ADDENDUM NUMBER TWO

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
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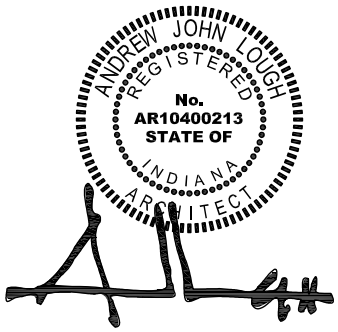

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Addendum Dated: APR 27, 2026

IU Project #: 20250072
BSALS Project #: 00360481

GENERAL

1. None.

CONTRACTOR QUESTIONS

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

CHANGES TO THE PROJECT MANUAL

1. **Section 01 2300:**
   a. Added line item 1.03, F for Alternate No. 6.

2. **Section 06 4200:**
   a. Added line item 1.01, C.
   b. Added line item 2.07.

3. **Section 08 1113:**
   a. Added line item 2.01.A.7.

4. **Section 11 5300:**
   a. Added language for Drying Rack drain and drain tube location in 2.7.E.

5. **Section 11 5313:**
   a. Added AMS as an acceptable manufacturer in 2.1.A.

6. **Section 12 3553:**
   a. Added end panel information in 2.4.K.
   b. Updated 2.4.J.1 and 2.4.J.2 to frosted glass.
   c. Added AMS as an acceptable manufacturer in 2.1.A.

7. **Section 13 2100:**
   a. Updated refrigerant language in 2.5.A.3.

8. **Section 23 0906:**
   a. Paragraph 1.01.A.6.b: The 230906 Control Supplier Installation Drawings (provided by Siemens Industry Inc. - Smart Infrastructure Division) dated 04/22/26 are attached to this Addendum. These replace the Control Supplier Installation Drawings dated 04/15/26 which were attached to Addendum 01.

9. **Section 23 6423:**
   a. Revised per the attached.

CHANGES TO THE DRAWINGS

1. **A112B – DIMENSION PLAN - LEVEL 2 - AREA B**
    a. Revised wall extents in Room 200 to better coordinate with FFE.

2. **A121A – ARCHITECTURAL PLAN - LEVEL 2 - AREA B**
    a. IMAGING LAB 107 - Adjusted overlapping Interior Elevation tags.
    b. Add new interior elevation references in ENTRY VESTIBULE 199K.

3. **A122B – ARCHITECTURAL PLAN - LEVEL 2 - AREA B**
    a. Revised wall extents in Room 200 to better coordinate with FFE.
    b. Removed elevation near HOTELING OFFICE 206 in Circulation area.
    c. Revised elevation reference to A605-3 near HOTELING OFFICE 206.
    d. Revised elevation references in CIRCLUATION 299E..

4. **A123A – ARCHITECTURAL PLAN – LEVEL 3 – AREA A**
    a. Removed elevation reference in SHARED OFFICE SPACE 308.
    b. Removed elevation reference in OFFICE 306.

5. **A124A – ARCHITECTURAL PLAN – LEVEL 4 – AREA A**
    a. Removed elevation reference in OPEN OFFICE WORKSPACE 408.

6. **A124B – ARCHITECTURAL PLAN – LEVEL 4 – AREA B**
    a. Added similar elevation references in PROJECT ROOM 429.

7. **A125B – ARCHITECTURAL PLAN – LEVEL 5 – AREA B**
    a. Added similar elevation references in CIRCULATION 599E.
    b. Added new interior elevation A607-4A in CIRCULATION 599E.

8. **A126B – ARCHITECTURAL PLAN – PENTHOUSE – AREA B**
    a. Removed interior elevation and section reference for clarification.

9. **A421 – ENLARGED PLANS AND ELEVATIONS**
    a. Revised tile height in women's RR to reflect RFI #25

10. **A605 – INTERIOR ELEVATIONS**
    a. Revised order of Interior Elevations.
    b. Revised reference number for Interior Elevation #3, coordinated with floor plans.
    c. Revised reference number for Interior Elevation #7, coordinated with floor plans.
    d. New Interior Elevation #8A, coordinated with floor plans.

11. **A606 – INTERIOR ELEVATIONS**
    a. Updated note reference on Interior Elevation #1.
    b. Removed Interior Elevation #2.
    c. Revised reference number Interior Elevation #12, coordinated with floor plans.

12. **A607 – INTERIOR ELEVATIONS**
    a. Revised dimension on Interior Elevation #4.
    b. New Interior Elevation #4A, coordinated with floor plans.
    c. New Interior Elevation #9, coordinated with floor plans.
    d. New Interior Elevation #10, coordinated with floor plans.

13. **IF111A – INTERIOR FINISH PLAN – LEVEL 1 – AREA A**
    a. Sheet reissued for corrected elevation references
    b. Wall base revised.

14. **IF111B – INTERIOR FINISH PLAN – LEVEL 1 – AREA B**
    a. Sheet reissued for corrected elevation references

15. **IF112A – INTERIOR FINISH PLAN – LEVEL 2 – AREA A**
    a. Sheet reissued for corrected elevation references

16. **IF112B – INTERIOR FINISH PLAN – LEVEL 2 – AREA B**
    a. Sheet reissued for corrected elevation references

17. **IF113A – INTERIOR FINISH PLAN – LEVEL 3 – AREA A**
    a. Sheet reissued for corrected elevation references
    b. Elevation marker made visible.

18. **IF113B – INTERIOR FINISH PLAN – LEVEL 3 – AREA B**
    a. Sheet reissued for corrected elevation references

19. **IF114A – INTERIOR FINISH PLAN – LEVEL 4 – AREA A**
    a. Sheet reissued for corrected elevation references

20. **IF114B – INTERIOR FINISH PLAN – LEVEL 4 – AREA B**
    a. Sheet reissued for corrected elevation references
    b. Elevation markers removed from sheet.

21. **IF115A – INTERIOR FINISH PLAN – LEVEL 5 – AREA A**
    a. Sheet reissued for corrected elevation references

22. **IF115B – INTERIOR FINISH PLAN – LEVEL 5 – AREA B**
    a. Sheet reissued for corrected elevation references

23. **IF116A – INTERIOR FINISH PLAN – LEVEL 6 – AREA A**
    a. Sheet reissued for corrected elevation references

24. **IF911 – INTERIOR SIGNAGE PLAN – LEVEL 1**
    a. 11/IF911
        i. Text revised.

25. **Q1.1, Q1.2 – EQUIPMENT SCHEDULES**
    a. Added note to Controlled Environmental Room, Sterilizer, and Lab Equipment Schedules (Undercounter Glassware Washer, Ice Machine, Ice Machine Bin) indicating "Contractor to provide breakout price to provide and install this equipment within the base bid scope.

26. **Q0.3 - CASEWORK SCHEDULES**
    a. Q7.2.1, Q7.3.1, Q7.4.1, Q7.4.2, Q7.5.1, Q7.5.3 – ENLARGED PLANS
        i. Added end panels to some adaptable benches.

27. **M201A, M201B, M202A, M202B, M203A, M203B, M204A, M204B, M205A, M205B, M402, M403, M406, M602, M603, M604, M608, M702, M703, M704, M711, M802A, M808A**
    a. Revised per the attached.

28. **E100 – ELECTRICAL SITE PLAN**
    a. Revised per the attached.

29. **E151A – ELECTRICAL POWER PLAN - LEVEL 1 - AREA A**
    a. Revised per the attached.

30. **E151B – ELECTRICAL POWER PLAN - LEVEL 1 - AREA B**
    a. Revised per the attached.

31. **E152A – ELECTRICAL POWER PLAN - LEVEL 2 - AREA A**
    a. Revised per the attached.

32. **E152B – ELECTRICAL POWER PLAN - LEVEL 2 - AREA B**
    a. Revised per the attached.

33. **E153A – ELECTRICAL POWER PLAN - LEVEL 3 - AREA A**
    a. Revised per the attached.

34. **E153B – ELECTRICAL POWER PLAN - LEVEL 3 - AREA B**
    a. Revised per the attached.

35. **E154A – ELECTRICAL POWER PLAN - LEVEL 4 - AREA A**
    a. Revised per the attached.

36. **E154B – ELECTRICAL POWER PLAN - LEVEL 4 – AREA B**
    a. Revised per the attached.

37. **E155A – ELECTRICAL POWER PLAN – LEVEL 5 - AREA A**
    a. Revised per the attached.

38. **E155B – ELECTRICAL POWER PLAN - LEVEL 5 - AREA B**
    a. Revised per the attached.

39. **E156A – ELECTRICAL POWER PLAN - PENTHOUSE - AREA A**
    a. Revised per the attached.

40. **E156B – ELECTRICAL POWER PLAN - PENTHOUSE - AREA B**
    a. Revised per the attached.

41. **E161A – ELECTRICAL POWER PLAN - LEVEL 1 - AREA A**
    a. Revised per the attached.

42. **E161B – ELECTRICAL POWER PLAN - LEVEL 1 - AREA B**
    a. Revised per the attached.

43. **E162B – ELECTRICAL POWER PLAN - LEVEL 2 - AREA B**
    a. Revised per the attached.

44. **E163A – ELECTRICAL POWER PLAN - LEVEL 3 - AREA A**
    a. Revised per the attached.

45. **E163B – ELECTRICAL POWER PLAN - LEVEL 3 - AREA B**
    a. Revised per the attached.

46. **E164A – ELECTRICAL POWER PLAN - LEVEL 4 - AREA A**
    a. Revised per the attached.

47. **E165A – ELECTRICAL POWER PLAN - LEVEL 5 - AREA A**
    a. Revised per the attached.

48. **E165B – ELECTRICAL POWER PLAN - LEVEL 5 - AREA B**
    a. Revised per the attached.

49. **E166A – ELECTRICAL POWER PLAN - PENTHOUSE - AREA A**
    a. Revised per the attached.

50. **E166B – ELECTRICAL POWER PLAN - PENTHOUSE - AREA B**
    a. Revised per the attached.

51. **E401 – ELECTRICAL ENLARGED PLANS**
    a. Revised per the attached.

52. **E421 – ELECTRICAL CONDUIT ROUTING PLAN - LEVEL 1**
    a. Revised per the attached.

53. **E501 – ELECTRICAL RISER DIAGRAMS - NORMAL**
    a. Revised per the attached.

54. **E510 – ELECTRICAL GROUNDING RISER**
    a. Revised per the attached.

55. **E601 – ELECTRICAL SCHEDULES**
    a. Revised per the attached.

56. **E602 – ELECTRICAL DISTRIBUTION PANEL SCHEDULES**
    a. Revised per the attached.

57. **E603 – ELECTRICAL DISTRIBUTION PANEL SCHEDULES**
    a. Revised per the attached.

58. **E604 – ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 1**
    a. Revised per the attached.

59. **E605 – ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 1**
    a. Revised per the attached.

60. **E607 – ELECTRICAL PANEL SCHEDULES - LEVEL 1**
    a. Revised per the attached.

61. **E617 – ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 3**
    a. Revised per the attached.

62. **E629 – ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 5**
    a. Revised per the attached.

63. **E630 – ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 5**
    a. Revised per the attached.

64. **E636 – ELECTRICAL EMERGENCY PANEL SCHEDULES - PENTHOUSE**
    a. Revised per the attached.

65. **E650 – LIGHTING SCHEDULE**
    a. Revised per the attached.

66. **E701 – ELECTRICAL DETAILS**
    a. Revised per the attached.

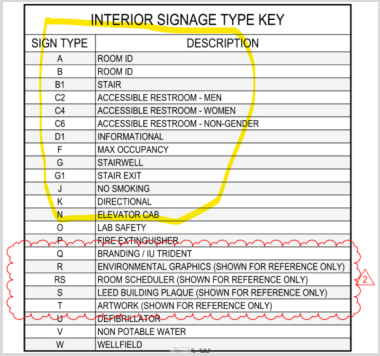
END OF ADDENDUM NUMBER TWO

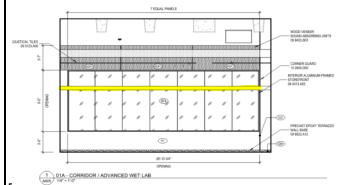
Attachments:

- Sections: **01 2300, 06 4200, 08 1113, 11 5300, 11 5313, 12 2553, 13 2100, 23 0906, 23 6423**

- Drawings: **A112B, A122A, A122B, A123A, A124A, A124B, A125B, A126B, A421, A605, A606, A607,IF111A, IF111B, IF112A, IF112B, IF113A, IF113B, IF114A, IF114B, IF115A, IF115B, IF116A, IF911, Q0.3, Q1.1, Q1.2, Q7.2.1, Q7.3.1, Q7.4.1, Q7.4.2, Q7.5.1, Q7.5.3, M201A, M201B, M202A, M202B, M203A, M203B, M204A, M204B, M205A, M205B, M402, M403, M406, M602, M603, M604, M608, M702, M703, M704, M711, M802A, M808A, E100, E151A, E151B, E152A, E152B, E153A, E153B, E154A, E154B, E155A, E155B, E156A, E156B, E161A, E161B, E162B, E163A, E163B, E164A, E165A, E165B, E166A, E166B, E401, E421, E501, E510, E601, E602, E603, E604, E605, E607, E617, E629, E630, E636, E650, E701**

20250072 - IU LAB - BP4 Bidder RFI's

RFI #	Bid Package	Discipline	Sheet/Spec Section	Question	Answer	Response By	Addendum
5		Interiors	Substitution Request Documentation Link	Lumicor Resin - 06 6413	Approved as a conditional alternate to be selected at a later date, subject to the requirements outlined in revised spec section 01 2300 under Alternate No. 6.	FPD	ADD-02
7	BE4-08A	Architectural	Substitution Request Documentation Link	De La Fontaine - 08 1113	This product is an acceptable substitution for hollow metal doors and frames with the exception of the tile clad and wood clad doors. If the contractor would like to propose a De La Fontaine door for the tile and wood clad instances, more product infomation will need to be provided to support this type of installation.	BSA	ADD-02
10	BE4-13A	Lab Planning		BE4-13 scope says that sterilizers, environmental rooms, ice makers, glass ware washers, and bio safety cabs will all be OFOI. We will be excluding spec 115317 LABORATORY GLASSWARE WASHERS since this will be OFOI. Same thing with 115319 laboratory sterilizers. Do you agree?	FAW thinks no, please confirm; SmithGroup: The equipment is CFCI and will be purchased from an outside funding source. Contractor to provide breakout price to provide and install this equipment within the base bid scope.	SmithGroup	ADD-02
16		Electrical		Does power need to be ran out to the sculptures as shown on LA series?	Yes, power will be needed to the north sculpture. This will be on the same circuit through the same control relay as the east sculpture. This will be addressed on drawings as part of ADD-02.	BSA	ADD-02
17	BE4-10D	Interiors	Substitution Request Documentation Link	Inpro WT - 12 2413	This product is not approved.	FPD	ADD-02
18	BE4-13A	Lab Planning		All environmental rooms, steam sterilizers, ice makers, and glassware washers are now OFOI per the VE log, please confirm and update schedule.	SmithGroup: The equipment is CFCI and will be purchased from an outside funding source. Contractor to provide breakout price to provide and install this equipment within the base bid scope.	SmithGroup	ADD-02
19	BE4-10H	Interiors		We are still missing some signage type details. The addendum added some details on sheet IF911 but there isn't a detail for every type that is on the key. 	Refer to project specifications for all IU standard sign types including sizes, font, color selections, etc. 101400FL-Interior Signage.	FPD	ADD-02
20	BE4-13A	Lab Planning	Substitution Request Documentation Link	AMS (Fume Hoods) - 11 5313	SmithGroup: This is acceptable to SmithGroup & IU.	SmithGroup	ADD-02
21	BE4-13A	Lab Planning	Substitution Request Documentation Link	AMS (Metal Lab Casework) - 12 3553	SmithGroup: This is acceptable to SmithGroup. BSA to confirm and coordinate with Owner for acceptance.	SmithGroup	ADD-02
22	BE4-13A	Lab Planning		2.3.C.6: Will tempered glass be allowed for the fume hood sashes in lieu of laminated glass? The tempered glass proposed meets UL1805 requirements.2.3.F: Will epoxy resin work surfaces be acceptable for the fume hoods in lieu of phenolic resin? 2.3.G: Please confirm if epoxy or polypropylene cup sinks will be allowed or if only stainless steel is acceptable. Is a mock up fume hood going to be required? Spec section 123553 item 2.15.I and J: Are both vacuum breakers and backflow preventers required? If needed, please specify source dn model for the back flow preventer associated with fume hood water supply	SmithGroup: I believe 2.3.C.6, 2.3.F, and 2.3.G refer to specification 11 5313 Laboratory Fume Hoods. The sash, work surfaces, and sinks should be bid per plans and specifications. A mock-up of the fume hood is required. We don't need both vacuum breakers and backflow preventers. Q1.1 indicates vacuum breakers and their locations.	SmithGroup	ADD-02
23	BE4-10F	Interiors		Is the large interior IU logo sign on Sheets A422 and A451 included in the scope of the interior signage package. If so, are there better specifications/ drawings for it? Also, would there be allowance for alternate construction methods	The large Trident is not included in the interior signage package.	FPD	ADD-02
24	BE4-10F	Interiors	08 1113_Substitution Request_De La Fontaine.pdf	Steel Doors and Frames Substitution request	This substitution request is already listed under bidder RFI #10.	BSA	ADD-02
25	BE4-10F	Interiors		The HM spec calls for "tile and wood clad HM doors" I have never seen those...it only has one manufacturer listed as "Ceco." Can the tile be excluded?	Tile cannot be excluded from this specification.	FPD	ADD-02
26	BE4-08A	Architectural		Specification section 08 44 35 is not listed in any bid package. You have 08 88 13 in 8B. I assume 08 44 35 should also be in 8A	This is part of BP 08B.	FAW	ADD-02

27	BE4-08B	Architectural		Specification section 08 4313 2.05 C. 1. calls for kynar painted aluminum finish, C.2. calls for clear anodized. Bidder cannot find anything on the drawing that shows which storefronts are anodized and which are painted. Please advse.	2.02, A, 4. indicates "*superior performing organic coatings at* ***vestibule locations and interior vestibule entrance doors****; class II natural anodized at* ***interior locations***".	BSA	ADD-02
28	BE4-09B	Interiors		Are we able to waive the NTMA Terrazzo requirements for this project? In Imaging Lab 107 on IF111A, it lists SVT1 at the floor and SVB1 as the base. SVB1 is Gerflor: Mipolam Symbioz? If the Gerflor sheet is to be used as an integral cove base, it will need to be a border. This is also two different manufacturers products that are making up the integral cove base system? Please advise if this is supposed to be integral cove base, what the width of the border would be, and if the integral cove base should be a Tarkett Rolled good to match the SVT1 – Tarkett: iQ Optima. Please confirm if all Men's & Women's Restrooms Wall Tile is to be 8'0" A.F.F. A420 shows wall tile 8'0" A.F.F at all walls with tile. A421 shows wall tile 8'0" A.F.F. at some walls and floor to ceiling (9'0" A.F.F.) at others.	Terrazzo: No Imaging Lab: wall base changed to RB1 - revision being issued in ADD.02 Restrooms: All tiles walls in women and men's restrooms to be at 8'-0" AFF	FPD	ADD-02
29	BE4-13A	Lab Planning		Specification section part 1.2.A.4 says the refrigeration systems for each room should be redundant. However, on the electrical drawings they only show power for one condensing unit. Please advise if each room should be redundant or standard with one condensing unit. Please confirm that this project is Non-union and does not require prevailing wages. We are planning to bid Scope of Work section BE4-13A - Lab Casework & Equipment. As part of our review, we noted that Spec Section 123661 - Simulated Stone Countertops is included within this package and we will not be covering that scope. We wanted to bring this to your attention, as this scope is typically carried under a millwork package	SmithGroup: I believe 1.2.A.4 specification section refers to 13 2100 Controlled Environmental Rooms. The intent is to say that if back-up systems are required, they would be required for each room. Redundant refrigeration systems would be indicated in the Refrigeration System part of the specification. No redundant refrigeration systems are required, one condensing unit per Controlled Environmental Room is acceptable. FAW to respond to remaining questions in RFI.	SmithGroup	ADD-02
30	BE4-08B	Architectural		 Please advise as to what the item highlited in yellow is on detail 1 sheet A605:	This is a modeling error with another discipline model. It is not an element to the interior storefront system beyond.	BSA	ADD-02

SECTION 01 2300
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.

B. Procedures for pricing Alternates.

1.02 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03 SCHEDULE OF ALTERNATES

A. Alternate No. 01 - Resinous Epoxy Flooring System:
   1. Base Bid Item: Section 03 3511 and Drawing number IF000 - IF116B including topical concrete floor sealer in mechanical rooms, plumbing rooms, lab storage and waste spaces, and mechanical penthouse as identified on the noted interior finish drawings.
   2. Alternate Item: Section 09 6723 and Drawing number IF000 - IF116B including an alternate cost to SUBSTITUTE resinous epoxy flooring system in mechanical rooms, plumbing rooms, lab storage and waste spaces, and mechanical penthouse as identified on the noted interior finish drawings in lieu of a topical concrete floor sealer.

B. Alternate No. 02 - Wood Slat Walls:
   1. Base Bid Item: Section 09 2116 and Drawing number A112A - A115B and A122A - A125B including metal stud framing wall construction with field-painted gypsum board finish to act as screen walls in the open office areas on floors 2-5 as indicated on the drawings.
   2. Alternate Item: Section 06 2000 and 06 4200 and Drawing number A112A - A115B, A122A - A125B, and A721 including an alternate cost to SUBSTITUTE a wood slat wall system with wood base to act as screen walls in the open office areas on floors 2-5, as indicated on the drawings, in lieu of metal stud framing wall construction with field-painted gypsum board.

C. Alternate No. 03 - Fluid Cooler Unit:
   1. Base Bid Item: Section Div 23 and Drawing number M-Series including process cooling provided via connection to base bid chilled water system as indicated on the drawings.
   2. Alternate Item: Section 23 6426, 23 2113, 23 2500, 23 0593, 23 0900 and Drawing number M400, M401, M603, M706, M802, M802A including an alternate cost to ADD, furnish and install, a fluid cooler unit complete with associated piping, accessories, controls integration, and electrical connections to serve the process cooling system as indicated on the drawings.

D. Alternate No. 04 - Double Wall HVAC Ducts:
   1. Base Bid Item: Section 23 3100 and 23 0713 and Drawing number M200 Series including single-wall galvanized steel ductwork with external insulation throughout, including ductwork in the areas indicated on the drawings.

2. Alternate Item: Section 23 3100 and 23 0713 and Drawing number M200 Series including an alternate cost to SUBSTITUTE double-wall insulated ductwork for single-wall externally insulated ductwork at the located highlighted on the reference diagram provided in Exhibit 01 2300.04A, including all associated fittings, supports, and transitions; remainder of ductwork to remain base bid construction.

E. Alternate No. 05 - Vinyl Sheet Flooring in Labs:
1. Base Bid Item: Section 09 6519 and 09 6513 and Drawing number IF000 - IF115B including resilient tile flooring and resilient cove base in all labs, adjacent equipment rooms, autoclave, consumables, cell culture, lab supply, freezer room, enviro room, and adjacent lab corridors with the *exception of Advanced Wet Lab 108A*.
2. Alternate Item: Section 09 6516 and Drawing number IF000 - IF115B including an alternate to SUBSTITUTE sheet vinyl flooring and resilient cove base in all labs, adjacent equipment rooms, autoclave, consumables, cell culture, lab supply, freezer room, enviro room, and adjacent lab corridors in lieu of resilient tile flooring and resilient cove base.

F. Alternate No. 06 - Resin Panel Fabrication:
1. Base Bid Item: Section 06 6413 and Drawing number A422, A440, A451, and IF000 to provide 3Form Resin System for lobby feature wall and illuminated branding signage as documented, DP1 and DP2.
2. Alternate Item: Section 06 6413 and Drawing number A422, A440, A451, and IF000 to provide Lumicor Resin System as a conditional alternate to SUBSTITUTE 3Form Resin System for the lobby feature wall and illuminated branding signage as documented, DP1 and DP2. Final approval will be subject to the following: Contractor must demonstrate through shop drawings that the proposed product achieves design intent per the Contract Documents, including but not limited to:
   a. “Folded” corners with welded seams with a finish that is visually seamless.
   b. Material is fully opaque such that attachment is not visible through the finish of the final product.
   c. Opaque white "trident" element is fully engineered and coordinated by the manufacturer and subcontractor to be suspended off of the "red" wall with halo back lighting.
   d. Additional opaque white samples to be provided for lighting mock-up to ensure front-lighting effect on trident aligns with design intent.
3. Approval of this substitution does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

SECTION 06 4200
WOOD PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Custom wood veneer paneling for built-in millwork.

B. Shop finishing.

C. Laminated wood blocking and framing for curved built-in furniture receiving custom wood veneer paneling.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 1053 - Miscellaneous Rough Carpentry: Grounds and concealed blocking.

C. Section 12 6200 - Upholstered Furniture: Upholstered bench top seating for built-in millwork.

1.03 REFERENCE STANDARDS

A. Composite Panel Association and California Air Resources Board (CARB).

B. AWI (QCP) - Quality Certification Program.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition.

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards.

1.04 SUBMITTALS

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

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
   2. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   3. Include certification program label.

C. Samples: Submit two samples of finished wood veneer on MDF substrate, 12 x 12 inch in size, illustrating wood grain and specified finish.

D. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.
   1. Company with at least three projects in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
   3. Single Source Responsibility: Provide and install this work from single fabricator.

B. Quality Certification:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
      a. This AWI (QCP) project is registered as project number 26.0114.

2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
3. Provide designated labels on shop drawings as required by certification program.
4. Provide designated labels on installed products as required by certification program.
5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 MOCK-UP

A. Construct seating bench mock-up, 8 feet long by 2 feet wide, illustrating full panel sheet, edge trim, joint trim, applied finish , and upholstered seating.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

B. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

PART 2 PRODUCTS

2.01 PANELING

A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless otherwise indicated.

B. Flat Paneling; Type WDV1:
1. Species: White oak.
2. Cut: Rift sawn.
3. Panels: Veneer of full width and balanced sequence matched.
   a. Panels More Than One Leaf High: Architectural end matching.
   b. Each Panel Within Single Area: Sequence matched uniform size sets.
4. Visible Edges and Reveals: Match faces.
5. Outside Corners: Metal edge trim, unless noted otherwise in drawings.

2.02 WOOD-BASED MATERIALS - GENERAL

A. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000.

B. Medium Density Fiberboard (MDF): Composite panel composed of cellulosic fibers, additives, and bonding system; cured under heat and pressure; comply with ANSI A208.2.

C. MDF products shall be certified and contain product labeling stating, "No-Added Formaldehyde (NAF)" or "Ultra-Low Emitting Formaldehyde (ULEF)".
1. Grade: 155; fire-resistant core.
2. Panel Thickness: 3/4-inch.
3. Products:
   a. Roseburg Forest Products; Medite FR Medium Density Fiberboard: www.roseburg.com/#sle.
   b. Substitutions: See Section 01 6000 - Product Requirements.

D. Lumber: Maximum moisture content of 6 percent; with vertical grain , of quality suitable for transparent finish.

2.03 ADHESIVES AND FASTENERS

A. Adhesives: Type suitable for intended purpose, complying with applicable air quality regulations.

B. Fasteners: Of size and type to suit application; zinc-plated or stainless steel finish in concealed locations.
   1. Exposed fasteners shall not be used.

2.04 FABRICATION

A. Shop prepare and identify panels for grain matching during site erection.

B. Prepare panels for delivery to site, permitting passage through building openings.

C. Finish exposed edges of panels as specified by grade requirements.

2.05 SHOP FINISHING

A. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

B. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 5, Varnish, Conversion.
      b. Stain: Custom selection or blend to match appearance of Wilsonart 7981K-12 Landmark Wood plastic laminate.
      c. Sheen: Satin.

2.06 ACCESSORIES

A. Metal Trim:
   1. Material: Extruded aluminum.
   2. Shape: As indicated on drawings.
   3. Finish: As selected by Architect from manufacturer's full range.
   4. Manufacturers:
      a. Eagle Mouldings, Inc; Millwork Trim: www.eagle-aluminum.com/#sle.
      b. Flannery, Inc; Millwork Metal Trim: www.flannerytrim.com/#sle.
      c. Fry Reglet, Inc; Millwork Profiles: www.fryreglet.com/#sle.

B. Metal Hanging Systems: Provide where indicated on drawings.
   1. Description: Cleated, z-shaped clips and rails, hanging systems.
   2. Material: Extruded aluminum; alloy 6005-T6 tempered in accordance with ASTM B221.
   3. Clips:
      a. Width: 2.00 inches.
      b. Height: 1.25 inches.
      c. Stand-Off: 0.24 inch.
      d. Lift-Off: 0.375 inch.
   4. Rails:
      a. Length: As necessary to support panel size and weight.
      b. Profile: Smooth.
   5. Products:
      a. Eagle Aluminum; Eagle Z-Clips: www.eagle-aluminum.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

C. Lumber for Blocking: Softwood lumber of pine species.

D. Shimming Material: Zinc-plated steel slot washer, non-combustible material.
   1. Products:
      a. McMaster-Carr Supply Company: www.mcmaster.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

E. Wood Filler: Tinted to match surface finish color.

2.07 LAMINATED WOOD BLOCKING AND FRAMING FOR CURVED BUILT-IN FURNITURE

A. Provide shop-fabricated laminated wood members for curved built-in furniture where radiused or free-form geometry is indicated. Fabricate to true curves with consistent section, smooth arrises, and surfaces suitable to receive specified finishes.

B. Performance Requirements:
   1. Members shall be free of twist, warp, and delamination under service conditions.
   2. Minimum radius: As indicated on drawings; where not indicated, do not exceed species-appropriate limits without evidence of prior successful fabrication or mock-up approval.
   3. Load Resistance: Provide section properties and reinforcement to support imposed loads from attached seating without visible deflection or creep.

C. Materials:
   1. Species: Same species as adjacent exposed millwork unless otherwise indicated; where concealed, use kiln-dried hardwood or softwood suitable for structural lamination.
   2. Moisture Content: 6 to 10 percent at time of fabrication.
   3. Laminations: Thickness: 1/8 to 1/4 inch (3 to 6 mm).
   4. Grain: Parallel to member length; free of knots, checks, and defects that would telegraph through finish surfaces.
   5. Adhesives: Comply with LEED v4 Low-Emitting Materials requirements. Adhesives shall be low-VOC and meet the applicable limits of South Coast Air Quality Management District (SCAQMD) Rule 1168.
      a. Composite wood adhesives shall contain no added urea-formaldehyde (NAUF).
      b. Acceptable adhesive types include:
         1) Water-based PVA (polyvinyl acetate), low-VOC formulation.
         2) Soy-based adhesives with zero or ultra-low formaldehyde emissions.
         3) Polyurethane (PUR) adhesives with low-VOC content and compliant emissions.
      c. Prohibit use of solvent-based adhesives exceeding VOC limits or adhesives containing added formaldehyde resins not compliant with LEED emissions criteria.
      d. Provide third-party documentation demonstrating compliance with CDPH Standard Method v1.2 (or latest) for VOC emissions where required for LEED credit compliance.
   6. Fasteners (where required for temporary clamping or concealed reinforcement): Non-corrosive, compatible with wood species; exposed fasteners are not allowed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify adequacy of backing and support framing.

C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Do not begin installation until wood materials have been fully acclimated to interior conditions.

C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.

D. Touch up damaged finish to match original, using materials provided by fabricator; replace components that cannot be refinished like new.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 4200

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

C. Sound-rated hollow metal doors and frames.

D. Tile and wood-clad hollow metal doors and frames.

E. Accessories, including fasteners and other components noted.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

C. Section 09 3013 - Ceramic Tiling: Field-applied ceramic tile cladding on door and frame assemblies.

D. Section 09 8433 - Sound Absorbing Wall Units: Field-applied sound absorbing wood panel cladding on door and frame assemblies.

