAL.
4. BLOW DOWN VALVE BY CHEMICAL TREATMENT PROVIDER: 232500.
5. TOTALIZING FLOW METER WITH PULSE OUTPUT BY CHEMICAL TREATMENT PROVIDER: 232500.
6. SPRING RETURN OPEN ON LOSS OF POWER.
7. SPRING RETURN CLOSED ON LOSS OF POWER.
8. CB SYSTEM TEMPERATURE VALVE SIZED FOR **250 GPM** AT **35 PSID**. FAIL IN PLACE UPON LOSS OF POWER.
9. CW MAKEUP WATER VALVE BY ECC. SIZED FOR **60 GPM** AT **20 PSID**. SPRING RETURN CLOSED UPON LOSS OF POWER.
10. CHILLED WATER BYPASS VALVE SIZED FOR **400 GPM** AT **35 PSID**. FAIL IN PLACE UPON LOSS OF POWER.
11. CW SYSTEM BYPASS VALVE SIZED FOR **700 GPM** AT **3 PSID**. FAIL IN PLACE UPON LOSS OF POWER.
12. UPS TO ALLOW ALL CONTROL AND ALARM LOOPS TO REMAIN IN OPERATION FOR 5 MINUTES FOLLOWING ELECTRICAL "BLIP" OR FULL SHUTDOWN. UPS TO BE COMPLETE WITH MAINTENANCE BYPASS SWITCH TO ACCOMMODATE BATTERY SERVICE. INSTALL ADJACENT TO DDC CONTROLLER.
13. ECC TO PROVIDE CONDUIT AND WIRING BETWEEN BLOWDOWN VALVE AND CONDUCTIVITY CONTROLLER. COORDINATE WITH 232500 WATER TREATMENT PROVIDER.
14. PROVIDE A DIFFERENTIAL PRESSURE SWITCH AT THE CHILLED WATER FILTER FEEDER, PRESSURE RANGE 0-20 PSID, SET AT 12 PSID OR PER FILTER FEEDER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
15. HARDWIRE TO THE CONDENSER CONTROLLER (NOT OVER THE NETWORK) WHERE THE LEVEL CONTROLLER RESIDES.
16. ECC TO PROVIDE ANY PUMP INTERLOCK WIRING AND EMT AND RELAYS WHICH THE WWHP REQUIRES TO OPERATE AS DETERMINED IN WRITING BY THE WWHP WRITTEN INSTALLATION INSTRUCTIONS.
17. FLOW SWITCH, ADJUSTABLE 5 SECOND TIMER, AND RELAY TO ALLOW FOR VFC HAND OPERATION OF PUMPS.
18. COORDINATE CLOSELY WITH THE FINAL PROCESSED ELECTRICAL SUBMITTALS AND THE ELECTRICAL EQUIPMENT MANUFACTURER REGARDING THE CCA/CCU MOTOR ALARM TRIP SIGNAL. PANEL ID CNO-1, WIRE AT A RELAY PACKAGE FURNISHED AS AN ACCESSORY ON THE ATS LOCATED WITHIN THE EMERGENCY POWER ELECTRICAL ROOM 198K (SIGNAL MAY BE TRANSFERRED OVER THE NETWORK TO DDC-COOLING). SUBMIT AN RFI TO THE ELECTRICAL ENGINEER OUTLINING THE SPECIFICS OF THE PROPOSED SOLUTION.
19. ANALOG INPUT ACTUATOR, FAIL IN PLACE UPON LOSS OF POWER, CONTROL VALVE FURNISHED BY THE ECC. WIRING AND EMT BETWEEN VALVE AND CHILLER PROVIDED BY THE ECC. ECC TO CONFIRM CHILLER SIGNAL WITH SUBMITTED MANUFACTURER. ECC TO CONFIRM THAT CHILLER MANUFACTURER'S SIGNAL WILL FULLY CLOSE THIS VALVE WHEN THE CHILLER IS INOPERATIVE TO ISOLATE THE INOPERATIVE CHILLER OR PROVIDE ADDITIONAL COMPONENTS AS REQUIRED. AS REQUIRED TO MEET THIS CONTROL FUNCTION, CHILLER OUTPUT WILL MODULATE VALVE AS REQUIRED TO MEET MANUFACTURER'S HEAD PRESSURE AND DIFFERENTIAL PRESSURE AND FLOW REQUIREMENT NEEDS WHEN THE CHILLER IS OPERATING.
20. VALVE ACTUATOR OPEN STATUS CONNECTED TO PUMP 'S VFD PERMISSIVE INPUT.
21. FAIL IN PLACE UPON LOSS OF POWER.
22. COOLING TOWERS ARE EACH FURNISHED WITH THREE FANS AND THREE FAN MOTORS POWERED BY THREE SEPARATE VFC. FOR VIBRATION SWITCHES AND MOTOR HEATERS SEE SKETCH ON SHEET M802A.

SCHEDULE OF DDC POINTS (COOLING)

ID	DESCRIPTION	TREND	ALARM	GRAPHIC
AI-1	SYSTEM CHILLED WATER SUPPLY TEMPERATURE	X	X	X
AI-2	CB WATER SUPPLY TEMPERATURE	X	X	X
AI-3	CONDENSER WATER SUPPLY TEMPERATURE	X	X	X
AI-4	PLANT CHILLED WATER RETURN TEMPERATURE	X	X	X
AI-5	CHW LOADS CHILLED WATER RETURN TEMPERATURE	X	X	X
AI-6	CONDENSER WATER RETURN TEMPERATURE	X	X	X
AI-7	MIXED CB RETURN TEMPERATURE	X	X	X
AI-8	SYSTEM CB RETURN TEMPERATURE	X	X	X
AI-9	SYSTEM CHILLED WATER DIFFERENTIAL PRESSURE #1	X	X	X
AI-10	SYSTEM CHILLED WATER DIFFERENTIAL PRESSURE #2	X	X	X
AI-11	SYSTEM CHILLED WATER FLOW RATE	X	X	X
AI-11A	SYSTEM CHILLED WATER LOAD (CALCULATED)	X	X	X
AI-12	HE-2 CB WATER LEAVING TEMPERATURE	X	X	X
AI-13	CH-1 EVAPORATOR DIFFERENTIAL PRESSURE	X	X	X
AI-14	CH-2 EVAPORATOR DIFFERENTIAL PRESSURE	X	X	X
AI-15	CH-3 EVAPORATOR DIFFERENTIAL PRESSURE	X	X	X
AI-16	ACC EVAPORATOR DIFFERENTIAL PRESSURE	X	X	X
AI-17	SYSTEM CHILLED WATER RETURN TEMPERATURE	X	X	X
AI-18	CH-1 CONDENSER DIFFERENTIAL PRESSURE	X	X	X
AI-19	CH-2 CONDENSER DIFFERENTIAL PRESSURE	X	X	X
AI-20	CH-3 CONDENSER DIFFERENTIAL PRESSURE	X	X	X
AI-21	SYSTEM GLYCOL WATER FLOWMETER	X	X	X
AI-22	SYSTEM CB DIFFERENTIAL PRESSURE #1	X	X	X
AI-23	SYSTEM CB DIFFERENTIAL PRESSURE #2	X	X	X
AI-24	SYSTEM CB DIFFERENTIAL PRESSURE #3	X	X	X
AI-25	OUTDOOR AIR TEMPERATURE	X	X	X
AI-26	SYSTEM GLYCOL SUPPLY TEMPERATURE	X	X	X
AI-27	SYSTEM GLYCOL RETURN TEMPERATURE	X	X	X
AI-28	HE-1 CB WATER LEAVING TEMPERATURE	X	X	X
AI-29	WWHP LEAVING CB (EVAPORATOR) TEMPERATURE	X	X	X
AI-30	WWHP ENTERING CB (EVAPORATOR) TEMPERATURE	X	X	X
AI-31	WWHP ENTERING HWR CONDENSER TEMPERATURE	X	X	X
AI-32	WWHP LEAVING HW CONDENSER TEMPERATURE	X	X	X
AI-34	MAKEUP CW WATER FLOWMETER	X	X	X
AI-35	WWHP CB WATER FLOW RATE	X	X	X
AI-36	WWHP HW WATER FLOW RATE	X	X	X
AI-37	CW HEADER DIFFERENTIAL PRESSURE	X	X	X
AI-38	CB SYSTEM CHILLED WATER RETURN TEMPERATURE	X	X	X
AI-39	WWHP EVAPORATOR DIFFERENTIAL PRESSURE	X	X	X
AI-40	WWHP CONDENSER DIFFERENTIAL PRESSURE	X	X	X
AI-41	HE-2 CW DIFFERENTIAL PRESSURE	X	X	X
AI-42	HE-2 CB DIFFERENTIAL PRESSURE	X	X	X
AO-1	CT-1 VFC SPEED	X		X
AO-2	CT-2 VFC SPEED	X		X
AO-3	CT-3 VFC SPEED	X		X
AO-4	CHWP-1 VFC SPEED	X		X
AO-5	CHWP-2 VFC SPEED	X		X
AO-6	CHWP-3 VFC SPEED	X		X
AO-7	CBP-1 VFC SPEED	X		X
AO-8	CBP-2 VFC SPEED	X		X
AO-9	CHILLED WATER SYSTEM BYPASS VALVE	X		X
AO-10	COOLING TOWER BYPASS VALVE	X		X
AO-11	CB SYSTEM BYPASS VALVE	X		X
AO-12	CH-1 CHILLED WATER TEMPERATURE CONTROL POINT	X		X
AO-13	CH-2 CHILLED WATER TEMPERATURE CONTROL POINT	X		X
AO-14	CH-3 CHILLED WATER TEMPERATURE CONTROL POINT	X		X
AO-15	ACC-5 TEMPERATURE CONTROL SETPOINT	X		X
AO-16	CB SYSTEM TEMP CONTROL VALVE	X		X
AO-17	CH-1 EVAPORATOR ISOLATION VALVE	X		X
AO-18	CH-2 EVAPORATOR ISOLATION VALVE	X		X
AO-19	CH-3 EVAPORATOR ISOLATION VALVE	X		X
AO-20	CH-1 CONDENSER ISOLATION VALVE	X		X
AO-21	CH-2 CONDENSER ISOLATION VALVE	X		X
AO-22	CH-3 CONDENSER ISOLATION VALVE	X		X
AO-23	CBP-3 VFC SPEED	X		X
AO-24	CBP-4 VFC SPEED	X		X
AO-25	HWP-4 VFC SPEED	X		X
AO-26	CBP-5 VFC SPEED	X		X
AO-27	GWP-1 VFC SPEED	X		X
AO-28	GWP-2 VFC SPEED	X		X
BI-1A	CT-1 FAN A VFC STATUS	X	X	X
BI-2A	CT-2 FAN A STATUS	X	X	X
BI-3A	CT-3 FAN A STATUS	X	X	X
BI-4A	CT-1 FAN A VFC FAULT	X	X	X
BI-5A	CT-2 FAN A FAULT	X	X	X
BI-6A	CT-3 FAN A FAULT	X	X	X
BI-7	PENTHOUSE WATER DETECTOR ALARM #1	X	X	X
BI-8	PENTHOUSE WATER DETECTOR ALARM #2	X	X	X
BI-9	CH-1 STATUS	X	X	X
BI-10	CH-2 STATUS	X	X	X
BI-11	CH-3 STATUS	X	X	X
BI-12	CHWP-1 STATUS	X	X	X
BI-13	CHWP-2 STATUS	X	X	X
BI-14	CHWP-3 STATUS	X	X	X
BI-15	CBP-1 STATUS	X	X	X
BI-16	CBP-2 STATUS	X	X	X
BI-17	GWP-1 STATUS	X	X	X
BI-18	GWP-2 STATUS	X	X	X
BI-19	CBP-3 STATUS	X	X	X
BI-20	CBP-4 STATUS	X	X	X
BI-21	CBP-5 STATUS	X	X	X
BI-22	HWP-4 STATUS	X	X	X
BI-23	CWF PUMP STATUS	X	X	X
BI-24	WWHP STATUS	X	X	X
BI-27	FILTER FEEDER CB DIFFERENTIAL PRESSURE SWITCH	X	X	X
BI-28	FILTER FEEDER CHW DIFFERENTIAL PRESSURE SWITCH	X	X	X
BI-30	ACC-5 GENERAL ALARM	X	X	X
BI-31	CH-1 GENERAL ALARM	X	X	X
BI-32	CH-2 GENERAL ALARM	X	X	X
BI-33	CH-3 GENERAL ALARM	X	X	X
BI-34	CHWP-1 FAULT	X	X	X
BI-35	CHWP-2 FAULT	X	X	X
BI-36	CHWP-3 FAULT	X	X	X
BI-37	CBP-1 FAULT	X	X	X
BI-38	CBP-2 FAULT	X	X	X
BI-39	CBP-3 FAULT	X	X	X
BI-40	CBP-4 FAULT	X	X	X
BI-41	GWP-1 FAULT	X	X	X
BI-42	GWP-2 FAULT	X	X	X
BI-43	CBP-5 FAULT	X	X	X
BI-44	HWP-4 FAULT	X	X	X
BI-45	CONDENSER WATER FILTER STATUS	X	X	X
BI-46	UPS LOW BATTERY ALARM	X	X	X
BI-47	LOSS OF POWER ALARM	X	X	X
BI-48	ACC-5 STATUS	X	X	X
BI-49	GENERATOR ON AND POWER TRANSFERRED	X	X	X
BI-50	CT-1 VIBRATION SWITCH ALARM RELAY	X	X	X
BI-51	CT-2 VIBRATION SWITCH ALARM RELAY	X	X	X
BI-52	CT-3 VIBRATION SWITCH ALARM RELAY	X	X	X
BO-1	CT-1 START-STOP	X	X	X
BO-2	CT-2 START-STOP	X	X	X
BO-3	CT-3 START-STOP	X	X	X
BO-4	CH-1 START-STOP	X	X	X
BO-5	CH-2 START-STOP	X	X	X
BO-6	CH-3 START-STOP	X	X	X
BO-7	ACC-5 START-STOP	X	X	X
BO-8	CHWP-1 START-STOP	X	X	X
BO-9	CHWP-2 START-STOP	X	X	X
BO-10	CHWP-3 START-STOP	X	X	X
BO-11	CBP-1 START-STOP	X	X	X
BO-12	CBP-2 START-STOP	X	X	X
BO-13	CBP-3 START-STOP	X	X	X
BO-14	HWP-4 START-STOP	X	X	X
BO-15	GWP-1 START-STOP	X	X	X
BO-16	GWP-2 START-STOP	X	X	X
BO-17	CBP-4 START-STOP	X	X	X
BO-18	CBP-5 START-STOP	X	X	X
BO-19	CT-1 CONDENSER SUPPLY ISOLATION VALVE	X	X	X
BO-20	CT-1 CS BLEED ISOLATION VALVE	X	X	X
BO-21	CT-2 CONDENSER SUPPLY ISOLATION VALVE	X	X	X
BO-22	CT-2 CS BLEED ISOLATION VALVE	X	X	X
BO-23	CT-3 CONDENSER SUPPLY ISOLATION VALVE	X	X	X
BO-24	CT-3 CS BLEED ISOLATION VALVE	X	X	X
BO-25	CT-1 CONDENSER RETURN ISOLATION VALVE	X	X	X
BO-26	CT-1 CR BLEED ISOLATION VALVE	X	X	X
BO-27	CT-2 CONDENSER RETURN ISOLATION VALVE	X	X	X
BO-28	CT-2 CR BLEED ISOLATION VALVE	X	X	X
BO-29	CT-3 CONDENSER RETURN ISOLATION VALVE	X	X	X
BO-30	CT-3 CR BLEED ISOLATION VALVE	X	X	X
BO-31	WWHP START-STOP	X	X	X
BO-32	WWHP ISOLATION VALVE	X	X	X
BO-33	CWF START-STOP	X	X	X
BO-34	CT-1 MOTOR HEATER ON/OFF	X	X	X
BO-35	CT-2 MOTOR HEATER ON/OFF	X	X	X
BO-36	CT-3 MOTOR HEATER ON/OFF	X	X	X
BO-37	HE-2 ISOLATION VALVE	X	X	X

SCHEDULE OF DDC POINTS (CONDENSER)

ID	DESCRIPTION	TREND	ALARM	GRAPHIC
AI-1	CONDENSER WATER TANK TEMPERATURE	X	X	X
AO-1	CWP-1 VFC SPEED	X		X
AO-2	CWP-2 VFC SPEED	X		X
AO-3	CWP-3 VFC SPEED	X		X
AO-4	CONDENSER WATER MAKEUP VALVE	X		X
AO-5	INDOOR CONDENSER WATER TANK LEVEL	X	X	X
BI-1	CWP-1 STATUS	X	X	X
BI-2	CWP-2 STATUS	X	X	X
BI-3	CWP-3 STATUS	X	X	X
BI-4	CWP-1 FAULT	X	X	X
BI-5	CWP-3 FAULT	X	X	X
BI-6	CWP-3 FAULT	X	X	X
BI-7	TANK ROOM WATER DETECTOR ALARM #1	X	X	X
BI-8	TANK ROOM WATER DETECTOR ALARM #2	X	X	X
BI-9	UPS ON BATTERY ALARM	X	X	X
BI-10	LOSS OF POWER ALARM	X	X	X
BI-11	CWP-1 FLOW SWITCH	X	X	X
BI-12	CWP-2 FLOW SWITCH	X	X	X
BI-13	CWP-3 FLOW SWITCH	X	X	X
BO-1	CWP-1 START-STOP	X	X	X
BO-2	CWP-2 START-STOP	X	X	X
BO-3	CWP-3 START-STOP	X	X	X

SETUP ALL TRENDS IN 15 MINUTE INTERVALS AND STORE FOR MINIMUM 45 DAYS. INCLUDE TRENDS FOR THE ASSOCIATED COMMAND AND/OR SETPOINT IN ADDITION TO POINT LISTED IN SCHEDULE. PROVIDE CHANGE OF VALUE AND INTERVAL TRENDS FOR BI AND BO POINTS.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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REFER TO CIVIL DRAWINGS FOR TRUE NORTH

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MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

COOLING SYSTEMS TEMPERATURE CONTROL DIAGRAMS

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

M802

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FUME HOOD EXHAUST VALVE SCHEDULE		
TAG	UNIT INLET SIZE (IN)	NOTES
FHEV-1-106-1	10	
FHEV-1-106-2	10	
FHEV-1-106-3	10	
FHEV-1-109	10	
FHEV-1-112-1	10	
FHEV-1-125 FUTURE	10	
FHEV-1-126	10	
FHEV-1-143-FUTURE	10	
FHEV-1-146-FUTURE	10	
FHEV-1-150-1	10	
FHEV-1-150-2 FUTURE	10	
FHEV-1-220 FUTURE	10	
FHEV-1-226	10	
FHEV-1-227 FUTURE	10	
FHEV-1-231	10	
FHEV-1-325	10	
FHEV-1-328	10	
FHEV-1-332 FUTURE	10	
FHEV-1-333 FUTURE	10	
FHEV-1-337	10	
FHEV-1-338 FUTURE	10	
FHEV-1-420-1	10	
FHEV-1-420-2 FUTURE	10	
FHEV-1-423-1	10	
FHEV-1-423-2 FUTURE	10	
FHEV-1-423-3	10	
FHEV-1-424-1	10	
FHEV-1-424-2 FUTURE	10	
FHEV-1-427-1	10	
FHEV-1-427-2 FUTURE	10	
FHEV-1-427-3 FUTURE	10	
FHEV-1-428-1	10	
FHEV-1-428-2 FUTURE	10	
FHEV-1-434-1	10	
FHEV-1-434-2 FUTURE	10	
FHEV-1-435-1	10	
FHEV-1-435-2 FUTURE	10	
FHEV-1-436-1 FUTURE	10	
FHEV-1-436-2	10	
FHEV-1-437-1 FUTURE	10	
FHEV-1-437-2	10	
FHEV-1-437-3 FUTURE	10	
FHEV-1-523 FUTURE	10	
FHEV-1-530 FUTURE	10	
FHEV-1-531 FUTURE	10	
FHEV-1-537	10	
FHEV-1-538	10	
Grand total: 47		

5

ALL FHEV ARE ARE FURNISHED BY THE CONTROL SUPPLIER. FHEV ARE INSTALLED BY THE SHEETMETAL TRADES. FHEV ARE SIEMENS MODEL AVD WITH OPTIONS FOR: PVDF COATING OPTION, FLANGED END CONNECTIONS, STAINLESS STEEL PRESSURE TAPS, SPRING RETURN UPON UPON LOSS OF POWER ACTUATOR WITH TWO SECOND FULL STROKE SPEED.

ALL FHEV WHOSE TAG ENDS WITH THE WORD "FUTURE" ARE NOT FURNISHED BY THE CONTROL SUPPLIER, NOR INSTALLED BY THE SHEETMETAL TRADES, NOR FURNISHED BY ANYONE ELSE AT THIS TIME (HENCE THE NAME "FUTURE"). PROVIDE IN THE BAS DESIGN FOR THE LANDING OF THESE FUTURE FHEV AND FUTURE FUME HOOD POINTS ON THE FURNISHED BAS EQUIPMENT AND THE CONTROLLING THESE FUTURE FHEV IN THE FURNISHED BAS PROGRAMMING.

LAB CONTROL SCHEDULE NOTES:

1. DUCT MOUNTED HEATING COILS IN LABS ARE NOT SCHEDULED ON THIS SHEET, SO THEY ARE NOT TO BE FURNISHED BY THE LABORATORY CONTROLS SUPPLIER, NOR ARE THEY FURNISHED BY THE ECC. SEE OTHER M SHEETS FOR WHO IS TO FURNISH THESE DUCT MOUNTED HEATING COILS.

2. THE TOTAL OF THE OCCUPIED LAB GENERAL EXHAUST AIR VALVE MINIMUM AND THE TRANSFER AIR EQUALS AT LEAST 6 ACH. THE TOTAL OF THE UNOCCUPIED LAB GENERAL EXHAUST AIR MINIMUM AND THE TRANSFER AIR EQUALS AT LEAST 4.0 ACH.

3. THE FINAL LGEV EXHAUST MINIMUM AIRFLOWS (OCCUPIED STATE AND UNOCCUPIED STATE) IS DETERMINED AFTER THE FINAL EH&S APPROVED FHEV SETTINGS ARE FINALIZED AND PUBLISHED. THE INITIAL LGEV SETTINGS SHOULD BE PROGRAMMED BASED ON THE INITIAL FHEV SETTINGS SCHEDULED AS SUCH:
   * ADD THE FINAL AIRFLOW SETTINGS OF ALL FUME HOODS WITHIN THE PARTICULAR LAB CONTROLS SYSTEM TOGETHER TO GET "SUM A".
   * ADD THE SCHEDULED LAB OCCUPIED MODE OFFSET TO THE QUANTITY "SUM A" TO YIELD "SUM B" FOR EACH SPACE. NOTE THAT ADDING AN "-100" OFFSET TO "SUM A" WILL RESULT IN "SUM B" BEING 100 CFM LESS THAN "SUM A".

4. INCLUDES THE SUM OF BOTH DAY ONE INSTALLED CHEMICAL FUME HOODS AND "FUTURE" INSTALLED CHEMICAL FUME HOODS. THE SUM IS THE TOTAL QUANTITY OF FHEV TO DESIGN THE LAB ROOM CONTROLLER TO CONTROL.

THIS TEMPERATURE CONTROL DRAWING IS FOR REFERENCE ONLY AND IS NOT TO BE USED AS A BASIS FOR BIDDING.

REFER TO THE CONTROLS SUPPLIER, SIEMENS BUILDING TECHNOLOGIES, INSTALLATION DRAWINGS, TO BE INCLUDED BY ADDENDUM, FOR THE BIDDING SCOPE OF THE CONTROL INSTALLATION CONTRACT.

LAB CONTROLS ROOM SCHEDULE (1)

LAB CONTROLS ZONE NUMBER	ROOM NUMBER	MINIMUM TOTAL LAB CONTROL SYSTEM SUPPLY AIRFLOW (CFM), OCCUPIED MODE (2)(3)	MINIMUM TOTAL LAB CONTROL SYSTEM SUPPLY AIRFLOW (CFM), UNOCCUPIED MODE (2)(3)	DESIGN QUANTITY CHEMICAL FUME HOODS PER LAB CONTROLS ZONE (4)	QUANTITY OF EQUIPMENT EXHAUST AIR VALVES PER LAB CONTROLS SYSTEM	TOTAL SUPPLY MINUS TOTAL EXHAUST LAB OCCUPIED MODE AND UNOCCUPIED MODE OFFSET (CFM)	COOLING ONLY CHILLED BEAMS VALVE	FINNED TUBE RADIATION VALVE	NOTES
106	103	720	X	THREE	NONE	- 75	NO	NO	
107	107	585	X	NONE	ONE	- 150	NO	NO	
108	107	1,220	X	NONE	ONE	- 150	NO	NO	
109	106	760	X	ONE	ONE	- 75	NO	NO	
110	106	1,035	X	NONE	ONE	- 75	NO	NO	
111	108A	560	X	NONE	NONE	- 50	NO	NO	
112	108A	430	X	TWO	ONE	- 50	NO	NO	
121	127	200	X	ONE	NONE	- 50	NO	NO	
122	113	75	X	NONE	NONE	- 50	NO	NO	
124	111	75	X	NONE	NONE	- 50	NO	NO	
130	118	400	X	NONE	NONE	NEUTRAL	YES	NO	
131	118	400	X	NONE	NONE	NEUTRAL	YES	NO	
143	108B	230	X	ONE	NONE	- 50	NO	NO	
144	108BA	300	X	NONE	NONE	NEUTRAL	NO	NO	
146	118A	95	X	ONE	NONE	- 50	NO	NO	
147	118B	45	X	NONE	NONE	PLUS 50	NO	NO	
148	118C	80	X	NONE	NONE	PLUS 50	NO	NO	
150	103	1,050	X	TWO	NONE	- 75	NO	NO	
219	227N	90	X	NONE	NONE	NEUTRAL	NO	NO	
220	227M	170	X	ONE	ONE	- 75	NO	NO	
221	227L	250	X	NONE	NONE	NEUTRAL	NO	NO	
223	227JB	105	X	NONE	NONE	NEUTRAL	NO	NO	
224	227JA	140	X	NONE	NONE	NEUTRAL	YES	NO	
225	227J	170	X	NONE	ONE	- 75	YES	NO	
226	227H	430	X	ONE	ONE	- 75	NO	NO	
227	227G	665	X	ONE	ONE	- 100	NO	NO	
228	227F	430	X	NONE	ONE	- 75	YES	NO	
229	227E	395	X	NONE	ONE	- 75	YES	YES	
230	227D	155	X	NONE	ONE	- 75	YES	YES	
231	227C	660	X	ONE	ONE	- 100	YES	YES	
232	227	425	X	NONE	NONE	PLUS 425	NO	NO	NO LGEV IN THIS ZONE
234	227A	350	X	NONE	NONE	NEUTRAL	NO	NO	
324	327F	90	X	NONE	NONE	NEUTRAL	NO	NO	
325	327	485	X	ONE	NONE	- 75	NO	NO	
326	327E	180	X	NONE	NONE	NEUTRAL	YES	NO	
327	327D	180	X	NONE	NONE	NEUTRAL	NO	NO	
328	327	655	X	ONE	ONE	- 75	NO	NO	
329	327	610	X	NONE	ONE	- 75	NO	NO	
330	327C	130	X	NONE	ONE	PLUS 50	YES	NO	
331	327B	60	X	NONE	NONE	NEUTRAL	NO	NO	
332	327	750	X	ONE	ONE	- 75	YES	YES	
333	327	945	X	ONE	ONE	- 75	YES	YES	
335	327A	350	X	NONE	NONE	NEUTRAL	NO	NO	
337	327	525	X	ONE	NONE	NEUTRAL	NO	NO	
338	327	515	X	ONE	ONE	NEUTRAL	NO	NO	
405	407	725	X	NONE	NONE	NEUTRAL	NO	NO	
419	427H	90	X	NONE	NONE	NEUTRAL	NO	NO	
420	427	345	X	TWO	NONE	- 75	NO	NO	
421	427G	180	X	NONE	NONE	NEUTRAL	YES	NO	
422	427F	180	X	NONE	NONE	NEUTRAL	NO	NO	
423	427	340	X	THREE	NONE	- 75	NO	NO	
424	427	1,005	X	TWO	ONE	NEUTRAL	NO	NO	
425	427E	130	X	NONE	NONE	PLUS 50	YES	NO	
426	427D	180	X	NONE	NONE	NEUTRAL	NO	NO	
427	427	450	X	THREE	NONE	- 75	NO	NO	
428	427	790	X	TWO	ONE	NEUTRAL	NO	YES	
429	427C	350	X	NONE	NONE	NEUTRAL	NO	YES	
430	407	725	X	NONE	NONE	PLUS 150	NO	NO	
431	427B	75	X	NONE	NONE	NEUTRAL	NO	NO	
434	427	215	X	TWO	NONE	- 75	NO	YES	
435	427	280	X	TWO	NONE	NEUTRAL	NO	YES	
436	427	400	X	TWO	NONE	- 125	NO	NO	
437	427	765	X	THREE	ONE	NEUTRAL	NO	NO	
502	504	1,000	X	NONE	NONE	NEUTRAL	NO	NO	
507	504A	115	X	NONE	NONE	NEUTRAL	YES	NO	
508	504B	120	X	NONE	NONE	NEUTRAL	YES	NO	
509	504	1,000	X	NONE	ONE	NEUTRAL	NO	NO	
521	527	585	X	NONE	ONE	- 150	NO	NO	
522	527J	90	X	NONE	NONE	NEUTRAL	NO	NO	
523	527	480	X	ONE	NONE	- 75	NO	NO	
524	527H	180	X	NONE	NONE	NEUTRAL	YES	NO	
526	527	615	X	NONE	ONE	- 125	NO	NO	
528	527F	180	X	NONE	ONE	PLUS 50	YES	NO	
529	527E	180	X	NONE	NONE	NEUTRAL	NO	NO	
530	527	780	X	ONE	ONE	- 75	YES	YES	
531	527	1,070	X	ONE	ONE	- 75	YES	YES	
532	527D	490	X	NONE	NONE	NEUTRAL	YES	NO	
533	527C	350	X	NONE	NONE	NEUTRAL	NO	NO	
534	509	725	X	NONE	NONE	PLUS 150	NO	NO	
535	527B	255	X	NONE	NONE	NEUTRAL	NO	NO	
536	504	1,075	X	NONE	ONE	- 75	NO	NO	
537	527	435	X	ONE	ONE	NEUTRAL	NO	NO	
538	527	505	X	ONE	NONE	NEUTRAL	NO	NO	
540	509	725	X	NONE	NONE	PLUS 150	NO	NO	

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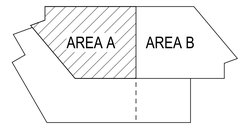
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

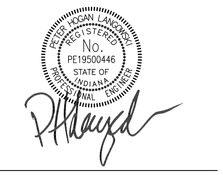
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



LAB CONTROL SCHEDULES AND DIAGRAMS

DATE **REF: SHEET INDEX**
BSA PROJECT NO. **00360481**

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SEQUENCE OF OPERATION - COOLING ONLY TERMINAL BOXES WITH MANUAL VOLUME DAMPER RETURN:

I. OCCUPIED MODE:
1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VALVE FROM SCHEDULED COOLING MINIMUM AIRFLOW TO SCHEDULED MAXIMUM AIRFLOW. THROUGH LAN TO OPERATORS WORK STATION, IT SHALL BE POSSIBLE TO READ AND ADJUST SUPPLY AIR VOLUME (MAXIMUMS AND MINIMUMS). ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

2. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  SPACE HEATING SETPOINT = **70°F**
  SPACE COOLING SETPOINT = **76°F**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

3. TERMINAL BOX SHALL MODULATE BETWEEN MAXIMUM AIRFLOW AND MINIMUM AIRFLOW TO MAINTAIN SPACE TEMPERATURE SETPOINTS. MINIMUM AIRFLOW WILL BE MAINTAINED FROM **1.0"F BELOW** THE *SPACE COOLING SETPOINT* TO THE *SPACE HEATING SETPOINT*. AIR VALVE WILL BE FULLY CLOSED BELOW THE *SPACE HEATING SETPOINT*.