E. Section 09 9113 - Exterior Painting: Field painting.

F. Section 09 9123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. HMMA: Hollow Metal Manufacturers Association.

D. NAAMM: National Association of Architectural Metal Manufacturers.

E. NFPA: National Fire Protection Association.

F. SDI: Steel Door Institute.

G. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

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

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100).

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.

J. ASTM C476 - Standard Specification for Grout for Masonry.

K. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

L. ASTM E413 - Classification for Rating Sound Insulation.

M. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

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

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

P. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames.

Q. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames.

R. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames.

S. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames.

T. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

U. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

V. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.

W. UL (DIR) - Online Certifications Directory.

X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

1.05 SUBMITTALS

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

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Samples: Submit two samples of metal, 6 by 6 inches in size, showing factory finishes, colors, and surface texture.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

G. Manufacturer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.

B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. MPI: www.metalproductsinc.com/sle#.
   4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   5. Steelcraft, an Allegion brand: www.allegion.com/#sle.
   6. Amweld Building Products: www.amweld.com/#sle.
   7. De La Fontaine Steel Doors and Frames: https://www.delafontaine.com/

B. Sound-Rated Hollow Metal Doors and Frames:
   1. As offered by the list of acceptable hollow metal door and frame manufacturers.

C. Tile and Wood-Clad Hollow Metal Doors and Frames:
   1. Curries, an Assa Abloy Group company; 747 Series (Steel Stiffened): www.assaabloydss.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Edge Profile: Manufacturers standard for application indicated.
   4. Typical Door Face Sheets: Flush.
   5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Flush.
   6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Type HM ,Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inches, nominal.

C. Type HM , Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.
   4. Door Core Material: Mineral board.
   5. Door Thickness: 1-3/4 inches, nominal.

D. Type HM , Sound-Rated Interior Doors: Provide fire-rated door construction as indicated for door Type HM , Fire-Rated Doors and the following sound-rated door requirements.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Sound Transmission Class (STC) Rating of Door and Frame Assembly: STC of 50, minimum or as indicated on drawings, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
   3. Door Core Material: Manufacturer's standard construction as required to meet acoustic requirements indicated.
   4. Door Thickness: As required to meet acoustic requirements indicated.

5. Sound Seals: Integral, in door and/or frame.
6. Opening Force of Sound-Rated Doors, Non-Fire-Rated: 5 pounds, maximum, in compliance with ADA Standards.

E. Type HM, Tile-Clad Interior Doors, Non-Fire-Rated:
1. Doors 198A, 298, 398, 401, and 501 as indicated on drawings.
2. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 3 - Extra Heavy-duty.
   b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 2 - Seamless.
   d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
   e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
3. Door Core Material: Manufacturer's standard steel-stiffened construction as required to meet load requirements indicated for cladding application.
4. Door Thickness: As required to meet load requirements indicated for cladding application.
5. Load Requirement for Cladding: 5.0 pounds per square foot maximum.
6. Door Cladding: As specified in Section 09 3013, field installed.
7. Provide core material and sound seals to meet acoustic requirements for STC rating of door and frame assembly as indicated on drawings.

F. Type HM, Wood-Clad Interior Doors, Fire-Rated:
1. Door 198 as indicated on drawings.
2. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 3 - Extra Heavy-duty.
   b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 2 - Seamless.
   d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
   e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
3. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   a. Attach fire rating label to each fire rated unit.
5. Door Core Material: Manufacturer's standard steel-stiffened construction as required to meet load requirements indicated for cladding application.
6. Door Thickness: As required to meet load requirements indicated for cladding application.
7. Load Requirement for Cladding: 5.0 pounds per square foot maximum.
8. Door Cladding: As specified in Section 09 8433, field installed.
9. Provide core material and smoke seals to meet fire rating of door and frame assembly as indicated on drawings.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Frame Finish: Factory primed and field finished.

C. Door Frames, Fire-Rated: Full profile/continuously welded type.
1. Fire Rating: Same as door, labeled.

2. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
3. Frame Finish: Factory primed and field finished.

D. Sound-Rated Door Frames: Full profile/continuously welded type.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Frame Finish: Factory primed and field finished.

E. Tile-Clad Door Frames, Non-Fire Rated: Concealed, single rabbet type with mud-in flanges.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Frame Finish: Factory primed and field finished.

F. Wood-Clad Door Frames, Fire Rated: Concealed, single rabbet type with mud-in flanges.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Frame Finish: Factory primed and field finished.

G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.06 ACCESSORIES

A. Glazing: As specified in Section 08 8000, factory installed.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Astragals for Double Doors: Specified in Section 08 7100.

D. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

E. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

F. Silencers: Resilient rubber or vinyl, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Install door hardware as specified in Section 08 7100.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Comply with glazing installation requirements of Section 08 8000.

G. Coordinate installation of electrical connections to electrical hardware items.

H. Install tile cladding at tile-clad door locations per manufacturer's installation instructions and per installation requirements of Section 09 3013.

I. Install sound absorbing wood panel cladding at wood-clad door locations per manufacturer's installation instructions and per installation requirements of Section 09 8433.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

C. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.06 SCHEDULE - SEE DRAWINGS

END OF SECTION 08 1113

SECTION 115300 - MISCELLANEOUS LABORATORY EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cabinet, Modular Gas.
2. Cabinet, Tall Corrosive Storage.
3. Cabinet, Tall Flammable Storage.
4. Coat Rack, Lab.
5. Drying Rack.
6. Drying Rack, Bench Top Mounted.
7. Gas Cylinder Restraints.
8. Gas Cylinder Corral Storage.
9. Ice Machine, Upright.
10. Point Exhaust.

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 055000 "Metal Fabrications" for furnishing and installation of metal fabrications to casework and accessory equipment.
3. Section 092216 "Non-Structural Metal Framing" for furnishing and installation of non-structural metal framing to casework and accessory equipment.
4. Division 22: Furnishing and installation of plumbing utilities and final connections to accessory equipment.
5. Division 23: Furnishing and installation of exhaust ductwork and equipment, and final connection to exhaust devices.
6. Division 26: Furnishing and installation of electrical utilities and final connections to casework and accessory equipment.

1.2 REFERENCES

A. Items specified as a part of this section must conform, where applicable, to the following standards.

B. American National Standards Institute (ANSI)
1. ANSI/UL 3101-1 – Electrical Equipment for Laboratory Use; Part 1: General Requirements

C. Underwriters Laboratories, Inc. (UL)
1. 1262 – Laboratory Equipment

D. American Society for Testing Materials (ASTM)
1. ASTM A167 for Stainless Steel, Alloy 302 or 304.
2. ASTM E84 for Burning Characteristics of Building Materials.
3. ASTM MT1010 for Support Columns

E. NSF International (NSF)
1. Standard #49.

1.3 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's data for each component and item of laboratory equipment specified. Include component dimensions, configurations, construction details, joint details, and attachments. Indicate location, size and service requirements for each utility connection.

B. Shop Drawings: Include the following:
1. Location of assemblies in each room and layout for roughing-in, including utility connections and related diagrams.
2. Details of fabrication and installation.
3. Dimensional locations for rough-in of mechanical and electrical services.
4. Model numbers indicated in this section to include all standard features listed in latest catalog or Website at date of submittal.

1.4 CLOSEOUT SUBMITTALS

A. Manufacturer's operating and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer shall have at least 5 years' experience in the fabrication of the specified equipment and shall have 10 installations of equal or larger size.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Schedule delivery of equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.

B. Handling: Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating though-out the remainder of construction.

1.7 FIELD CONDITIONS

A. Do not deliver or install equipment until the following conditions have been met:
   1. Windows and doors are installed and the building is secure and weathertight.
   2. Ceiling, overhead ductwork, and lighting are installed.
   3. All painting is completed and flooring is installed.

B. Field Measurements: Take field measurements to verify or supplement dimensions indicated. Be responsible for accurate fit of the Work. Verify that all equipment in this section is coordinated to provide a complete working process and system integration.

1.8 WARRANTY

A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design and installation of product. "Defects" is defined to include but not limited to deterioration or failure to perform as required.

   1. Warranty Period: Manufacturer shall warrant the products to be free from material and labor defects for a period of 1 year from date of operational acceptance by the Using Agency.
   2. Date of operational acceptance shall be after factory check, test and start-up services is complete, the unit is operating in a satisfactory manner, and the equipment has been satisfactorily commissioned by the Using Agency.
   3. The Using Agency will perform routine maintenance as described in the Manufacturers Standard Operation and Maintenance manuals during the warranty period. Using Agency performance shall in no way invalidate said warranties.

B. Installer's Warranty: Furnish installer's written workmanship warranty signed by an authorized representative using installer's standard form agreeing to provide labor required to repair or replace work which exhibits workmanship defects. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
   1. Warranty Period: Installer shall warrant the installation to be free from workmanship Defects for a period of 1 year from date of operational acceptance by the Using Agency.

1.9 COORDINATION AND UTILITIES VERIFICATION

A. Utilities and connections may vary between approved manufacturers. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.
   1. All utilities for these items are indicated in mechanical and electrical documents, the Equipment Schedule, and are referenced in Divisions 20, 21, 22, 23 and 26. Any deviations from these utilities must be documented within bid and shop drawing submittals.
   2. The Contractor is responsible for verifying field conditions, final services, connections and locations.

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".

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: As indicated in schedule on the Drawings. If no schedule, then the first manufacturer listed in each Article shall be the basis of design.

2.2 PERFORMANCE REQUIREMENTS

A. Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required and shall not be construed as an engineered design. Furnish and install all Work required for a complete installation.

B. Coordination of Contract Documents and Work:
   1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturer/fabricators, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.
   2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

2.3 CABINET, SINGLE GAS CYLINDER (MQ-01D)

A. Acceptable Manufacturers:
   1. Matheson Gas Products; Model 1177F, Gas Cabinet Series (Single Cabinet).
   2. Praxair Distribution, Inc.
   3. Scott Specialty Gases.
   4. Spectra Gases Inc.

B. General:
   1. Standard gas cabinet series with a flat top design Cabinet to house single gas cylinder with regulator assembly (hydrogen).

C. Cabinet Dimensions:
   1. Single Cylinder: 18 inches (455 mm) wide by 19 inches (480 mm) deep by 79 inches (2000 mm) high, 300 pounds (136 kilograms).

D. Cabinet Construction:
   1. Each gas cabinet shall be constructed of a minimum of 12 gage steel. The cabinet shall be welded and coated with a corrosion resistant epoxy paint.
   2. Door: Full length door, fully gasketed with neoprene gasket, with automatic closer, three-point latch and a flush mounted door handle with lock.
   3. Window: Manufactured of either 1/2 inch (12 mm) wire reinforced safety glass or 0.25 inch (6 mm) Lexan. The window shall be hinged with automatic closer, gasketed and key lock.
   4. Adjustable cylinder brackets and straps shall be provided for each cylinder the gas cabinet can hold.
   5. Shelves: Vertically adjustable to accommodate different sizes of standard gas cylinders.
   6. Color selection by the Owner's Representative from one of the manufacturer's standard colors.

E. Cabinet Accessories:

1. Sprinkler Head: UL approved, rated at 155 degrees Fahrenheit (68 degrees Celsius), and flow capacity of 35 gallons per minute (133 liters per minute) at 40 psi (2.8 bar). Water Pipe Connection: 1/2 inch NPT (15 DN) Female.
2. Each gas cabinet shall have a rubber mat on the floor of the cabinet.
3. All wiring and tubing in the cabinets shall be standardized and color coated.
4. Provide bulkhead connectors for all lines entering or exiting the cabinet that will enable a continuous tube run without breaks.
5. Exhaust air shall enter at the bottom of the cabinet and sweep the complete interior of the cabinet to the smooth nonrestricting gas transition at the top of the cabinet. A vent connection shall be provided at the top of each cabinet for connection to the building exhaust system.
   a. Exhaust Flow Required (SCFM): 175 for single.
   b. Exhaust Stack Diameter: 4 inch (100 mm) for single.

2.4 CABINET, TALL CORROSIVE STORAGE (MQ-01B)

A. Acceptable Manufacturers:
1. Justrite Manufacturing Company, L.L.C., Model 894522
2. Eagle Manufacturing Company.
3. Securall.

B. Capacity:
1. 45 gallons (170 liters) - 43 inches (1090 mm) wide by 18 inches (455 mm) deep by 65 inches (1650 mm) high.

C. Design: Construct cabinet in accordance with OSHA Regulations and the requirements of International Fire Code, Chapter 50 Hazardous Materials. Provide cabinets Factory Mutual (FM) approved or Underwriters Laboratories (UL) listed or as constructed below.

D. Casing: Bottom, top, back, door, and sides of cabinet, minimum 18 gage (1.2 mm) sheet steel, double walled with 1-1/2 inches (36 mm) air space. Rivet or weld joints airtight. Provide with adjustable zinc plated leveling legs.

E. Door: Provide with continuous piano hinge and a 3-point latch arrangement with door sill raised at least 2 inches (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet. Provide self-closing self-latching door(s) with fusible link(s) to hold doors wide open and melt at 74 degrees Celsius for automatic closure. Provide with keyed lock.

F. Ventilation: Provide a 2 inches (50 mm) threaded vent connection on each side of the cabinet for supply and exhaust ventilation air. Provide flame arrestors at supply and exhaust connections to cabinet.

G. Shelving: Provide with three 18 inches (450 mm) deep, full width adjustable shelves. Provide each shelf with 1/4-inch (6 mm) thick heat welded, polypropylene or ABS plastic pan, liquid tight, removable, 1 inch (25 mm) deep.

H. Liner: Provide cabinet with ChemCor thermoplastic coating on all interior surfaces as provided on the Justrite Centura line or similar.

I. Identification: Mark all corrosive storage cabinets with conspicuous red lettering on a contrasting background: HAZARDOUS—KEEP FIRE AWAY.

J. Identification: Mark all corrosive storage cabinets with conspicuous red lettering on a contrasting background: CAUTION—ACIDS.

K. Identification: Mark all corrosive storage cabinets with conspicuous red lettering on a contrasting background: CAUTION—CORROSIVES.

L. Identification: Mark all corrosive storage cabinets with conspicuous red lettering on a contrasting background: CAUTION—BASES.

M. Color: Manufacturer's standard dark blue.

N. Finish: Provide as specified for Metal Finishes in Section 123553.

2.5 CABINET, TALL FLAMMABLE STORAGE (MQ-01A)

A. Acceptable Manufacturers:
1. Justrite Manufacturing Company, L.L.C., Model 894520
2. Eagle Manufacturing Company.
3. Securall.

B. Capacity:
1. 45 gallons (170 liters) - 43 inches (1090 mm) wide by 18 inches (455 mm) deep by 65 inches (1650 mm) high.

C. Design: Construct cabinet in accordance with OSHA Regulations and the requirements of NFPA 30, National Fire Protection Association, Flammable and Combustible Liquids Code.

D. Casing: Bottom, top, back, door, and sides of cabinet shall be at least 18 gage (1.2 mm) sheet steel, double walled with 1-1/2 inch (36 mm) air space. Joints shall be welded airtight. Provide with adjustable zinc plated leveling legs.

E. Door: Provide with continuous piano hinge and a 3-point latch arrangement with door sill raised at least 2 inches (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet. Provide self-closing self-latching door(s) with fusible link(s) to hold doors wide open and melt at 74 degrees Celsius for automatic closure. Provide with keyed lock.

F. Ventilation: Do not ventilate cabinet unless required by local authorities. Seal vent openings with plugs, supplied by the manufacturer.

G. Shelving: Provide with three 18 inch (450 mm) deep, full width adjustable shelves.

H. Grounding: Provide a grounding lug connection at lower right side of cabinet.

I. Identification: All flammable storage cabinets shall be marked with conspicuous red lettering on a contrasting background: FLAMMABLE—KEEP FIRE AWAY.

J.

K. Color: Manufacturer's standard yellow.

L. Finish: Provide as specified for Metal Finishes in Section 123553 except interior shall be triple epoxy coated.

M.

2.6 COAT RACK, LAB (MQ-XXX)

A. Available Manufacturers:
1. Global Industrial, Model T9F695715.
2. Bradley, Model 9944-000000.
3. Safco, Model 4162.

B. Size: 36 inches wide by 2-5/8 inches deep by 7-1/4 inches high nominal dimension.

C. Type: Multiple hat and coat hooks, wall mounted on mounting backplates.

D. Construction: 22 gauge stainless steel backplate with 14 gauge stainless steel double hooks.

2.7 DRYING RACK (DRXXXX)

A. Available Manufacturers:
1. Mod-Rack by Inter-Dyne; Model ”V” Victoria Series.
2. Or Equal (No Known Equal).

B. Body: One-piece, 20 gage (1.0 mm), Type 304 stainless steel with a Number 4 finish. Provide top with two 90 degree bends and sides with one 90 degree bend. Bottom shall have two 90 degree bends to provide an integral drip trough and catch drain. Provide front with a multiple of T-shaped holes to accommodate pegs.

C. Pegs: Injection molded white polypropylene, 1/2 inch (12 mm) diameter by 6 inches (150 mm) long. T-shaped protrusion on base of pegs shall allow easy removal and replacement without need for tools. Design T-shaped holes to fit protrusion on support pegs for holding single or multiple utensil drip trays, drain shelves, funnel racks, or pipette holders. Provide five 2-3/4 inch (70 mm) peg extenders for each drying rack.

D. Drip Trough: 4 inch (100 mm) wide, 20 gage (1.0 mm), Type 304 stainless steel with a 3/8 inch (9 mm) OD stainless drain tube and a stainless steel screen insert. Screen; 16 gage (1.6 mm), 14 by 14 mesh, 0.025 wire. Provide with a 3/8 inch (9 mm) ID flexible drain tube minimum of 36 inches (914 mm) long. Where edge of drying rack is more than 24 inches from edge of sink, drain and drain tube to be located on side of rack closest to sink with sufficient flexible drain tube length to reach the inside of sink.

E. Provide with hanger to allow removal and replacement of entire rack for cleaning without need for tools.

F. Finished Backs: Provide with all units not mounted on walls. Fabricate from 20 gage (1.0 mm), Type 304 stainless steel with a Number 4 finish.

2.8 DRYING RACK, BENCH TOP MOUNTED (DRXXXX)

A. Available Manufacturers:
1. Heathrow Scientific Global, Model HS23243A.
2. Or Equal (No Known Equal).

B. Description: Self-supporting, spot-welded HDPE-coated steel wire with polystyrene tray and back. Provide with removable bottom drainage pan.

C. Provide one at each accessible sink indicated in Q7 Drawing Series.

2.9 GAS CYLINDER RESTRAINTS (CRT-XX)

A. Acceptable Manufacturers:
1. Justrite Manufacturing Company, LLC; Model 35254 (one cylinder), Model 35268 (two cylinders).
2. USA Safety; Model GB160FS.
3. Troemner (supplied by Cole Parmer); Model 974037.

B. Description: Gas Cylinder restraints shall be steel construction with a nylon strap with adjustable buckle and safety chain. Provide one bracket per each gas cylinder.

C. Reference standards: Compressed Gas Institute, CGA P-1 latest edition, CGA PS-6 latest edition.

2.10 GAS CYLINDER CORRAL STORAGE (CRK-XX)

A. Acceptable Manufacturers:
1. Justrite Manufacturing Company, LLC.
2. Work Safe Technologies.
3. Specialty Gas Equipment.

B. General: Steel cylinder restraint unit, designed to restrain six gas cylinders 10 to 12 inches in diameter.

C. Description:
1. All steel construction with lab-approved exterior-grade urethane powder-coat finish.
   a. 2 inch (50 mm) by 2 inches (50 mm) thick steel tubing frames.
   b. Adjustable back frame allows side panels to be set to accommodate cylinders of various widths.
   c. Side panels anchor to concrete floor with welded "L" brackets.
   d. Seismic Tank Corral with back frame anchors to concrete floor or wall.
   e. Hardware is galvanized for corrosion resistance.
   f. Available with steel chain or stainless-steel cable restraints

D. Reference standards: Compressed Gas Institute, CGA P-1 latest edition, CGA PS-6 latest edition.

2.11 ICE MACHINE, UPRIGHT (MQ-XXX)

A. Acceptable. Manufacturers:
1. Scotsman Ice Systems; Model <**Prodigy Plus FS0522AX-1 with B530S bin**>.
2. Hoshizaki Europe B.V.; Model <**F-422MAK with B-500SF bin**>.
3. Manitowoc Ice; Model <**RFP0620 with D570 bin**>.

B. Size:
1. Machine: nominal 23 inches (584 mm) wide by 24 inches (610 mm) deep by 23 inches (584 mm) high.
2. Storage Bin: nominal 30.5 inches (775 mm) wide by 34 inches (864 mm) deep by 50 inches (1270 mm) high.

C. Description: Air cooled compressor/condenser, flake ice machine with storage bin. Storage bin to include four legs and bin top.

D. Capacity: Ice making capacity of minimum 450 pounds (200 kg) in 24 hours. 1/2 horsepower (370 watts) with a bin storage capacity of minimum 500 pounds (225 kg).

E. Finish: Provide all units in stainless steel. If Manitowoc Ice is selected, provide the Duratech metal finish for the bin.

F. Electrical: 120/60/1, 20 amp. Provide with grounded cord and plug.

2.12 POINT EXHAUST (PE-XX)

A. Available Manufacturers:
1. Nederman; Model; FX2 75 Original.
2. Movex Inc.; Model; ME-75 with metal hood MEM 250-75.
3. Airflow Systems Inc.; Model; E-Z ARM 2.5.

B. Description: 3 inches (100 mm) diameter by 60 inches (1500 mm) long self-supporting telescopic arm.

C. Construction: Aluminum tubes connected with jointed elbows. Provide internal stainless steel support spring as recommended by the manufacturer. Provide arm with polypropylene mini hood and clear combi hood with outside dimension of 15-inch by 18-inch (380 mm by 460 mm), and external collar for duct coupling. Provide connection to existing ductwork which will allow an unrestricted 360-degree movement of the arm.

D. Jointed Elbows: Provide polypropylene with glass fiber reinforcement with 90-degree radius elbows and knurled adjusting knobs supported by ball bearings. The two outermost elbow joints shall rotate and swivel through 360-degrees. Provide adjustable external locking rings at each joint.

E. Inlet Hood: Provide with 9 inch diameter metal inlet hood.

F. Inlet Hood: Provide with 13 inch diameter clear dome hood inlet hood.

G. Inlet Hood: Provide with clear, 9 inch by 14 inch rectangular inlet hood.

H. Mounting bracket: Provide a wall or ceiling mounting bracket for each point exhaust. Mount so the bottom of upper jointed elbow is at 6 foot, 6 inches above the floor, to provide full service at desktop level.

I. Air flow control: Any such device on the point exhaust arm such as a manual damper that restricts or stops allows air flow through the point exhaust arm is not acceptable. This device must be removed.

J. Finish: Epoxy powder coated white.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

A. Installation Quality Standards: Perform Work according to following, unless otherwise specified:
1. Respective manufacturer/fabricator's written installation instructions.
2. Accepted submittals.
3. Contract Documents.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

C. Coordinate delivery of all equipment with building work and scheduling for final placement.

D. Check project for conditions that affect work. Do not begin installation until unsatisfactory conditions are corrected.

3.3 PREPARATION

A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION

A. Miscellaneous laboratory equipment shall be installed in strict accordance with the manufacturer's recommendations, including recommended operating and servicing clearances.

B. Plumbing hookups under Division 22.

C. Mechanical hookups under Division 23.

D. Electrical hookups under Division 26.

3.5 ADJUSTING

A. Touch up damaged finishes equal to original condition as approved

B. Repair or remove and replace defective work as directed by Owner's Representative upon completion of installation.

C. Adjust moving or operating parts to function smoothly.

3.6 CLEANING AND PROTECTION

A. Clean shop finished equipment, touch up as required, and remove and refinish damaged or soiled areas.

B. Cover equipment for protection against soiling and deterioration during remainder of construction period.

C. Equipment shall be protected before, during and after installation. Damaged materials due to improper protection shall be cause for rejection.

END OF SECTION 115300

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. Air Master Systems Corporation, Solution.
2. Kewaunee Scientific Corporation, Supreme Air.
3. Lab Crafters, Inc., Air Sentry.
4. Labconco Corporation Protector XStream.
5. 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 123553 - GENERAL REQUIREMENTS FOR LABORATORY CASEWORK AND FUME HOODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes laboratory casework with supplementary items necessary to complete their installation.
1. Manufacturers.
2. Mock-up Requirements.
3. Materials.
4. Hardware.
5. Under-counter Corrosive Storage Cabinets.
6. Under-counter Flammable Storage Cabinets.
7. Vacuum Pump Cabinets.
8. Tables.
9. Stainless Steel Bench.
10. Adjustable Shelving.
11. Finishes.
12. Work surfaces.
13. Sinks.
14. Laboratory Service Fixtures.
15. Electrical Service Fixtures.
16. Under-Cabinet/Shelving Task Lighting.
17. Emergency Shower and Eye Wash Units.
18. Overhead Service Columns.
19. Sleeves in Countertops.

B. Related Requirements:
1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking for anchoring laboratory casework and fume hoods.
2. Section 092216 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring laboratory casework and fume hoods.
3. Section 096513 "Resilient Base and Accessories" for resilient base applied to floor mounted laboratory casework and fume hood base cabinets.
4. Section 115313 "Laboratory Fume Hoods."
5. Section 123553.03 "Adaptable Laboratory Casework Systems."
6. Section 123553.13 "Metal Laboratory Casework."
7. Section 123553.16 "Plastic Laminate Laboratory Casework."
8. Section 123553.19 "Wood Laboratory Casework."
9. Section 123553.23 "Polypropylene Laboratory Casework."
10. Section 123553.26 "Solid Phenolic Resin Laboratory Casework."
11. Division 22: Furnishing and installation of plumbing utilities and final connections.
12. Division 23: Furnishing and installation of exhaust duct work and equipment, and final connections.
13. Division 26: Furnishing and installation of electrical utilities and final connections.
14. Division 27: Furnishing and installation of communication utilities and final connections.

1.2 REFERENCES

A. American Hardboard Association (AHA)
1. A135.4 – Basic Hardboard.

B. Americans with Disabilities Act (ADA).

C. American National Standards Institute (ANSI)
1. ANSI A117.1 – Accessible and Useable Buildings and Facilities
2. ANSI Z358.1 - Emergency Eyewash and Shower Equipment.

D. American Society for Testing and Materials (ASTM).
1. ASTM A167-99 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
2. ASTM A240 - Chromium and Chromium-nickel Stainless Steel Plate, Sheet, and Strip for pressure Vessels and General Applications.

3. ASTM A1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
4. ASTM B221/B221M – Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
5. ASTM B584 – Specification for Copper Alloy Sand Castings for General Applications.
6. ASTM C1036 – Specification for Flat Glass.
7. D543 – Practices for Evaluating the Resistance of Plastics to Chemical Reagents
8. ASTM D570 - Water Absorption of Plastics.
9. ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Plastics in Horizontal Position.
10. ASTM D638 - Tensile Properties of Plastic.
11. ASTM D648 - Deflection Temperature of Plastic Under Flexural Load in the Edgewise Position.
12. ASTM D695 - Compressive Properties of Rigid Plastics.
13. ASTM D785 – Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
14. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
15. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.

E. Business and Institutional Furniture Manufacturers Association (BIFMA).

F. Factory Mutual (FM).

G. Forest Stewardship Council (FSC).

H. Leadership in Energy and Environmental Design (LEED).

I. National Electrical Manufacturers Association (NEMA).
1. NEMA LD3 - High-Pressure Decorative Laminates.

J. National Fire Protection Association (NFPA).
1. NFPA 30 - Flammable and Combustible Liquids Code.
2. NFPA 45 – Standards on Fire Protection for Laboratories Using Chemicals

K. Office of Safety and Health Administration (OSHA).

L. United States Department of Commerce, National Institute of Standards and Technology
1. PS 1 – Construction and Industrial Plywood.
2. PS 51 – Hardwood and Decorative Plywood

M. Scientific Equipment and Furniture Association (SEFA).
1. SEFA Desk Reference.

N. Underwriters Laboratories (UL).

1.3 Woodwork Institute (WI).

1.4 PREINSTALLATION CONFERENCE

A. Before Work begins, conduct conference at Project site to comply with requirements of applicable Division 01 Sections.
1. Required Attendees:
   a. Owner.
   b. Architect.
   c. Contractor, including superintendent.
   d. Installer, including project manager and supervisor.
   e. Manufacturer/fabricator's qualified technical representative.
   f. Installers of other construction interfaced with Work.
2. Minimum Agenda: Installer shall demonstrate understanding of the Work required by describing detailed procedures for preparing, installing, and cleaning the Work. Demonstration shall include, but not be limited to, following topics:
   a. Tour representative areas of Work, inspect and discuss condition of substrate, and other preparatory work performed by other trades.
   b. Review Work requirements (Drawings, Specifications, and other Contract Documents).
   c. Review required submittals, both completed and yet to be completed.
   d. Review and finalize construction schedule related to Work and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and

avoid delays.
e. Review required inspection, testing, certifying, and material usage accounting procedures.
f. Review environmental conditions and procedures for coping with unfavorable conditions.
g. Resolve deviations or differences between Contract Documents and the manufacturer/fabricator's specifications.

3. Record discussions of conference, including decisions and agreements reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

1.5 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for lateral support of fume hoods, wall and tall cabinets.

B. Coordinate installation of fume hoods with laboratory casework and other laboratory equipment.

1.6 ACTION SUBMITTALS

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

B. Sustainable Design Submittals:
1. Environmental Product Declaration (EPD): For each product.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

C. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.

D. Shop Drawings: Include the following:
1. Location of assemblies in each room to include plans, elevations, sections, and attachment details for casework, fume hoods, canopy hoods, point exhausts and ceiling service panels. Include roughing-in information for mechanical, plumbing, and electrical connections.
2. Details of construction.
3. Details of connections between units and to adjacent work.
4.
5. Show adjacent walls, doors, windows, other building components, laboratory casework, and other laboratory equipment. Indicate clearances from the above items
6. Location and size of holes and cutouts.
7. Dimensional locations for rough-in of mechanical and electrical services.
8. Molded epoxy resin tops jointing pattern.
9. Include coordinated dimensions for laboratory equipment specified in other Sections.

E. Samples:
1. Submit Samples which conform to specified requirements, including construction and finishes. Samples will be retained for comparison with Work fabricated and will be returned upon completion of the Contract.
2. Submit the following Samples for approval:
a. Casework: Metal finish, wood finish, service fixture finish, and work tops.
b. Fume Hoods: Exterior finishes, interior lining, and work tops.
c. One of each mechanical service fixture.

1.7 INFORMATIONAL SUBMITTALS

A. Manufacturer's Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required, and that a warranty will be issued.

B. Qualification Data: For manufacturer/fabricator, installer and professional engineer.
1. For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.
2. Architect may waive submittal of qualification data for available manufacturers listed in this Section.

C. Test Reports: Submit test reports verifying conformance to specified performance tests.

D. Field Quality Control Reports: Written report of testing and inspection required by "Field Quality Control".

1.8 CLOSEOUT SUBMITTALS

A. Furnish maintenance instructions and complete touchup kit for each type and color of laboratory paint finish provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged casework and fume hood finishes.

B. Operation & Maintenance Manuals: Provide complete written instruction manuals outlining safe operating procedures, safety guidelines, and proper maintenance procedures for equipment and fume hoods.

C. Warranty: Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations and exclusions.

D. Receipts: Furnish receipts for keys and other loose items.

1.9 QUALITY ASSURANCE

A. Single Source Responsibility: Provide casework, work surfaces, laboratory furnishings, and accessories, all furnished by a single laboratory furniture company.

B. Manufacturer/Fabricator Qualifications: Manufacturer/fabricator with not less than 10 years experience with successful production of products and systems similar to scope of this Project, with a record of successful in-service performance and completion of projects for a period of not less than 10 years, and with sufficient production capability, facilities, and personnel to produce required Work.
   1. Modern plant with proper tools, dies, fixtures, and skilled production staff to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:
      a. 10 years or more experience in manufacture of laboratory casework and equipment of type specified.
      b. 10 installations of equal or larger size and requirements.