II. UNOCCUPIED MODE:

1. THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME SCHEDULE. INITIAL YEAR UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 5:00PM TO 5:30AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO COMMISSIONING OR TURNOVER.

THE SPACES SHALL BE INDEXED INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION WITH SPACES INDEXED **TEN MINUTES (ADJ.)** AFTER THE LAST SPACE.

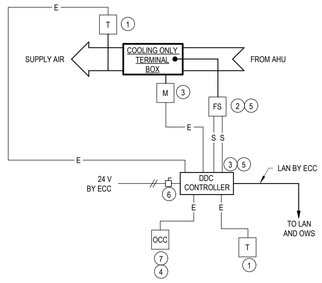
2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60°F (ADJ.)**
  UNOCCUPIED SPACE COOLING SETPOINT = **81°F (ADJ.)**

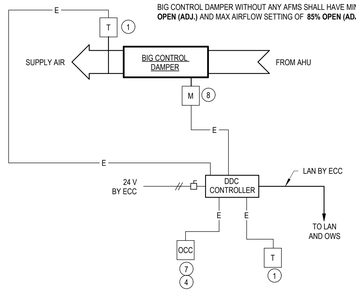
3. TERMINAL BOX SHALL MODULATE BETWEEN MAXIMUM AIRFLOW AND UNOCCUPIED MINIMUM AIRFLOW TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINTS. MINIMUM AIRFLOW WILL BE MAINTAINED FROM **1.0°F BELOW** THE *UNOCCUPIED SPACE COOLING SETPOINT* TO THE *UNOCCUPIED SPACE HEATING SETPOINT*. AIR VALVE WILL BE FULLY CLOSED BELOW THE *UNOCCUPIED SPACE HEATING SETPOINT*.

DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **50% (ADJ.)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT).

3. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

TEMPERATURE SPACE SENSORS:
EACH TERMINAL UNIT SHALL UTILIZE A FLAT PLATE WALL-MOUNTED SPACE SENSOR.

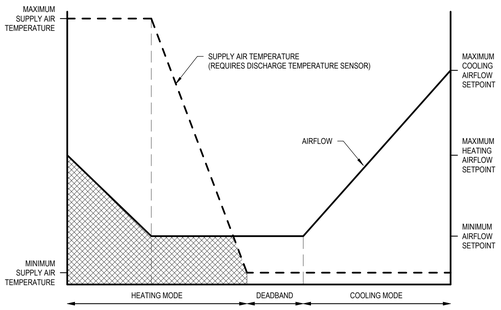


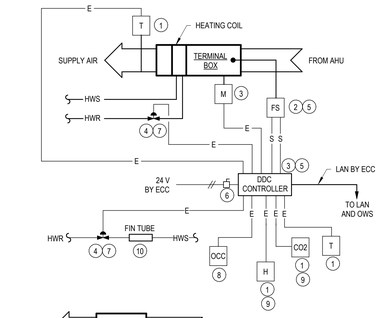


BIG CONTROL DAMPER WITHOUT ANY AFMS SHALL HAVE MIN AIRFLOW SETTING OF **5% OPEN (ADJ.)** AND MAX AIRFLOW SETTING OF **85% OPEN (ADJ.).**

PLAN NOTES:
1. FURNISHED, INSTALLED, WIRED AND COMMISSIONED BY ECC.
2. INTEGRAL WITH TERMINAL BOX.
3. FURNISHED AND COMMISSIONED BY ECC; INSTALLED BY TERMINAL BOX SUPPLIER.
4. REFER TO FLOOR PLANS FOR LOCATIONS AND QUANTITIES.
5. AIR VOLUME SENSOR TO RECALIBRATE AUTOMATICALLY WITH A SCHEDULE APPROVED BY OWNER.
6. DISCONNECT BY BOX MFR.
7. FAIL IN LAST POSITION.
8. FURNISHED AND COMMISSIONED BY ECC; INSTALLED BY ECC.

1 M810 CONTROL SCHEMATIC (VOLUME DAMPER RETURN AHU-7)
NO SCALE





PLAN NOTES:
1. FURNISHED, INSTALLED, WIRED AND COMMISSIONED BY ECC.
2. INTEGRAL WITH TERMINAL BOX.
3. FURNISHED AND COMMISSIONED BY ECC; INSTALLED BY TERMINAL BOX SUPPLIER.
4. FURNISHED BY ECC; INSTALLED BY MC.
5. AIR VOLUME SENSOR TO RECALIBRATE AUTOMATICALLY WITH A SCHEDULE APPROVED BY OWNER.
6. DISCONNECT BY BOX MFR.
7. FAIL IN LAST POSITION.
8. OCCUPANCY SENSOR RELAY IS FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. WIRING FROM THE OCCUPANCY SENSOR RELAY TO THE TERMINAL UNIT CONTROLLER IS FURNISHED, INSTALLED, AND COMMISSIONED BY ECC.
9. REFER TO FLOOR PLANS FOR LOCATIONS AND QUANTITIES. NOT ALL SPACES HAVE ALL THESE INPUTS/OUTPUTS (e.g. HUMIDITY, CO2). SENSOR CAN BE COMBINATION STYLE FOR SPACE MONITORING EXCEPT FOR HUMIDIFIER CONTROL.
10. FIN TUBE HEAT WHERE SHOWN ON PLANS, CONFIRM WITH PLANS.

NOTE: SOME ZONES DO NOT HAVE AN EV PAIRED WITH THE TB: 105, 232, 201, 301, 401, 501. ...

6 M810 VAV TERMINAL BOX AND EXHAUST AIRFLOW CONTROL VALVE CONTROL SCHEMATIC
1/8" = 1'-0"

SEQUENCE OF OPERATION - TERMINAL BOXES WITH AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:
1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE **90°F (ADJ.)** *MAXIMUM LEAVING AIR TEMPERATURE*. UPON REACHING THE *MAXIMUM LEAVING AIR TEMPERATURE* THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY **90°F +/- 5.0°F (ADJ.)** DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

2. PRESSURE-INDEPENDENT AIRFLOW CONTROL VALVE (AFCV) SHALL BE CONTROLLED IN SEQUENCE WITH SUPPLY AIR TERMINAL BOX FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN THE DESIGN AIRFLOW DIFFERENTIAL IN EACH ROOM. **SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.**

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW **50°F (ADJ)** OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE **52°F (ADJ)** OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.
B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT* OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ.)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ.)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ.)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ.)** FOR LONGER THAN **15 MINUTES (ADJ.)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).
B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ.)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ.)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:

1. THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. THE FOURTH GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE THIRD GROUP. THE LAST GROUP OF SPACES CONSISTING OF THE REMAINDER OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FOURTH GROUP.

2. TIME SCHEDULE IS UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE/OPEN OR MODULATE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- SPACE UNOCCUPIED MODE (SPACE OCCUPANCY IS SCHEDULED UNOCCUPIED). IF AHU OCCUPANCY IS SCHEDULED TO TURN THE AHU OFF OR BUILDING-WIDE OCCUPANCY IS SCHEDULED OFF IT DOES NOT REVISE THE SPACE UNOCCUPIED MODE OPERATION.
  UNOCCUPIED SPACE HEATING SETPOINT = **60°F (ADJ.)**
  UNOCCUPIED SPACE COOLING SETPOINT = **80°F (ADJ.)**
  DURING UNOCCUPIED MODE, THE TERMINAL BOX AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ.)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS TERMINAL BOX CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE AHU IS OPERATING OR NOT). DURING UNOCCUPIED MODE, THE EXHAUST AIR VALVE CONTROLS TO AN UNOCCUPIED MODE MINIMUM AIRFLOW WHICH IS **10% (ADJ.)** OF THE OCCUPIED MINIMUM SCHEDULED AIRFLOW (THIS EXHAUST AIR VALVE CONTROL SEQUENCE OCCURS REGARDLESS OF WHETHER THE EXHAUST FAN IS OPERATING OR NOT). **SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.**

HEATING COIL CONTROL AND FIN TUBE RADIATION CONTROL ARE THE SAME AS OCCUPIED MODE EXCEPT UTILIZE THE *UNOCCUPIED SPACE HEATING SETPOINT* AND THE *UNOCCUPIED SPACE COOLING SETPOINT* AS TEMPERATURE SETPOINTS RATHER THAN THE OCCUPIED VERSIONS OF THESE SETPOINTS.

3. EACH TERMINAL BOX HEATING VALVE SHALL REMAIN ACTIVE WHEN ITS ASSOCIATED AHU IS DE-ENERGIZED. THE FIN TUBE VALVE CONTROL REMAINS ACTIVE WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF, CONTROLLING THE SPACE TEMPERATURE TO THE *UNOCCUPIED SPACE HEATING SETPOINT*. THE TERMINAL BOX AIR VALVE SHALL NOT BE FULLY CLOSED WHEN THE ASSOCIATED AHU SERVING THE SPACE IS OFF (TO ASSIST IN RESTARTING OF THE AHU).

SEQUENCE OF OPERATION - CAV BOXES (OCCUPIED AND UNOCCUPIED):

1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE BY MODULATING HEATING COIL VALVE. SUPPLY AIR VOLUME AND EXHAUST AIR VOLUME IS TO BE MAINTAINED AT A CONSTANT VALUE REGARDLESS OF CHANGES IN SUPPLY DUCT STATIC PRESSURE THROUGH CONTROL OF DAMPER ACTUATOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE SPACE TEMPERATURE AND SUPPLY AIR VOLUMES (MAXIMUM AND MINIMUMS).

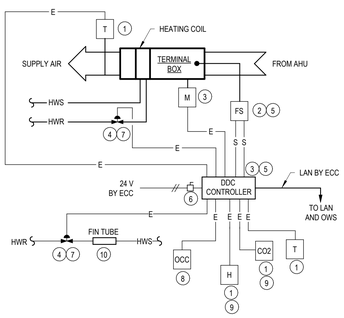
2. OCCUPIED/UNOCCUPIED TEMPERATURE SETBACK SEQUENCES MATCH VAV SEQUENCE.

TEMPERATURE SPACE SENSORS:

EACH TERMINAL UNIT SHALL UTILIZE SPACE SENSORS NOTED BELOW UNLESS NOTED OTHERWISE ON THE PLANS:

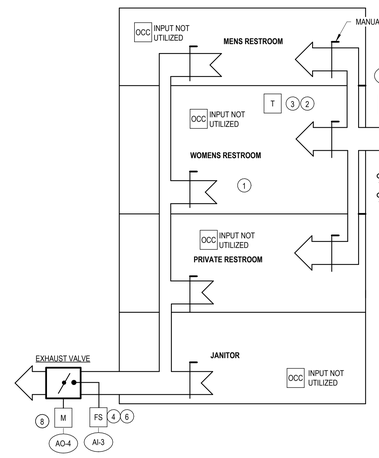
THERMOSTAT: WALL-MOUNTED SPACE SENSOR WITH USER ADJUSTABLE OCCUPIED SETPOINT ADJUSTMENT RANGE OF PLUS THREE DEGF OR MINUS THREE DEGF FROM THE STANDARD SETPOINTS NOTED ABOVE.

4 M810 VAV TERMINAL BOX WITHOUT EXHAUST AIRFLOW CONTROL VALVE CONTROL SCHEMATIC
1/8" = 1'-0"



PLAN NOTES:
1. FURNISHED, INSTALLED, WIRED AND COMMISSIONED BY ECC.
2. INTEGRAL WITH TERMINAL BOX.
3. FURNISHED AND COMMISSIONED BY ECC; INSTALLED BY TERMINAL BOX SUPPLIER.
4. FURNISHED BY ECC; INSTALLED BY MC.
5. AIR VOLUME SENSOR TO RECALIBRATE AUTOMATICALLY WITH A SCHEDULE APPROVED BY OWNER.
6. DISCONNECT BY BOX MFR.
7. FAIL IN LAST POSITION.
8. OCCUPANCY SENSOR RELAY IS FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. WIRING FROM THE OCCUPANCY SENSOR RELAY TO THE TERMINAL UNIT CONTROLLER IS FURNISHED, INSTALLED, AND COMMISSIONED BY ECC.
9. REFER TO FLOOR PLANS FOR LOCATIONS AND QUANTITIES. NOT ALL SPACES HAVE ALL THESE INPUTS/OUTPUTS (e.g. HUMIDITY, CO2). SENSOR CAN BE COMBINATION STYLE FOR SPACE MONITORING EXCEPT FOR HUMIDIFIER CONTROL.
10. FIN TUBE HEAT WHERE SHOWN ON PLANS, CONFIRM WITH PLANS.

5



OCCUPIED/UNOCCUPIED MODE:

THESE SPACES SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL REGULAR SCHOOL YEAR UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. PROVIDE A SUMMER SEMESTER UNOCCUPIED HOURS PROGRAMMED MODE WITH THE UNOCCUPIED CYCLE FROM 7:00PM TO 6:00AM MONDAY THROUGH FRIDAY; AND ALL DAY ON WEEKENDS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

TERMINAL BOX SQUENCE OF OPERATION:

1. TERMINAL BOX WILL OPERATE UNDER THE STANDARD "VAV TERMINAL BOX AND AIRFLOW CONTROL VALVE CONTROL SCHEMATIC" SEQUENCE OF OPERATIONS AS MODIFIED BELOW.
2. THE TERMINAL BOX SHALL TRACK THE EXHAUST VALVE BY A NEGATIVE OFFSET AS INDICATED BY THE AIRFLOWS LISTED ON THE DRAWINGS AND UTILIZE NORMAL CAV SPACE TEMPERATURE CONTROL TO MEET THE SPACE TEMPERATURE SETPOINT.
4. IN UNOCCUPIED MODE THE TERMINAL BOX SHALL FULLY CLOSE.

EXHAUST VALVE SQUENCE OF OPERATION:

1. EV WILL OPERATE UNDER THE STANDARD "VAV TERMINAL BOX AND EXHAUST VALVE CONTROL SCHEMATIC" SEQUENCE OF OPERATIONS AS MODIFIED BELOW.
2. IN OCCUPIED MODE THE MINIMUM EXHAUST AIRFLOW SHALL BE AS INDICATED BY THE AIRFLOWS LISTED ON THE DRAWINGS AND IN THE EV SCHEDULE.
3. THERE IS NO OCCUPIED STANDBY MODE. THE OCCUPANCY SENSOR INPUTS ARE NOT UTILIZED.
4. IN UNOCCUPIED MODE THE EXHAUST AIRFLOW SHALL BE **150 CFM (ADJ.)** CONSTANT VOLUME.

3 M810 RESTROOM CONTROL SCHEMATIC
NO SCALE

GENERAL NOTES:

A. CONTROL LOGIC NOTED ON THIS SHEET SHALL RESIDE IN THE TERMINAL UNITS.
B. PROVIDE A SEPARATE GRAPHICS PAGE WHICH ILLUSTRATES ALL THE ITEMS ON THIS SCHEMATIC.
C. CONTROL SUPPLIER MAY UTILIZE TERMINAL EQUIPMENT CONTROLLERS AND PASS VALUES OVER THE NETWORK TO THE DDC PANEL, BUT ALL ADJUSTABLE POINTS NOTED ABOVE SHALL BE ADJUSTABLE DIRECTLY FROM THE SEPARATE GRAPHICS PAGE FOR THIS ROOM.
D. ALL SETPOINTS TO BE ADJUSTABLE. SETPOINTS TO BE EXPOSED ON GRAPHIC DISPLAY OR HIDDEN BASED ON OWNER REQUEST.

SCHEMATIC NOTES:

1. SEE DUCTWORK DRAWING FOR MAXIMUM OCCUPIED DIFFUSER AND GRILLE AIRFLOWS.
2. PROVIDE STAINLESS FLAT PLATE SPACE SENSOR.
3. FURNISHED, INSTALLED, WIRED, AND COMMISSIONED BY ECC.
4. INTEGRAL WITH TERMINAL BOX.
5. FAIL IN LAST POSITION.
6. AIR VOLUME SENSOR TO RECALIBRATE AUTOMATICALLY WITH A SCHEDULE APPROVED BY OWNER.
7. FURNISHED BY ECC; INSTALLED BY MC.
8. FURNISHED AND COMMISSIONED BY ECC; INSTALLED BY TERMINAL BOX SUPPLIER.

SEQUENCE OF OPERATION - TERMINAL BOXES WITH AIRFLOW CONTROL VALVE (EXHAUST VALVE - EV):

I. OCCUPIED MODE:
1. TERMINAL BOX CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE AND VARIATIONS IN SYSTEM STATIC PRESSURE (PRESSURE INDEPENDENT) TO MODULATE SUPPLY AIR VOLUME VALVE FROM SCHEDULED MINIMUM TO MAXIMUM. WHEN TERMINAL BOX HEATING IS REQUIRED, HEATING COIL TO MODULATE OPEN AND PROVIDE **90°F (ADJ.)** *MAXIMUM LEAVING AIR TEMPERATURE*. UPON REACHING THE *MAXIMUM LEAVING AIR TEMPERATURE* THE BOX HEATING AIRFLOW IS THEN MODULATED FROM THE SCHEDULED HEATING MINIMUM AIRFLOW TO THE SCHEDULED MAXIMUM HEATING AIRFLOW TO MAINTAIN A RANGE OF APPROXIMATELY **90°F +/- 5.0°F (ADJ.)** DISCHARGE AIR TEMPERATURE AS ADDITIONAL HEAT IS REQUIRED. ECC TO NOTE THAT ALL ACTUATORS ARE FURNISHED BY ECC AND INSTALLED BY BOX MANUFACTURER ON DDC CONTROLLED BOXES.

2. PRESSURE-INDEPENDENT AIRFLOW CONTROL VALVE (AFCV) SHALL BE CONTROLLED IN SEQUENCE WITH SUPPLY AIR TERMINAL BOX FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN THE DESIGN AIRFLOW DIFFERENTIAL IN EACH ROOM. **SUPPLY AIRFLOW TRACKS EXHAUST AIRFLOW.**

3. HEATING COIL CONTROL:
A. IF THE SPACE IS NOT SERVED BY FIN TUBE, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
B. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS ENABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
C. IF FIN TUBE IS PRESENT AND WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.

4. WHERE FIN TUBE RADIATION IS USED:
A. THE FIN TUBE CONTROL VALVE SHALL BE ENABLED TO MODULATE WHEN AT OR BELOW **50°F (ADJ)** OUTDOOR AIR TEMPERATURE. THE FIN TUBE CONTROL VALVE SHALL BE COMMANDED FULLY CLOSED AND DISABLED FROM MODULATION ABOVE **52°F (ADJ)** OUTDOOR AIR TEMPERATURE IRRESPECTIVE OF OTHER CONTROL SEQUENCES.
B. WHEN ENABLED, THE FIN TUBE CONTROL VALVE SHALL WORK IN CONJUNCTION WITH THE HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT* OF THE ROOM IT IS LOCATED IN. THE FIN TUBE CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*. THE HEATING COIL CONTROL VALVE OPERATES FROM 50% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.
C. WHEN THE FIN TUBE CONTROL VALVE IS DISABLED, THE HEATING COIL CONTROL VALVE OPERATES FROM 0% TO 100% HEATING MODE LOOP OUTPUT TO MAINTAIN THE *SPACE HEATING SETPOINT*.

5. WHERE CO2 SENSING IS USED:
A. ANYTIME THE OCCUPANCY SENSOR INDICATES OCCUPANCY AND THE CO2 LEVEL EXCEEDS **950 PPM (ADJ.)**, THE TERMINAL BOX SHALL ENGAGE CO2 CONTROL TO SLOWLY MODULATE SUPPLY AIR VOLUME FROM MINIMUM SCHEDULED AIRFLOW TO MAXIMUM SCHEDULED AIRFLOW AS REQUIRED TO LOWER THE PPM BACK TO **800 PPM (ADJ.)** WHILE THE HEATING COIL VALVE MODULATES AS NEEDED TO MAINTAIN SPACE TEMPERATURE SETPOINTS. UPON REACHING **800 PPM (ADJ.)**, THE CO2 CONTROL SHALL BE RELEASED AND THE AIRFLOW IS MODULATED TO MEET THE SPACE TEMPERATURE SETPOINTS. INITIATE AN ALARM TO THE OWS IN THE EVENT THAT THE SPACE IS OCCUPIED AND THE CO2 LEVEL EXCEEDS **1,300 PPM (ADJ.)** FOR LONGER THAN **15 MINUTES (ADJ.)**. CO2 CONTROL IS APPLICABLE IN ALL MODES OF OPERATION (OCCUPIED, STANDBY, AND UNOCCUPIED).
B. ANYTIME THE BUILDING SCHEDULE IS "ON", AND THE OCCUPANCY SENSOR INDICATES NO OCCUPANCY FOR **THIRTY MINUTES (ADJ.)**, THE CO2 LEVEL CONTROL IS DISENGAGED AND THE CONTROL REVERTS THE SUPPLY AIR TO THE MINIMUM SCHEDULED AIRFLOW. ALERT THE BAS IF THE SENSED CONCENTRATION EXCEEDS THE SETPOINT BY MORE THAN 10%.

6. TIME SCHEDULE AND OCCUPANCY SENSORS ARE UTILIZED TO RESET SPACE DEADBAND TEMPERATURES AND CLOSE TERMINAL BOXES IN ACCORDANCE WITH THE FACILITY'S TEMPERATURE SETBACK POLICY:
- OCCUPIED MODE (ROOM OCCUPANCY SENSED)
  HEATING SET POINT = **70 DEGREES**
  COOLING SET POINT = **75 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.
- STANDBY MODE (BUILDING OCCUPANCY SCHEDULED ON, ROOM OCCUPANCY NOT SENSED FOR **THIRTY MINUTES (ADJ.)**)
  HEATING SET POINT = **67 DEGREES**
  COOLING SET POINT = **78 DEGREES**
  TERMINAL BOX AIR VALVE CONTROLS TO AIRFLOW SETPOINT.

II. UNOCCUPIED MODE:

1. THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

THE SPACES SHALL INDEX INTO UNOCCUPIED MODE AND OUT OF UNOCCUPIED MODE IN A STAGGERED FASHION. THE FIRST GROUP OF SPACES CONSISTING OF 15% OF THE TOTAL SPACES WITH THIS CONTROL SEQUENCE SHALL BE INDEXED AT THE TIMES NOTED ABOVE. THE SECOND GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE FIRST GROUP. THE THIRD GROUP OF SPACES CONSISTING OF THE NEXT 20% OF THE TOTAL SPACES SHALL BE INDEXED THREE MINUTES AFTER THE SECOND GROUP. TH

ZONES WITH A CONDENSATE SENSOR: 103, 104, 131, 138, 139, 211, 212, 217, 218, 306, 314, 321, 402, 413, 416, 503, 506.

OCCUPIED MODE:

1. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

2. THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT IS **70°F (ADJ.)** AND THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT IS **75°F (ADJ.)**. THE CHILLED BEAM HEATING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS GREATER THAN THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE BOTH WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW. STANDARD TERMINAL BOX CONTROL MODIFICATION: WHILE ACTIVELY HEATING THE TERMINAL BOX DISCHARGE TEMPERATURE MAY PROVIDE A MAXIMUM OF **120 DEGF (ADJ.)** DISCHARGE AIR TEMPERATURE (CHILLED BEAM MIXED AIR DELIVERY TEMPERATURE WILL BE APPROX 85 DEGF WITH 120 DEGF PRIMARY AIR TEMPERATURE).

4. THE ZONE CONTROL SYSTEM SHALL BE INDEXED FROM UNOCCUPIED MODE TO OCCUPIED MODE BY THE VACANCY SENSOR AND REMAINS IN OCCUPIED MODE FOR TEN MINUTES AFTER OCCUPANCY WAS LAST SENSED.

5. AFTER EVERY CHANGE OF STATUS TO "ON" OF THE AHU SERVING THE SPACE, THE ZONE CONTROLLER SHALL BE FORCED INTO OCCUPIED MODE FOR **ONE HOUR (ADJUSTABLE)**. AFTER THE END OF THE FORCED OCCUPIED TIME PERIOD, THE ZONE CONTROLLER SHALL BE IN UNOCCUPIED MODE UNLESS THE ZONE VACANCY SENSOR IS ACTIVATED.

6. FOR ALL SPACES WHICH HAVE CONDENSATE SENSORS:
   A. THE TERMINAL BOX AIRFLOW REMAINS AT THE NORMAL SCHEDULED / NORMAL CONTROLLED COOLING / HEATING AIRFLOW UNLESS THE AIRFLOW WAS RAISED FOR HUMIDITY OVERRIDE.
   B. AS SPACE HUMIDITY INCREASES ABOVE A LEVEL OF **58% RH (ADJ.)**, HUMIDITY OVERRIDE IS ENABLED AND THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO THE SCHEDULED MAXIMUM AIRFLOW TO REDUCE THE RELATIVE HUMIDITY IN THE SPACE. BELOW **53% RH (ADJ.)** READING THE SUPPLY AIRFLOW IS RELEASED FOR NORMAL CONTROL. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE SPACE HUMIDITY SENSOR READING EXCEEDS **65% RH (ADJ.)**.
   C. WHILE IN HUMIDITY OVERRIDE IF THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT (e.g. 70 degF) THE TERMINAL BOX/DUCT-MOUNTED HEATING COIL VALVE MODULATES OPEN TO PROVIDE ADDITIONAL HEATING AND TO MAINTAIN THE OCCUPIED HEATING SETPOINT.
   D. IF AT ANY TIME, THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM CHILLED WATER SUPPLY PIPING, THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO MAXIMUM OCCUPIED SCHEDULED AIRFLOW TO PROVIDE MORE DRY AIR AND REMAINS AT MAXIMUM OCCUPIED SCHEDULED AIRFLOW UNTIL THE CONDENSATE DETECTION IS CLEARED. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE CONDENSATE SENSOR DETECTOR INDICATION EXCEEDS **24 HOURS (ADJ.)** STRAIGHT.
   E. HUMIDITY OVERRIDE CONTROL IS ACTIVE IN UNOCCUPIED MODE. IF SPACE HUMIDITY EXCEEDS **58% RH (ADJ.)** THEN THE TERMINAL BOX SUPPLY AIR DAMPER CONTROLS THE SUPPLY AIR VOLUME TO THE OCCUPIED AIRFLOW SETTINGS FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.
   F. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED DURING THE SCHEDULED UNOCCUPIED TIMES, THAT INDIVIDUAL CLASSROOM SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

UNOCCUPIED MODE:

THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

1. IN UNOCCUPIED MODE THE SPACE TEMPERATURE READING IS ALLOWED TO FLOAT BETWEEN THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT OF **65°F (ADJ.)** AND THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT OF **80°F (ADJ.).**

2. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

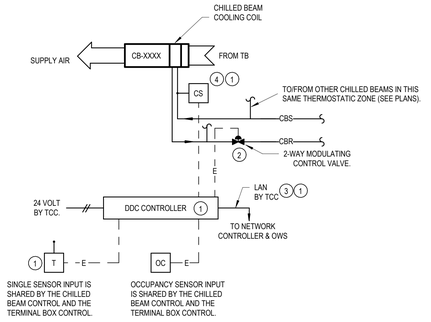
3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

4. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED, THAT INDIVIDUAL SPACE SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR A MINIMUM OF **TWENTY MINUTES (ADJ.)**. AT THE END OF THE TWENTY MINUTE PERIOD, THE OCCUPIED ROOM SHALL RETURN TO NORMAL OPERATION AND THE VACANCY SENSOR MAY THEN RETURN THE ROOM TO OCCUPIED OR UNOCCUPIED AS SENSED AND AS SCHEDULED.

EITHER MODE:

1. IF THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM WATER SUPPLY PIPING, THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED. NOTE THAT ONLY THOSE ZONES SPECIFICALLY NOTED CONTAIN A CONDENSATE SENSOR.

2. IF POWER HAS BEEN TRANSFERRED TO THE GENERATOR, FULLY CLOSE THE CB COOLING VALVE. UPON RETURN TO NORMAL POWER, RETURN CB COOLING VALVE TO NORMAL CONTROL.



PLAN NOTES:

1. FURNISHED, INSTALLED, WIRED, CALIBRATED AND COMMISSIONED BY TCC.

2. FAIL IN LAST POSITION UPON LOSS OF POWER. CONTROL VALVE FURNISHED BY TCC; INSTALLED BY MC. WIRED, CALIBRATED AND COMMISSIONED BY TCC.

3. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE TEMPERATURE SETPOINT, CHILLED BEAM HEATING COIL VALVE POSITION, CHILLED BEAM COOLING COIL VALVE POSITION, AND FINTUBE VALVE POSITION. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ THE ANALOG INPUTS OF SPACE TEMPERATURE AND THE BINARY INPUT OF THE VACANCY SENSOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO OVERRIDE AND INDEX THE SPACE FROM OCCUPIED TO UNOCCUPIED MODE.