C. Installer Qualifications:
   1. Experience: Installer with not less than 10 years experience in performing specified Work similar to scope of this Project, with a record of successful in-service performance and completion of projects for a period of not less than 10 years, and with sufficient production capability, facilities, and personnel to produce required Work.
   2. Supervision: Installer shall maintain a competent supervisor who is at Project during times specified Work is in progress, and, who is experienced in installing systems similar to type and scope required for Project.
   3. Manufacturer/Fabricator Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer/fabricator to install products.

D. Manufacturer's Technical Representative Qualifications: Direct employee of technical services department of manufacturer with minimum of 10 years experience in providing recommendations, observations, evaluations, and problem diagnostics. Sales representatives are not acceptable.

E. Mockups: Prior to fabrication and installation, provide a laboratory mockup where indicated on drawings. Location may be changed to meet construction phasing with approval of Architect. Components utilized meet the requirements of the Drawings and Specifications. The purpose of the mockup is to verify designs and confirm or modify the sequence of installation between the various trades. Approved mockup serves as the standard of quality against which the remaining laboratory work is measured. Build mockup to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockup in the location and of the size indicated or, if not indicated, as directed by Architect. Contractor shall provide structural support framework.
      a. Provide laboratory casework and furnishings. Furnishings, such as the fume hood, must be installed, complete with fixtures and accessories, but does not need to be operational.
      b. Provide plumbing pipe, valves, fittings, and accessories required to make connections to complete the laboratory mockup. Fixtures and furnishings are not required to be operational, but must be installed to review and ensure proper coordination.
      c. Provide electrical systems in conjunction with the laboratory mockup. Power receptacles, raceway, data back boxes and conduit must be installed, but do not need to be operational. Lighting to be fully operational.

d. Provide supply and exhaust ductwork required to make connections to complete the laboratory mockup. Connections to the laboratory furnishings are required, but the systems do not need to be operational.

2. Clean exposed faces of mockup.
3. Notify Architect fourteen days in advance of the dates and times when mockup will be installed and ready for review.
4. Make such changes and alterations to mockup as may be discussed, agreed upon, and documented in writing resulting from the review. Modifications to the mockup that are agreed upon in writing will be incorporated into the overall design of the project without change in contract sum. Obtain Architect's acceptance of mockup before starting fabrication.
5. Maintain mockup during construction in an undisturbed condition as a standard for review of the completed Work.
6. Acceptance of mockup does not constitute acceptance of deviations from the Contract Documents contained in mockup unless such deviations are specifically noted by Contractor, submitted to Architect in writing, and accepted by Architect in writing.
7. Once installed and approved the mockup becomes part of the completed Work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of casework and equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.

B. Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating. Protect all work surfaces from damage throughout construction period. Do not allow standing on work surfaces during the construction period. Provide signage marked in large lettering that reads: "NO STANDING".

1.11 FIELD CONDITIONS

A. Do not deliver or install equipment until the following conditions have been met:
1. Building areas requiring the installation of laboratory casework: Dry and unexposed to adverse weather conditions which may damage finished materials.
2. The air conditioning or heating system: On and functioning in areas of casework installation to maintain the temperature between 60 and 85 degrees Fahrenheit (16 and 30 degrees Celsius) with the relative humidity between 45 percent and 65 percent.

B. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.12 SEQUENCING AND SCHEDULEING

A. All overhead mechanical, electrical and plumbing rough-in work: Complete prior to laboratory casework deliveries.

B. All mechanical, electrical and plumbing rough-in work required along walls and service islands, where lab furnishings are to be installed: Complete prior to delivery of materials.

C. Walls and partitions must be in place and finished with at least the primer coat of paint. If finish painting is to take place after lab casework and furnishings installation, protect the casework and furnishings by covering and masking prior to commencement.

D. All necessary wood or metal blocking must be installed within partitions prior to delivery of casework and furnishings.

E. Overhead soffits and ceiling grid must be in place prior to casework installation.

F. Overhead lighting must be installed and connected prior to casework installation.

G. All flooring required to be placed under lab casework systems must be installed prior to lab casework material delivery.

H. Concrete floors must be level within 1/8 inch (3 mm) of level per 10 foot (3 m) run, nonaccumulative, when tested with a straight edge in any one direction.

I. Wet operations to be performed must be complete prior to material deliveries.

1.13 WARRANTY

A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design and installation of product. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
1. Warranty Period: Manufacturer shall warrant the products to be free from material and labor defects for a period of 1 year from date of operational acceptance by the Using Agency.
2. Date of operational acceptance shall be after factory check, test and start-up services is complete, the unit is operating in a satisfactory manner, and the equipment has been satisfactorily commissioned by the Using Agency.
3. The Using Agency will perform routine maintenance as described in the Manufacturers Standard Operation and Maintenance manuals during the warranty period. Using Agency performance shall in no way invalidate said warranties.

B. Installer's Warranty: Furnish installer's written workmanship warranty signed by an authorized representative using installer's standard form agreeing to provide labor required to repair or replace work which exhibits workmanship defects. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
1. Warranty Period: Installer shall warrant the installation to be free from workmanship defects for a period of 1 year from date of operational acceptance by the Using Agency.

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.
2. ICI Scientific.
3. Mott Manufacturing Limited.
4. Air Master Systems Corporation.

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**>.

C. Furnish and install casework, fume hoods, furnishings and equipment specified in the following sections by the same supplier.
1. Section 115300 - Miscellaneous Laboratory Equipment.
2. Section 115313 - Laboratory Fume Hoods.
3. Section 123553 - General Requirements for Laboratory Casework and Fume Hoods.
4. Section 123553.03 - Adaptable Laboratory Casework Systems.
5. Section 123553.13 - Metal Laboratory Casework.

2.2 PERFORMANCE REQUIREMENTS

A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required and shall not be construed as an engineered design. Furnish and install all Work required for a complete installation.

B. Coordination of Contract Documents and Work:
1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturer/fabricators, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.

2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

2.3 CASEWORK, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Certified Wood: Wood products shall comply with requirements of ASTM D7612-10 (FSC, SFI, ATSM, CSA or PEFC certifications are acceptable).

2.4 MATERIALS

A. Wood:

2. Composite Wood Products:
3. Recycled Content of MDF and Particleboard: Postconsumer recycled content plus one-half of preconsumer recycled content not less than <**70**> percent.
4. Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
5. Definition of cabinet components by surface visibility.
6. Exposed Exterior Surfaces: Defined as all exterior surfaces exposed to view:
7. All surfaces visible when doors and drawers are closed, including knee spaces.
8. All sides of cabinets that abut other casework but will become visible when the casework is reconfigured.
9. All exterior surfaces of suspended casework.
10. All exterior surfaces of mobile casework.
11. Underside of cabinet bottoms 42 inches (1070 mm) or more above finished floor, including cabinet bottoms behind light valances and the bottom edge of light valances.
12. Cabinet tops under 80 inches (2000 mm) above finished floor, or if 80 inches (2000 mm) and over and visible from an upper floor or building level after installation.
13. Visible front edges of stretchers, ends, dividers, tops, bottoms, shelves, and hanging stile.
14. Visible portions of bottoms, tops, and ends in front of sliding doors.
15. Sloping tops of cabinets.
16. Visible portions of cabinets after fixed appliances are installed.
17. Exposed Interior Surfaces: Defined as all interior surfaces exposed to view in open casework or behind transparent doors:
18. Fixed, adjustable and pull-out shelves, including edgebanding of all sides.
19. Dividers and partitions.
20. Interior face of ends (sides), backs, and bottoms, including Interior surfaces of cabinet top members 36 inches (910 mm) or more above the finished floor.
21. Interior face of door and applied drawer fronts.
22. Semi-exposed Surfaces: Defined as those interior surfaces exposed to view when doors or drawers are opened:
23. Fixed, adjustable and pull-out shelves, including edgebanding of all sides.
24. Dividers and partitions.
25. Interior face of ends (sides), backs, and bottoms on cupboard and drawer units, including the interior surfaces of cabinet top members 36 inches (910 mm) or more above finished floor.
26. Drawer sides, sub-fronts, backs, and bottoms.
27. The underside of cabinet bottoms between 24 inches (610 mm) and 42 inches (1070 mm) above finished floor.
28. Security and dust panels or drawer stretchers.
29. Concealed Surfaces: Defined as those exterior and interior surfaces that are covered or not normally exposed to view:
30. Toe space unless otherwise specified.
31. Sleepers, stretchers, security panels, and solid sub-tops.

32. Underside of bottoms of cabinets less than 24 inches (610 mm) above finished floor.
33. Flat tops of cabinets over 80 inches (2000 mm) above finished floor and not visible from an upper level.
34. The three non-visible edges of adjustable shelves.
35. Bamboo cabinets do not have the same grading and matching as traditional wood cabinets. For a project with only bamboo cabinet construction the traditional sections on hardwood lumber, hardwood plywood, grade, cut, matching, etc do not apply and should be deleted. If your project does not have bamboo, then delete the bamboo section.
36. For projects with traditional wood cabinets edit the following sections:
37. Under Hardwood Lumber select the appropriate lumber and cut. They appear in order of least expensive to more expensive. If you have a different species and cut, please edit as needed. Always include subparagraph d. & e.
38. Hardwood Lumber:
39. Type 1 Hardwood: Plain sawn white Maple Grade FAS, first and seconds or better, well matched for color and grain.
40. Provide all lumber clean and free of defects; kiln and air dried to a uniform minimum moisture content of 6 percent.
41. Hardwood Plywood:
42. In accordance with ANSI/HPVA HP-1 latest edition unless otherwise specified herein.
43. Face Veneer:
44. Grade:
45. Middle or higher of A-1.
46. Species:
47. Exposed and Semi-Exposed Surfaces: Select White Maple.
48. Concealed Surfaces: Plain sliced hardwood veneer, suitable for unexposed surfaces.
49. Cut:
50. Plain Sliced, 1/50 inch (0.5 mm) thick minimum.
51. Comb, 1/50 inch (0.5 mm) thick minimum.
52. Matching Type:
53. Book.
54. Grain Direction:
55. Vertical matched grain direction on cabinet drawer heads, doors, end panels, KO panels, KO aprons, table aprons, and filler panels.
56. Provide the following cabinet components with Horizontal grain direction unless otherwise noted; cabinet tops, bottoms, and fixed, adjustable and pullout shelves.
57. Color and Matching Selection:
58. Compatible in color with solid stock and well matched in color and grain with adjacent plywood panels.
59. Hand select plywood prior to fabrication of cabinet faces for uniformity of color and grain on each run of bench. Darker and lighter panels are not acceptable in the same run of bench or same room after installation of casework.
60. Cores:
61. Veneer: One piece hardwood solid core with crossbanding and hardwood face veneers. Minimum 9 ply for 1 inch (25 mm), 7 ply for 3/4 inch (19 mm), 5 ply for 1/2 inch (12 mm), and 3 ply for 1/4 inch (6 mm).
62. Combination with composite crossbands: Minimum 7 ply for 3/4 inch (19 mm). One piece hardwood solid core with two hardwood solid and two MDF crossbands and hardwood face veneers. MDF crossbands under face veneers.
63. Bond Type: Type II
64. Hardboard:
65. Tempered hardboard designed for strength and moisture resistance; consisting of wood fibers, highly compressed into a hard, dense, 1/4 inch (6 mm) thick, homogeneous sheet using natural resins and other added binders.
66. Physical Properties:
67. Average modulus of rupture: 5300 psi (36,540 kPa).
68. Density: 50 to 60 pounds per cubic foot (800 to 960 kg per m3).
69. Tensile strength: 3,500 psi (24,100 kPa).
70. Butcher Block Tops: Composed from solid hard maple strips, kiln dried to 6% to 8% moisture

content, fabricated from strips not more than 1-7/8 inch (48 mm) wide, glued with water resistant resin under heavy pressure side to side and end to end.

71. Adhesives: Type 2 or Type 3 water resistant glue with gluing done in clamps and jigs.

B. Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Dowels: Minimum 3/8 inch (10 mm) diameter hardwood, laterally fluted, chamfered ends.

D. Sheet Steel: ASTM A1008 /1008M mild steel, cold-rolled, pickled, double annealed, and free from rust, scales, deep scratches, buckles, ragged edges, and other defects. Provide metallic furniture stock sheets.

E. Galvanized Steel: ASTM A123 /123M or ASTM A653/A653M mild steel, hot rolled, pickled, double annealed, and free from rust, scales, deep scratches, buckles, ragged edges, and other defects. Provide with zinc coating.

F. Stainless Steel:
1. Type: Unless otherwise noted on Drawings or elsewhere in this Section, provide Type 304; ASTM Specification Number A240/240M; stainless steel for tops, sinks, umbilical collar, shelves, and casework; gage as indicated on Drawings.
2. Finish: Exposed surfaces ground and polished to a Number 4 satin finish. Provide Type 304 with a tumbled finish approximating a Number 4 finish for nuts, screws, bolts, and rivets. Provide the grain finish direction as follows:
   a. Vertical on door and drawer fronts
   b. Vertical on tall storage cabinets door fronts and end panels.
   c. Horizontal on all other exterior surfaces.
3. Welding: Provide all stainless steel welding material of type similar to sheet material. Provide welds made without discoloration; ground, polished, and passivated to blend harmoniously with a Number 4 satin finish.

G. Metal Gages for Sheet Steel, Galvanized Steel and Stainless Steel:
1. Construct metal cabinets of sheet steel with minimum thickness in U.S. standard gage (mm) as follows:

Corner gussets for leveling bolts	11 gage (3.2 mm)
Apron corner braces, wall rail systems	12 gage (2.7mm)
Drawer support, hinge reinforcement, reinforcing gussets	14 gage (1.9 mm)
Horizontal rails and top rails, aprons, support struts, adjustable wall and island shelving, shelving hat channels	16 gage (1.5 mm)
Cabinet tops, end panels, bottoms, backs, toespace rails, security panels, vertical posts, vertical dividers, glazed doors, scribe strips, filler panels	18 gage (1.2 mm)
Door panels	18 gage (1.2 mm) exterior 20 gage (0.9 mm) interior
Enclosures, drawer fronts and bodies, pull-out tablet fronts and bodies, cabinet shelving, closure panels, overhead service carriers	20 gage (0.9 mm)

H. Aluminum Type: Unless otherwise noted on Drawings or elsewhere in this Section, provide extruded aluminum per ASTM B 221 in either alloy 6063-T42 or 6063-T5.

I. Solid Phenolic Resin Sheets:
1. A self-supporting flat panel, specifically designed for laboratory work surfaces, based on thermosetting resins, homogeneously reinforced with cellulose fibers and manufactured under high pressure. Hardened chemical resistant polyurethane acrylic surface finish.
2. Physical Properties:
   a. Material: Laboratory grade solid phenolic panel.
   b. Density: 84 lbs/ft3 (1.35 g/cm3) minimum.
   c. Modulus of Elasticity: 1,305,340 psi (9,000 MPa) minimum.
   d. Shear Strength: 2000 psi (14 MPa) minimum.

e. Compressive Strength: 24,000 psi (165 MPa) minimum.
f. Flexural Strength: 11,603 psi (80 MPa) minimum.
g. Tensile Strength: 8,702 psi (60 MPa) minimum.
h. Weight: 93 pcf (1,490 kg/m3) maximum.
i. Fire Performance: Maximum flame spread of 25 per ASTM E84 (Class I, Class A).
j. Nonporous surface and edges.
k. Microbial Characteristics: Will not support micro-organic growth.

J. Glass:
1. Laminated safety glass: Two outer plies of frosted glass with a vinyl interlayer, nominal 1/4 inch (6 mm) thick.
2. Tempered safety glass: Heat treated glass, nominal 1/8 inch (3 mm) thick with ~~a minimum of 88 percent clarity.~~ frosted glass.

K. End Panel Markerboard:

1. 1/2 inch (13 mm) frosted tempered polished glass.

2. Aluminum brackets and pan head sheet metal screws.

L. Polypropylene: Provide 1/4 inch (6 mm) thick sheets unless otherwise noted, white, flame retardant, stress relieved, smooth, free of surface blemishes with all edges rounded to 1/8 inch (3 mm) radius; low flame spread and low smoke generating type.

M. Sealant:
1. Epoxy sealant: Two-component epoxy compound.
2. Silicone sealant: One-part water base silicone sealing compound, in custom color matching color of surface to be sealed, Dow Corning 732 RTV or General Electric SCS 1200.

2.6 HARDWARE

A. Drawer and Hinged Door Pulls: 3/8 inch (10 mm) diameter stainless steel wire pull, 4-3/4 to 5-1/16 inches (120 mm to 128 mm) center to center with radiused corners and a projection of 1 inch to 1-1/2 inches (25 mm to 40 mm). Model DP57C as manufactured by Mockett, Model 115.61.602 as manufactured by Hafele America Co., or Model CC01-MC402-5-SS by Hardware Décor.
1. Mount door pulls vertically and drawer pulls horizontally.
2. Provide drawers 28 inches (710 mm) wide and smaller with one pull per drawer at centerline of cabinet.

B. Retracting Grab Bar Handless for Mobile Cabinets: Provide stainless steel folding handle in recessed tray, handle nominal 3 inches (85 mm) by 2 inches (6 mm) recessed 1/2 inch (8.5 mm) into cabinet end panels. Model RHEE-07.39 as manufactured by Elesa USA Corporation, Model 06961-01 as manufactured by Norelem, or Model EE-03 as manufactured by Rohde.
1. Provide two handles per mobile cabinet, mounted to each side, within 8 inches (203 mm) of cabinet front and 8 inches (203 mm) of cabinet top.
2. Mobile cabinets with the add-a-drawer option: Mount grab bar handles in lower portion.

C. Rear Bumpers for Mobile Cabinets: Provide round, clear, screw-on bumpers with integrated screw hole, 7/8 inch (20 mm) by 3/8 inch (9 mm) into back of cabinet. Model 9072 as manufactured by Shepherd Hardware Products.
1. Provide two bumpers per mobile cabinet, mounted to back, within 1 inch (25 mm) of cabinet top.

D. Drawer Slides:
1. Description: Full extension with soft closing action, ball bearing, rail mounted, multimembered slides fabricated of minimum 16 gage (1.6 mm) steel with an electro-zinc finish.
2. Acceptable Manufacturers:
a. Accuride International Incorporated, Santa Fe Springs, California
b. CompX Precision Slides, Waterloo, Ontario Canada
c. Knape and Vogt, Grand Rapids, Michigan

3. Drawer and Pullout Shelving Slide Ratings:
   a. Drawer Width: 0 - 24 inches (0 - 610 mm) Maximum dynamic load rating 100 pounds (45 kg)
   b. Drawer Width: Over 24 inches (610 mm) Maximum dynamic load rating 200 pounds (90 kg)
4. File Cabinet Drawer Slide Ratings:
   a. Drawer Width: All sizes Maximum dynamic load rating 150 pounds (68 kg)
5. Slides shall have progressive movement with a positive stop at full extension or at a minimum 1 inch (25 mm) over travel and permit removal of drawer without use of tools. Drawers shall not lift out or otherwise be removable without the release of a locking device on each slide.
6. Dynamic Load Rating: Slides meet BIFMA "Business Institutional Furniture Manufacturers Association" Standards. 0.017 pounds per cubic inch at full travel plus or minus 1/4 inch for 50,000 cycles.

E. Hinges:
1. Description: Institutional type, 5-knuckle, projecting barrel, minimum 2-1/2 inches (60 mm) long. Hinges for full overlay cabinets to have a wraparound design and slotted screw holes for adjustability.
2. Material: Type 304 stainless steel, minimum 0.095 inches (2.4 mm) thick.
3. Provide minimum of 2 hinges for doors under 48 inches (1200 mm) high; minimum of 3 hinges for doors 48 inches (1200 mm) to 84 inches (2130 mm) high; and minimum of 4 hinges for doors over 84 inches (2130 mm) in height.
4. Mounting: Drill each leaf for screw attachment to door and frame. Use stainless steel flathead screws.

F. Door Catches: Roller or magnetic type, adjustable, roller type operating with a built-in tension spring. Provide all parts of cadmium plated steel except roller. Attach to top of base cabinet doors, the bottom of wall cabinet doors, and at the top and bottom of tall cabinet right-hand doors. Provide a vertical sliding bolt assembly, astragal strip and dummy pull for the left-hand door of tall cabinets. Vertical sliding bolts; concealed in the stiles of glazed doors and between pans of solid doors to engage stainless steel keepers.

G. Doorstop:
1. Provide at all tall cabinets with glass doors located adjacent to a benchtop or perpendicular surface, such as a wall.
2. Provide with base and wall cabinets located adjacent to a perpendicular surface, such as a wall.
3. Chain or cable, secured to the top of the door and cabinet frame. Provide in lengths required to stop the door from opening more than 90 degrees.

H. Shelf clips: Die formed steel, zinc plated or polycarbonate clip with grooved plug and spring clip. Provide shelf clips adjustable on 1-1/4 inch (32 mm) centers and meet seismic requirements. For metal cabinets shelf adjustment holes are on nominal 1/2 inch (12 mm) centers.

I. Locks:
1. Provide with base and wall cabinets as shown on the Drawings.
2. Provide with all tall cabinets.
3. Provide with all chemical storage cabinets.
4. Unless otherwise directed, key locks differently within a room, differently between rooms. Provide Master key per Department with a Grandmaster for the building.
5. Description: 5-pin tumbler, heavy duty cylinder cam lock type.
6. Acceptable Manufacturers:
   a. CompX National, Greenville, South Carolina.
   b. Corbin, Berlin, Connecticut.
   c. Best Lock Corporation, Indianapolis, Indiana.
   d. Illinois Lock Company, Wheeling, Illinois.
   e. Wesco International Inc., Pittsburgh, Pennsylvania.
7. Finish: Exposed surfaces of locks shall match other casework hardware.
8. Keying: Capacity for a minimum of 750 primary key changes. Master key 1 level with built-in flexibility to accommodate, if required, 3 levels; 1 Grandmaster, 59 Master groups and 70 Submaster groups with 13 primary changes under each.
9. Keys: Stamped brass available from manufacturer or local locksmith, and supplied in the following quantities unless otherwise specified:

a. 2 for each keyed different lock.
b. 3 for each group keyed alike locks.
c. 2 for master keys for each system.
d. Provide controlled key blanks and registered key plan.

J. File Suspension Rails: Provide each file drawer with a pair of 14 gage (2 mm) steel, file suspension rails.

K. Leveling Glides: 2 inch (48 mm) diameter, two-piece pivot construction, steel housing, non-marring, phenolic or translucent plastic insert, 1/2 inch (12 mm) diameter, minimum 1-1/2 inch (36 mm) long zinc plated stems.

L. Table Casters - Swivel Type: 4 inch (100 mm) overall height, with wheel lock. Provide minimum load rating of 300 pounds (136 kg) per caster.
1. Basis of Design: Payson Model 050-3UM WK.

M. Mobile Cabinet Casters - Swivel Type: 3 inch (75 mm) overall height, with toe brake. Provide minimum load rating of 165 pounds (75 kg) per caster.
1. Basis of Design: Shepherd Softech PSF75101BK-B.

N. Table Leg Shoes: 2-1/2 inch (63 mm) high vinyl with bottom coved, color to match base selected by the Architect for the room finish.

O. Anti-Tip Interlock: Provide in all mobile cabinets with drawers and adjustable shelves. Provide with snapper actuator, lockbar, adjustable locking pins, drawer wedges, lockbar retainers, and wedge lock.
1. Basis of Design: Compx Timberline, System 350.

P.

Q. Grommets in Countertops: Manufacturer: Outwater Plastic Industries, Wood Ridge, New Jersey, (800) 631-8375, Model Number 35 DG, Dove Gray, or equal (no known equal). Seal Grommets to bench with silicone sealer.

2.7 UNDER-COUNTER CORROSIVE STORAGE CABINETS (METAL) (B__N)

A. General: Construct cabinets in accordance with OSHA Regulations and the requirements of International Fire Code, Chapter 50 Hazardous Materials. Provide chemical safety cabinets listed in accordance with UL 1275 or construct as specified for metal laboratory casework and as follows:

B. Casing: Bottom, top, back, door, and sides of cabinet shall be at least 18 gage (1.2 mm) sheet steel, double walled with 1-1/2-inch (36 mm) air space. Joints shall be welded airtight. Provide with adjustable zinc plated leveling legs.

C. Door: Provide with continuous piano hinge and a 3-point latching arrangement with door sill raised at least 2 inches (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet. When more than 1 door is used, there shall be a rabbeted overlap of not less than 1 inch (25 mm). Provide self-closing, self-latching door(s) with fusible link(s) to hold doors wide open and melt at 165 degrees F (73.8 C) for automatic closure. Provide with keyed lock.

D. Ventilation: Provide a 2 inch (50 mm) polypropylene vent pipe at the outside rear of the cabinet with 2 inlets, 1 high and 1 low. Extend vent pipe to 4 inches (100 mm) above the hood work surface, behind the baffle.

E. Shelving: Provide each cabinet with a full width adjustable shelf.

F. Liner: Provide cabinet with ChemCor thermoplastic coating as provided on the Justrite Centura line, molded or heat welded polypropylene liner, molded polyethylene liner, hi-tech polymer alloy or similar on all interior surfaces.

G. Pan: Provide with 1/4 inch (6 mm) thick heat welded, polypropylene or ABS plastic pan, liquid tight, removable, 1 inch (25 mm) deep on bottom of cabinet and upper shelf.

H. Hardware: All exposed to outside and inside of cabinet shall be Stainless Steel.

I. Identification: Mark all undercounter ventilated cabinets with conspicuous red lettering on a contrasting background: HAZARDOUS - KEEP FIRE AWAY.

J. Color: To match Mott Manufacturing Limited Taupe.

K. Finish: Provide as specified for Metal Finishes in this section.

2.8 UNDER-COUNTER FLAMMABLE STORAGE CABINETS (METAL) (B_ _F)

A. Construction: Construct as specified for metal laboratory casework and as detailed on drawings.

B. Design: Construct cabinets in accordance with OSHA Regulations and the requirements of NFPA 30, National Fire Protection Association, Flammable and Combustible Liquids Code. Provide cabinets Factory Mutual (FM) approved or Underwriters Laboratories (UL) listed.

C. Casing: Bottom, top, back, door, and sides of cabinet shall be at least 18 gage (1.2 mm) sheet steel, double walled with 1-1/2 inch (36 mm) air space. Joints shall be welded airtight. Provide with adjustable zinc plated leveling legs.

D. Door: Provide with continuous piano hinge and a 3-point latching arrangement with door sill raised at least 2 inches (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet. When more than 1 door is used, there shall be a rabbetted overlap of not less than 1 inch (25 mm). Provide self-closing, self-latching door(s) with fusible link(s) to hold doors wide open and melt at 165 degrees Fahrenheit (73.8 Celsius) for automatic closure. Provide with keyed lock.

E. Ventilation: Do not ventilate cabinet unless required by local authorities. Seal vent openings with plugs, supplied by the manufacturer.

F. Shelving: Provide each cabinet with a full width adjustable shelf.

G. Grounding: Provide a grounding lug connection at back of cabinet.

H. Identification: Mark all flammable storage cabinets with conspicuous red lettering on a contrasting background: FLAMMABLE - KEEP FIRE AWAY.

I.

J. Color: To match Mott Manufacturing Limited Taupe.

2.9 VACUUM PUMP CABINETS

A. Construction: Construct as specified for metal laboratory casework and as detailed on drawings.

B. Vacuum Pump and Cabinet Exhaust: Provide 10mm OD PTFE (Teflon) tubing running from the pump to the lab exhaust duct. The run should be as short as possible and no greater than 100 feet from the pump. The exhaust line must always allow the pump to exhaust to atmospheric pressure. Each pump should have its own separate exhaust line connected to the lab exhaust duct.

C. Doors: Provide air gap between back of door and toe kick panel.

D. Interior: Provide rigid, aluminum-faced acoustical insulation on all sides, back, top, and doors.

E. Vacuum Line Pass-Through: Provide a 1 inch (25 mm) hole in back of cabinet for the vacuum tubing provided by Division 22.

F. Electrical: Factory install receptacle, wiring, and all required electrical fittings in accordance with applicable codes and Division 26 specifications. Final connection to back of cabinet by electrical contractor.

G. Finish: Color to match Mott Manufacturing Limited Taupe.

2.10 TABLE - METAL LEG FRAME, ADJUSTABLE HEIGHT

A. Perimeter rails: 2 inches by 2 inches by 12 gage (50 mm by 50 mm by 2.7 mm) steel channel with a continuous inner reinforcement U-channel. Spot weld inner reinforcement channel approximately 12 inches (300 mm) on center, staggering weld on each side.

B. Legs: 1-1/2 inch by 1-1/2 inch by 12 gage (38 mm by 38 mm by 2.7 mm) steel tubing. Height adjustment to be accomplished through inner telescoping leg and spring bolts.
   1. Provide each leg with leveling glides and/or casters as scheduled on the drawings

C. Inner leg: 27-1/4 inches long (692 mm by 2.7 mm) by 12 gage inner telescoping leg extension. Provide with six 9/16 inch (14 mm) round holes on inside of table for spring bolts. Provide each leg with a leveling glide unless otherwise noted.

D. Quick Release Pins: Provide each leg with two 1/2 inch diameter by 2-1/2 inch (13 mm diameter by 64 mm) usable leg stainless steel push-button, quick-release pins, McMaster-Carr model 92384A096, or equal.

E. Stretcher rails: 2 inches by 1-1/4 inch by 16 gage (51 mm by 32 mm by 1.6 mm) steel tube. Connect by welding between two end legs and between two back legs.

F. Finish: Finish as specified for Metal Finishes under this section.

G. Tops: As specified for Work Surfaces under this section. Refer to Table Schedule for type.

2.11 SHELF FRAME ASSEMBLIES

A. Nominal Shelf Dimensions:
   1. Width: 24 inches (610 mm), 30 inches (760 mm), 36 inches 914 mm), 42 inches (1067 mm) or 48 inches (1219 mm).
   2. Depth and weight capacity: 6 inches (150 mm), 8 inches (200 mm), 12 inches (305 mm), or 18 inches (457 mm); 130 pounds (59 kg). 24 inches (610 mm); 100 pounds (45 kg).
   3. Thickness: 1 inch (25 mm).

B. General Requirements:
   1. Shelves shall have a 1 inch (25 mm) overhang behind the face of the rear tubular posts.
   2. Shelf Brackets: 11 gage (3.0 mm) metal with 3 blade hooks and rise above the shelf surface 6-inches to provide sides. Depth to match shelf depth. Provide one pair for each shelf. Screw shelves to each bracket. Top shelf assemblies shall have inverted shelf brackets.
   3. Front Retainer Rod: Type 304 stainless steel 1/4 inch (6 mm) diameter rod with a number 4 polished finish. Bend 90 degrees at 1-1/2 inches (38 mm) from each end. Insert bent ends into shelf to a depth of 1/2 inch (12 mm) with horizontal portion of rod at 1 inch (25 mm) above shelf.

C. Wall Frame Assemblies:
   1. Standards: 16 gage (1.6 mm) metal, single-slotted or double-slotted type on 1 inch (25 mm) centers, 30 inches (760 mm) long and 1 inch (25 mm) depth.
   2. Cross Rails and Cross Rail Brackets: 16 gage (1.6 mm) metal.
   3. Brackets: 11 gage (3.0 mm) metal with 3 blade hooks and rise above the shelf surface to provide sides. Screw shelves to each bracket.

D. Rear Shelf Angle: 2 inch high, same material as shelf attached to rear edge of shelving with screws, maximum 12 inches on center.