4. CONDENSATE SENSOR AT ONE CHILLED BEAM IN THIS ZONE (THE CB CLOSEST TO THE DDC CONTROLLER). COORDINATE INSTALLATION WITH THE INSULATION TRADES SUCH THE SENSOR (MOUNTED ON THE PIPE EXTERIOR SURFACE AND UNDER THE PIPE INSULATION) RECEIVES AN INSTALLED LABEL ON THE PIPE INSULATION. SIMILAR TO SIEMENS QXA2101 WITH REMOTE SENSOR; MOUNT REMOTE SENSOR ON TERMINAL BOX CONTROL ENCLOSURE.

2 M811 CHILLED BEAM ZONE CONTROL SCHEMATIC FOR 2-PIPE CB
NO SCALE

ZONES 102, 115, 199, AND 205

OCCUPIED MODE:

1. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

2. THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT IS **70°F (ADJ.)** AND THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT IS **75°F (ADJ.)**. THE CHILLED BEAM HEATING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS GREATER THAN THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT. THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED WHEN THE SPACE TEMPERATURE READING IS LESS THAN THE SPACE TEMPERATURE OCCUPIED COOLING SETPOINT. THE CHILLED BEAM ZONE CONTROLLER SHALL RESPOND TO CHANGES IN SPACE TEMPERATURE READINGS TO CONTROL AND MODULATE BOTH WATER FLOWS FROM FULL SHUTOFF TO FULL OPEN.

3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW. STANDARD TERMINAL BOX CONTROL MODIFICATION: WHILE ACTIVELY HEATING THE TERMINAL BOX DISCHARGE TEMPERATURE MAY PROVIDE A MAXIMUM OF **120 DEGF (ADJ.)** DISCHARGE AIR TEMPERATURE (CHILLED BEAM MIXED AIR DELIVERY TEMPERATURE WILL BE APPROX 85 DEGF WITH 120 DEGF PRIMARY AIR TEMPERATURE).

4. THE ZONE CONTROL SYSTEM SHALL BE INDEXED FROM UNOCCUPIED MODE TO OCCUPIED MODE BY THE VACANCY SENSOR AND REMAINS IN OCCUPIED MODE FOR TEN MINUTES AFTER OCCUPANCY WAS LAST SENSED.

5. AFTER EVERY CHANGE OF STATUS TO "ON" OF THE AHU SERVING THE SPACE, THE ZONE CONTROLLER SHALL BE FORCED INTO OCCUPIED MODE FOR **ONE HOUR (ADJUSTABLE)**. AFTER THE END OF THE FORCED OCCUPIED TIME PERIOD, THE ZONE CONTROLLER SHALL BE IN UNOCCUPIED MODE UNLESS THE ZONE VACANCY SENSOR IS ACTIVATED.

6. FOR ALL SPACES WHICH HAVE CONDENSATE SENSORS:
   A. THE TERMINAL BOX AIRFLOW REMAINS AT THE NORMAL SCHEDULED / NORMAL CONTROLLED COOLING / HEATING AIRFLOW UNLESS THE AIRFLOW WAS RAISED FOR HUMIDITY OVERRIDE.
   B. AS SPACE HUMIDITY INCREASES ABOVE A LEVEL OF **58% RH (ADJ.)**, HUMIDITY OVERRIDE IS ENABLED AND THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO THE SCHEDULED MAXIMUM AIRFLOW TO REDUCE THE RELATIVE HUMIDITY IN THE SPACE. BELOW **53% RH (ADJ.)** READING THE SUPPLY AIRFLOW IS RELEASED FOR NORMAL CONTROL. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE SPACE HUMIDITY SENSOR READING EXCEEDS **65% RH (ADJ.)**.
   C. WHILE IN HUMIDITY OVERRIDE IF THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE OCCUPIED HEATING SETPOINT (e.g. 70 degF) THE TERMINAL BOX/DUCT-MOUNTED HEATING COIL VALVE MODULATES OPEN TO PROVIDE ADDITIONAL HEATING AND TO MAINTAIN THE OCCUPIED HEATING SETPOINT.
   D. IF AT ANY TIME, THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM CHILLED WATER SUPPLY PIPING, THE TERMINAL BOX SUPPLY AIR VOLUME INCREASES TO MAXIMUM OCCUPIED SCHEDULED AIRFLOW TO PROVIDE MORE DRY AIR AND REMAINS AT MAXIMUM OCCUPIED SCHEDULED AIRFLOW UNTIL THE CONDENSATE DETECTION IS CLEARED. INITIATE AN ALARM AT THE CAMPUS CONTROL ROOM IF THE CONDENSATE SENSOR DETECTOR INDICATION EXCEEDS **24 HOURS (ADJ.)** STRAIGHT.
   E. HUMIDITY OVERRIDE CONTROL IS ACTIVE IN UNOCCUPIED MODE. IF SPACE HUMIDITY EXCEEDS **58% RH (ADJ.)** THEN THE TERMINAL BOX SUPPLY AIR DAMPER CONTROLS THE SUPPLY AIR VOLUME TO THE OCCUPIED AIRFLOW SETTINGS FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.
   F. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED DURING THE SCHEDULED UNOCCUPIED TIMES, THAT INDIVIDUAL CLASSROOM SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR THE REMAINDER OF THE UNOCCUPIED CYCLE.

UNOCCUPIED MODE:

THE SPACE SHALL BE INDEXED FROM OCCUPIED TO UNOCCUPIED MODES BY A TIME PROGRAM IN THE CAMPUS BAS. INITIAL UNOCCUPIED CYCLE SHALL BE PROGRAMMED BY ECC FROM 8:00PM TO 6:00AM MONDAY THROUGH FRIDAY; BEFORE 7:00AM AND AFTER 5:00PM SATURDAY; AND ALL DAY ON SUNDAYS AND HOLIDAYS. COORDINATE HOURS AND DAY SCHEDULING WITH THE OWNER PRIOR TO TURNOVER.

1. IN UNOCCUPIED MODE THE SPACE TEMPERATURE READING IS ALLOWED TO FLOAT BETWEEN THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT OF **65°F (ADJ.)** AND THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT OF **80°F (ADJ.).**

2. AS THE SPACE TEMPERATURE READING INCREASES ABOVE THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED COOLING SETPOINT, THE CHILLED BEAM COOLING WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

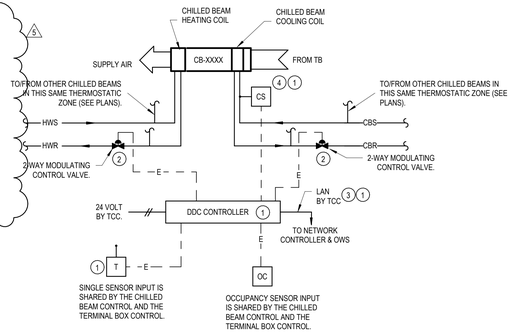
3. AS THE SPACE TEMPERATURE READING DECREASES BELOW THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL VALVE IS MODULATED OPEN TO INCREASE WATER FLOW. AS THE SPACE TEMPERATURE READING RISES ABOVE THE SPACE TEMPERATURE UNOCCUPIED HEATING SETPOINT THE CHILLED BEAM HEATING COIL WATER VALVE IS MODULATED TO DECREASE WATER FLOW.

4. IF THE VACANCY SENSOR INDICATES THAT AN INDIVIDUAL SPACE IS OCCUPIED, THAT INDIVIDUAL SPACE SHALL BE AUTOMATICALLY RETURNED TO OCCUPIED MODE FOR A MINIMUM OF **TWENTY MINUTES (ADJ.)**. AT THE END OF THE TWENTY MINUTE PERIOD, THE OCCUPIED ROOM SHALL RETURN TO NORMAL OPERATION AND THE VACANCY SENSOR MAY THEN RETURN THE ROOM TO OCCUPIED OR UNOCCUPIED AS SENSED AND AS SCHEDULED.

EITHER MODE:

1. IF THE SINGLE CONDENSATE SENSOR DETECTS CONDENSATION ON THE CHILLED BEAM WATER SUPPLY PIPING, THE CHILLED BEAM COOLING VALVE IS FULLY CLOSED.

2. IF POWER HAS BEEN TRANSFERRED TO THE GENERATOR, FULLY CLOSE THE CB COOLING VALVE. UPON RETURN TO NORMAL POWER, RETURN CB COOLING VALVE TO NORMAL CONTROL.



PLAN NOTES:

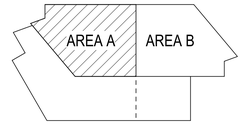
1. FURNISHED, INSTALLED, WIRED, CALIBRATED AND COMMISSIONED BY TCC.

2. FAIL IN LAST POSITION UPON LOSS OF POWER. CONTROL VALVE FURNISHED BY TCC; INSTALLED BY MC. WIRED, CALIBRATED AND COMMISSIONED BY TCC.

3. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ AND ADJUST SPACE TEMPERATURE SETPOINT, CHILLED BEAM HEATING COIL VALVE POSITION, AND CHILLED BEAM COOLING COIL VALVE POSITION. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO READ THE ANALOG INPUTS OF SPACE TEMPERATURE AND THE BINARY INPUT OF THE VACANCY SENSOR. THROUGH LAN TO OPERATORS WORK STATION IT SHALL BE POSSIBLE TO OVERRIDE AND INDEX THE SPACE FROM OCCUPIED TO UNOCCUPIED MODE.

4. CONDENSATE SENSOR AT ONE CHILLED BEAM IN THIS ZONE (THE CB CLOSEST TO THE DDC CONTROLLER). COORDINATE INSTALLATION WITH THE INSULATION TRADES SUCH THE SENSOR (MOUNTED ON THE PIPE EXTERIOR SURFACE AND UNDER THE PIPE INSULATION) RECEIVES AN INSTALLED LABEL ON THE PIPE INSULATION. SIMILAR TO SIEMENS QXA2101 WITH REMOTE SENSOR; MOUNT REMOTE SENSOR ON TERMINAL BOX CONTROL ENCLOSURE.

3 M811 CHILLED BEAM (FOUR PIPE) ZONE CONTROL SCHEMATIC
NO SCALE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

THIS TEMPERATURE CONTROL DRAWING IS FOR REFERENCE ONLY AND IS NOT TO BE USED AS A BASIS FOR BIDDING.

REFER TO THE CONTROLS SUPPLIER, SIEMENS BUILDING TECHNOLOGIES, INSTALLATION DRAWINGS, TO BE INCLUDED BY ADDENDUM, FOR THE BIDDING SCOPE OF THE CONTROL INSTALLATION CONTRACT.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

PETER KEGAN LANGHAM
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

ZONE LEVEL TEMPERATURE CONTROL DIAGRAMS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M811

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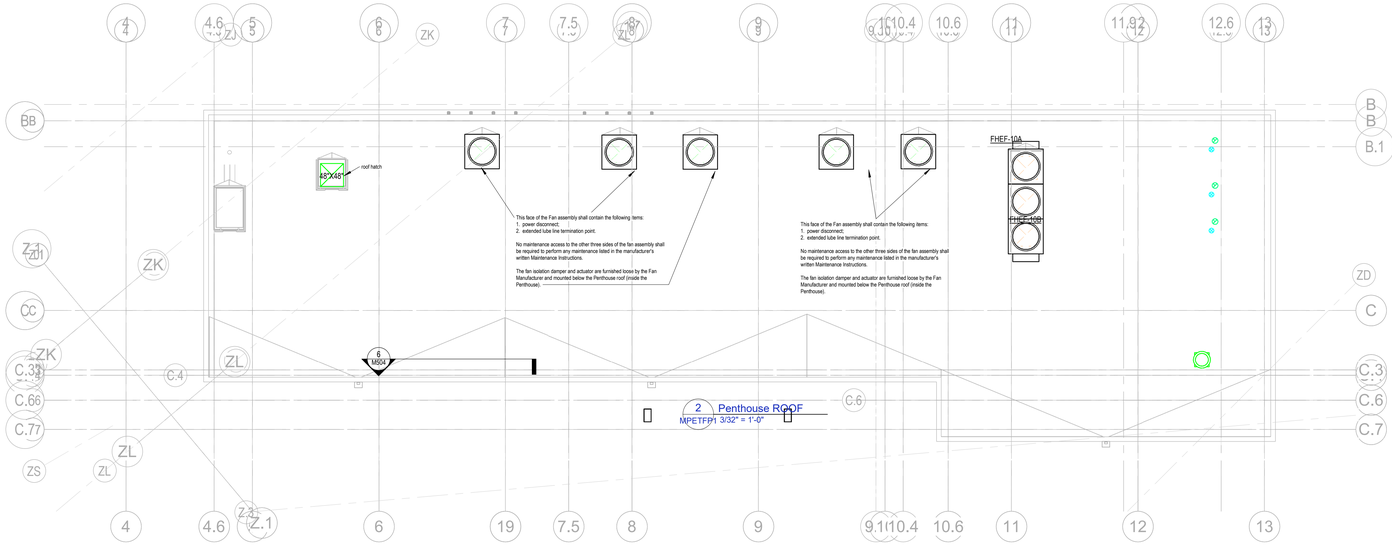

PLAN NOTES

X00	PLAN NOTES
001	Penthouse Roof Hatch above. Maintain aisleway width 4'-6" by 4'-6" and rather than 10'-0" clear; maintain totally clear to the underside of the roof deck beneath the Penthouse Roof Hatch.
002	2" tall ramp from the "high side" at the entrance to the elevator, sloped down to the main Penthouse portion to the south that has floor drains.
003	2" tall ramp from the "high side" at the entrance to the stairwell, sloped down to the main Penthouse portion that has floor drains.
004	Removeable wall panel section by Arch & Struct. Access out onto the roof for when a crane is parked in the parking lot picking up a replacement chiller off a flatbed truck. Or the crane and truck is on Waterway Blvd with the road blocked.
005	Removeable wall panel section by Arch & Struct. Access across the roof for when a crane is parked on Indiana Avenue to replace an AHU. Only conduit serving the devices mounted directly in front of this removeable wall panel shall be located within this clearance area (when AHUs are replaced, the AHU serving electrical devices shall be temporarily relocated).
006	Access across the roof to Indiana Avenue for when a crane is parked on Indiana Avenue picking up a long coil off a truck (or something else) that doesn't fit in the elevator (or the elevator is broke and needs an elevator part craned up to get to the top of the elevator shaft).
007	2" tall ramp from the "high side" at the entrance to the elevator, sloped down to the corner of the Penthouse portion to the north. that has floor drains.

CONTRACT REQUIREMENTS

A. ALL CONTRACTORS AND ALL TRADES INCLUDING, BUT NOT LIMITED TO HEATING, VENTILATION/SHEETMETAL, ELECTRICAL POWER, ELECTRICAL LIGHTING, ELECTRICAL FIRE ALARM, TELECOMMUNICATIONS, TELECOM, AV, SECURITY, BAS TEMPERATURE CONTROL, PLUMBING, FIRE PROTECTION, LAB FURNISHINGS, AND ARCHITECTURAL GENERAL TRADES SHALL PROVIDE THE CLEAR ACCESS SPACE ILLUSTRATED ON THIS DRAWING.

B. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF 10'-0" ABOVE THE FINISHED FLOOR IN ALL AREAS WHICH ARE MARKED WITH THE HATCHED AISLEWAYS ON THIS DRAWING AND SHALL INCLUDE THE ENTIRE WIDTH OF THE AISLEWAY AREA AND THE ENTIRE LENGTH OF THE AISLEWAY AREA ILLUSTRATED. INCLUDE ADDITIONAL ACCESS AISLEWAYS NOT ILLUSTRATED AS REQUIRED TO MEET THE EQUIPMENT MANUFACTURER'S WRITTEN INSTALLATION AND MAINTENANCE INSTRUCTIONS.

C. THE CLEAR ACCESS SPACE PROVIDED SHALL BE FREE AND CLEAR OF ANY AND ALL PERMANENT INSTALLATIONS INCLUDING, BUT NOT LIMITED TO: DUCTWORK, DUCT HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; PIPING, PIPE HANGERS, HANGER SUPPORTS, HANGER RODS AND HANGER UNISTRUT; DUCT OR PIPING INSULATION; CONDUIT AND RACEWAY INCLUDING HANGER RODS AND HANGER UNISTRUT; FIRE PROTECTION BRANCH PIPING, FIRE PROTECTION MAIN PIPING, FIRE PROTECTION SPRINKLER HEADS, COMPONENTS, EQUIPMENT, AND MATERIALS; OTHER SYSTEMS HANGERS AND SUPPORTS; LIGHTING AND LIGHTING SUPPORTS; CABLE TRAY AND CABLE TRAY SUPPORTS, CABLES/CABLING, CABLE SUPPORTS, EXIT SIGNAGE, FIRE ALARM HORNS OR STROBES, AND MISCELLANEOUS LOW VOLTAGE SYSTEM ACCESSORIES. THIS CLEAR ACCESS SPACE (VOLUME ABOVE THE AISLEWAY) SERVES AS AN AISLEWAY FOR MEANS OF PERSONNEL ACCESS AND EQUIPMENT ACCESS (REPAIR AND/OR REPLACEMENT OF INSTALLED COMPONENTS LOCATED ADJACENT TO THE ACCESS SPACE). THIS REQUIREMENT APPLIES TO THE LOWEST ELEVATION (THE BOTTOM) OF ANY SUCH COMPONENT OR MATERIAL LOCATED ABOVE THE CLEAR ACCESS SPACE INDICATED.

D. PRIOR TO INSTALLING ANY COMPONENTS, THE CLEAR ACCESS SPACE AISLEWAYS SHALL BE MARKED UPON THE CONCRETE FLOOR BY THE MECHANICAL CONTRACTOR FOR VISUAL REMINDER TO THE INSTALLING TRADESPERSONS. THESE FLOOR MARKINGS SHALL BE MAINTAINED COMPLETE UNTIL AFTER FINAL SUBSTANTIAL COMPLETION INSPECTION IS UNDERTAKEN.

E. COORDINATION AMONGST THE INSTALLING TRADES IS RECOMMENDED IN ORDER TO PROVIDE THE CONTRACTUALLY REQUIRED CLEAR ACCESS SPACE. THE REMOVAL AND REINSTALLATION OF IMPROPERLY INSTALLED COMPONENTS AS NEEDED TO PROVIDE THE CLEAR ACCESS SPACE SHALL OCCUR SOLELY AT THE EXPENSE OF THE CONTRACTOR WHICH INSTALLED THE IMPROPER COMPONENT AND SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF PARTIAL SUBSTANTIAL COMPLETION OR ANY OTHER SUBSTANTIAL COMPLETION CERTIFICATE.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

8'-0" wide by 12'-0" tall clear aisleway and clear wallspace for AHU re-installation.
6'-0" wide by 12'-0" tall clear aisleway and clear wallspace for AHU re-installation.
3'-0" wide aisleway 12'-9"
4'-6" wide aisleway
floor drain CL located here so that drain body is outside of ELEC room 586.
PIPES 698B 115 SF
HE-1
BT-2 GW
ELEV CTRL 698C 86 SF
PENTHOUSE 698 7,010 SF
STAIR A 639F 136 SF
4'-5 3/4"
DOOR
SW1 SWITCHGEAR ASSY
SW2 SWITCHGEAR STATION
SW3 SWITCHGEAR STATION
water treatment chemical tote 1
water treatment chemical tote 2
CWF-1
laundry sink by sheets
safety shower by sheets
5'-6" wide aisleway
DOORS
5'-9"
3' WIDE HEATING COIL PULLSPACE
3' WIDE COOLING COIL PULLSPACE
4' WIDE FAN PULLSPACE
AHU-1 bottom portion
AHU-2 bottom portion
AHU-3 bottom portion
WWBP-1
process cooling Heat Pump Chiller
CB to HW
DDC-ELEC SWITCHGEAR
DP-6GSH1
P-6NH1?
P-6NL1
P-6NH2?
DDC-COOLING-1
DDC-COOLING-2
DDC-LABEXHAUST 1
DDC-LABEXHAUST 2
DOOR
4'-0" wide aisleway
4'-6" wide aisleway
BT-3 CB
BT-1 CHW
ET-2 GW
ET-1 CHW
EXH-1
EXH-2
EXH-3
EXH-4
EXH-5
EXH-6
EXH-7
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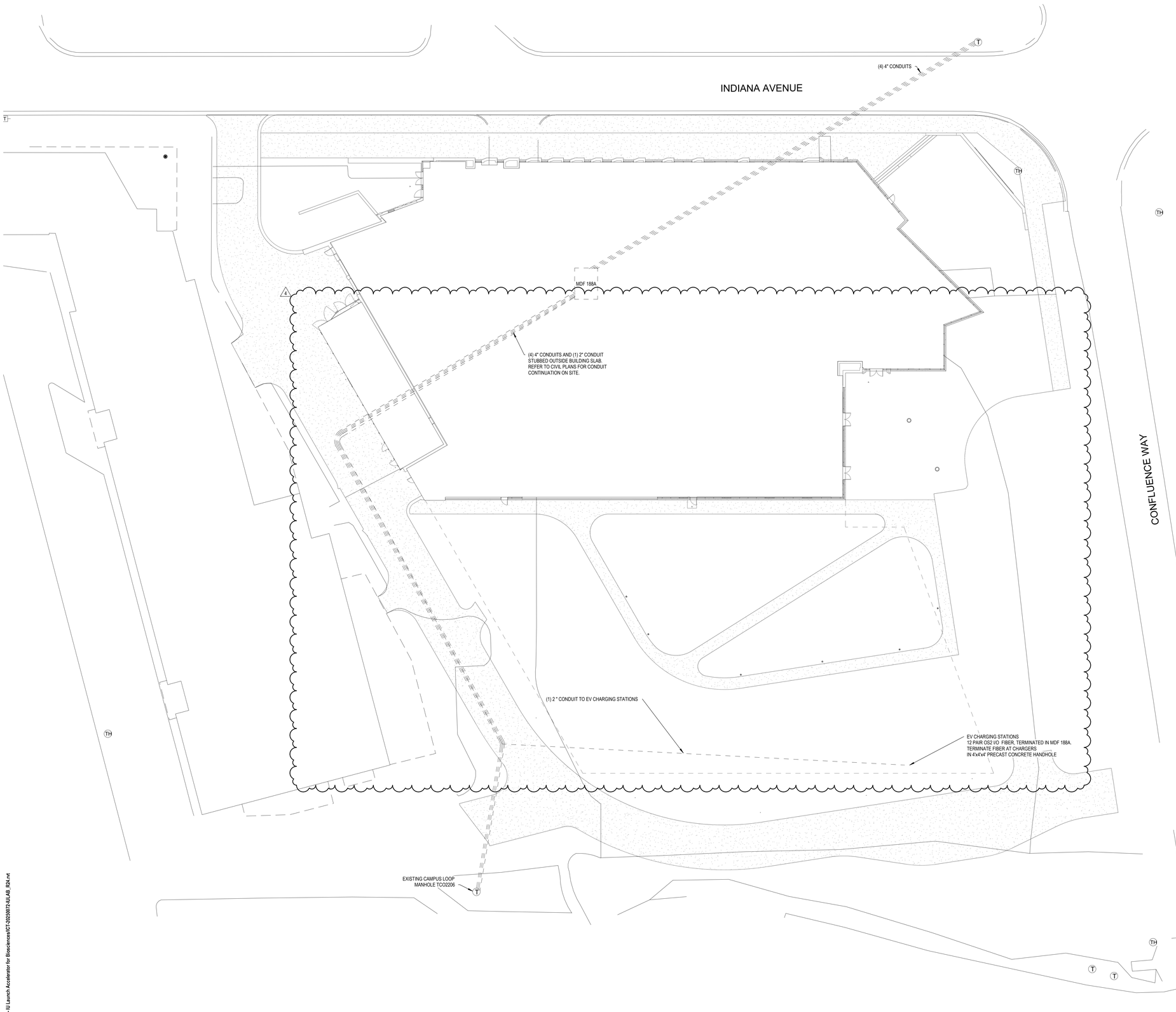
EXH-40



1 ICT SITE PLAN
SCALE: 1" = 20'-0"

GENERAL SHEET NOTES

A. REFER TO CIVIL AND ELECTRICAL SITE UTILITY DRAWINGS FOR PATHWAYS SERVING OUTSIDE PLANT COMMUNICATIONS CABLING AND OTHER SITE RELATED EXTERIOR ICT DEVICES.
B. PULLING POINTS SHOULD BE LOCATED FOR SAFE AND EASY ACCESS BY PERSONNEL AND EQUIPMENT ACCESSING THE MANHOLE / HANDHOLE
C. THE NUMBER OF BENDS SHOULD BE MINIMIZED, THE TOTAL DEGREES OF BEND IN CONDUITS BETWEEN PULLING POINTS SHOULD NOT EXCEED 180 DEGREES.
D. CONDUIT LENGTH BETWEEN PULLING POINTS SHOULD NOT EXCEED 600 FEET
E. CONDUITS SHOULD BE INSTALLED TO SLOPE AWAY FROM BUILDINGS AND TOWARD PULLING POINTS.

○ SHEET KEYNOTES

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
Bicsi
Christopher Foster
BICSI ID # 336450
EXPIRES 12-31-26
RCDD

MICHAEL J. WEINGARTZ
REGISTERED
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ICT SITE PLAN

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

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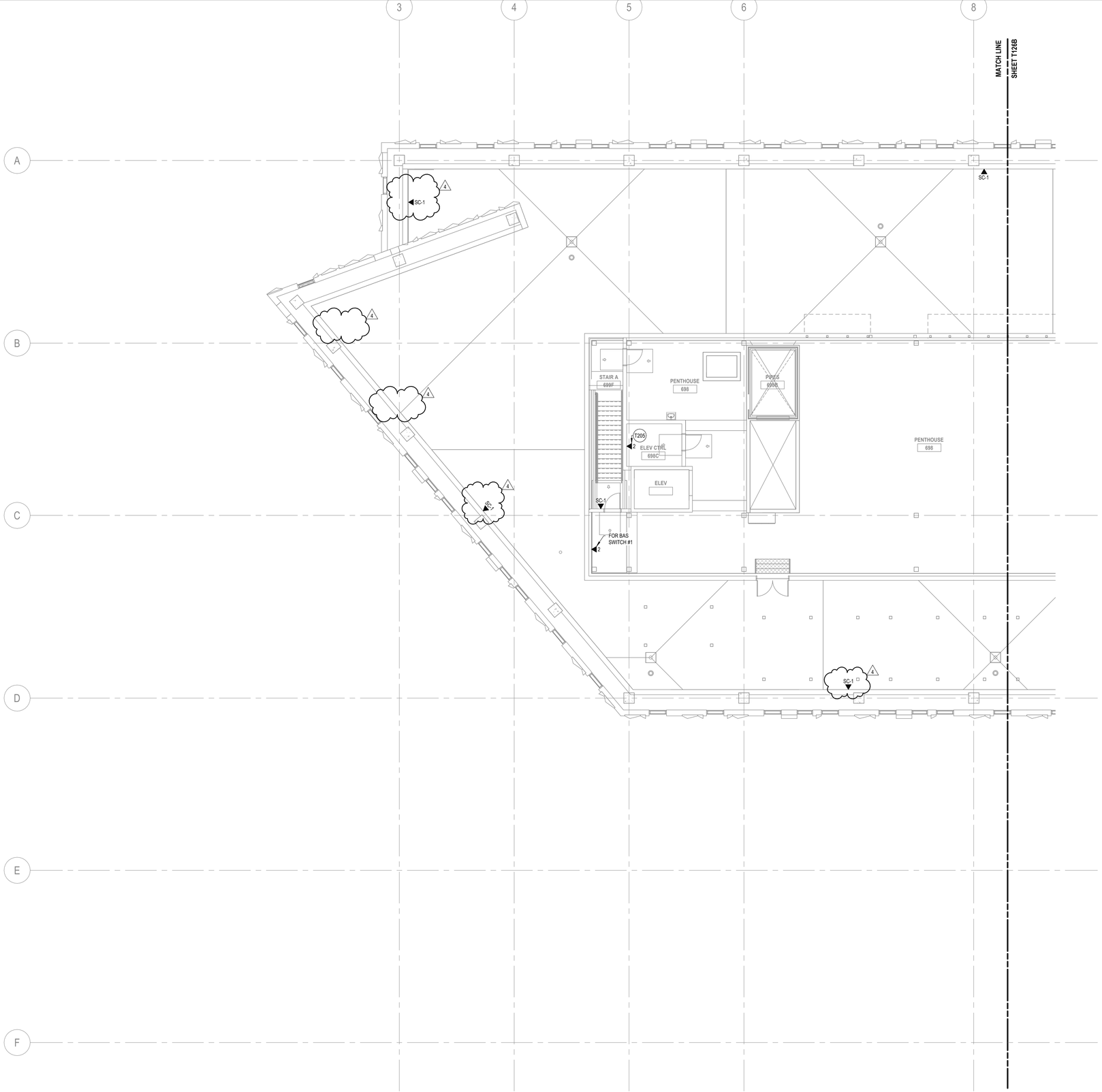

1 ICT FLOOR PLAN - PENTHOUSE - AREA A
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

A. ALL DATA IN RACEWAY TO BE MOUNTED HORIZONTALLY. REFER TO ELECTRICAL DRAWINGS FOR COORDINATION.

SHEET KEYNOTES

T205	PROVIDE DATA FOR ELEVATOR CONTROL ROOM. COORDINATE WITH ELEVATOR CONTRACTOR FOR LOCATION.