E. Adaptable Frame Assemblies: Refer to Section 123553.03 Adaptable Laboratory Casework Systems.

F. Shelf Materials:
   1. Refer to Section 123553.13 for Metal.

G. Finish as specified for metal finish in this section.

2.12 FINISHES

A. Metal Finishes:
   1. Finish casework, casework support structure, fume hood super-structure and other laboratory furnishings.
   2. Preparation: Spray clean metal with a heated cleaner / phosphate solution, pretreat with iron phosphate spray, water rinse, and neutral final seal. Immediately dry in heated ovens, gradually cooled, prior to application of finish.
   3. Application: Electrostatically applied epoxy or urethane powder coat painting process that coats all hidden and exposed surfaces with an acid and abrasion resistant coating. Bake in a controlled high

temperature oven to ensure a smooth, hard satin finish. Surfaces shall have a chemical resistant, high grade laboratory furniture quality finish of the following thicknesses:
a. Exterior and interior surfaces exposed to view: 1.5 mil average and 1.2 mil minimum.
b. Backs of cabinets and other surfaces not exposed to view: 1.0 mil average.
c. Finish drawer bodies in matching or harmonizing color and apply corrosion resistant treatment to selected, concealed interior parts.

4. Color: To match Mott Manufacturing Limited Taupe.
5. Metal Finish Performance Requirements:
a. Abrasion Resistance: Maximum weight loss of 5.5 mg per 100 cycle when tested on a Taber Abrasion Tester Number E40101 with 1000 gm wheel pressure and Calibrase Number CS10 wheel.
b. Hardness: Surface hardness equivalent to 4H or 5H pencil.
c. Humidity Resistance: Withstand 1,000 hour exposure in saturated humidity at 100 degrees F (38 degrees C).
d. Moisture Resistance: No visible effect to surface finish after boiling water trickled over test panel inclined at 45 degrees Fahrenheit for 5 minutes. No visible effect to surface finish following 100 hour continuous application of a water soaked cellulose sponge, maintained in a wet condition throughout the test period.
e. Adhesion: Score finish surface of test panel with razor blade into 100 squares, 1/16 inch by 1/16 inch (1.6 mm by 1.6 mm), cutting completely through the finish but with minimum penetration of the substrate, and brush away particles with soft brush. Minimum 95 squares shall maintain their finish.
f. Salt Spray: Withstand minimum 200 hour salt spray test, conforming to ASTM B117-59 procedure.

B. Wood Finish

C. Finish casework, casework support structure and other laboratory furnishings.

D. Preparation: Sand exposed surfaces smooth, free from dirt, defects, and mill marks resulting from machining.

E. Stain: Apply stain to all exposed exterior and interior casework surfaces. Allow surfaces to completely dry under controlled conditions before applying subsequent coats. Force dry in dust-free atmosphere, sand and wipe surfaces clean between coats. Apply and wipe dry in a manner to achieve a match with the selected color sample, upon completion of application of the finish coats. Color to match Architect’s sample.

F. Finish surface: Smooth, satin luster finish. Provide water clear and bright finish on exterior and interior surfaces exposed to view. Cloudy, muddy finishes or finishes carrying tinting pigment will not be acceptable.

G. Finish coats: After staining, apply 1 coat of clear sealer and 2 coats of highly chemical resistant, catalyzed polyurethane or acrylic urethane with "blocker" additive to resist fading of finish of sunlight to all exposed and unexposed surfaces.

H. Wood Top Finish:
1. Natural finish, highly water resistant, ThermoKure Number 331-0095 with catalyst Number 390-50019, as manufactured by Guardsman Chemical Company, Louisville, Kentucky. Apply 2 coats on top and 1 on underside.

2.13 WORK SURFACES

A. Butcher Block Tops:
1. Description: Edge grain maple top.
2. Thickness: 1-3/4 inch (45 mm) thick, unless otherwise noted on Drawings.
3. Fabrication:
a. Round top edges and corners, and sand smooth. Provide with a 1/4 inch by 3/16 inch (6 mm by 5 mm) drip groove around all exposed edges.
b. Finish at the factory and include all machine drilling and cutouts.
c. Size Tolerances: Length, plus or minus 1/8 inch (3 mm). Width, plus or minus 1/16 inch (1.5 mm).
d. Squareness: Plus or minus 1/64 inch (0.4 mm) for each 12 inches (300 mm). A top

spanning 48 inches (1.2 m); held to plus or minus 1/16 inch (1.5 mm).
e. Location of Cutouts And Drillings: Plus or minus 1/8 inch (3 mm).
f. Sizes of Cutouts And Drillings: Plus 1/8 inch (3 mm), minus 0.

4. Curbs: Provide curbs 4 inch (300 mm) high by 1 inch (25mm) thick unless otherwise indicated on Drawings. Supply loose for field application. Where tops abut wall, casework, or fume hood, supply an end curb. Caulk joints between curb and walls, fume hoods, and cabinets with acid-resistant silicone caulk.
5. Finish: Clear, urethane or other synthetic-based satin finish.

B. Solid Phenolic Resin:
1. Available Manufacturers:
a. FunderMax North America, Inc.
b. Trespa North America, Ltd.
c. ChemTops, A OnePointe Solutions Company.
2. Materials: As specified in Materials of this specification section
3. Thickness: 3/4 inch (19 mm) thick unless otherwise noted on Drawings. Check thickness before fabrication. Each corner of top shall not deviate more than plus or minus 1/32 inch (1.5 mm) from nominal.
4. Provide in longest practical lengths to provide minimum number of joints.
5. Installation Materials: Provide solid phenolic laboratory top manufacturer's joint adhesive and sealants as required to suit project conditions.
6. Fabrication:
a. Fabricate solid phenolic laboratory tops in accordance with manufacturer's recommendations, approved submittals and SEFA 3.
1) Comply with requirements of Architectural Woodwork Standards Premium grade.
b. Edge Treatment:
1) Ease all top edges and vertical corners to 1/4 inch radius and sand smooth.
2) Provide drip groove unless otherwise indicated.
7. Curbs: Supply loose for field application in same thickness as countertops. Provide curbs 4 inches (100 mm) high unless otherwise indicated on Drawings. Where tops abut wall, cabinets or fume hood, supply an end curb. Caulk joints between curb and walls, fume hoods, and cabinets with acid-resistant silicone caulk.
8. Color: Manufacturer's standard light grey color. Basis of Design color is Trespa North America, Ltd. Pastel Grey.
9. Finish: Matt sheen.

2.14 SINKS

A. Stainless Steel Sink:
1. Available Manufacturers:
a. Just Manufacturing Company.
b. Elkay Manufacturing.
2. Description: Minimum 18 gage (1.2 mm), Type 304 stainless steel, Number 4 polish. Provide radius cove at vertical and horizontal corners and pitch bottom to drain. All sink joints; butt welded, ground smooth, and polished to render all joints seamless. Soldering will not be permitted in conjunction with sink construction. Provide all sink units designed and fabricated with sufficient reinforcement to prevent oil canning. Apply heavy mastic type sound deadening coating to underside of sinks. Faucet holes to be reinforced with 16 gage (1.6 mm) stainless steel hat channel on the underside.
3. For sinks greater than 10 inches (254 mm) deep or with a perimeter greater than 96 inches (244 mm) provide minimum 16 gage (1.6 mm), Type 304 stainless steel, Number 4 polish.
4. Except for sinks integral with stainless steel top, mount sinks with an integral frame.
5. Provide sink with the following accessories:
a. Stainless steel drain outlet.
b. Stainless steel open end overflow standpipe. Standpipe to be 2 inches (50 mm) shorter than depth of sink.
c. Strainer.
d. Tailpiece: Just Model # J-15-SSW-316; or Elkay Model # LK 338.

B. Stainless Steel Cupsink:
1. Description: 3 inches by 6 inches by 4 inches (75 mm by 152 mm by 102 mm) ID. Type 316

stainless steel, minimum thickness 20 gage (0.9 mm), Number 4, mill polish finish. All joints butt welded and ground smooth. Pitch bottoms to drain outlet. Provide 1 inch by 2 inch (25 mm by 51 mm) stainless steel mounting clips at each end for the removable splash guard.

2. Provide sink with the following accessories:
   a. Stainless steel drain outlet.
   b. Removable Splash Guard: Type 316 stainless steel, 1/8 inch (3 mm) diameter rod perimeter frame with 0.028 wire diameter 8 by 8 mesh per square inch (645 mm2) screen. Spot weld screen to frame. Provide 1-1/2 inch (38 mm) opening at each end for hose/tube pass through.
   c. Tailpiece: Town & Country Model #PP-11-X3; or Blucher-Josam Model #851.025.040.

2.15 LABORATORY SERVICE FIXTURES

A. General:
1. Installation: Provide and install at point of use all service fixtures. Connect to the service piping systems specified in Division 22. Provide the product of one manufacturer for all laboratory service fixtures, including fixtures supplied with fume hoods and emergency shower and eye wash units. Provide all fixtures designed for laboratory use and comply with SEFA 7.
2. Refer to Laboratory Service Fixture Schedule for fixture types and descriptions.
3. Acceptable Manufacturers:
   a. WaterSaver Faucet Company.
   b. Broen-LAB A/S
   c. Chicago Faucet Company.
4. Materials: Provide the bodies of service valves, fixtures and accessories of cast or forged brass with a minimum copper content of 85 percent. Fabricate assembly components and operating parts such as valve stems, renewable units, packing nuts, outlet nozzles, and straight serrated hose ends from solid brass bar stock. Fabricate replaceable seats, needle cones, valve disc screws, and other accessories from monel metal or stainless steel alloys especially selected for use intended.
5. Assembled at the factory: Service fixtures, including the mounting of valves and shanks to turrets, flanges, and other mounting accessories.
6. Furnish and install nipples, locknuts, washers, shanks and other accessories required to properly mount and connect the fixtures.
7. Testing: Individually factory test fixtures. Valves and fixtures, except water fixtures, shall withstand a test pressure of 100 pounds per square inch (690 kPa). Test water fixtures at 80 pounds per square inch (550 kPa).
8. Fixtures located on the same plane shall have their handles project the same distance from the plane of reference to present a uniform, related appearance, regardless of valve type.
9. Identify mechanical services with full view colored index buttons in accordance with SEFA 7 Color Code.

B. Water Valves:
1. Renewable unit containing all working parts which are subject to wear, including stainless steel or monel metal seat, monel metal screw, heavy duty seat disk, Teflon packing, and an integral or external adjustable volume control.
2. Provide unit capable of being readily converted from compression to self closing, and vice versa, without disturbing faucet body proper and shall also be capable of being readily converted from water construction to needle valve or steam valve construction without disturbing faucet body.
3. Provide unit sealed in valve body with special composition gasket. Metal-to-metal or ground-joint type of sealing not acceptable.

C. Needle Valves:
1. Gas and air needle valves shall have a stainless steel replaceable floating cone that is precision ground and self-centering.
2. Action of valve: Slow compression for fine control under pressure up to 150 psi (1050 kPa) and shall have parts subject to wear, easily replaceable.

D. Fine Control Valves:
1. Fine Control valves for special gas service: As described for needle valves with the following additions.
   a. Fine stem threads with approximately 30 threads per inch (25 mm).

b. Renewable stainless steel needle and seat with 1/8 inch (3 mm) orifice.
c. Constructed to maintain a constant flow rate of 4 bubbles per 15 seconds as valve is tested out under 50 pounds (350 kPa), 100 pounds (700 kPa), 150 pounds (1050 kPa), 200 pounds (1400 kPa), and 250 pounds (1720 kPa) of nitrogen pressure.

E. Vacuum Valves:
1. 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.

F. High Purity Water Valves:
1. Forged brass body with all interior components coming in contact with water constructed of polypropylene.
2. Maximum working pressure of 50 psig (350 kPa).
3. Provide with 3/8 inch (10 mm) brass riser and gooseneck with polypropylene lining.
4. Provide with polypropylene serrated tip at the outlet.

G. Laboratory Ball Valves: Straight pattern body, valve stem with integral chrome plated ball and TFE-coated O-rings stem seals in valve body, molded TFE valve seals, and tested at 125 psi nitrogen under water. Valves shall have chrome plated forged brass lever-type handle with screw-on type index requiring less than 5 pounds pressure to actuate. Provide with removable 10 serrated hose end.

H. Goosenecks: Hot water/cold water gooseneck mixers shall swivel. Provide swivel point at turret or at valve level if wall or panel mounted. Provide swing joints with heavy Teflon packings. All goosenecks shall provide full thread for attachment of antisplash outlet fixtures, serrated tips or filter pumps.

I. Vacuum Breakers: Provide vacuum breakers, integral with the gooseneck where required. Vacuum breakers shall have a forged brass body, renewable seat and a special design valve member for fine flow control. Vacuum breakers shall not spill over at low water volume. At fume hoods provide vacuum breakers externally mounted on face of fume hood superstructure where required as part of the factory pre-piping.

J. In-line Backflow Preventer: Provide in-line dual check backflow preventer, integral with water service fixtures to maintain continuous pressure. ASSE certified under Standard 1024.

K. Pre-Rinse Units: Provide self-closing squeeze valve with rubber-bound spray head, insulated handle and locking ring. Valve mounted on spring loaded 39-inch stainless steel hose.

L. Aerators: Aerators shall have 3/8 inch (10 mm) NPS male inlet. Provide with integral flow control that adjusts between 0.5 GPM (1.29 LPM) and 3.0GPM (7.77 LPM). Flow control to be set as indicated on Drawings.

M. Serrated Tips: Serrated tip fixtures shall have 3/8 inch (10 mm) IPS thread with hose end being tapered and shall not have less than 10 serrations. Provide 1/8 inch (3 mm) diameter of orifice in serrated tip, except where otherwise specified. For water units provide with integral flow control that adjusts between 0.5 GPM (1.29 LPM) and 3.0 GPM (7.77 LPM). Flow control to be set as indicated on Drawings.

N. Turrets: Round type design, brass drop forging, as indicated on Drawings. One-way or two-way as required with 3/8 inch (10 mm) IPS female inlet thread for connections. Furnish units with brass shanks, brass locknuts, and washers.

O. Infrared Sensor Operator: Infrared sensor operator shall include the infrared sensor with range between 2 inches (50 mm) and 8 inches (200 mm), thermostatic mixing valve, solenoid valve with strainer filter, battery powered control module, and plug-in adapter for 120 VAC power supply.

P. Electrical Fixtures - Pedestal Type: Cast aluminum box complete with cover plates. Fabricate units with sloped single face or double face, as indicated, and conceal mounting holes in base for attaching to casework. UL listed. Provide holes tapped for conduits and grounding screws. Coordinate required face plates with receptacles and other devices specified in Divisions 26 and 27.

Q. Quick Disconnect Fitting with 1/4 Inch Male NPT: For service tube ends. Each keyed disconnect shall

include nipple and coupler with color-keyed band marking media.

R. Wrist blade Handles: 4 inch forged brass wrist blade handles. Install handles so blades are perpendicular to the benchtop in the off position and horizontal to the benchtop in the open position.

S. Quick Connect Bodies: For service connections to flexible casework systems. Each keyed disconnect shall include nipple and coupler with color-keyed band marking media and hose between service panel and flexible casework system.
1. Finish: Type 316 stainless steel.
2. Provide with stainless steel braided hose with Teflon lining with a maximum working pressure of 1000 psig (6,895 kPa).

T. Fixture Finish: Satin Nickel Plated with Clear Epoxy Finish. Fixtures shall have nickel plated finish brushed to an AISI No. 6 finish then coated with an electrostatically applied clear epoxy powder coating.

U. Faucet and Valve Handles: Finished to match fixture finish, 4-arm type or wrist blade type with removable screw-on type colored plastic discs with identification lettering stamped on disc in a contrasting color as scheduled below.

Service	Index Color	Symbol
Air	Orange	AIR
Argon	Violet	AR
Carbon Dioxide	Pink	CO2
Chilled Water Return	Green	CHWR
Chilled Water Supply	Green	CHWS
Compressed Air	Orange	CA
Cold Water – Potable	Green	CW
Hot Water – Potable	Red	HW
Gas	Blue	GAS
Industrial Cold Water	Green	ICW
Industrial Hot Water	Red	IHW
Lab Air	Orange	LA
Distilled Water	White	DW
Deionized Water	White	DI
Reverse Osmosis Water	White	RO
Nitrogen	Brown	NIT
Special Gas	Light Blue	Varies by gas
Steam	Black	STM
Vacuum	Yellow	VAC

2.16

2.16 EMERGENCY SHOWER AND EYE WASH UNITS

A. General: Provide and install at point of use all emergency shower and eyewash units. Connection to the service piping systems specified in Division 22. Provide units that meet the requirements of ANSI Standard Z358.1.

B. Acceptable Manufacturers:
1. Water Saver Faucet Company. WaterSaver fixtures are referenced herein.
2. Broen-LAB A/S.
3. Guardian Equipment.

C. Emergency Showers:
1. Deluge type with a concealed stay-open ball valve. Provide with "Panic Bar" activation as detailed on the Drawings.
2. Shower head, nipple, and escutcheon: stainless steel. Maximum mounting height of shower head 96 inches (2.4 m).

3. Design valve so that water flow remains on without requiring use of the operator's hands.
4. All exposed valves, piping, and associated devices: Stainless steel.
5. Provide modesty curtain, and track. Bottom of curtain to be 1’ a.f.f.

D. Recessed Swing-Down Eye/Face Wash:
1. Barrier free, wall mounted, "AutoFlow", swing-down eye/face wash with recessed stainless steel cabinet.
2. Furnish and install units to meet the requirements of the Americans With Disabilities Act (ADA).
3. Cabinet: Type 304 stainless steel with Number 3 satin finish.
4. All exposed valve components: Polished chrome plated brass.
5. Valve: Plug-type design with Teflon coated "O" rings to seal valve orifice. Water flow activated by swinging outlet heads from the vertical to the horizontal position. Water to turn on when the arm assembly is no more than 30 degrees from horizontal. Cabinet shall house valve assembly.
6. Furnish with 2 polypropylene fine spray heads with polyurethane filter and integral volume control.
7. Cabinet shall house the emergency shower stay-open ball valve with "Panic Bar" operation.
8. Cabinets located in rated walls shall be fire rated to maintain the integrity of the rated wall.

E. Surface Mounted Swing-Down Eye/Face Wash:

F. Barrier free wall mounted, "AutoFlow," swing-down eye/face wash with surface mounted stainless steel cabinet.

G. Furnish and install units to meet the requirements of the Americans with Disabilities Act (ADA).

H. All exposed valve and piping components, including piping drops from the ceiling: Polished chrome plated brass.

I. Cabinet: Type 304 stainless steel bracket and housing.

J. Valve: Plug-type design with Teflon coated "O" rings to seal valve orifice. Water flow activated by swinging outlet heads from the vertical to the horizontal position. Water to turn on when the arm assembly is no more than 30 degrees from horizontal. Cabinet shall house valve assembly.

K. Furnish with 2 polypropylene fine spray heads with polyurethane filter and integral volume control.

L. Provide with a wall mounted drench hose where indicated and detailed on the Drawings.

M. Cabinet shall house the emergency shower stay-open ball valve with "Panic Bar" as detailed on the drawings.

N. Alarm: Provide local visual and audible alarm with electrical signal within the room that alarms when either shower or eyewash are activated. Provide silencing switch to silence alarm horn during weekly testing. Connection to light and horn is in Division 26.
1. Visual Signal: Amber strobe light with shatter-resistant lens.
2. Audible Signal: Horn delivers distinctive, urgent signal at a minimum of 90 decibels.

O. Test Kit for Emergency Shower and Safety Stations:
1. Provide 48 inch (1219 mm) telescopic aluminum pole, 11-1/2 inch diameter Tyvek test chute, 5 gallon plastic pail and eyewash tester.

P. Deck Mounted Eye, Face and Body Spray Units:

Q. Dual purpose eyewash/drench hose unit.

R. The angled dual head body and valve of forged brass.

S. The squeeze handle of stainless steel with plastic cover.

T. The handle and deck flange of molded nylon, with handle locater guides.

U. Provide self-closing valve with a locking clip to hold the valve open once the unit is activated.

V. Provide unit with dual, polypropylene, angled, gentle spray heads; polyurethane filter; integral volume control; integral backflow preventer; and integrated nylon flip-top dust cover.

W. Finish: Match laboratory service fitting finish.

X. Provide with 8 foot long high pressure, reinforced PVC hose.

Y. Thermostatic Mixing Valve
1. In Division 22.

2.17 UNDERCABINET/SHELVING TASK LIGHTING

A. Description: UL1598, UL2108 and UL8750 listed, LED light fixture in lengths equal to the cabinet or shelf it is mounted to. Provide standard output, neutral white, color temp to match general room lighting color temp, minimum 90 CRI or higher, daisy chained together with integral individual dimming from 0 to 100 percent and rocker switch on each fixture. Provide with occupancy sensor and automatic shut-off after 10 hours in silver, anodized aluminum, or white finish.

B. Acceptable Manufacturers:
1. LightCorp; Model: Reed Premier – Standard Output.
2. Mocha Lighting; Model: Lungo – Low Voltage.
3. BOCA Flasher; Model: TASK Master.

C. .

2.18 OVERHEAD SERVICE COLUMNS (OSC)

A. Description: Construct of 20 gauge metal panels and slotted channel framing in dimensions indicated in drawings. Coordinate connection of services, point exhaust, electrical and data with other trades. Provide service columns pre-plumbed for required utilities and coordinate laboratory gas piping material with Division 22. Provide service columns with receptacles and pre-wired for required electrical and data and coordinate requirements with Divisions 26/27. Coordinate connection of services, electrical and data and junction boxes with other trades.

B. OSC Structure: Securely and rigidly fasten the entire assembly, including diagonal braces, to structural slab above or to a structural grid where provided.

C. Ceiling Trim Plate: Provide ceiling trim pate at each vertical support that penetrates the ceiling system where appropriate. Refer to reflected ceiling plans for ceiling locations.

D. Finish: Finish as specified for metal finish in this section. Paint all exposed piping and conduit servicing the carrier. Color to match Mott Manufacturing Limited Taupe.

2.19 SLEEVES IN COUNTERTOPS

A. Description: 14 gage (2.0 mm), Type 304 stainless steel, with a Number 4 finish.

B. Extend sleeves 1 inch (25 mm) above the countertop and provide with a flange on the bottom for fastening to the underside of the countertop. Install with clear silicone sealant between the outside of the sleeve and the countertop. Provide top edge of sleeve with a smooth radius to prevent chafing of insulation on hoses.

2.20 SOURCE QUALITY CONTROL TESTING OF METAL FINISH

A. Metal Finish: Meet or exceed the latest edition of the following Section and Articles of SEFA-8-M Recommended Practices;
1. 8.0 Cabinet Surface Finish Tests"
   a. 8.1 Chemical Spot Test.
   b. 8.2 Hot Water Test.
   c. 8.3 Impact Test.
   d. 8.4 Paint Adhesion Test.
   e. 8.5 Paint Hardness Test.

B. Testing Requirements: Provide a third party tester that is not a representative of the Manufacturer or Installation Contractor.

C. Test Results: Submit a certified report providing test results and indicating the finish conforms with or exceeds the above SEFA-8-M Recommended Practices.

2.21 SOURCE QUALITY CONTROL TESTING OF WOOD FINISH

2.22 Wood Finish: Meet or exceed the latest edition of the following Section and Articles of SEFA-8-W Recommended Practices:

2.23 8.0 Cabinet Surface Finish Test:

2.24 8.1 Chemical Spot Test.

2.25 8.2 Hot Water Test.

2.26 Testing Requirements: Provide a third party tester that is not a representative of the Manufacturer or Installation Contractor.

2.27 Test Results: Submit a certified report providing test results and indicating the finish conforms with or exceeds the above SEFA-8-W Recommended Practices.

2.28 SOURCE QUALITY CONTROL TESTING OF BUTCHER BLOCK WORK SURFACES

A. Meet or exceed the latest edition of the following Section and Articles of SEFA-3 Recommended Practices:
   1. 2.1 Chemical/Stain Resistance Test:
      a. Test Method A.
      b. Test Method B.

B. Testing Requirements: Provide a third party tester that is not a representative of the Manufacturer or Installation Contractor.

C. Test Results: Submit a certified report providing test results and indicating the finish conforms with or exceeds the above SEFA-3 Recommended Practices.

2.29 SOURCE QUALITY CONTROL TESTING OF SOLID PHENOLIC RESIN WORK SURFACES

A. Meet or exceed the latest edition of the following Section and Articles of SEFA-3 Recommended Practices:
   1. 2.1 Chemical/Stain Resistance Test:
      a. Test Method A.
      b. Test Method B.

B. Testing Requirements: Provide a third party tester that is not a representative of the Manufacturer or Installation Contractor.

C. Test Results: Submit a certified report providing test results and indicating the finish conforms with or exceeds the above SEFA-3 Recommended Practices.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 DELIVERY

A. Delivery casework systems in two stages:
   1. Deliver fixed casework and fume hoods.
   2. Deliver flexible casework systems.

B. Deliver flexible casework systems just prior to building occupancy, as instructed by Architect.

3.3 PREPERATION

A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION

A. General:

1. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified.
   a. Respective manufacturer/fabricator's written installation instructions.
   b. Approved submittals.
   c. Contract Documents.
2. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.
3. Install casework, tables, casework support systems, overhead service drops, fume hoods and local point exhaust devices in accordance with manufacturer's instructions and approved Shop Drawings, and under the supervision of the manufacturer's trained personnel.
   a. Include installation of service fixtures. Final connections to services are specified in Division 22.

B. Casework Installation:
1. Install, plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Securely anchor to building structure. Where laboratory furniture abuts other finished work, scribe and apply filler strips for accurate fit with fasteners concealed where practicable.
2. Installation of each individual bench run shall start at the high point of the floor under that bench run with levelers screwed in as much as possible.
3. Where required, assemble units into one integral unit with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).
4. At fixed casework installations provide galvanized backer plates at toe kicks to receive applied base where floor elevation deviations cause gaps over one inch between bottom of cabinet base and floor.
5. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by Manufacturer.
6. Securely fasten tall cabinets, fume hood superstructures and tall flammable storage cabinets to solid support material near top of cabinet.
7. Reinforcement of stud walls to support cabinets, shelving, and other wall mounted laboratory furnishing items: Done during wall erection by trade involved. Laboratory furniture company/supplier is responsibility for indicating on Shop Drawings the accurate location and sizing of reinforcement.

C. Wall Cabinet Installation:
1. Securely fasten to solid supporting material, not plaster, lath, or wallboard. Anchor, adjust, and align wall cabinets as specified for base cabinets.
2. Reinforcement of stud walls to support wall mounted cabinets: Done during wall erection by trade involved. Laboratory furniture company/supplier is responsibility for indicating on Shop Drawings the accurate location and sizing of reinforcement.

D. Work Surface Installation:
1. Field jointing where practicable: Made in same manner as factory jointing using dowels, splines, adhesives, and fasteners recommended by Manufacturer. Locate field joints as shown on accepted Shop Drawings, factory prepared so that there is no job site processing of top and edge surfaces.
2. Abut top and edge surfaces in 1 true plane, with internal supports placed to prevent any deflection.
3. Provide all holes and cutouts as required for built-in equipment and mechanical and electrical service fixtures. Prior to making openings, verify size of opening with actual size of equipment to be used. Form inside corners to a radius of not less than 1/8 inch (3 mm). After sawing, rout and file cutouts to ensure smooth, crack free edges. Seal exposed edges after cutting with a waterproofing material recommended by manufacturer.
4. Secure tops to support with concealed Z-Type, angle type fastening, "Liquid Nails", Ply400/Ply 200 adhesive or equivalent. Fastening devices spaced no more than 3 feet (0.9 m) on center. Adhesives shall be liberally applied for solid anchoring of tops.
5. Plastic laminate worktop joints: 1/4 inch (6 mm) diameter bolt type "dog-bone" or "tite-joint" fasteners routed into bottom surface of worktops. Provide flush hairline joints in top units and seal with silicone sealant.
6. Epoxy Resin Work Surface Joints: 3/32 inch (2.38 mm) flush and smooth with epoxy sealant.
7. Stainless Steel Work Surface joints: Electrically weld all shop and field joints; grind smooth and polish.
8. Caulk joints between curb and walls, fume hoods, and cabinets with acid-resistant silicone caulk.

E. Sink Installation: Set in chemical resistant sealing compound sinks which were not factory installed and secured and supported per manufacturer's recommendations.

F. Accessory Installation: Install accessories, fixtures and equipment in accordance with manufacturer's recommendations ready for final connection to services.

G. Refer to Specification Section 115313 for additional information regarding fume hood installation.

3.5 FIELD QUALITY CONTROL

A. Manufacturer/Fabricator's Field Service: Manufacturer/fabricator's qualified technical representative shall inspect first day's Work and periodically inspect Work to ensure installation is proceeding in accordance with manufacturer/fabricator's designs, recommendations, instructions, and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings, and conclusions of inspection.

B. Owner's Testing Agency Field Service: The Owner may employ and pay a qualified independent testing agency to perform field quality control. Materials and installation failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor's expense.

3.6 ADJUSTING

A. Repair or remove and replace defective work, as directed by Owner's Representative upon completion of installation.

B. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly.

3.7 CLEANING AND PROTECTION

A. Clean shop finished casework and fume hoods, touch up as required, and remove and refinish damaged or soiled areas.

B. Cover casework for protection against soiling and deterioration during remainder of construction period.

C. Clean countertops with diluted dishwashing liquid and water leaving tops free of all grease and streaks. Use no wax or oils.

D. If steel wool is used in cleaning stainless steel, use only stainless wool.

E. Protect casework and fume hoods before, during, and after installation. Materials damaged due to improper protection are cause for rejection.

END OF SECTION

SECTION 132100 - CONTROLLED ENVIRONMENTAL ROOMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Providing labor, materials, equipment and services necessary for the complete installation of environmental rooms in accordance with the Contract Documents.
2. Factory assembly and testing of major components, including conditioning module, compressor / condensing unit, humidification / dehumidification equipment, and control panels.
3. Delivery of room components to their final location, and assembly of rooms in place by factory trained technicians.
4. Refrigeration piping, electrical power wiring, control wiring and final connections to equipment and devices which are an integral part of the rooms.
5. Interconnection to building mechanical, plumbing and electrical services.
6. Startup and field testing of rooms by factory trained technical personnel.

B. Related Requirements:
1. Section 123553 "General Requirements for Laboratory Casework and Fume Hoods."
2. Section 123553.03 "Adaptable Laboratory Casework Systems."
3. Section 123553.13 "Metal Laboratory Casework."
4. Division 21: Furnishing and installation of fire suppression system, freeze protection and final connections.
5. Division 22: Furnishing and installation of plumbing utilities and final connections.
6. Division 23: Furnishing and installation of ventilation ductwork and final connection to environmental rooms.
7. Divisions 26 and 27: Furnishing and installation of electrical and data utilities and final connections to room control panels and remote compressor/condenser units.

1.2 SYSTEM DESCRIPTION

A. Design Requirements:
1. Environmental rooms shall be designed, manufactured, and installed by one supplier for single source responsibility.
2. Rooms shall be self-contained units with essential systems and equipment necessary for a complete and functional room.
3. Design systems with sufficient capacity to simultaneously and continuously meet loads; including heat transmission from external sources, ventilation load, and internal heat gain from equipment, lighting and people; as scheduled on the drawings. Scheduled power supply represents the amount of power allocated by the building electrical system design for each environmental room. Provide additional power, in excess of the amount scheduled, that is required to maintain specified environmental conditions.
4. Separate and independent refrigeration systems, including back-up systems, shall be provided for each environmental room.
5. Compressor / condensing units shall be installed in stacking steel racks designed and provided by the compressor manufacturer/supplier, maximum two compressors high. Location as indicated on the Drawings.
6. The environmental room design and installation shall conform to applicable codes, ordinances and regulations.

1.3 QUALITY ASSURANCE

A. Single source responsibility: Systems and components, which comprise the walk-in controlled environmental room equipment, shall be designed, fabricated and assembled by a single manufacturer.

B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled workers to produce high quality walk-in coolers and freezers, and shall meet the following minimum requirements.
1. 10 years or more experience in the manufacture and installation of laboratory environmental rooms and equipment of type specified
2. 10 installations of equal or larger size and with similar requirements.

C. Coordination: The supplier/installer shall coordinate the installation of products under this section and shall coordinate the installation and rough-in sizes and locations for utilities required for walk-in coolers

and freezers. The manufacturer shall coordinate electrical requirements with the electrical contractor.

D. Architect may wish to inspect products at the manufacturer's factory prior to shipment. Products found not to be in conformance with requirements of the contract documents may be rejected.