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SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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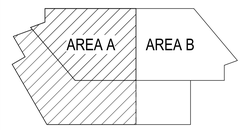
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

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ICT PLAN - PENTHOUSE - AREA A

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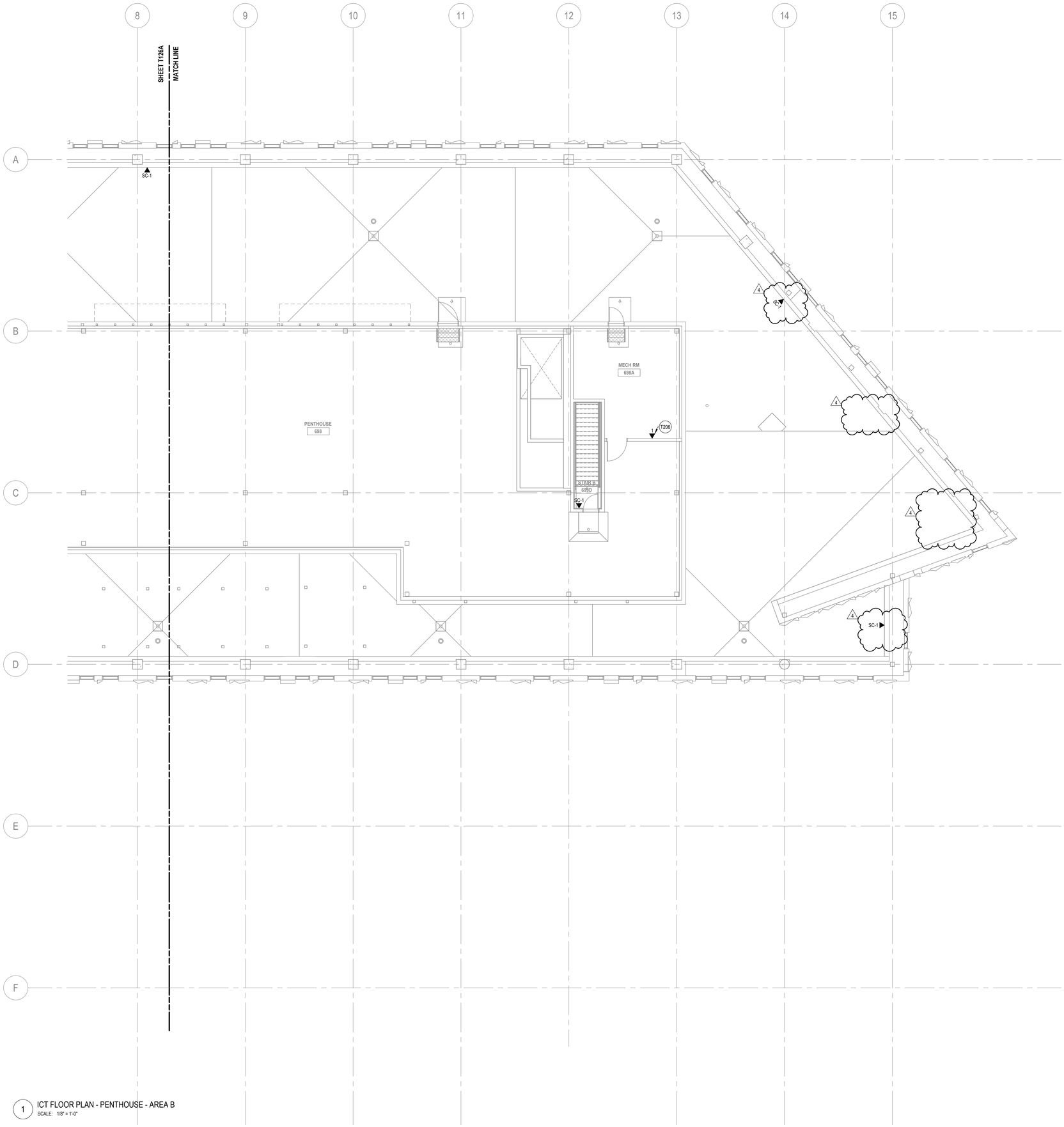

1 ICT FLOOR PLAN - PENTHOUSE - AREA B
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

A. ALL DATA IN RACEWAY TO BE MOUNTED HORIZONTALLY. REFER TO ELECTRICAL DRAWINGS FOR COORDINATION.

SHEET KEYNOTES

T206	COORDINATE FINAL LOCATION WITH CONTRACTOR.

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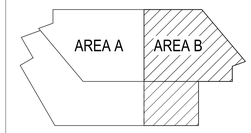
CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
4	04/20/2026	BP4-CD: ADDENDUM 01
3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

ICT PLAN - PENTHOUSE - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

T126B

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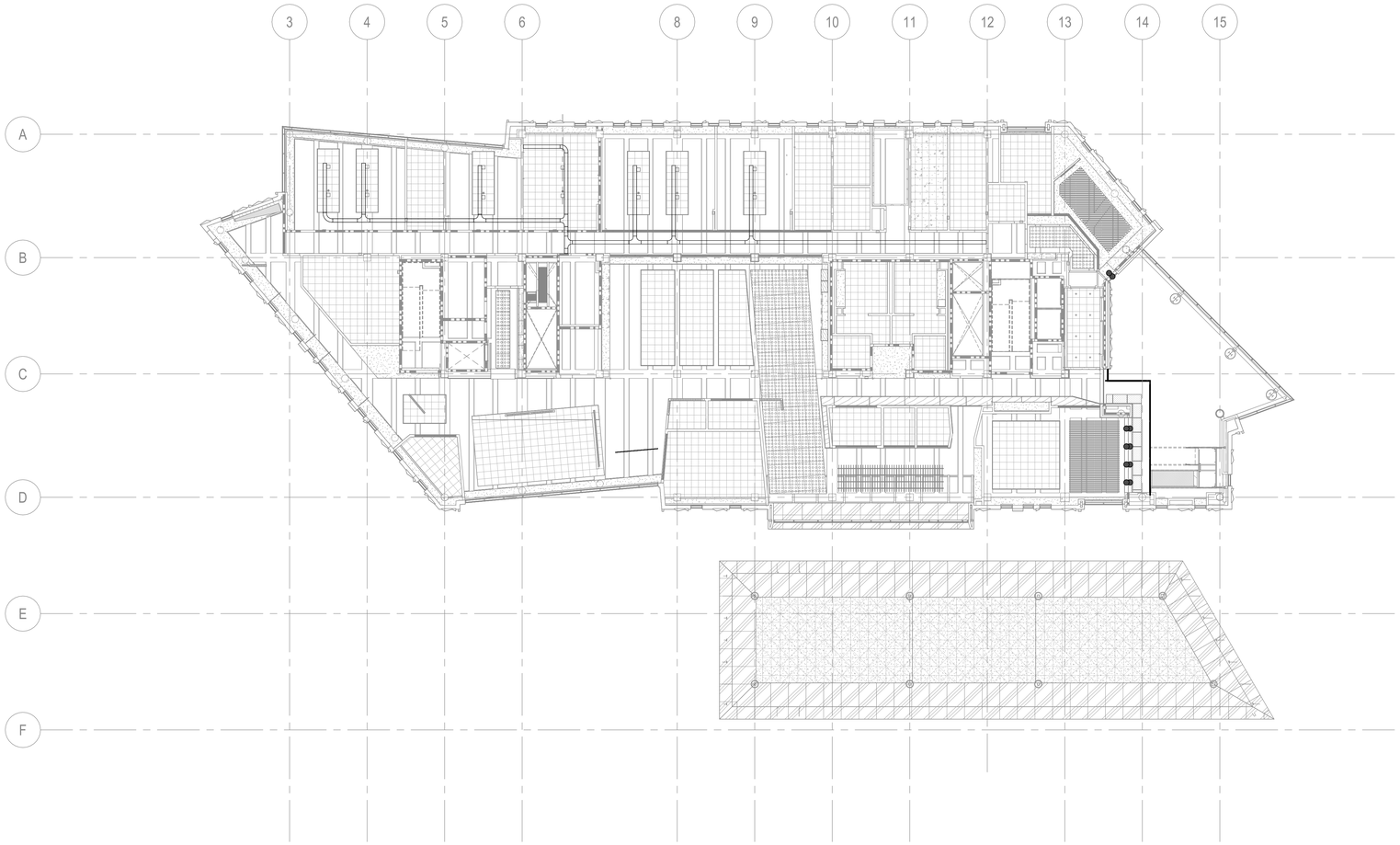


1 ICT RCP - LEVEL 2 OVERALL
SCALE: 1/16" = 1'-0"

GENERAL SHEET NOTES

A. BOTTOM OF LAB EQUIPMENT CABLE TRAY (12"W X 4"D)TO BE INSTALLEDY AT 8'-2" AFF. MOUNT TRAY DIRECTLY BELOW PHYSICAL CEILING CLOUDS WITHIN LAB AREAS. TRAY SIZE AND MOUNTING HEIGHT TO BE CONSISTENT ACROSS LEVELS 2 THROUGH 5.
B. ALL LAB EQUIPMENT TRAY SHALL BE SOLID BOTTOM PAINTABLE SURFACE

2

SHEET KEYNOTES

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

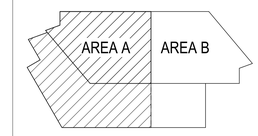
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

RECOVERED COMMUNICATIONS DISTRIBUTION DESIGNER
Bicsi
Christopher Foster
BICSI ID # 336450
EXPIRES 12-31-25
RCDD

MICHAEL J. WEINGARTNER
REGISTERED
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ICT REFLECTED CEILING PLAN - LEVEL 2 - OVERALL

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

T132

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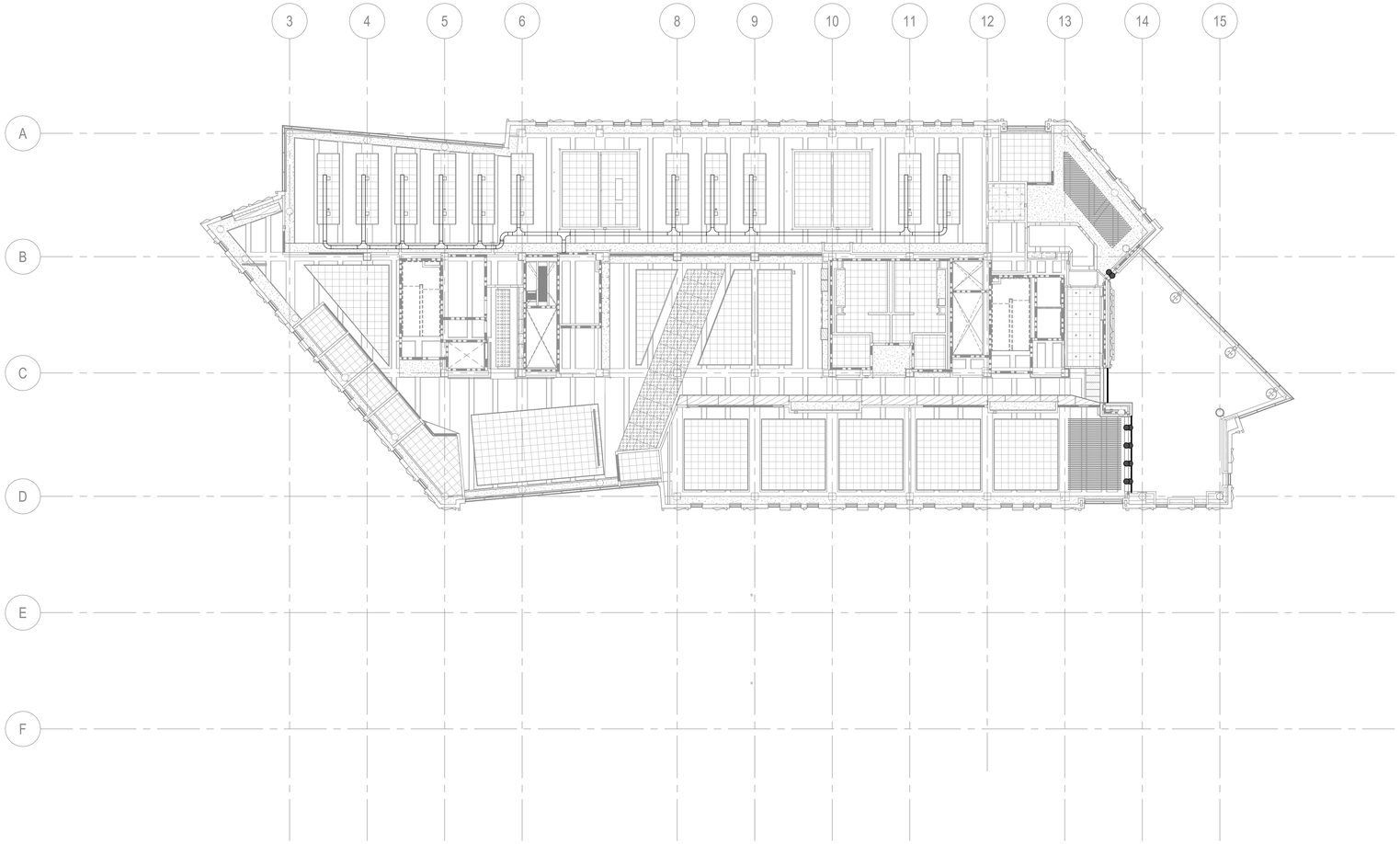

1 ICT RCP - LEVEL 3 OVERALL
SCALE: 1/16" = 1'-0"

GENERAL SHEET NOTES

A. BOTTOM OF LAB EQUIPMENT CABLE TRAY (12"W X 4"D)TO BE INSTALLEDY AT 8'-2" AFF. MOUNT TRAY DIRECTLY BELOW PHYSICAL CEILING CLOUDS WITHIN LAB AREAS. TRAY SIZE AND MOUNTING HEIGHT TO BE CONSISTENT ACROSS LEVELS 2 THROUGH 5.
B. ALL LAB EQUIPMENT TRAY SHALL BE SOLID BOTTOM PAINTABLE SURFACE

2

SHEET KEYNOTES

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smithgroup.com

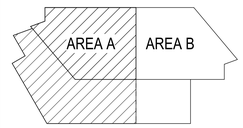
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ICT REFLECTED CEILING PLAN - LEVEL 3 - OVERALL

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

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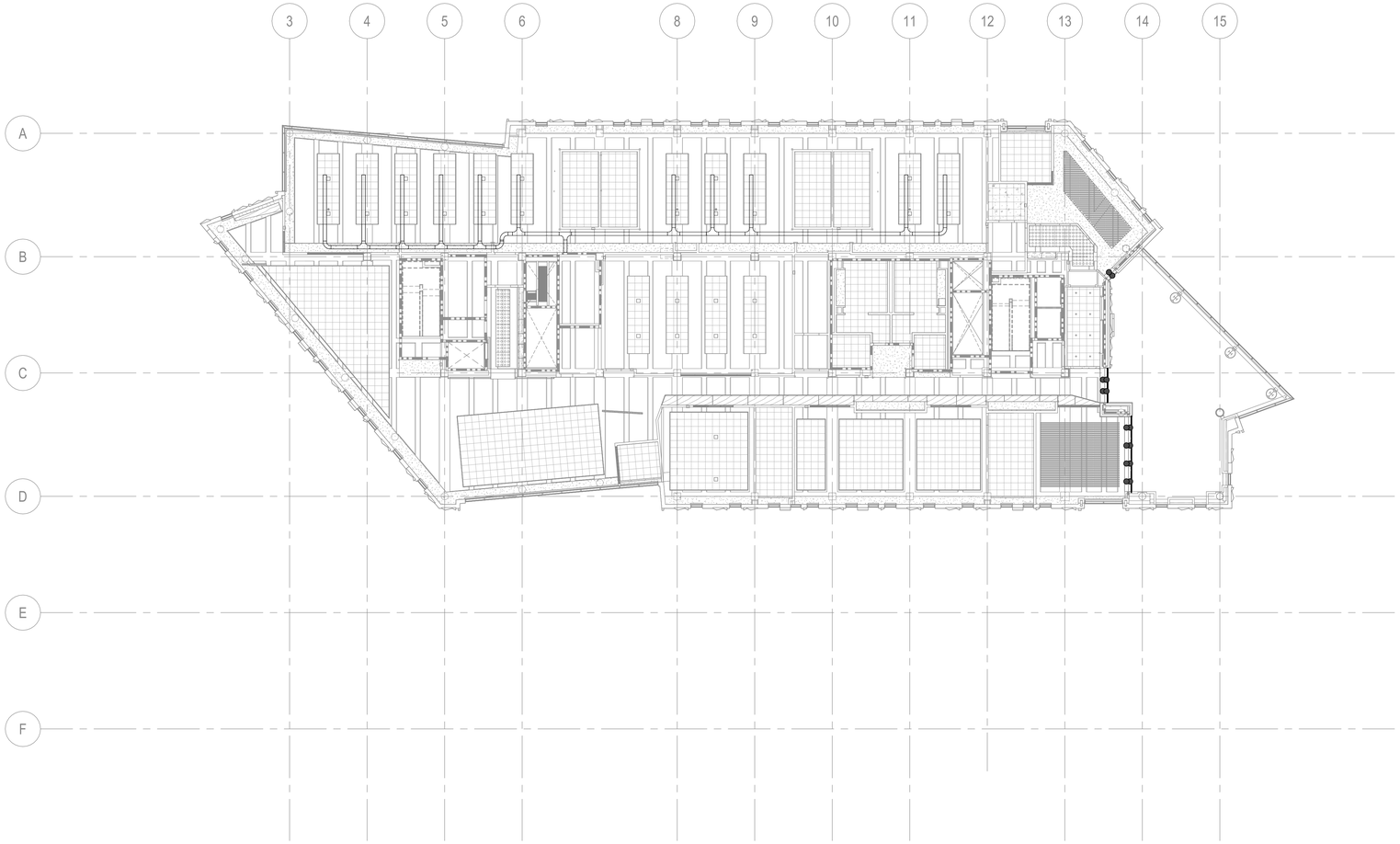

1 ICT RCP - LEVEL 4 OVERALL
SCALE: 1/16" = 1'-0"

GENERAL SHEET NOTES

A. BOTTOM OF LAB EQUIPMENT CABLE TRAY (12"W X 4"D)TO BE INSTALLEDY AT 8'-2" AFF. MOUNT TRAY DIRECTLY BELOW PHYSICAL CEILING CLOUDS WITHIN LAB AREAS. TRAY SIZE AND MOUNTING HEIGHT TO BE CONSISTENT ACROSS LEVELS 2 THROUGH 5.
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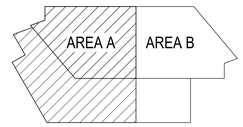
CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ICT REFLECTED CEILING PLAN - LEVEL 4 - OVERALL

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

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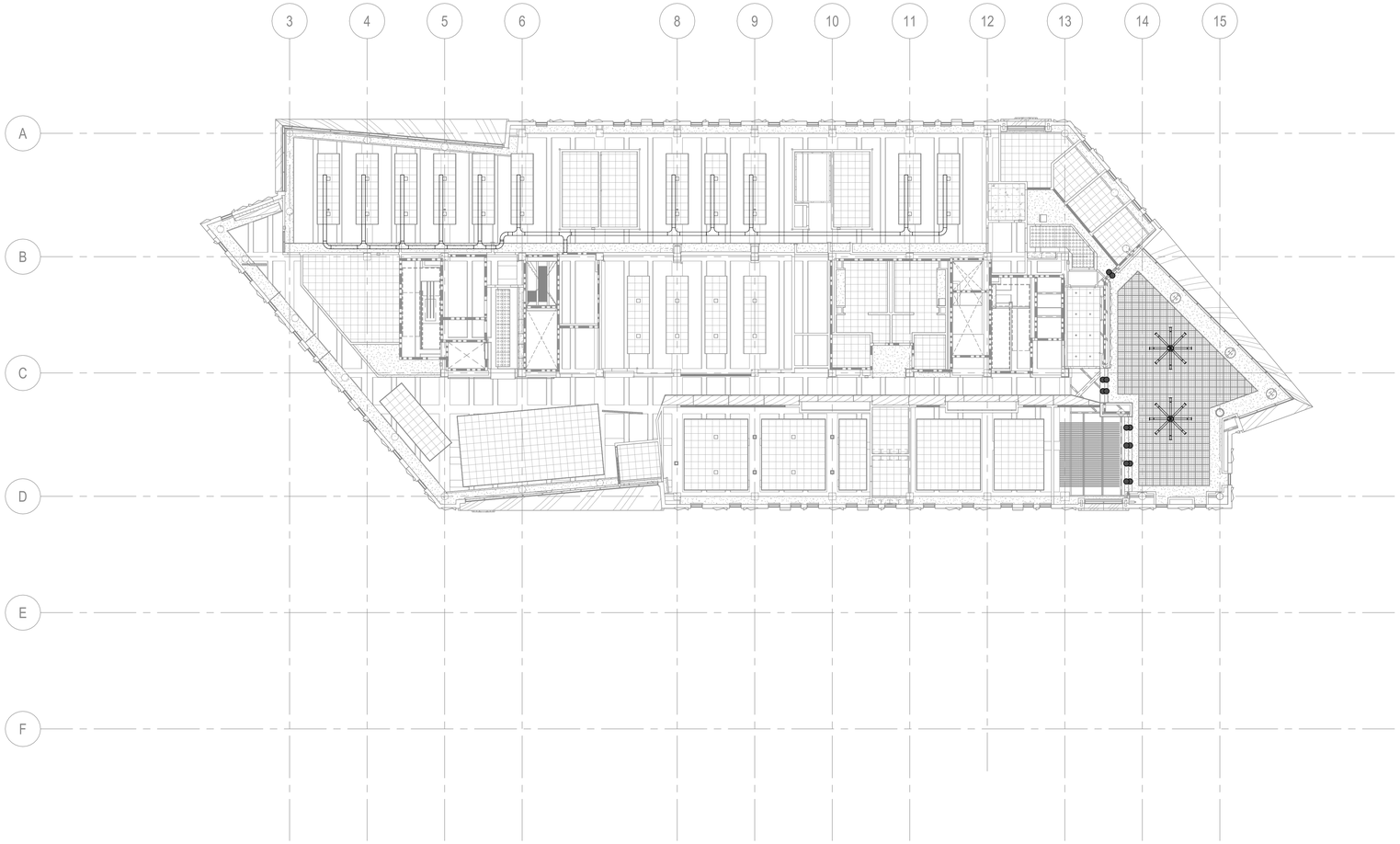

1 ICT RCP - LEVEL 5 OVERALL
SCALE: 1/16" = 1'-0"

GENERAL SHEET NOTES

A. BOTTOM OF LAB EQUIPMENT CABLE TRAY (12"W X 4"D)TO BE INSTALLEDY AT 8'-2" AFF. MOUNT TRAY DIRECTLY BELOW PHYSICAL CEILING CLOUDS WITHIN LAB AREAS. TRAY SIZE AND MOUNTING HEIGHT TO BE CONSISTENT ACROSS LEVELS 2 THROUGH 5.
B. ALL LAB EQUIPMENT TRAY SHALL BE SOLID BOTTOM PAINTABLE SURFACE

2

SHEET KEYNOTES

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500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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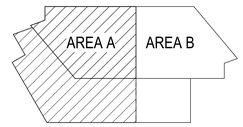

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ICT REFLECTED CEILING PLAN - LEVEL 5 - OVERALL

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BSA PROJECT NO.	00360481

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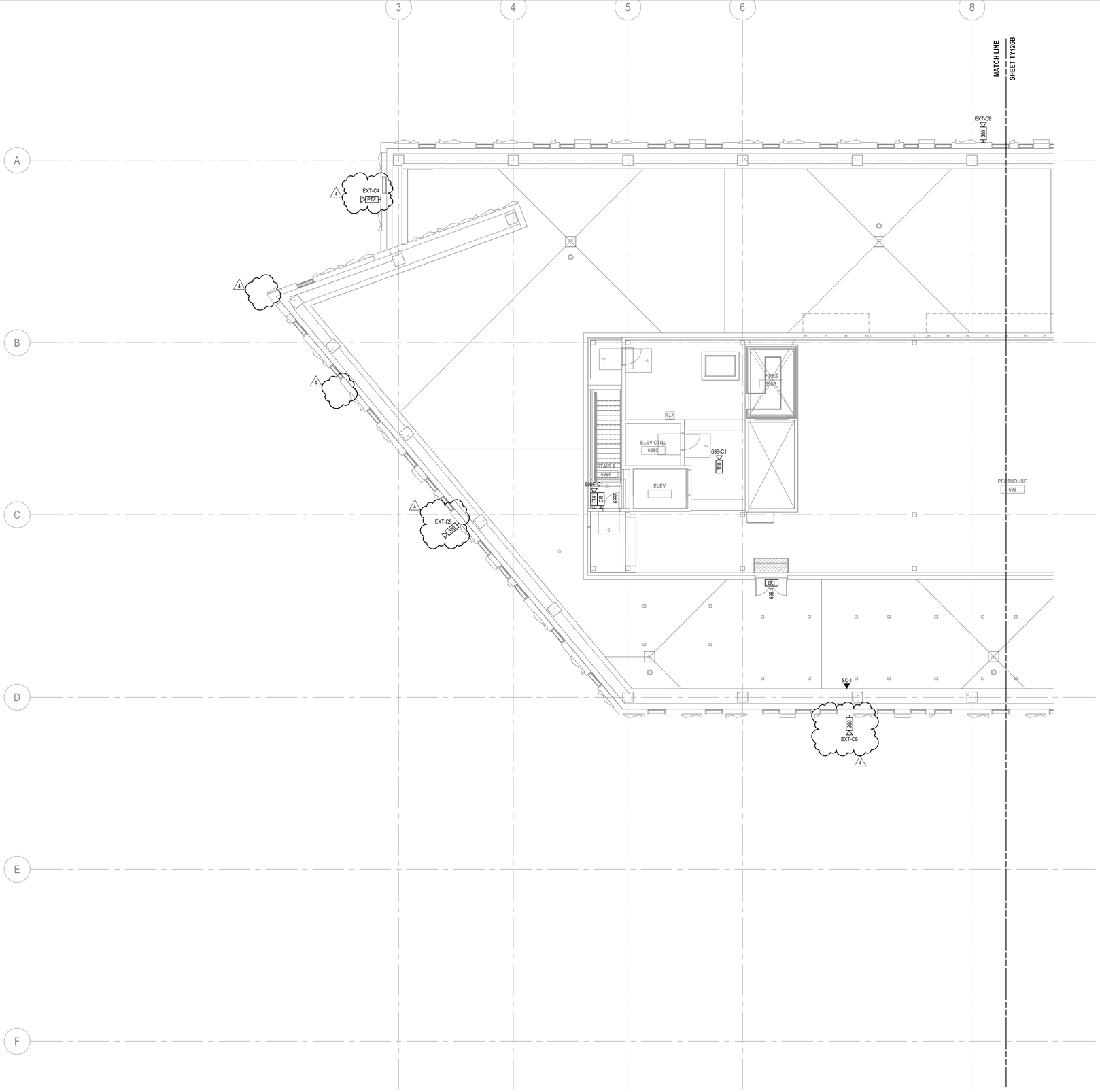

1 ICT SECURITY FLOOR PLAN - PENTHOUSE - AREA A
SCALE: 1/8" = 1'-0"

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BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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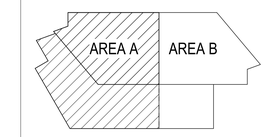

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ICT SECURITY FLOOR PLAN - PENTHOUSE - AREA A

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BSA PROJECT NO. 00360481

TY126A

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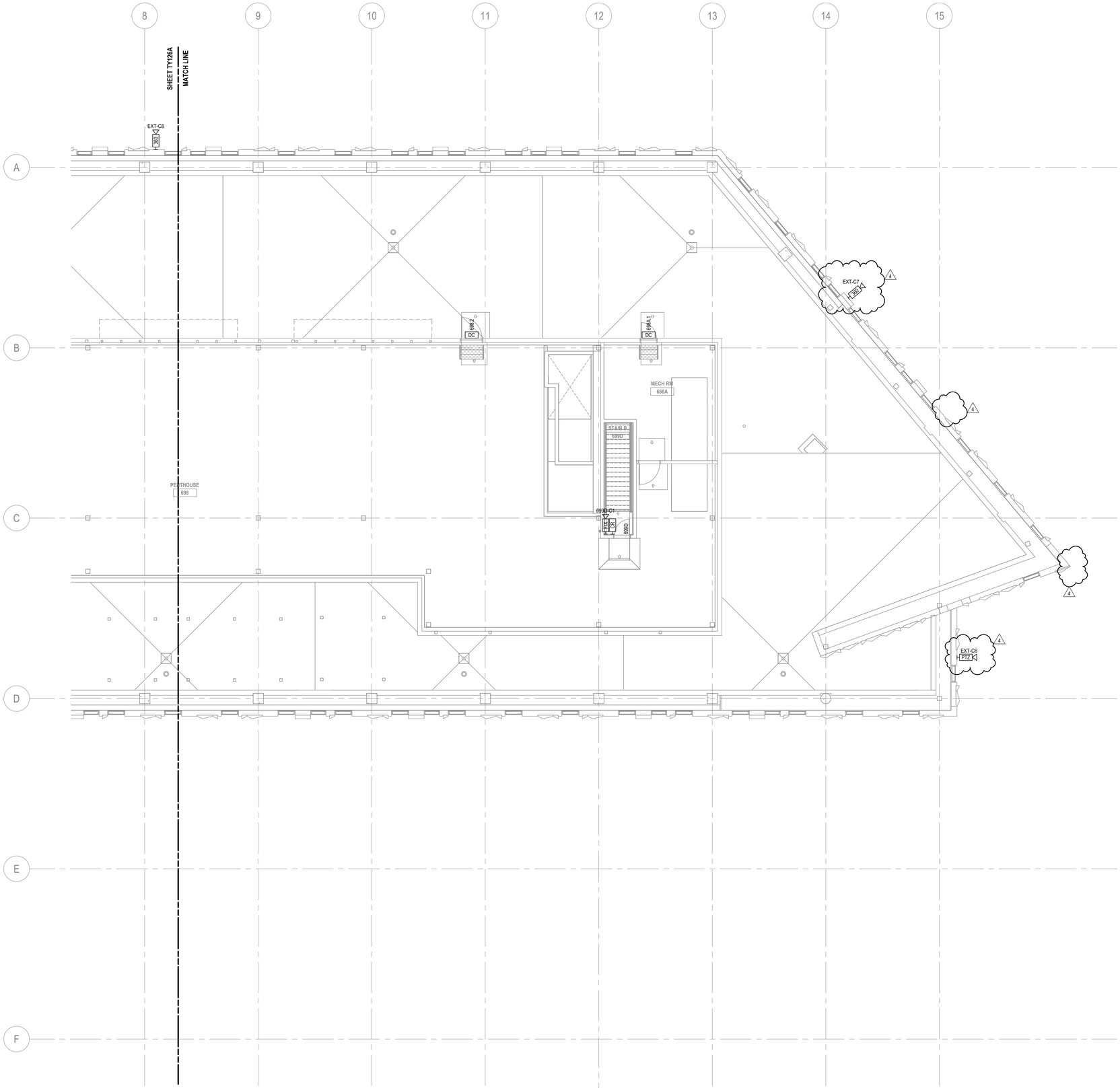

1 ICT SECURITY FLOOR PLAN - PENTHOUSE - AREA B
SCALE: 1/8" = 1'-0"

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BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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smithgroup.com

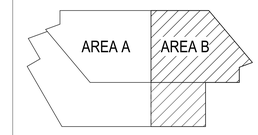
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP-4-CD: BUILD-OUT PACKAGE



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PROJECT NORTH
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3	03/30/2026	BP4-CD: BUILD-OUT PACKAGE
2	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP4-50% DD: BUILD-OUT PACKAGE

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
Bicsi
Christopher Foster
BICSI ID # 336450
EXPIRES 12-31-26
RCDD

MICHAEL J. WEINCEK
REGISTERED
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ICT SECURITY FLOOR PLAN - PENTHOUSE - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

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