E. Company Field Advisor: A company field advisor shall be on site supervising installation of the walk-in controlled environmental rooms, including equipment necessary for the proper operation of the walk-in controlled environmental rooms. The field advisor shall be an employee of the controlled environmental room manufacturer. Additionally, the field advisor shall be certified in writing by the manufacturer to be technically qualified in the design, installations, and servicing of the required products.

F. Installers: Installation of the equipment specified under this section shall be undertaken by the manufacturer's crew of installers, or a crew of installers who are approved in writing by the manufacturer. In either case, the installation of equipment specified under this section shall remain the responsibility of the manufacturer as a subcontractor to the General Contractor.

G. Each walk-in unit shall be classified by Underwriter's Laboratory, Inc., and approved by Factory Mutual. Electrical components shall also be UL listed.

H. Install equipment in accordance with the National Electric Code and the electrical drawings and specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products on the site in such a manner as to minimize the risk of damage, decay, deterioration or loss from theft.

B. Products shall be delivered to the job site in manufacturer's original unopened containers, crates or protective wrappings with the manufacturer's name and address clearly labeled thereon.

C. Accept products on site and inspect on arrival for damage.

1.5 ACTION SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: Manufacturer's catalog sheets, specifications, utility and service requirements and locations, and installation instructions for each item specified.

C. Shop Drawings: Provide drawings showing wall, floor and ceiling panel layout, light fixture layout, lighting photometric analysis, door locations, locations for recessed control panels, floor recess depth, monitoring devices, electrical diagrams, etc. Include applicable details for fabrication and erection, including panel, door, door hardware, and electrical details.

1.6 INFORMATIONAL SUBMITTALS

A. Quality Control Submittals:
   1. Company Field Advisor Data:
      a. Name, business address and telephone number of Company Field Advisor secured for the required services.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   2. List of Completed Installations: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least four comparable installations which can prove the proposed products have performed satisfactorily for five years.

B. Test Reports: Submit test reports verifying conformance to specified performance tests.

C. Field Quality Control Reports: Written report of testing and inspection required by "Field Quality Control".

1.7 CLOSEOUT SUBMITTALS

A. Operation & Maintenance Manuals: Provide complete written instruction manuals outlining safe operating procedures, safety guidelines, and proper maintenance procedures for equipment and systems.

B. Warranty: Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations, and exclusions.

1.8 WARRANTY

A. Warranty: In addition to the General Contractor's warranty for work, furnish an additional warranty for a period of five years after acceptance of the work that each walk-in unit will furnish the full temperature range as specified. Make repairs and replace equipment to meet this guarantee.

1.9 COORDINATION

A. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer. Coordinate final openings, sizes and electrical and plumbing utility rough-in sizes and locations with the appropriate trades.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. BioCold Environmental Inc.
   2. Controlled Environments, Inc.
   3. Environmental Growth Chambers.
   4. Harris Environmental Systems.
   5. Hussmann Services Corporation.
   6. Norlake Scientific.
   7. Stability Environments, Inc.

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: <**Environmental Growth Chambers**>.

2.2 PERFORMANCE REQUIREMENTS

A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required and shall not be construed as an engineered design. Furnish and install all Work required for a complete installation.

B. Coordination of Contract Documents and Work:
   1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturer/fabricators, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.
   2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

2.3 ROOM CONSTRUCTION

A. Rooms shall be of modular construction incorporating wall, ceiling and floor panels consisting of foamed-in-place polyurethane insulation sandwiched between interior and exterior metal surfaces. Provide panels in standard size increments, fully interchangeable, and in a configuration that meets the specified dimensions. Structural metal, wood, or fiberglass material shall not be used between interior and exterior surfaces to ensure continuity of insulation and prevent condensation.

B. Insulation: Foamed-in-place non-CFC polyurethane with a minimum thermal conductivity (K factor) of 0.14 BTU/hr/sqft/degrees F/inch and an overall coefficient of heat transfer (U factor) of not more than 0.035.
   1. Insulation Values: Foam shall be 97 percent closed cell, impervious to moisture. Insulation shall

bond the panel and have a minimum compressive strength of 28 pounds per square inch.
2. Minimum insulation values for rooms maintaining a temperature above freezing: R-30.
3. Minimum insulation values for rooms maintaining a temperature below freezing: R-34.

C. Assembly: Panel sections shall lock together from inside the room with non-corrosive cam type fasteners activated with a hex wrench, providing accurate, tight joining. Provide a minimum of 3 locking devices on each vertical joint. Distance between locking devices shall not exceed 48 inches. Edge of panels shall be tongue and groove construction with every tongue including an interior and exterior flexible vinyl gasket to ensure a tight fit. Gaskets shall be impervious to stains, greases, oils and mildew. Batten strips or pressure clips as a means of covering seams or joining panel sections shall not be utilized. Close wrench holes with flush mounted plastic or stainless-steel caps.

D. Panels shall be toxicity rated, have a flame spread of not more than 25 and a smoke generation of 450 or less when tested in accordance with ASTM E84 and as certified by Underwriters Laboratories.

E. Wall and Ceiling Panels:
1. Thickness: minimum 4 inches
2. Exterior and Interior Surfaces: 20-gauge stucco embossed aluminum with baked white polyester enamel finish.

F. Floor Panels:
1. Thickness: minimum 2 inches for rooms -4 degree Celsius or above.
2. Exterior and Interior Surfaces: 14-gauge galvanized steel capable of handling floor loads up to 600 pounds per square foot (2940 kg per square meter).

G. Ramps:
1. Provide a 1 inch rise for each 12 inch run ramps at doors with height transitions, extending inside of rooms, as shown on the Drawings.
2. Provide with a non-skid surface, color black.

H. Wall Protection:
1. Hat-shaped wall protector, 7-inches high by 1-inch deep.
2. Attached wall protection to wall panels at 12-inches on center at top and bottom.
3. Fabricate wall protection from 16-gauge stainless steel, with a number 4 finish.

I. Swing Doors:
1. Infitting, semiflush, doors shall have a thermal resistance within 10 percent of that for wall panels.
   a. Size: Minimum clear opening of 42 inches wide by 78 inches high.
2. Observation Window: Minimum of 14 inches high by 14 inches wide, 3 pane hermetically sealed window. Window shall be removable for replacement. With heated glass and frame.
3. Gaskets: Extruded vinyl, resistant to oils and sunlight, and easily replaceable. Provide junction box and antisweat heaters to control condensation as a standard item on door jambs at rooms designed for operation below 5 degrees Celsius.
4. Hardware: Stainless steel, cam action type, self-closing, self-lubricating, and edge or strap mounted with stainless steel. A minimum of 3 hinges per door, one being a slow action, cam rise spring assist self-closing hinge. Hinges shall be adjustable for proper gasket seal.
   a. Door Closer: Dual speed, gas loaded hydraulic cylinder to control closure and reduce slamming. Closer to include concealed fasteners.
   b. Kick Plate: 48 inches high by full width of door on both sides of door.
   c. Door Jamb Plate: 48 inches high on both sides of wall at door jambs.
5. Lock: Provide with keyed cylinder lock capable of release from the room interior whether or not the door is locked. Include signage in room interior explaining how the door operates and how to open the door.
6. Concealed wiring.
7. Threshold: Stainless steel heated threshold at rooms below 0 degrees.

J. Pressure Relief Port: Provide a pressure relief port in walls where a swinging door will operate to reduce the resistance required to open and close swinging doors. Port ventilator shall seal tight, provide frost resistance, and heater to prevent blockage.
1. Power the pressure relief port frost protection feature through the control panel.

K. Door Jamb and Head: Openings shall be made of fiberglass reinforced plastic using thermoset resin and continuous pultrusion process.

L. Digital Thermometer: Provide a solid state, two-digit thermometer with 1/2 inch display at each door to

indicate inside air temperature in degrees Fahrenheit or Celsius.

M. Closure Panels:
1. Furnish and install vertical and horizontal closure panels, strips and shrouds to close the opening between environmental rooms and adjacent building partitions and ceiling.
2. Finish to match adjoining environmental room wall panels.

2.4 ROOM INTERIORS

A. Lay-in Ceiling: Provide a 24 inch by 48 inch (610 mm by 1220 mm) eggcrate type lay in ceiling panels supported by anodized aluminum grid members and covering the total ceiling area. Panels shall be acrylic with 1/2 square perforations.

B. Ceiling Plenum:
1. Plenum to contain conditioning modules, heating elements, control valves and other equipment necessary to condition the room air to maintain specified conditions.
2. Conditioned air shall be directed into a positive pressure plenum extending across the room ceiling.
3. Plenum to provide the correct percentage of total opening of lay-in ceiling to ensure uniform air distribution throughout the room.

C. Conditioning Module:
1. Room air shall be temperature conditioned by a conditioning module consisting of an evaporator coil with drain pan, air circulating blowers and controls.
2. Locate conditioning module in ceiling plenum above lay in ceiling. Conditioning module shall be low profile type to maximize the clear height inside the room and arranged so that cooled air is discharged parallel to the ceiling.
3. Electrical power feed to conditioning module shall be through the environmental room control panel.

D. Lighting:
1. Design: Lighting shall be sufficient to provide a minimum 75 footcandles of uniform illumination when measured at 36 inches above the floor.
2. Mount fixtures above the false ceiling panels within ceiling plenum.
3. Surface mount fixtures to room ceiling panels and provide an accessible junction box on the outside surface of the ceiling panels. Coordinate locations of fixtures to provide even distribution of light and avoid conflicts with conditioning modules.
4. Fixtures: Vaporproof LED type suitable for from -20 degrees Celsius to 60 degrees Celsius. Underwriters Laboratories approved for horizontal mounting in wet locations. Lighting shall be 120 volts. CRI shall be greater than 80. Color temperature to match general room lighting.
5. Lamps: Provide type specified under Division 26. For rooms at 0 degrees Celsius and below, provide low temperature lamps.
6. Diffuser: Molded polycarbonate, ribbed diffuser, secured to fully-gasketed housing by captive, cam-action latches, eight per fixture. Milky diffuser.
7. Switch: Provide with pilot light and locate outside of the room next to the door.

E. Flooring:
1. Acceptable Manufacturers:
   a. Altro Walkway 20 Safety Flooring
   b. Armstrong
   c. Mannington
2. Crevice free, non-absorbent, slip resistant, abrasive, vinyl flooring.
3. Depending on room size, floors shall be seamless or have welded seams, coved 4 inch (100 mm) up sides and capped with vinyl trim piece and continuously silicone sealed between vinyl cap and walls.
4. Color: Selected by the Owner's Representative from one of the manufacturer's standard colors.
5. Flooring shall have temperature stability, dimensional stability and flexibility from -30 degrees Celsius to 60 degrees Celsius.
6. Flooring shall meet the current slip resistance Static Coefficient of Friction Guidelines of the Americans with Disabilities Act and OSHA, and be unaffected by surface water.
7. Provide flooring with an underlayment as recommended by the flooring manufacturer.

2.5 REFRIGERATION SYSTEM

A. Design:

1. Complete, integrated system consisting of a conditioning module, compressor / condenser unit, interconnecting piping, interconnecting wiring, and controls designed for continuous system operation. The refrigeration system shall be a fully modulating type which continuously proportions the mixture of liquid and hot gas phases of the refrigerant entering the evaporator, utilizing a modulating control valve. On/off solenoid valve type of control will not be acceptable. The system shall also include high/low pressure controls, receiver, expansion valve, and necessary components for a complete system to achieve the specified performance.
2. System capacity shall be sufficient to simultaneously and continuously meet loads, from 0 to 100 percent, including heat transmission from external sources, ventilation load, and internal heat gain from equipment, lighting and people. Door openings are per the Controlled Environmental Room Schedule.
3. Refrigerant: ~~448A or CO2 (R 744).~~ Type A1 low Global Warming Potential (GWP) and compliant with the EPA AIM Act.
4. Rooms used for purposes other than storage, ventilation will be continuously provided from the building supply air system. Rooms must maintain temperature control and uniformity with ventilation load continuously present.

B. Conditioning Module:
1. Evaporator Coil: Copper tube, copper cross-fin coils with aluminum housing. Maximum 6 fins per inch (25 mm), minimum 4 rows deep. Air velocity shall be less than 500 fpm (2.5 m/s).
2. Coil Blower Motor: Permanently lubricated, electronically communicated (EC), ball bearing design, rubber mounted, and thermally protected.
3. Drain Pans: Provide an insulated, stainless steel or heavy gage aluminum, condensate drain pan large enough to collect condensate during normal operating and defrost cycles. Drain discharge to rear of module.

C. Compressor / Condenser Unit:
1. Water cooled, semi-hermetic, serviceable unit sized to maintain temperature / humidity conditions scheduled for each room on the drawings.
2. Components of the unit shall be designed for 125 psig working pressure or 150 percent of maximum operating pressure, whichever is greater.
3. Unit shall have a minimum of a high/low pressure safety control, receiver with fusible plug, liquid line drier with sight glass, crankcase pressure regulator, accumulator, vibration absorbers and thermal protection.
4. Unit shall be designed for continuous operation for maximum compressor life and to eliminate on-and-off cycling.
5. The compressor / condenser unit shall be linked to an evaporator of matching capacity.
6. Units located outdoors or in an unprotected area shall have a weatherproof housing, low ambient protection and crankcase heaters.
7. Water cooled units shall be provided with modulating water regulating valves to maintain head pressure

D. Automatic Defrost System:
1. For rooms with setpoint temperature 0 degrees Celsius and below, provide electric defrost with timer and fan delay switch. Set defrost initiation time and duration so that room temperature increase is minimized while achieving complete removal of accumulated frost. Electric heat trace and insulate drainpipe.

E. Piping: ACR type, hard drawn, cleaned and capped Type L copper tubing soldered with silver solder. Hot gas piping shall be silver brazed. Piping shall be installed to allow for linear expansion of copper after startup.
1. Suction Piping: Size for velocity of 500-700 fpm (2.5-3.5 m/s) on horizontal runs with a slight pitch toward condensing unit. When condensing unit is located below evaporator and there is no possibility of trapping oil; size vertical runs same as horizontal runs. When condensing unit is located above evaporator; size vertical runs for velocity of 1,000-1,500 fpm (5-7.5 m/s) and install proper traps spaced not more than 10 feet (3 m) apart on tubing risers.
2. Hot Gas Piping: When hot gas piping is field installed remote from compressor, size at same velocities and with same trap requirements as specified above for suction lines.
3. Liquid Piping: Size liquid piping for maximum 2 psig (13.8 kPa) pressure drop.
4. Hangers: Provide with appropriate tubing clamps to support liquid, suction, and discharge lines individually. Space hangers or clamps 8 feet (2.4 m) on center maximum.

5. Condensate Drain Piping: Provide 7/8 inch (20 mm) or greater, Type L copper tubing from evaporator drain pan to the building waste system. Drain piping shall terminate 2 inches (48 mm) above the floor sink or floor drain outside the room. Horizontal piping between drain pan and environmental room wall shall be located above the lay in ceiling, or above required clearance zone and pitched in the direction of flow. Rigidly support piping at walls, 3 feet (1 m) on center with a 1 inch (24 mm) clear space between the wall and the drain line. Provide cleanout tee near drain pan. Where piping passes through wall of room, provide chrome plated escutcheons on both faces of the wall and a trap seal at the outside surface of the wall. Insulate and electric heat trace drain piping.
6. Refrigerant Testing: Pressurize and leak test entire system at not less than 100 psig (690 kPa). Clean and dehydrate by maintaining a vacuum of 500 microns, or lower, for a 5 hour period. Add required charge of refrigerant, and oil if necessary, and test entire system for performance. The type of refrigerant used shall be in accordance with State and Local Codes. Mark each system clearly as to refrigerant type used.
7. Service line penetrations shall be properly sealed with silicone caulking.
8. Refer to drawings for location of roof-mounted remote compressor and condenser units and floor sinks.

F. Pipe Insulation: Suction and hot gas refrigeration lines shall be insulated with a closed cell foam plastic insulation. The material shall be tubular in form and sized according to the pipe size. Joints shall be thoroughly bonded by the adhesive recommended by the manufacturer of the insulation. Insulation shall meet local and state fire and smoke requirements. Penetrations of the insulation must be thoroughly sealed to form a complete vapor barrier. Wherever the insulation terminates the edges shall be sealed to the pipe with sealant.

2.6 INSTRUMENT AND CONTROL SYSTEMS

A. Control Panel Enclosure: Install instruments, controls, and major electrical components in a control console outside of the room next to the door, mounted at eye level. Provide an easy access service door for front servicing of major electrical components.
1. Surface mount control panel.
2. Provide control center at panel front protected with a hinged acrylic cover with lock to prevent unauthorized access.
3. Control panel shall contain circuit fusing, timers, switches, pilot lights, main and safety controls, alarms, and other devices required for system operation.
4. Console enclosure shall extend from control panel to 6 inches above ceiling to conceal wiring and conduit.
5. If control panel protrudes into walking path more than 4 inches, console enclosure shall extend from bottom of control panel to 6 inches above finished floor to address accessibility.

B. Temperature Controller: Controller shall be a PLC with touch-screen interface and password protection. Controller shall have non-volatile memory to maintain settings and functions in the event of a power failure without the use of batteries and shall automatically restart upon power restoration.
1. Plug-in components shall be used for easy replacement.
2. Controller shall disallow inputs that are not within the operating range of the room. Temperature control shall be 100% solid state, proportional controller capable of both Celsius and Fahrenheit operation.
3. Temperature sensors shall be resistive with an initial accuracy and inter-changeability better than plus or minus 2 degrees Celsius.
4. Control sensitivity shall be better than plus or minus 0.03 degrees Celsius with display and set-point resolution of 0.1 degree Celsius.
5. Temperature control shall be within plus or minus 0.5 degree Celsius over the ranges scheduled on the drawings.
6. Controller proportional output shall be both analog (0-10VCD) and digital (increase/decrease, active low).
7. Proportional valves, solid-state heat controls, as well as zero-crossing solid-state switches, shall be fully supported.
8. An interface port shall be available for monitoring, data logging, or copying of stored data to a memory device.
9. All switched devices operated by the controller shall be switched by optically-isolated, individually replaceable, solid state relays

C. Relative Humidity Controller: Controller shall be a PLC with touch-screen interface and password protection. Controller shall have non-volatile memory to maintain settings and functions in the event of a power failure without the use of batteries and shall automatically restart upon power restoration.
   1. Plug-in components shall be used for easy replacement.
   2. Thin Film Capacitance Sensor: Sensitivity shall be greater than or equal to plus or minus 2 percent.
   3. The microprocessor PID controller shall continuously monitor room condition versus setpoint, providing an output which will modify the conditioning system capacity in response to deviations.
   4. Controller range shall be established to cover the required range of the room as scheduled.
   5. Accuracy: Plus or minus 0.5 percent span or I/digit for display.
   6. Ambient Temperature Error: 0.01 percent of span per percent relative humidity deviation from 25 degrees Celsius.
   7. Resolution: 1 percent relative humidity per unit.
   8. Calibration Drift: Self compensating for ambient temperature. Calibration values shall be stored in memory. No field calibration shall be required.
   9. Noise rejection: Normal mode, 85 dB minimum at 60 Hertz or greater.
   10. Common mode, 90 dB minimum.
   11. An interface port shall be available for monitoring, data logging, or copying of stored data to a memory device.
   12. Switched devices operated by the controller shall be switched by optically isolated, individually replaceable, solid state relays.

D. Programming: System shall use graphical style programming with up to 32 time-line program steps per 24 hours for channels. Edit & Examine capability allows operator to edit or examine any line and step through the whole program line-by-line without affecting program content or losing control:
   1. The control system shall be capable of executing setpoints read from a user-generated data file, created in a format specified by the manufacturer, located on either removable media at the controller or on the local area network, as desired. The data file shall be capable of containing an indefinite number of setpoint steps that are read and executed sequentially by the controller.

E. Control Channels: Provide two closed loop control channels standard, for temperature and humidity, and optionally expandable to up to six closed loop channels; and up to nine open loop control channels for lighting or other optional on/off equipment control. Provide each closed-loop channel with proportional and ON/OFF outputs, temperature configurable in Celsius. User selectable global ramping control for closed loop channels.

F. Backup, Averaging or Monitoring Sensors: Control system shall be capable of integrating an optional backup, averaging or monitoring sensor to each closed-loop control channel. Mode of operation, backup, averaging, monitoring or disabled, shall be selectable per channel.
   1. Backup Mode - Control system shall continuously monitor, display and record input from the backup sensor and shall automatically switch to the backup sensor for control input in the event of a primary sensor fault.
   2. Averaging Mode - Control system shall average the input from two separately located sensors and use the average value as the control process value.
   3. Monitoring Mode - Control system shall continuously monitor, display and record input from the monitoring sensor in addition to the primary control sensor.

G. Displays: Real-time display of setpoint and actual operating conditions. Graphic charting of control data for user-selected period of up to previous 24 hours displayed for each closed loop control channel.

H. Data logging: System shall include capacity for logging of closed-loop control channels with ability to transfer or download to portable media. System shall be capable of storing a minimum of one (1) year, logged at five-minute intervals, of data locally (at the chamber). Data is stored in unencrypted format for transfer and analysis by user.

I. Security: Controller shall be capable of being accessed only by authorized users via a secure username/password system. There shall be no limit to the quantity of users. Password shall be user specified and changeable. Each user shall belong to one of four security groups providing various levels of access to controller features. Only the highest-level Administrator group shall have access to username and password control. The other three groups shall provide decreasing levels of access. A view only feature shall be permitted when no authorized user is logged on. Logons shall automatically time-out and the controller returned to a secured state when no activity exists for user selectable duration.

J. Alarm and Safety Control System: Provide each room with a High/Low temperature safety alarm system as follows. Separately adjustable high and low limit control safeties shall be provided in the control panel. Limit controls shall be independent from others and will actuate a set of normally open and normally closed relay contacts for connection to building alarm system. Provide functions and devices as follows:
   1. High Limit: When room rises above high temperature limit, heat producing devices shall shut down including lights, fans, and door heat. Remote alarm relay shall shift giving a normal open or closed signal. System shall remain in this state until temperature drops, at which time system automatically resets.
   2. Low Limit: When room drops below low temperature limit the refrigeration compressor is deactivated. Remote alarm relay shall shift giving a normal open or closed signal. System shall remain in this state until temperature rises within limits, at which time system automatically resets.
   3. Alarm System Functioning:
      a. In addition to safety alarms, the system shall also include local alarms to monitor high and low limit performance, sensor malfunction, or other errors. These local alarms will activate an audible buzzer and annunciator light on the control console but will not activate the safety alarms described above.

K. Remote Access: Provide software for remote access and control of the controller when connected to a local area network or over the internet when properly configured.

2.7 ACCESSORY ELECTRICAL COMPONENTS

A. Outlets: Power outlets through the control panel. Provide outlets as shown on drawings with a minimum of one GFCI-type electrical outlet with waterproof cover in each room.

B. Provide seal-off fittings to seal conduits and prevent condensation at penetrations of environmental room walls or ceiling panels.

2.8 PERSONNEL EMERGENCY ALARM

A. Provide room with a reset type, electrically powered personnel emergency alarm system. Power shall be from the room electrical input. The system shall consist of an actuator within the room and audible and visual alarms affixed to the front exterior of the room. Provide an additional alarm for the building automation system utilizing two dry contacts. Include signage in room interior explaining how the personnel emergency alarm operates in the event of an emergency.

B. The alarm system actuator shall be a heavy duty, oil tight switch, equipped with a red button marked, "EMERGENCY ALARM - PULL TO RESET." The actuator shall be mounted on the interior wall of the room adjacent to the door jamb and 12 inches (300 mm) above the finish floor.

C. The audible alarm shall be of a type that provides a high decibel level of sound output at a frequency distinct from room parameter alarms. The visual alarm shall be mounted in an area providing no vision interference and shall be prominently labeled "PERSONNEL EMERGENCY."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine and verify work areas for correct dimensions, and verify that rough-ins for electrical, plumbing and mechanical services are installed and properly configured.

B. Examine surfaces and conditions to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

C. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in, structural backing for items attached to walls, and for rough opening dimensions required for the installation of products in this section.

3.2 INSTALLATION

A. Installation and start-up shall be performed by manufacturer's personnel. Manufacturer shall supply factory trained, on-site supervision when work of this section is performed.

B. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to the following, unless otherwise specified.

1. Respective manufacturer/fabricator's written installation instructions.
2. Accepted submittals.
3. Contract Documents.

C. Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

D. Deliver to job site, uncrate, place in location, and assemble equipment specified herein. Remove debris and crating materials. Components shall not be exposed to weather.

E. Install components straight, plumb, level and true. Install service lines at right angles to walls and floors, except where required to pitch to drains. Seal or otherwise ensure that fastenings to rooms do not compromise vapor barriers or insulation. Seal between piping and sleeves. Sections shall match without distortion. Door shall close and seal without binding.

F. Provide vertical and horizontal closure panels, strips or shrouds to close the opening between environmental rooms and adjacent building partitions and ceiling.

G. Electrical:
1. Furnishing, installation and connection of control panel, complete with disconnects for incoming service and branch circuits.
2. Incoming service to control panel mounted disconnects from junction box located above the environmental room.
3. Interlocking control wiring between control panel and remote compressor/condenser units, conditioning module, dehumidifiers, humidifiers and heaters.
4. Provide a dry contact, for use by building automation system, that will close when any of the operating controls fail or when any of the safety devices prevent operation of conditioning equipment.
5. Provide seal-off fittings to seal conduit and prevent condensation at penetrations of environmental room walls or ceiling panels.
6. Provide packaged compressor units complete with disconnects and motor starters.

H. Mechanical:
1. Service line penetrations into rooms shall be properly sealed with silicone caulking.
2. Provide piping and valving between rooms and remote equipment and condensate drain piping to building drainage system.
3. When applicable, insulate the supply and exhaust ducts for a minimum of 6 feet(1.8 m) beyond the collar

I. Anchor equipment securely in place. Comply with seismic restraint code requirements for installation of walk-in units and associated equipment.

J. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.

3.3 SUPERVISION AND STARTUP

A. Provide the services of the manufacturer's factory trained field representative to inspect and provide written approval of the installation.

B. Include the services of the manufacturer's representative to start up and test the equipment. The manufacturer shall certify in writing that the rooms are operating according to specifications.
1. Simulate and verify alarm and limit functions.
2. Operate and verify defrost functions.
3. Verify operation of specified functions and switches.

C. Prepare a detailed written checklist indicating the step-by-step tests performed and results observed. Include completed test checklists with O&M manuals.

3.4 CLEANUP, MAINTENANCE, ADJUSTING AND DEMONSTRATION

A. At completion, clean surfaces thoroughly using no cleaners, which will harm adjacent surfaces.

B. Protect equipment and surfaces from damage and replace damaged items.

C. Include the services of the manufacturer's representative to instruct Owner's staff in the complete operation of each type of room including controls, start-up procedures and general maintenance

requirements. The operating and maintenance manual shall include sequential operation, start-up and shut-down, and preventative maintenance, with pertinent control data, schematics, test results, and drawings.

3.5 TESTING

A. Installation of casework, shelving, and furnishings as indicated on the drawings to be completed prior to testing of room.

B. Provide equipment and instrumentation for testing and perform the specified tests. Tests shall confirm that rooms conform to the following requirements:
   1. Temperature control of plus or minus 0.2 degrees Celsius shall be the temperature at the sensing bulb and shall be the total variation in the temperature control of the rooms. It should not be confused with the temperature uniformity as noted below.
   2. Temperature uniformity of plus or minus 0.5 degrees Celsius refers to the temperature as measured throughout the chamber to within 12 inches of walls, floors and ceilings. Uniformity shall be measured by a multi-point strip chart recorder or data logger utilizing a minimum of twelve (12) sensors, distributed randomly throughout the room during a continuous 24-hour test period. Where room is specified to cover a range of temperatures samples from both high and low end of the range, multiple temperature set points (high and low) shall be recorded during the test period.
   3. Temperature Gradient: Verify that maximum temperature gradient from floor to ceiling does not exceed 1.0 degrees Celsius.
   4. Recovery Test: Rooms, except freezers, shall recover preset operating temperature within 5 minutes after door has been fully opened to 75 degrees Fahrenheit ambient for a period of 1 full minute.
   5. Internal Load Test: Each room shall maintain plus or minus 1.0 degree Celsius control when operating with the number of people, amount of ventilation, and internal heat gain of lighting and equipment as scheduled on the Drawings.

C. Witnessing of Startup and Tests: Owner's Representative shall be given the option of witnessing and confirming test results. Notify Owner's Representative, in writing, 10 business days prior to start of room operation and tests.

D. Provide written reports, in duplicate, of tests. Reports shall indicate procedures followed, instruments used, and tabulation of results.

3.6 FIELD QUALITY CONTROL

A. Manufacturer/Fabricator's Field Service: Manufacturer/fabricator's qualified technical representative shall inspect first day's Work and periodically inspect Work to ensure installation is proceeding in accordance with manufacturer/fabricator's designs, recommendations, instructions, and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings, and conclusions of inspection.

B. Owner's Testing Agency Field Service: The Owner may employ and pay a qualified independent testing agency to perform field quality control. Materials and installation failing to meet specified requirements shall be replaced at the Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor's expense.

3.7 PROTECTION OF FINISHED WORK

A. Provide necessary protective measures to prevent damage to equipment from exposure to other construction activity.

END OF SECTION 132100

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IU LAUNCH ACCELERATOR FOR BIO

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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

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Table of Contents

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TOCA

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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

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Table of Contents

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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

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Table of Contents

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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

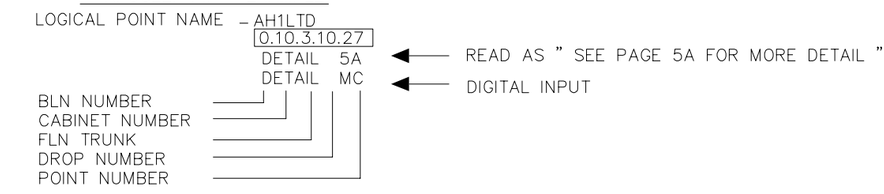
30. CIC shall create and keep an up to date list of DXR Bar Codes in a binder that is accessible to Siemens. CIC will create a list of terminal equipment that is controlled by DXR Controllers. CIC will remove the Bar Code from the DXR Controllers at the time of controls installation for each DXR and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

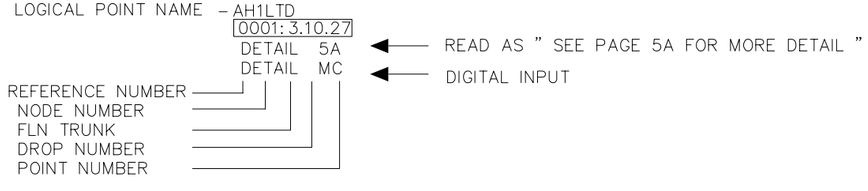
CONTROL SYMBOL	CONTROL SYMBOL DESCRIPTION
HHC	HAND-HELD OPERATOR'S TERMINAL
HL	HIGH LIMIT
HMI	GAMMA TOUCH PANEL
HOA	HAND-OFF-AUTO SWITCH
HORN	HORN
HPC	HEAT PUMP CONTROLLER
HTD	HIGH TEMPERATURE DETECTOR
HTE	HUMIDITY TRANSMITTER ELECTRIC
HTP	HUMIDITY TRANSMITTER PNEUMATIC
INT	INTERCOM
KWM	ELECTRIC KILOWATT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

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

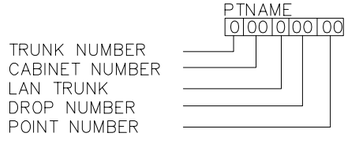
APOGEE: PII – EXAMPLE



APOGEE: ETHERNET – EXAMPLE



DDC ELECTRICAL POINT



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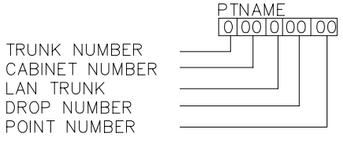
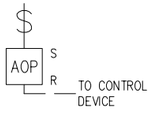
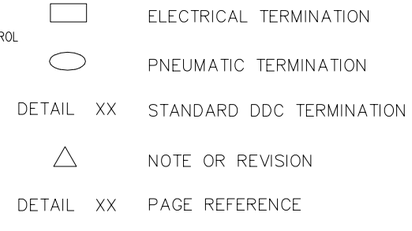




DETAILS



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
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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

Legend & Abbreviations

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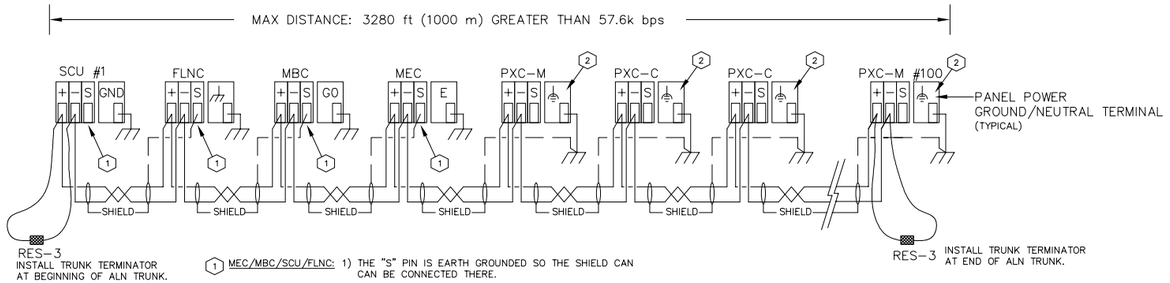
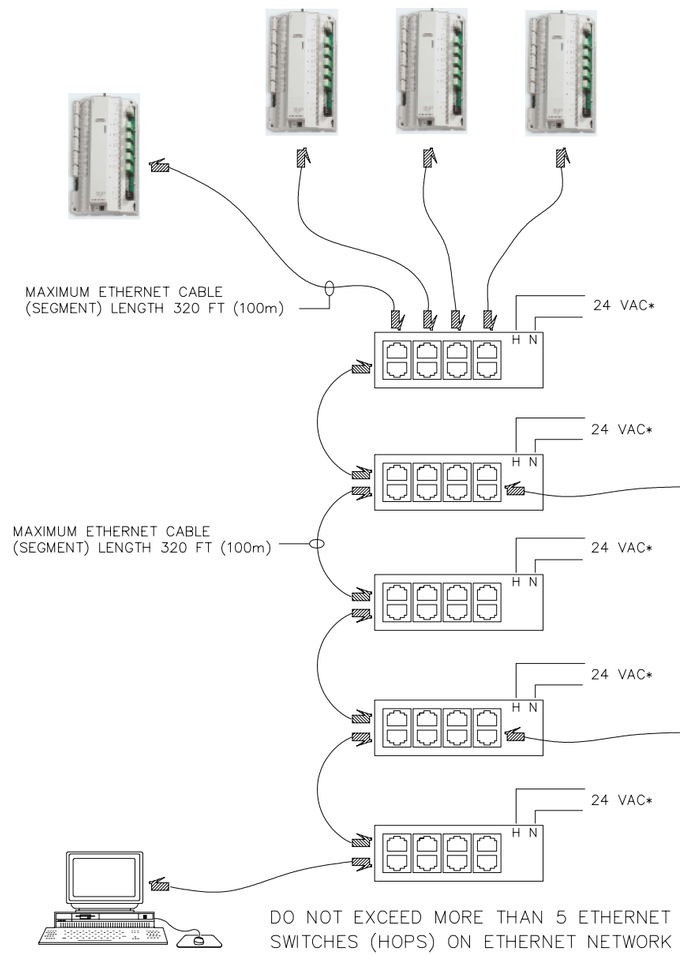


RES-3
538-664
BLN TRUNK TERMINATOR

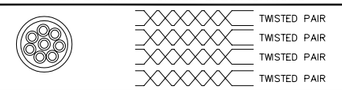
1/011 SIEMENS P2 ALN (BLN) NETWORK
SIEMENS P2 AUTOMATED LEVEL NETWORK (ALN)
COMMUNICATION PROTOCOL: RS-485



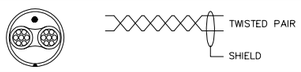
APPLICABLE TO:
MLN (WORKSTATION TO ETHERNET)
ALNs (ETHERNET, BACnet/IP, AEM)
HUBS, SWITCHES, ROUTERS
NETWORK INTERFACE CARD

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

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

ALN COMMUNICATION

440P412785
0
ALN

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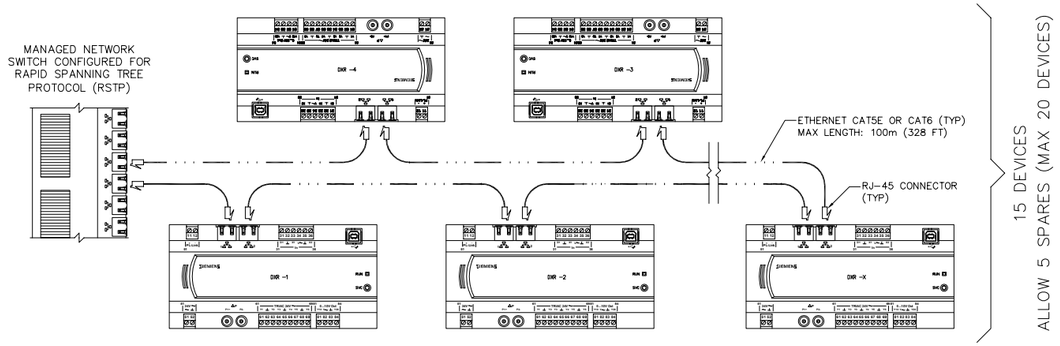
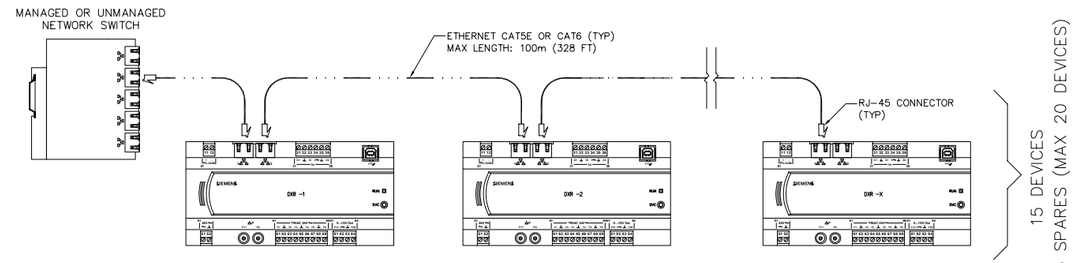
INSTALLATION NOTES

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)



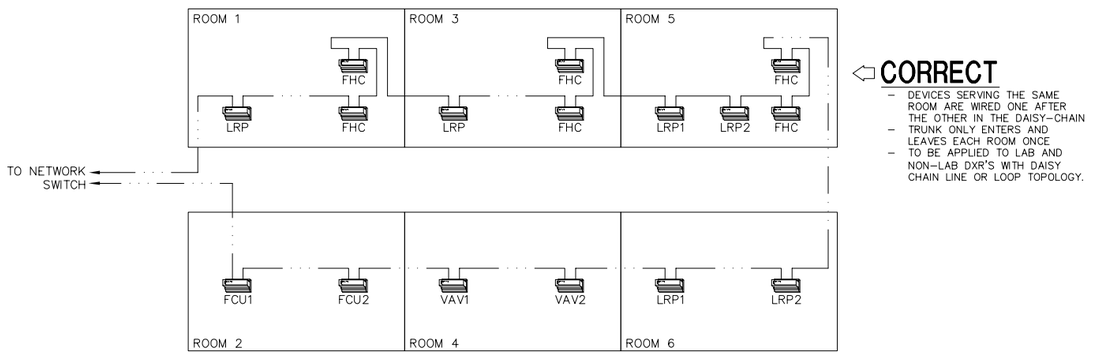
1/012 "CRITICAL ENVIRONMENTS" LOOP TOPOLOGY
BACNET IP FLOOR LEVEL NETWORK
FAULT-TOLERANT TOPOLOGY



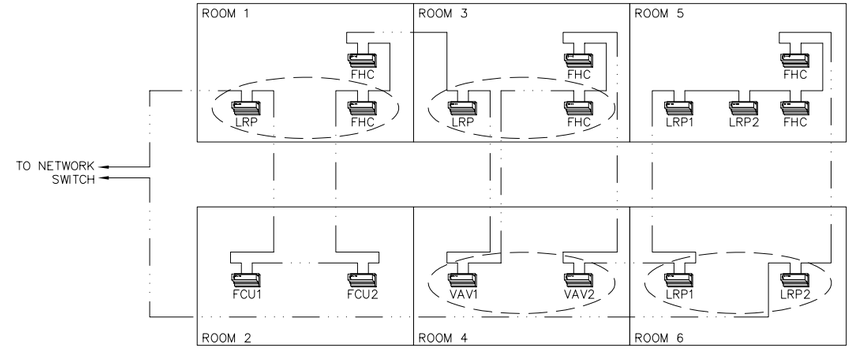
2/012 LINE TOPOLOGY (DAISY CHAIN)
BACNET IP FLOOR LEVEL NETWORK

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

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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

DXR COMMUNICATION

440P412785
0
DXR

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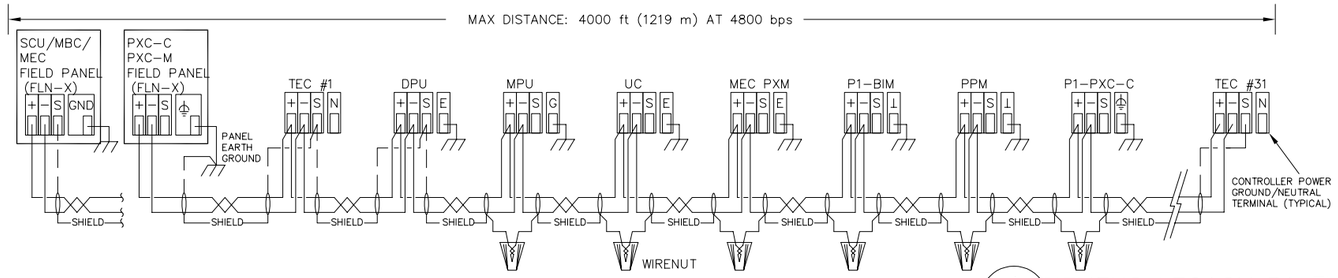
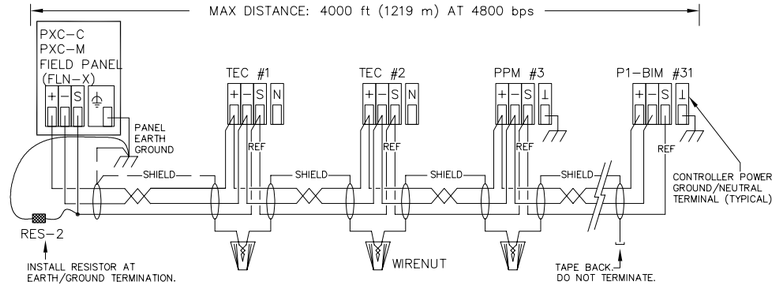


1 MSTP

SIEMENS LEGACY P1 FLN NETWORK

SIEMENS P1 FLOOR LEVEL NETWORK (FLN)
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1 PAIR (2 CONDUCTOR TSP)

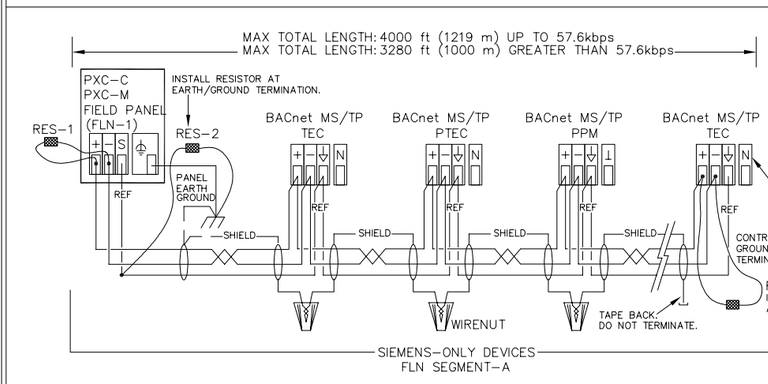


RES-2
550-974P10
EARTH TERMINATOR RESISTOR

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.

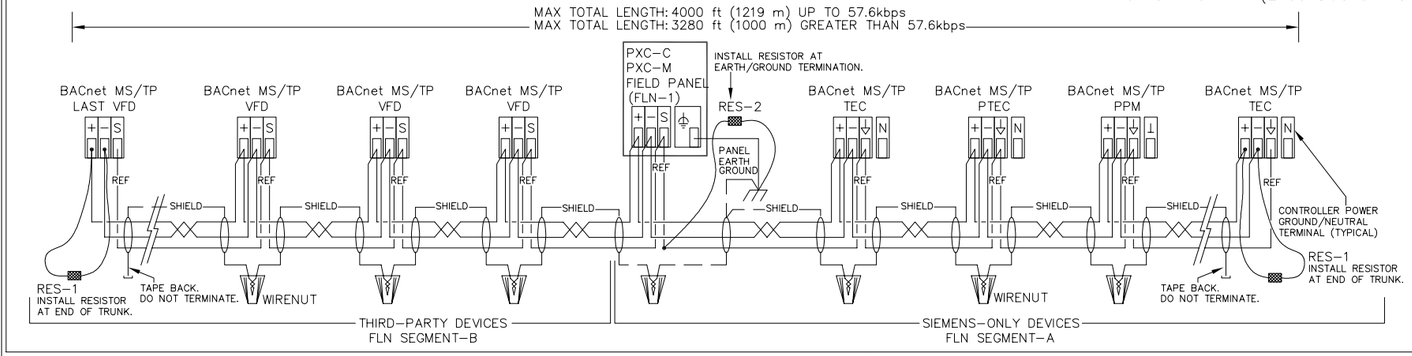
RES-1
550-975P100
120 OHM 1/2W RESISTOR

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



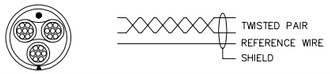
TWISTED PAIR
24 AWG (STRANDED)
12 PICOFARAD/FT CAPACITANCE OR LESS
4 TWISTS PER FOOT.

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

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

MSTP COMMUNICATION

440P412785
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MSTP

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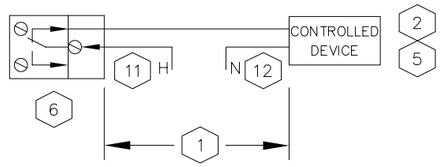

A
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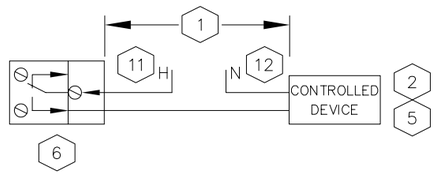
DIGITAL OUTPUT (6R) NC
PULSED OR LATCHED



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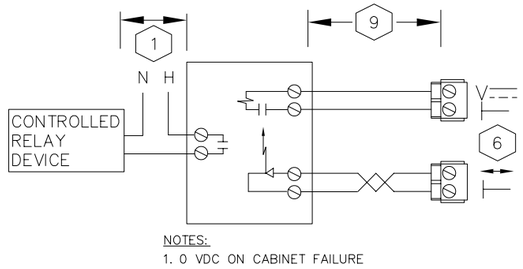
DIGITAL OUTPUT (6R) NO
PULSED OR LATCHED



C
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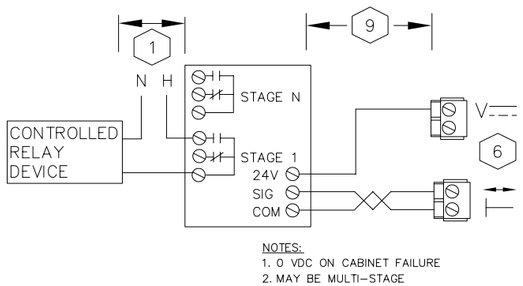
DIGITAL OUTPUT (8U,8X) Latched
VOLTAGE TO SOLID STATE RELAY



D
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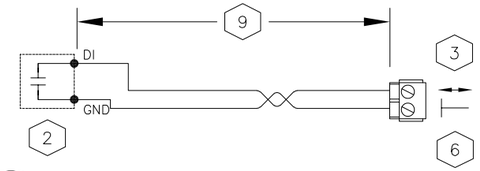
DIGITAL OUTPUT (8U,8X) Sequenced
VOLTAGE TO SEQUENCING MODULE



E
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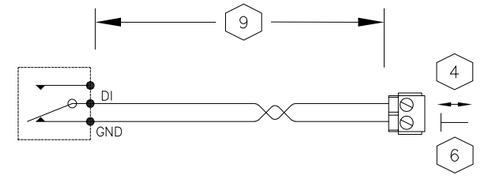
DIGITAL INPUT (8D,16D,8U,8x)
DRY CONTACT



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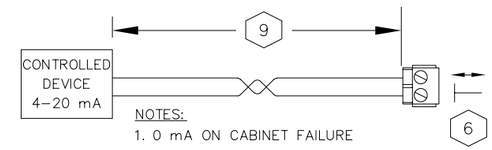
DIGITAL INPUT (8D,16D,8U,8X)
PULSE ACCUMULATOR



H
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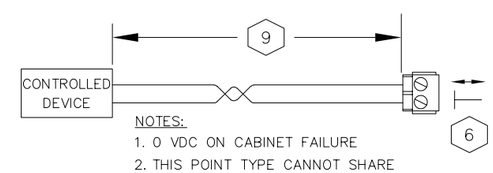
ANALOG OUTPUT (8X) 4-20 mA



I
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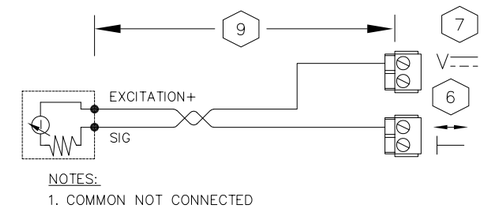
ANALOG OUTPUT (8U,8X) 0-10VDC



M
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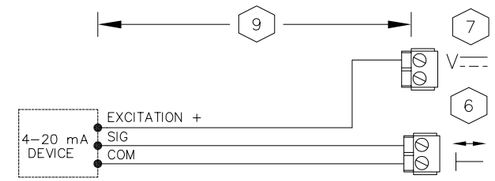
ANALOG INPUT (8X) 4-20 mA
2-WIRE INTERNAL POWERED



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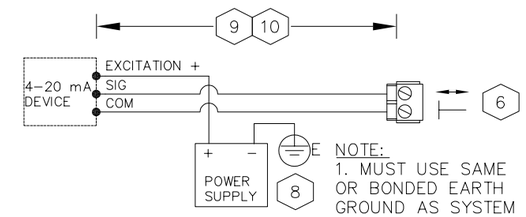
ANALOG INPUT (8X) 4-20mA
3-WIRE INTERNAL POWERED



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

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IU LAUNCH ACCELERATOR FOR BIO
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TX-I/O Termination Spec.

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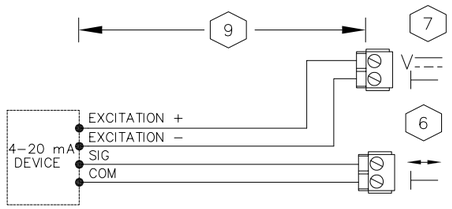
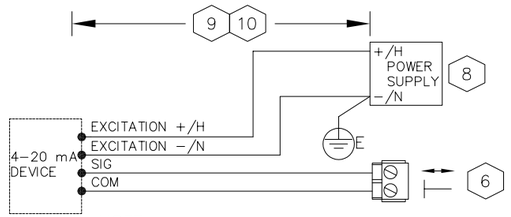


P 00 — ANALOG INPUT (8X) 4–20mA

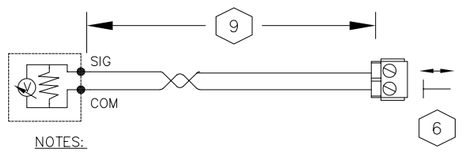
4–WIRE INTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

Q 00 — ANALOG INPUT (8X) 4–20mA

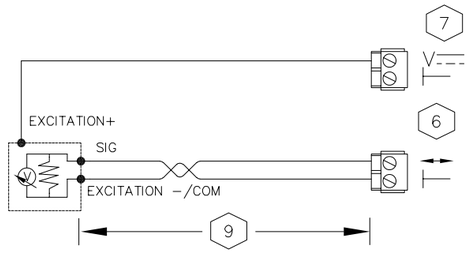
4–WIRE EXTERNAL POWERED



NOTES:
1. TRANSDUCER POWERED FROM ISOLATED INPUT
2. TRANSDUCER OUTPUT VOLTAGE

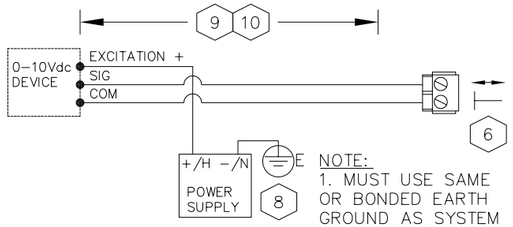
R 00 — ANALOG INPUT (8U,8X) 0–10 Vdc

SELF POWERED TRANSDUCER



S 00 — ANALOG INPUT (8U,8X) 0–10VDC

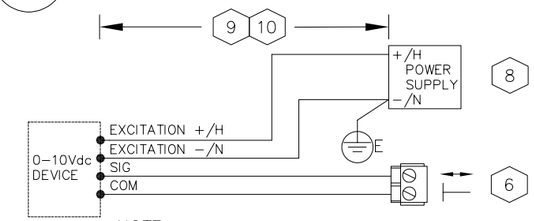
3–WIRE INTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

T 00 — ANALOG INPUT (8U,8X) 0–10VDC

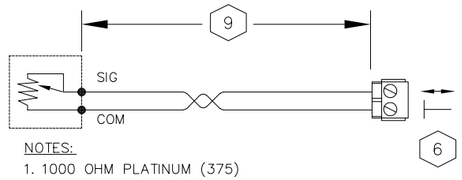
3–WIRE EXTERNAL POWERED



NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

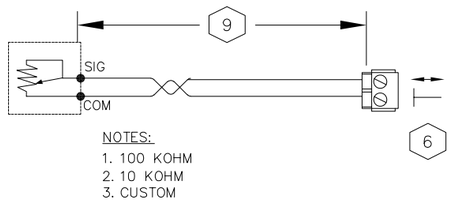
U 00 — ANALOG INPUT (8U,8X) 0–10VDC

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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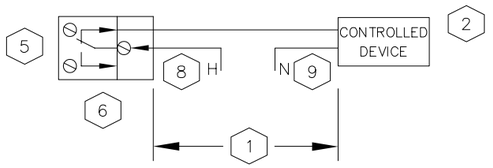

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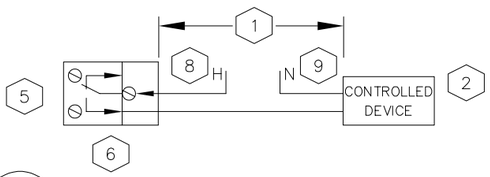
DIGITAL OUTPUT (1.4D3R, 1.8T) NC
PULSED OR LATCHED



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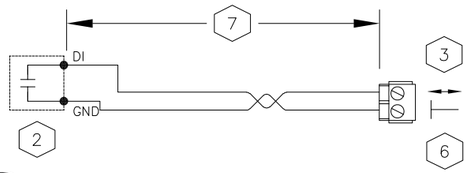
DIGITAL OUTPUT (1.4D3R, 1.8T) NO
PULSED OR LATCHED



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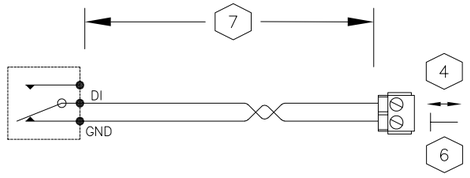
DIGITAL INPUT (1.4D3R)
DRY CONTACT



F
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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
HB	HB	KR	04/02/26	04/02/26

TX-I/O Termination Spec. 3

440P412785
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TTRM3

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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.

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IU# 20250072, IN

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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)	

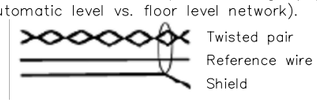
Distance between switch and station = max 328ft (100m).
Distance between switch and end unit = max 328ft (100m).

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.

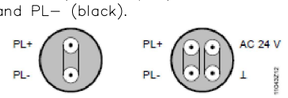
(Parallel operation)
5. In principle, parallel operation of external bus supplies among themselves is possible. However, check if the specific PSU is allowed to be operated in parallel with other PSUs. Refer to the technical specifications. The below mentioned Siemens devices are not submitted to this 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

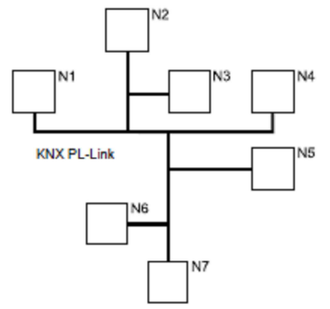
KNX PL-Link Technical data
KNX bus :
1. Transmission medium (bus cable),TP (twisted pair)
2. Baud rate, 9.6 kbps (fixed for TP)
3. Bus line polarity, PL+, PL– (not interchangeable)
4. Bus terminating resistor, Not required.

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.

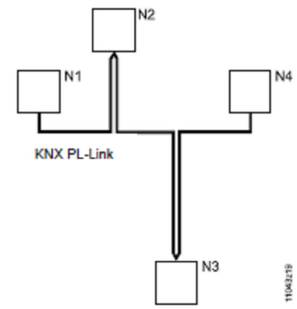
Bus power supply: DXR2 is 30V DC, 50mA for max. 5 KNX devices with 10mA each .

Max. number of devices: 64 devices in a KNX PL-Link network.

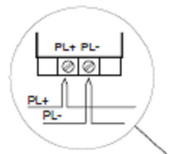
Tree Topology(with stub lines)



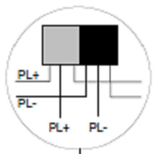
Line Topology (with loops)



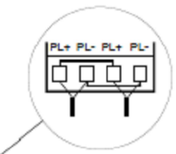
Device with screw terminals

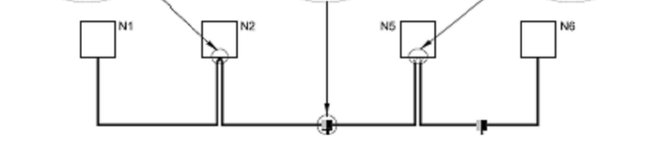


T branch with bus terminals



Device with spring cage terminals





REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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

DXR Wiring Specification2

440P412785
0
DWIR2

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EXHAUST AIR VALVES FOR FUME HOOD BY SIEMENS
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/22/2026
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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
106	ELECTRONICS & SENSORS STUDIO	FHEV-1-109	FUME HOOD	GEF-1/2/3	M101	1	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
127	CHEM WASTE	FHEV-1-121	FUME HOOD	GEF-1/2/3	M101	1	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227H	WET LAB	FHEV-1-226	FUME HOOD	GEF-1/2/3	M102	2	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227C	WET LAB	FHEV-1-231	FUME HOOD	GEF-1/2/3	M102	2	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	WET LAB	FHEV-1-325	FUME HOOD	GEF-1/2/3	M103	3	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-9	FHEV-1-328	FUME HOOD	GEF-1/2/3	M103	3	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
327	AREA B-6	FHEV-1-337	FUME HOOD	GEF-1/2/3	M103	3	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-427-1	FUME HOOD	GEF-1/2/3	M104	4	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
427	WET LAB	FHEV-1-428-1	FUME HOOD	GEF-1/2/3	M104	4	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
108B	SUPPORT	FHEV-1-143	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
118A	SUPPORT	FHEV-1-146	FUTURE FUME HOOD	GEF-1/2/3	M101	1	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227M	WET LAB	FHEV-1-220	FUTURE FUME HOOD	GEF-1/2/3	M102	2	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS
227G	WET LAB	FHEV-1-227	FUTURE FUME HOOD	GEF-1/2/3	M102	2	10	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 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	675	200	SINGLE	10	1500	58	AVD110VFOEO21	ALUMINUM CASING	PVDF	FLANGE END	LAB DXR BACNET IP	HIGH SPEED	N.O	0-2 IN WC	FUME HOOD AIR VALVE BY SIEMENS

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/22/2026
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)	MIN. OCC (CFM)	MIN. UNOCC (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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
103	INSTRUCTIONAL LAB SPACE		460	106	FHEV-1-106-2			FUME HOOD	FHEF-10A/B/C	M101	1	B	10		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	525		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				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	290		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				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	765		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				108																							
106	ELECTRONICS & SENSORS STUDIO		460	109	FHEV-1-109			FUME HOOD	FHEF-10A/B/C	M101	1	A	10		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	550		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	760		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	410		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	310		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	140		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	20		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	20		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	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	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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	160		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	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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	80		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	120	120		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	130	130		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	770		DXR2.E17C-103B	HIGH SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP., HUM & CO2. SENSOR ONLY, NO DISPLAY	YES	
				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	65		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/22/2026
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)	MIN. OCC (CFM)	MIN. UNOCC (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	110		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	185		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	80		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	105		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	110		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	305		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	475		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	305		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	240		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	85		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		675	200		-100	DXR2.E17C-103B	HIGH SPEED	0/2 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	450		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	+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	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	65		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	345		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	135		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	135		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	475		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	440		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	85		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
DATE: 04/22/2026
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)	MIN. OCC (CFM)	MIN. UNOCC (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	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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	525		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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	620		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	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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	395		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	390		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	545		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	65		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	240		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	135		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	135		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	235		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200		0	DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	AREA B-8	406	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			424	LTB-1-424			SUPPLY	AHU-1/2/3	M104	4	B	16	1005	2130	1005	755		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	85		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	135		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB		460	427	FHEV-1-427-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	320		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB		460	428	FHEV-1-428-2			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB		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	402	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	480		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	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
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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)	MIN. OCC (CFM)	MIN. UNOCC (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	410	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			430	LTB-1-430			SUPPLY	AHU-1/2/3	M104	4	A	12	725	1220	725	695		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	410	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			431	LTB-1-431			SUPPLY	AHU-1/2/3	M104	4	B	7	245	390	245	185		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	403	460	434	FHEV-1-434-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB B-4		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	145		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	407	460	435	FHEV-1-435-1			FUME HOOD	FHEF-10A/B/C	M104	4	A	10		675	200		0	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB B-5		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	210		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	407	460	436	FHEV-1-436-1			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	A	10		675	200		-125	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB B-6		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	270		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	404	460	437	FHEV-1-437-1			FUTURE FUME HOOD	FHEF-10A/B/C	M104	4	B	10		675	200		0	DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
427	WET LAB B-11		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	575		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	410	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			502	LTB-1-502			SUPPLY	AHU-1/2/3	M105	5	B	14	1000	1625	1000	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	409	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			507	LTB-1-507	CB-507		SUPPLY	AHU-1/2/3	M105	5	B	5	115	200	115	85		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				507																							
504B	LAB SUPP	409	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			508	LTB-1-508	CB-508		SUPPLY	AHU-1/2/3	M105	5	B	5	120	220	120	90		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				508																							
504	ANALYXIN GENOMICS CORE	408	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		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	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	408	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		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	400		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	410	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			522	LTB-1-522			SUPPLY	AHU-1/2/3	M105	5	B	9	90	585	90	65		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	No information provided, assuming TEMP. SENSOR ONLY, NO DISPLAY	YES	
				522																							
527	WET LAB B-11	407	460	523	FHEV-1-523			FUTURE FUME HOOD	FHEF-10A/B/C	M105	5	B	10		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 IN WG	SR-NO					
527	WET LAB B-11		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	345		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	409	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			524	LTB-1-524	CB-524		SUPPLY	AHU-1/2/3	M105	5	B	7	180	440	180	135		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		2-WAY	TEMP. SENSOR ONLY, NO DISPLAY	YES	
				524																							
527	AREA B-8	408	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		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	430		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	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	410	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			529	LTB-1-529			SUPPLY	AHU-1/2/3	M105	5	A	5	180	225	180	135		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	400	460	530	FHEV-1-530			FUTURE FUME HOOD	FHEF-10A/B/C	M105	5	A	10		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	570		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		675	200		-75	DXR2.E17C-103B	HIGH SPEED	0/2 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	595		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				

LAB ROOM SCHEDULE SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 04/22/2026
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)	MIN. OCC (CFM)	MIN. UNOCC (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		532	LTB-1-532	CB-532		SUPPLY	AHU-1/2/3	M105	5	A	10	490	770	490	365		DXR2.E17C-103B	STANDARD SPEED	0/1 IN WG	SR-NC		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	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	695		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	190		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	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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	325		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		675	200			DXR2.E17C-103B	HIGH SPEED	0/2 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	380		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	695		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: 4/22/2026
REVISION: 0

																SIEMENS CONTROL DEVICES							
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	YES	
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	NO	
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	YES	
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								

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/22/2026
REVISION: 0

																SIEMENS CONTROL DEVICES							
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	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	YES	
198C	MDF		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	YES	
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	YES	
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	NO	
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	YES	
	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	YES	
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	YES	
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	YES	
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								

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/22/2026
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																SIEMENS CONTROL DEVICES							
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	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	YES	
N/A	OFFICE		4- 238	EV-4-238			EXHAUST	GEF-4/5	M102	2	B	4		125	10								
N/A	MEETING ROOM	442	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	
N/A	MEETING ROOM		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	YES	
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	YES	
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	YES	
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	YES	
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	NO	
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	YES	
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	

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/22/2026
REVISION: 0

																SIEMENS CONTROL DEVICES							
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
402	P3 LAB	442	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								
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	NO	
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								
			414																				
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	YES	
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	NO	
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	YES	
598A	IDF		513	EV-1-513			EXHAUST	GEF-1/2/3	M105	5	A	12		1285	45								

NON-LAB ROOM SCHEDULE
IU INDY - LAUNCH ACCELERATOR FOR BIOSCIENCES
JOB NUMBER: 44OP-412785
DATE: 4/22/2026
REVISION: 0

																SIEMENS CONTROL DEVICES							
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
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								
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	YES	
	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	YES	
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	YES	
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	YES	
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	YES	
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	YES	

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

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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

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REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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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

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
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DDC PANEL SCHEDULE

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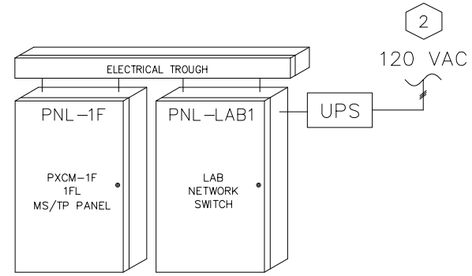
INSTALLATION NOTES:

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

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 MSTP DXR NETWORK

440P412785
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R02

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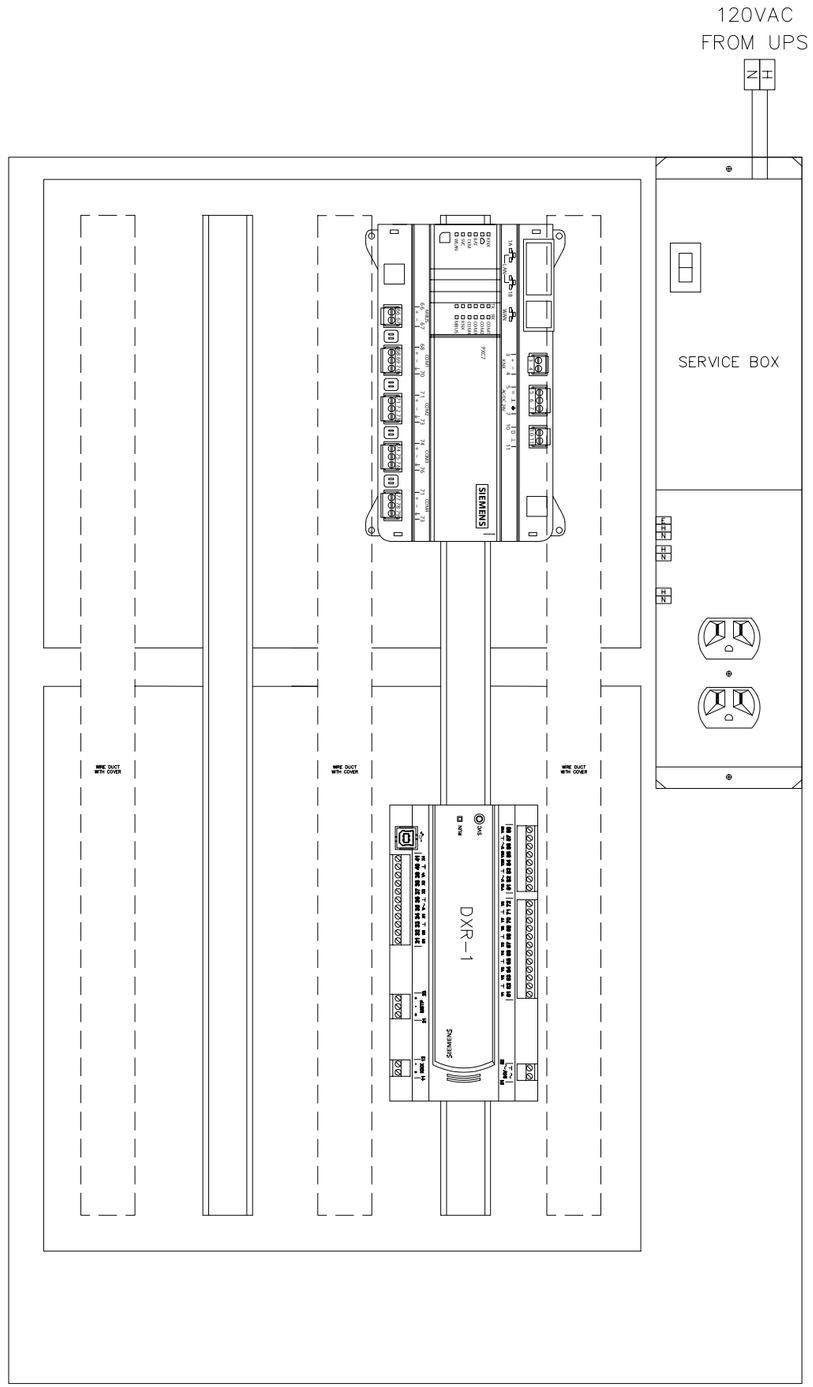

GENERAL NOTES:

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

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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PNL-1F LAYOUT

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R02A

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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 LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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1ST FLR MSTP DXR NETWORK BOM

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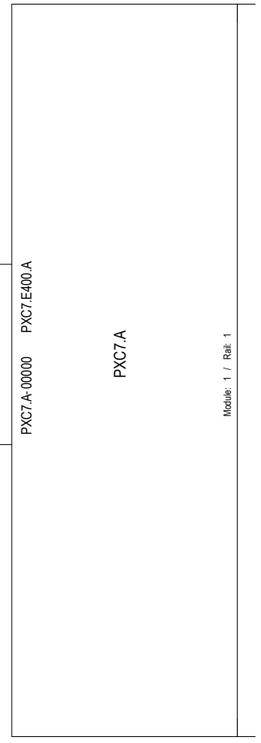

REVISION HISTORY			
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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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1FL MS/TP DEVICES

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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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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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1FL MS/TP DEVICES BOM

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E02A

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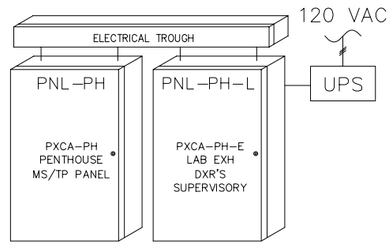
INSTALLATION NOTES:

(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 LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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PH MSTP DXR NETWORK

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R03

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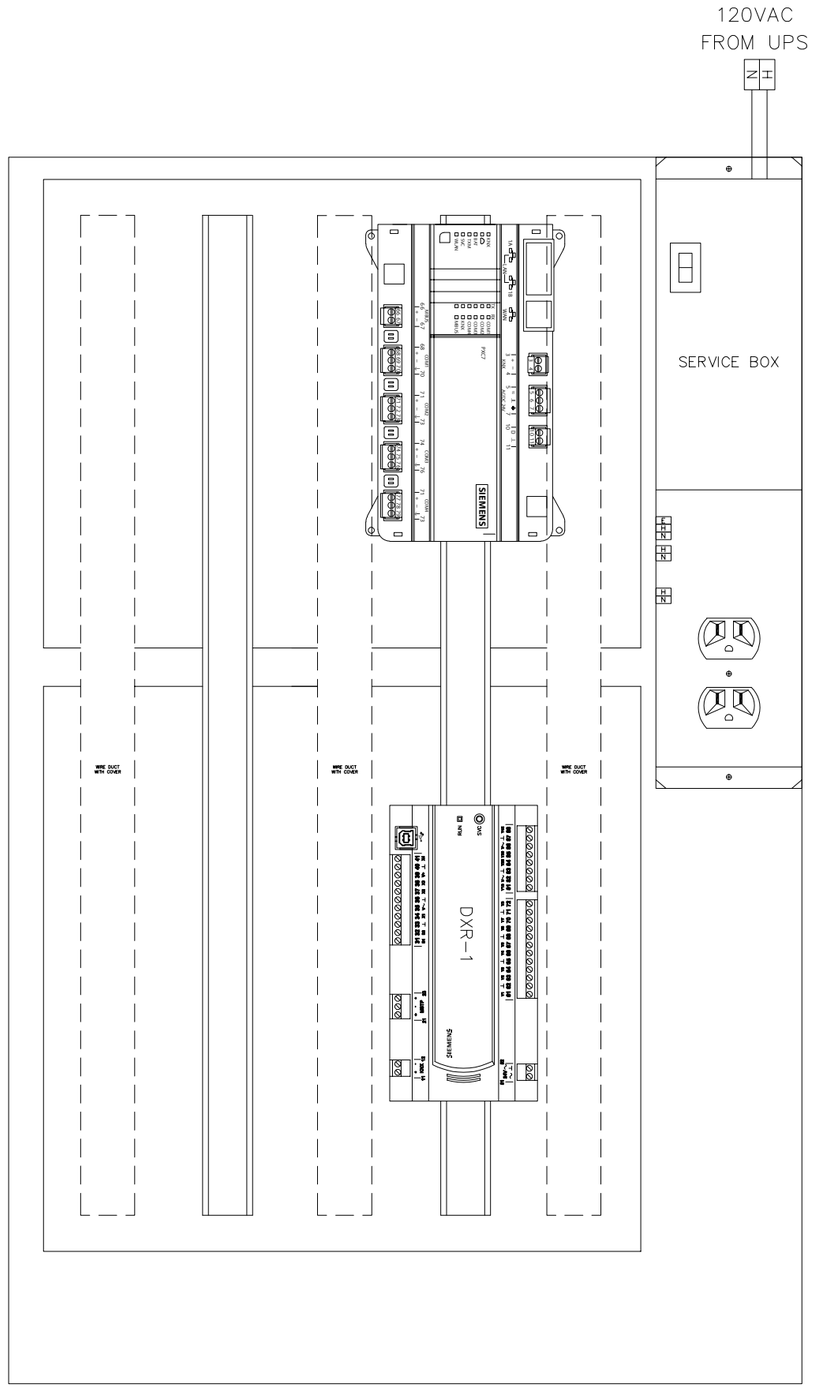

GENERAL NOTES:

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

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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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PNL-PH LAYOUT

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R03A

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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 LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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PH MSTP DXR NETWORK BOM

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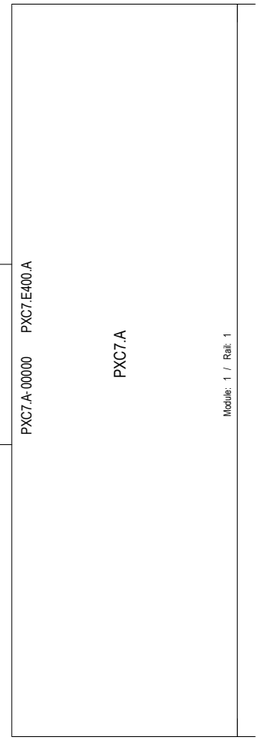

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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PH MS/TP DEVICES

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E03

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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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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

PH MS/TP DEVICES BOM

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E03A

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INSTALLATION NOTES:

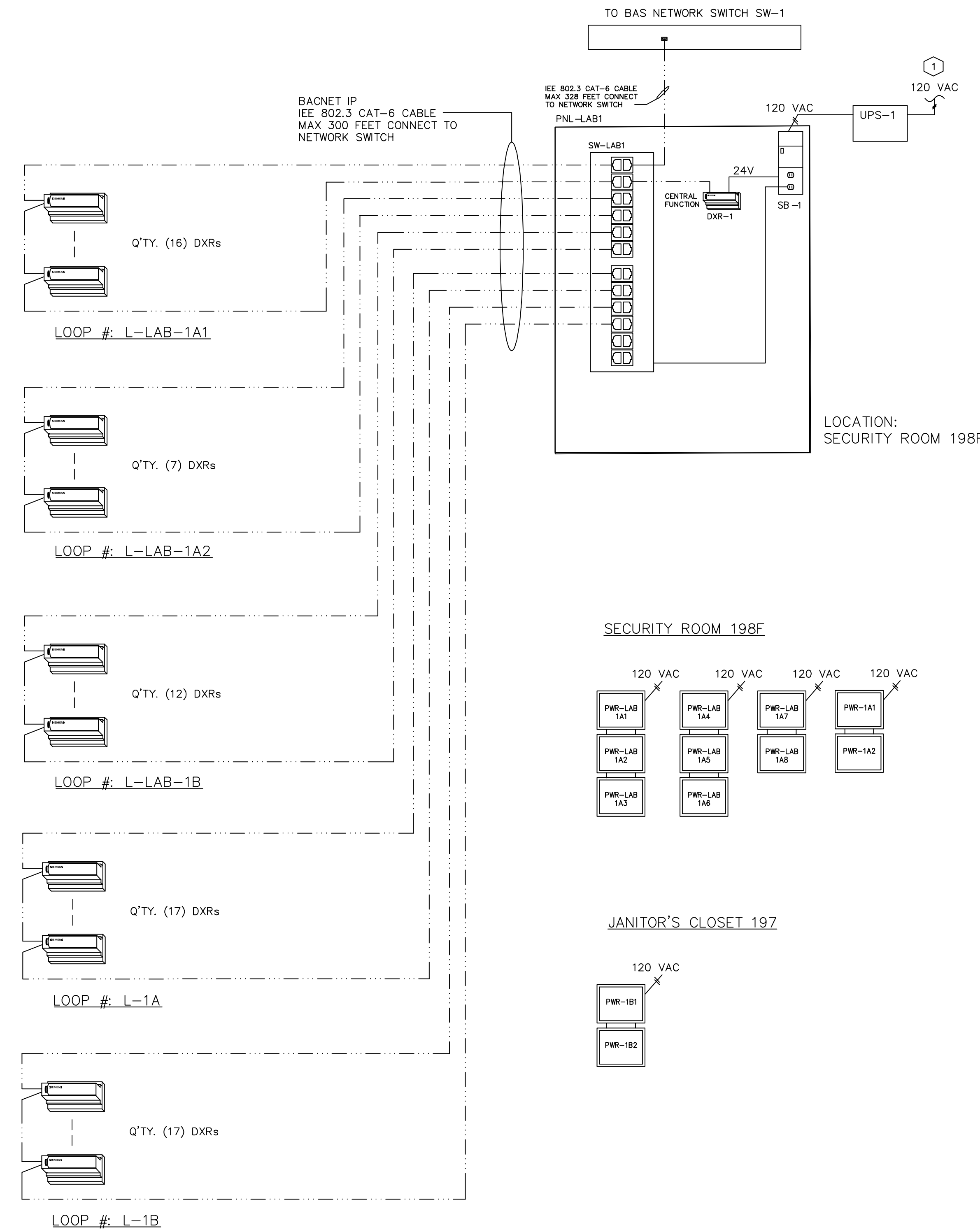
1. EMERGENCY POWER BY DIVISION 26 ELECTRICAL (TYPICAL).
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY-CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H-2C14-CL3P FOR POWER TRUNK
4. USE CAT-6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.

1ST 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	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) ASSOCIATED	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



1 / R04 1ST FLOOR ETHERNET DXR LAYOUT

SERVES: BACNET IP DEVICES

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R04

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

1ST FLR ETHERNET DXR NETWORK

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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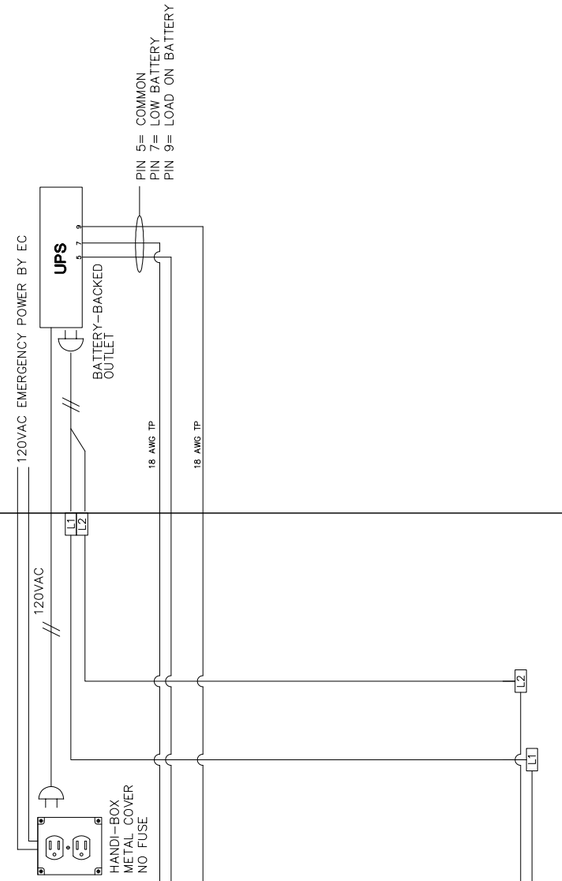
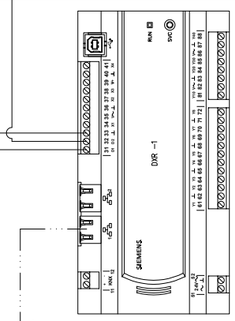
COMPONENT PANEL / POWER

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

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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

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

1ST FLR E. DXR NETWORK BOM

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2ND FLOOR LAB ROOM ETHERNET DXR SCHEDULE

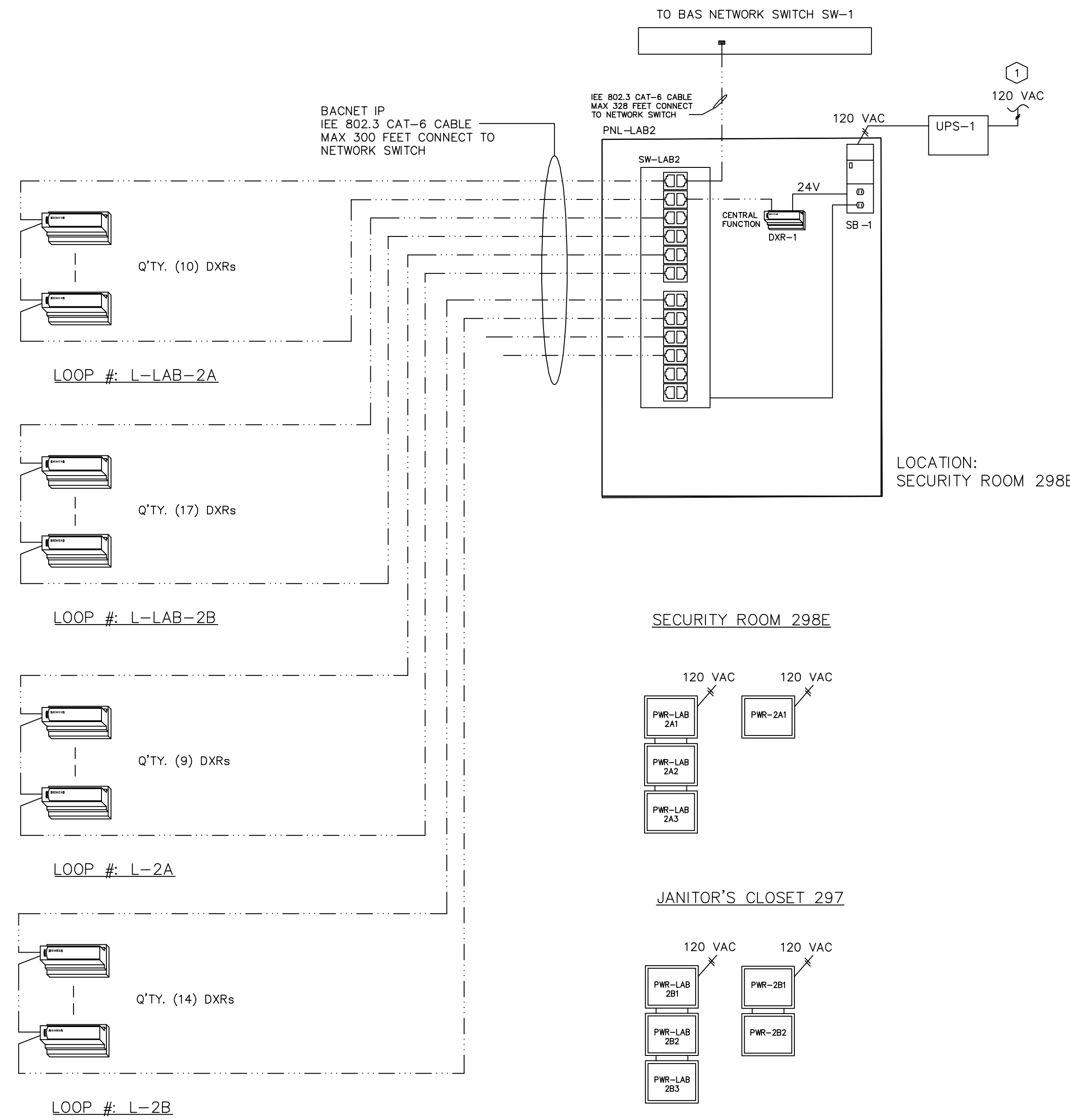
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA TRUNK_1	POWER VA TRUNK_2
IN347	SW-LAB2	L-LAB-2B				DXR2.E18-101B	LA02_DXR-CF	TBD	3470201				SB-1		8.0	
IN347	SW-LAB2	L-LAB-2B	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) ASOOCIATED	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.



1 R04 2ND FLOOR ETHERNET DXR LAYOUT

SERVES: BACNET IP DEVICES

440P412785
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R05

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

2ND FLR ETHERNET DXR NETWORK

SIEMENS
3502 WOODVIEW TRACE
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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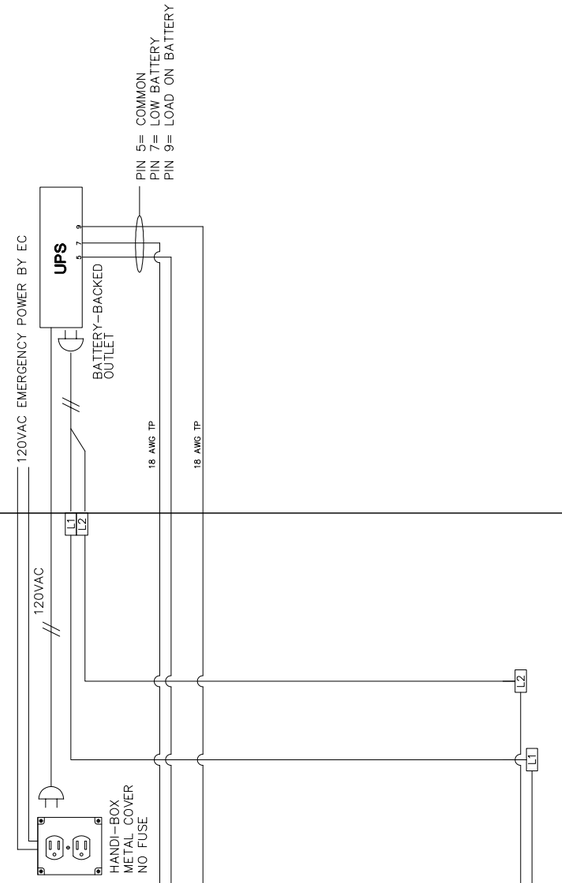
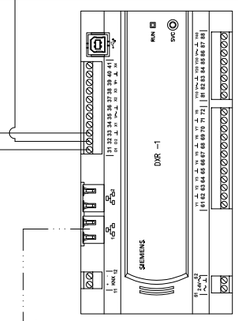
COMPONENT PANEL / POWER

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

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

PNL-LAB2 UPS WIRING

440P412785
0
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

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3RD FLOOR LAB ROOM ETHERNET DXR SCHEDULE

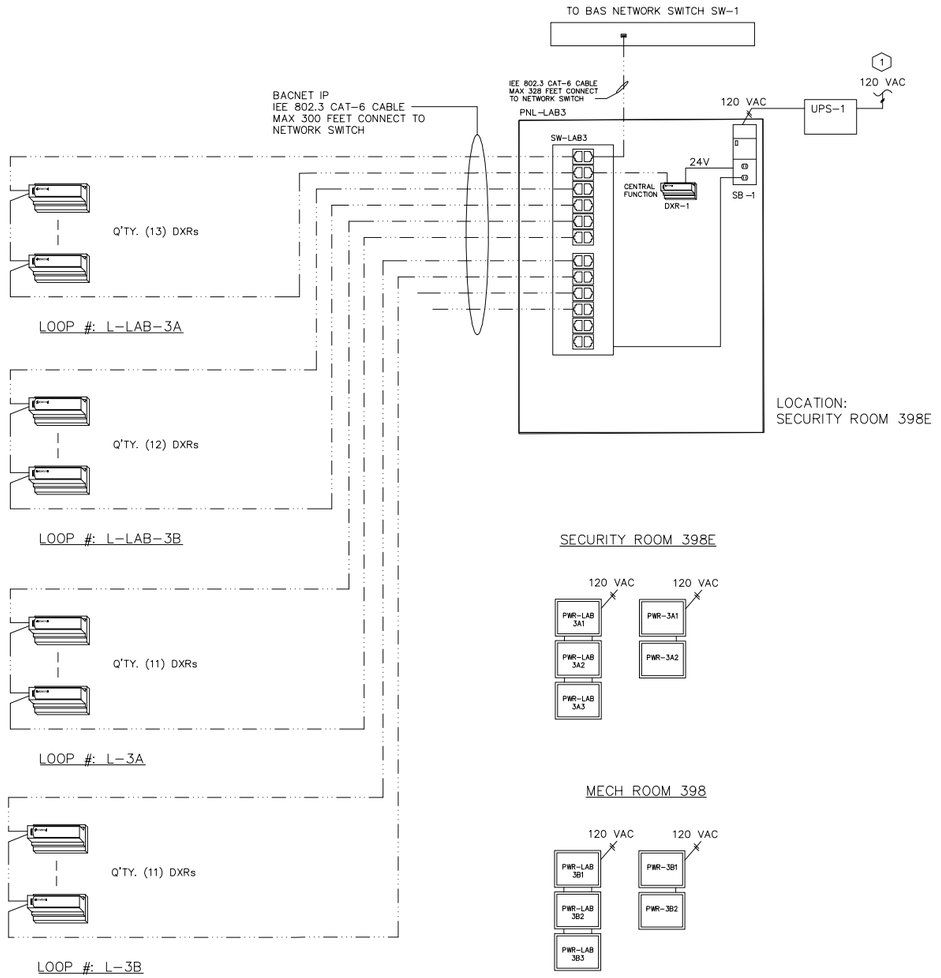
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOCCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA	
															TRUNK_1	TRUNK_2
IN347	SW-LAB3	L-LAB-3B				DXR2.E18-101B	LA03_DXR-CF	TBD	3470301				SB-1			
IN347	SW-LAB3	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

SIEMENS

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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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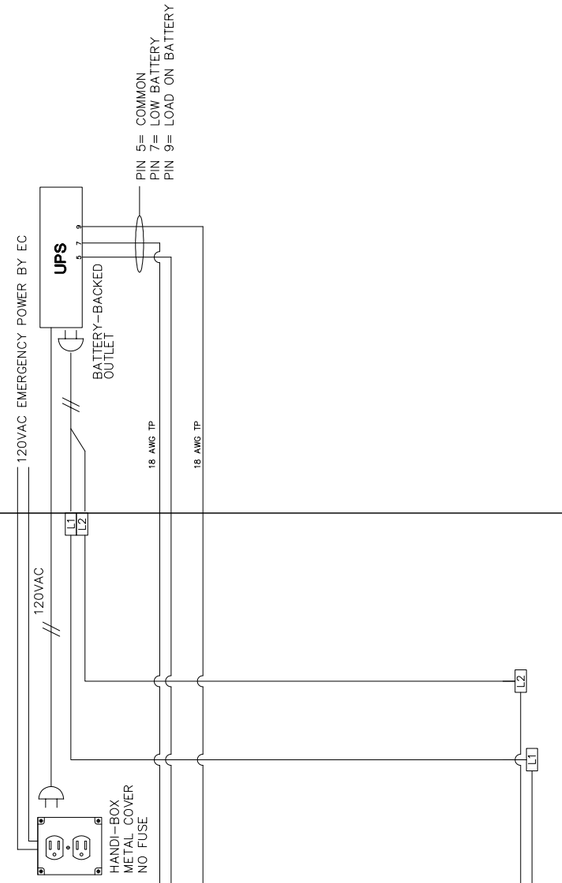
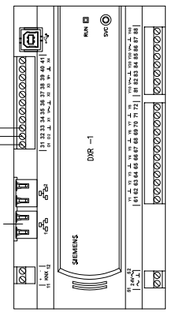
COMPONENT PANEL / POWER

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

440P412785
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R06A

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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

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

3RD FLR E.DXR NETWORK BOM

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INSTALLATION NOTES:

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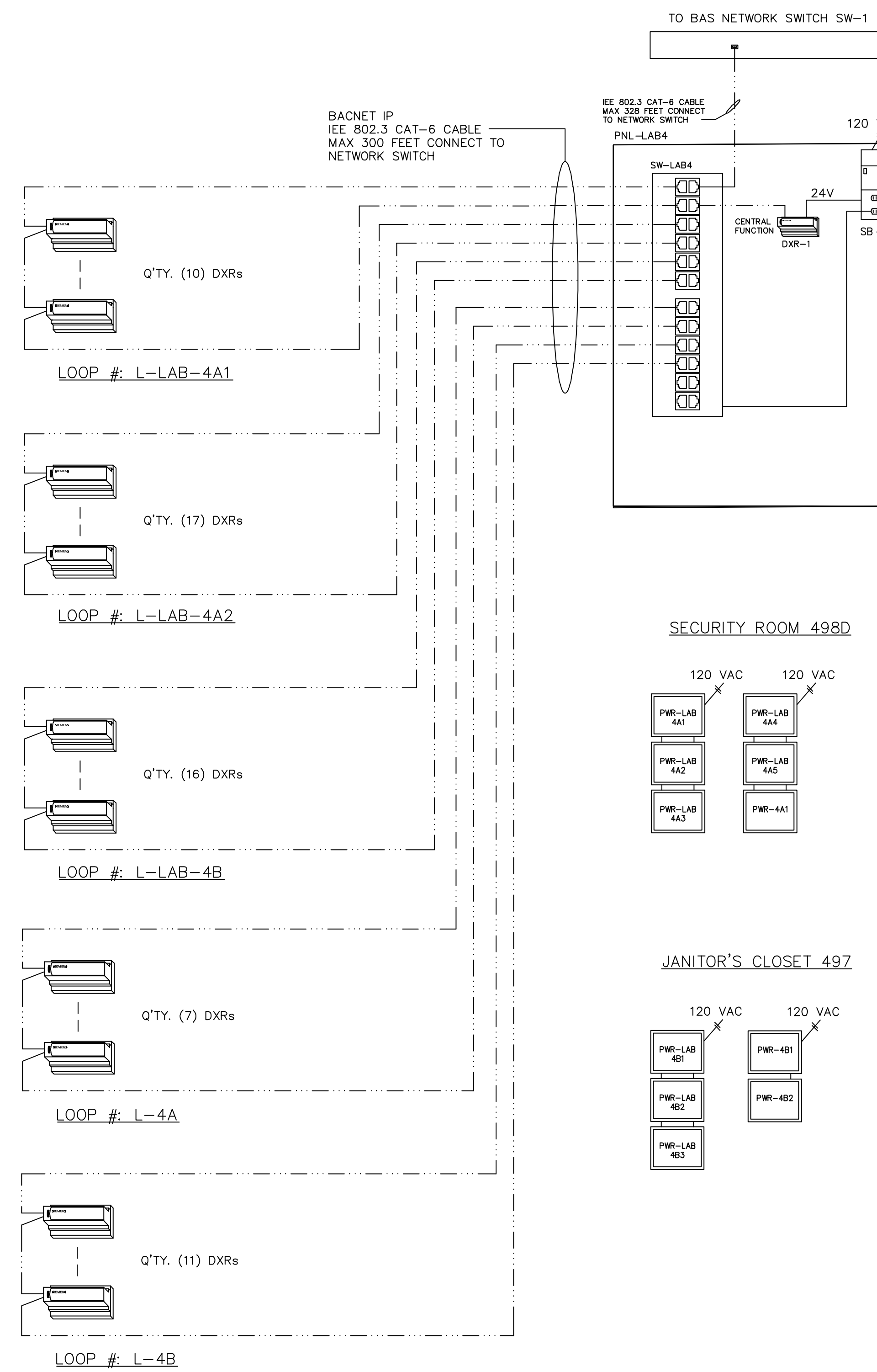
2. DXR NETWORK FOR LABS TO USE CAT 6 ETHERNET. NOTE CAT 6 IS DAISY–CHAINED SO EACH LOOP COMES BACK TO NETWORK SWITCH PANRL TO COMPLETE THE LOOP.
3. USE SIEMENS PART# H–2C14–CL3P FOR POWER TRUNK
4. USE CAT–6 CABLE MAX 328 FEET CONNECT TO NETWORK SWITCH.

4TH 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	POWER VA 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



1 / R04 4TH FLOOR ETHERNET DXR LAYOUT
SERVES: BACNET IP DEVICES

440P412785
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R07

SIEMENS

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

4TH FLR ETHERNET DXR NETWORK

3502 WOODVIEW TRACE
SUITE 240
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PHONE: 317-293-8880
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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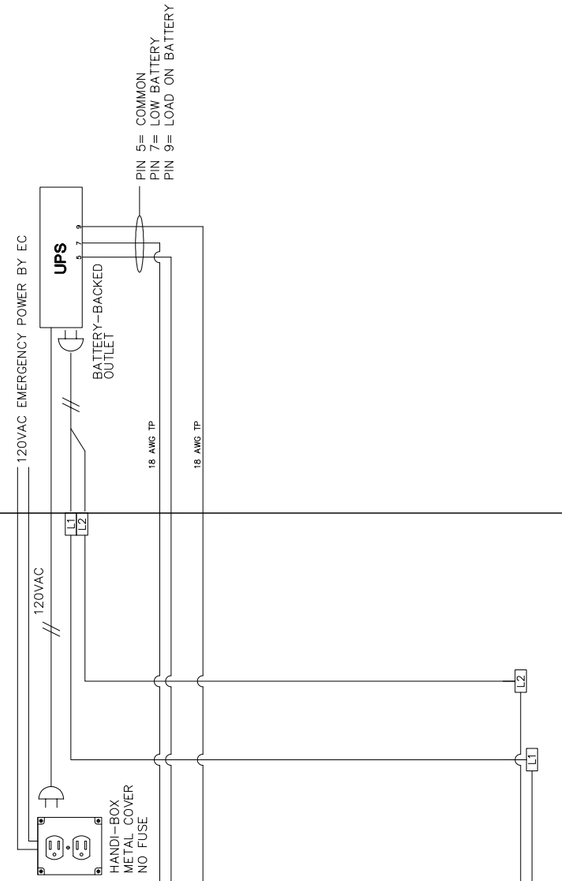
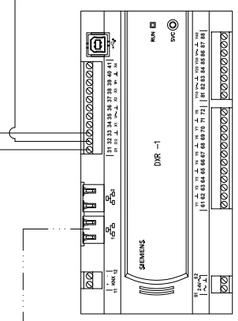
COMPONENT PANEL / POWER

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

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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.
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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

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R07B

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5TH FLOOR LAB ROOM ETHERNET DXR SCHEDULE

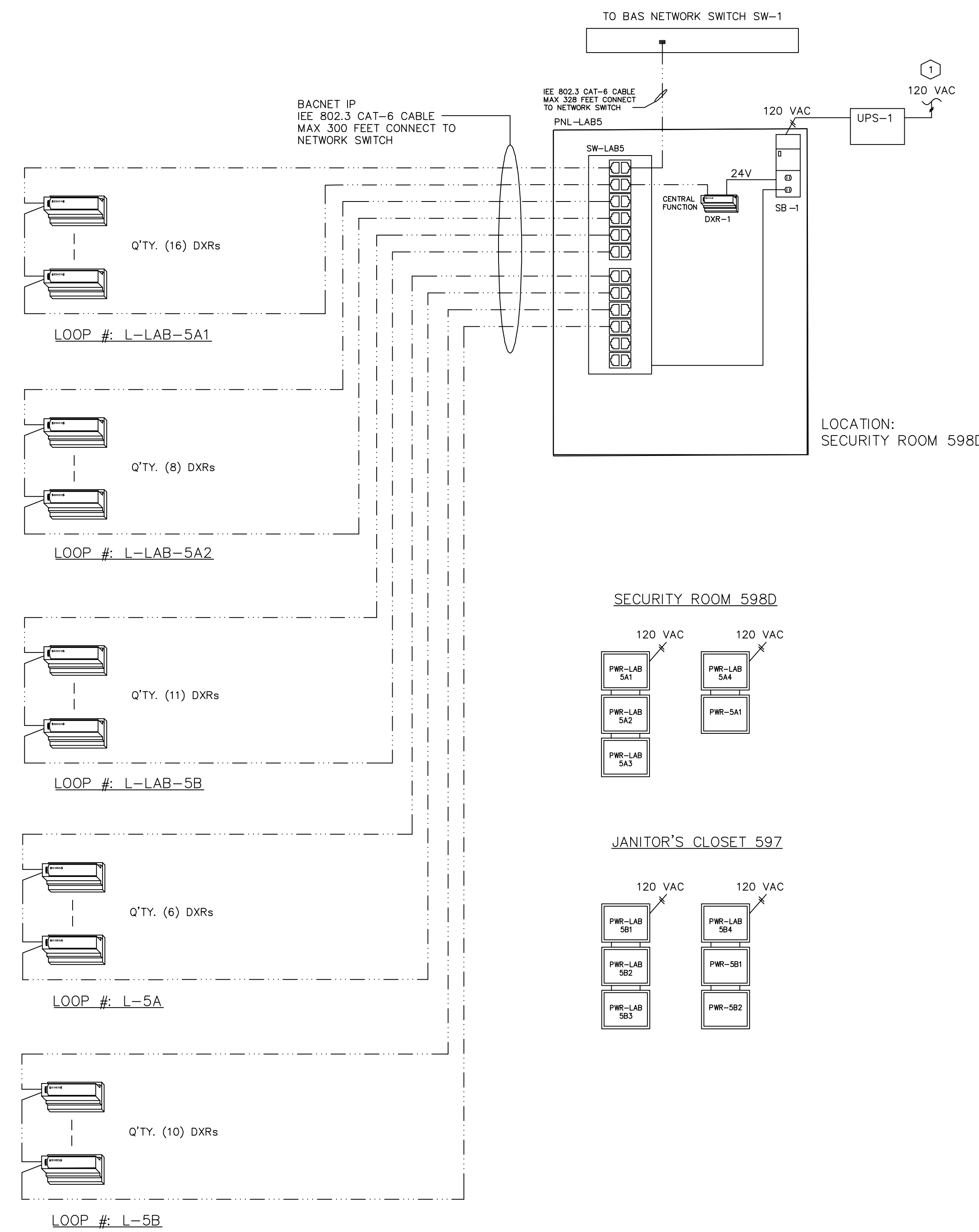
BLDG	SWITCH	ETHERNET LOOP	ZONE	LAB SUPPLY BOX	LAB EXHAUST BOX (S) ASOOCIATED	CONTROLLER	SYSTEM NAME	IP ADDRESS	INSTANCE NUMBER	ROOM NUMBER	ROOM SERVED	PLAN	PSH/XFMR	CIRCUIT	POWER VA TRUNK_1	TRUNK_2
IN347	SW-LAB5	L-LAB-5B				DXR2.E18-101B	LA17_DXR-CF	TBD	3471701				SB-1			
IN347	SW-LAB5	L-LAB-5B	502	LTB-1-502	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) ASOOCIATED	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

440P412785
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R08

EU 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

5TH FLR ETHERNET DXR NETWORK

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

REVISION HISTORY

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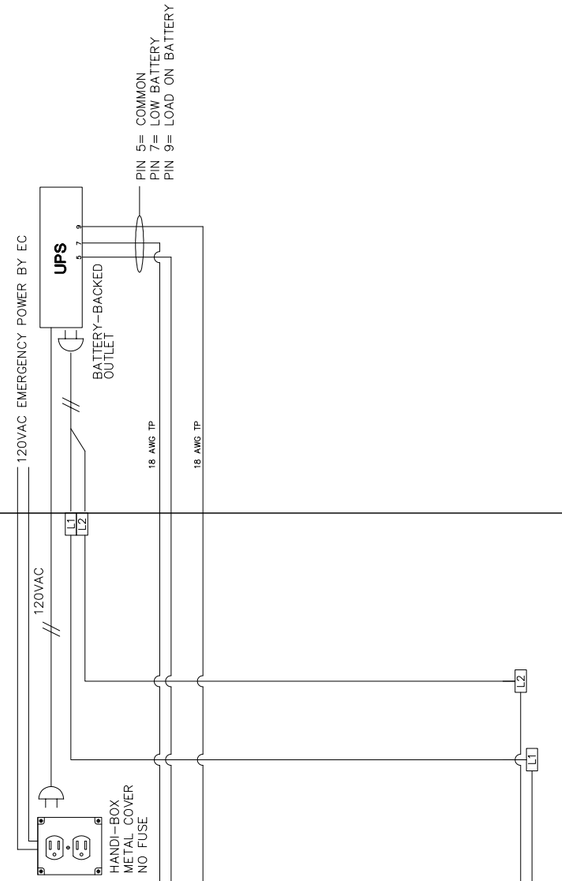
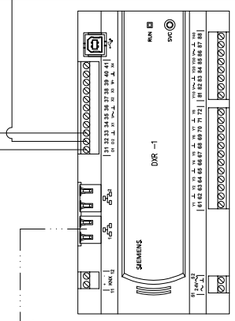
COMPONENT PANEL / POWER

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

00	4/2/2026	HB	SUBMITTAL SET

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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
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PNL-LAB5 UPS WIRING

440P412785
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R08A

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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

00	4/2/2026	HB	SUBMITTAL SET

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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

5TH FLR E.DXR NETWORK BOM

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R08B

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120VAC
FROM UPS

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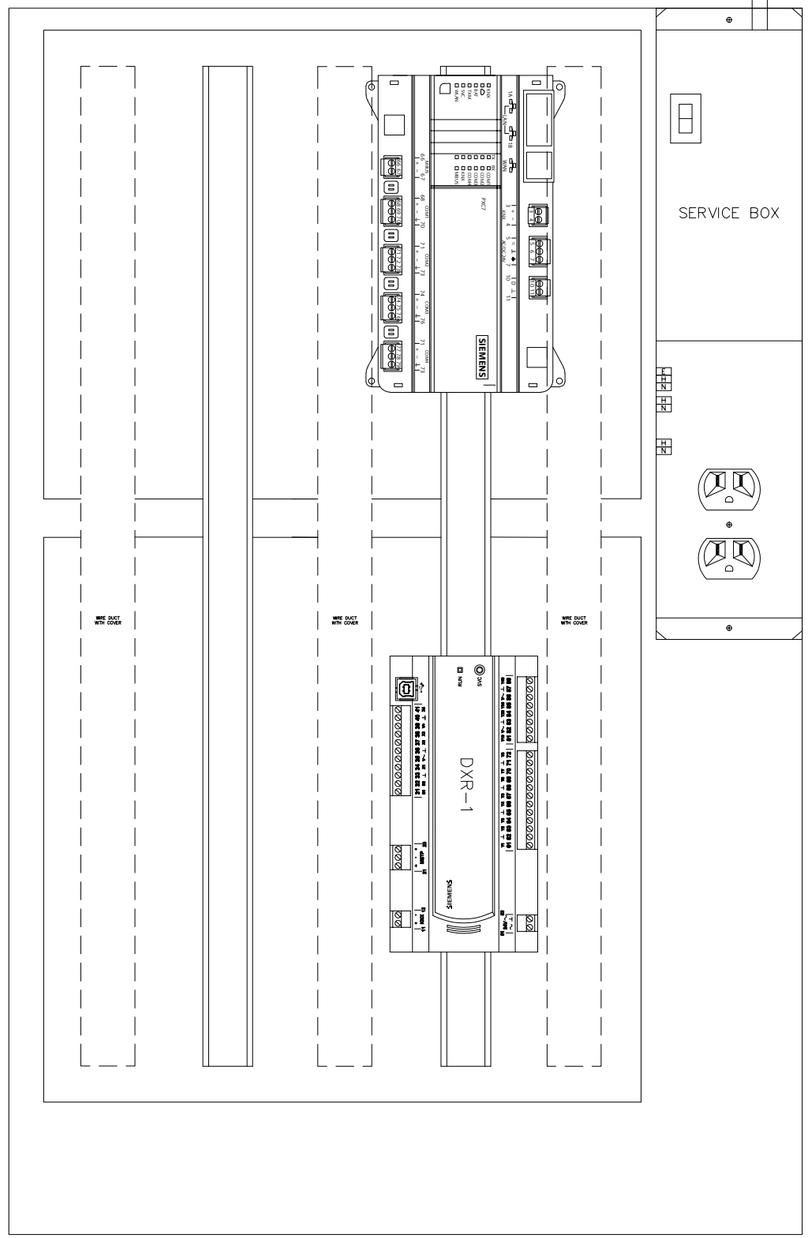

GENERAL NOTES:

1. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND DOES NOT REFLECT THE ACTUAL ARRANGEMENT OF EQUIPMENT, DUCTWORK, OR PIPING.

1
R02A

PNL-PH-E PANEL LAYOUT

LCATION: PENTHOUSE

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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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
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PNL-PH-E LAYOUT

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R09

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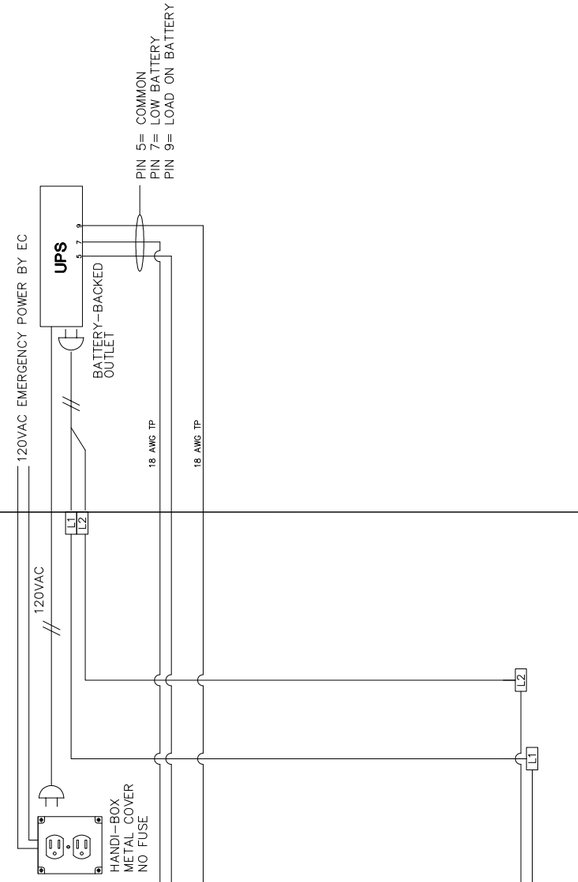
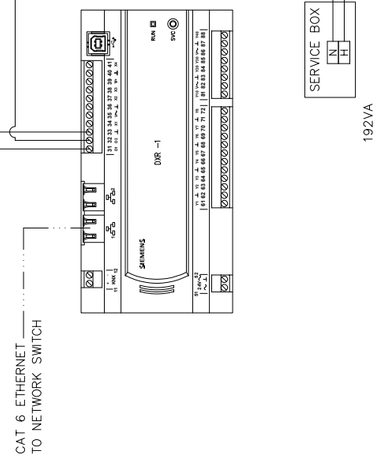
COMPONENT PANEL / POWER

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

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
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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-PH-E UPS WIRING

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R09A

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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

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-PH-E PANEL BOM

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R09B

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PXC7.A

Module: 1 / Rail: 1

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

E DXR SUPERVISORY

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E09

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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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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA17.PXCA BOM

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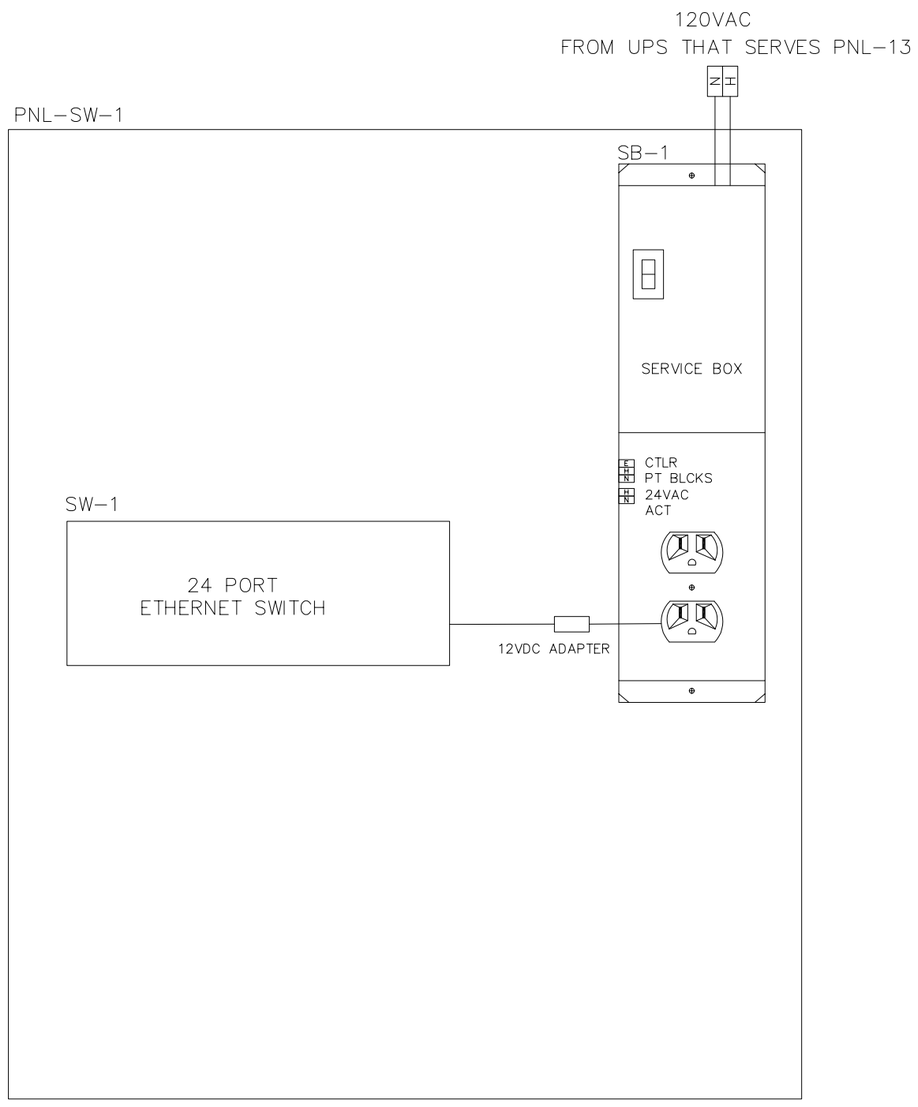

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R10

PNL-SW-1 PANEL LAYOUT

LOCATION: NEXT TO AUX-12

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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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	04/06/26

PNL-SW-1 LAYOUT

440P412785
0
R10

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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

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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PNL-SW-1 PANEL BOM

440P412785
0
R10A

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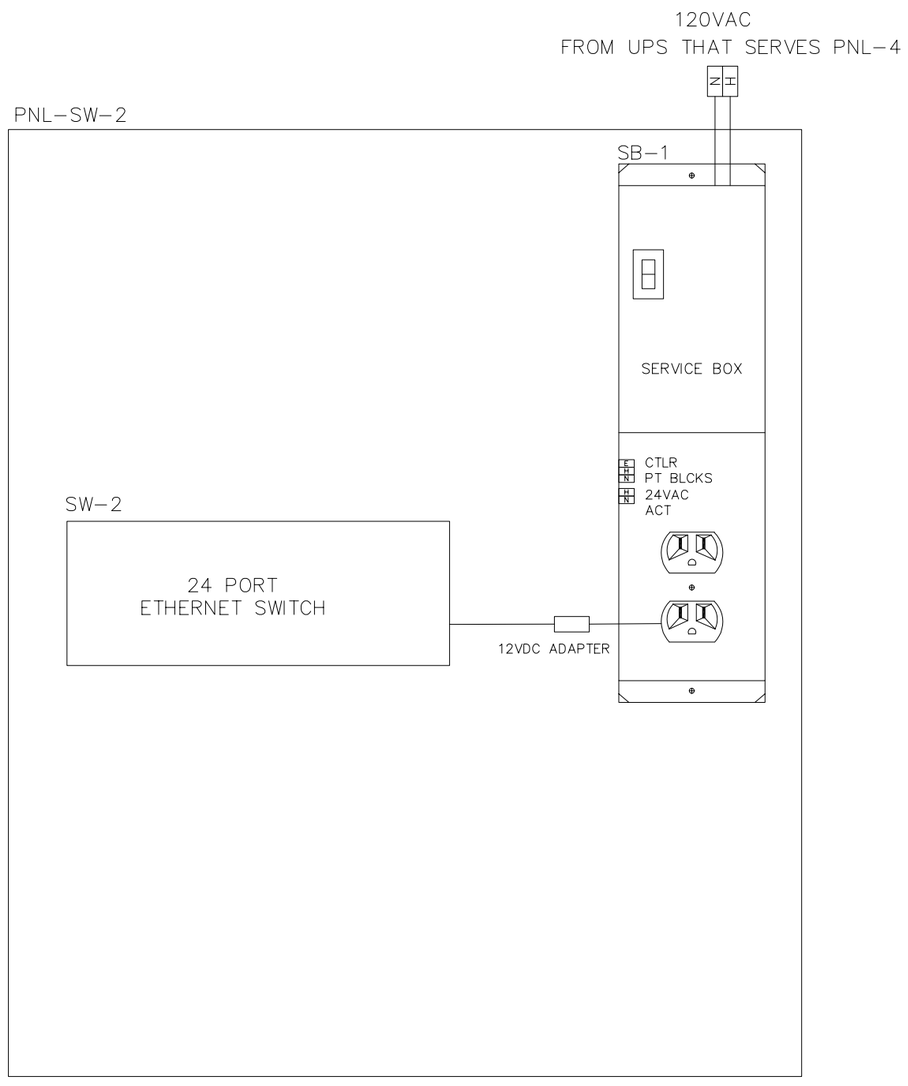

1 / R11 PNL-SW-2 PANEL LAYOUT
LOCATION: NEXT TO AUX-4

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SUITE 240
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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

PNL-SW-2 LAYOUT

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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

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-SW-2 PANEL BOM

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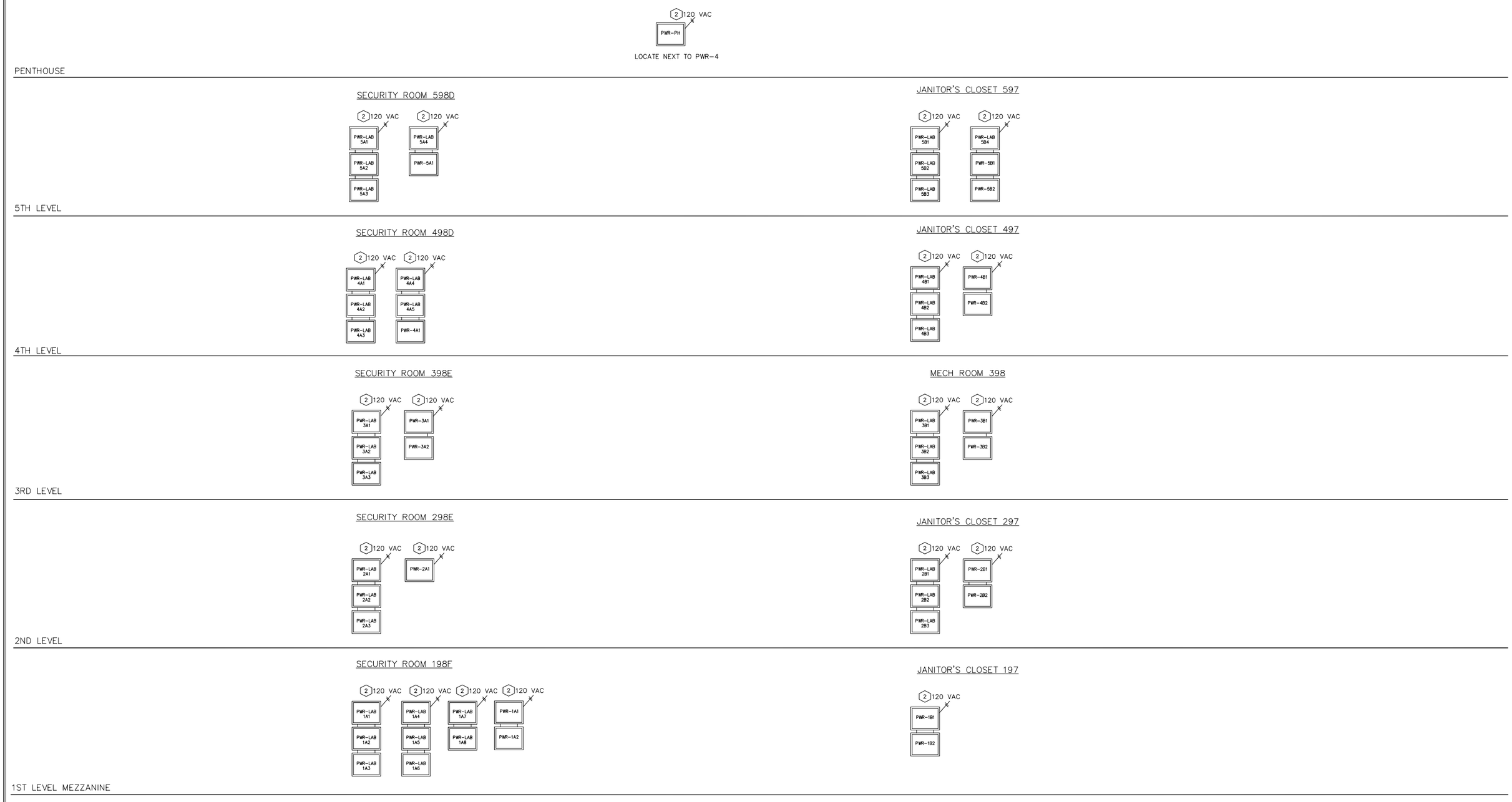
INSTALLATION NOTES:

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

00	4/2/2026	HB	SUBMITTAL SET

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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

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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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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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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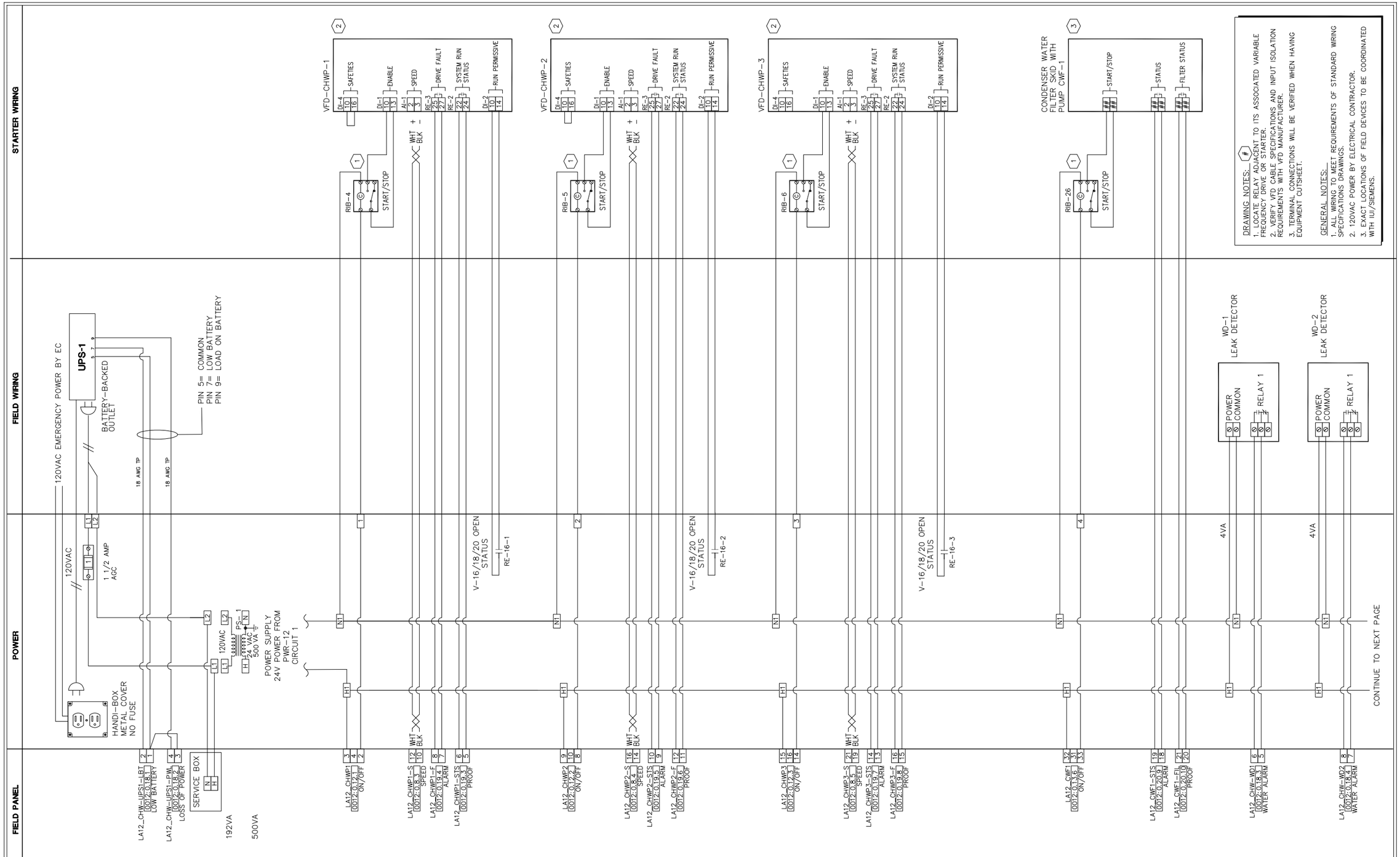

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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CHW SYS ELEC. WIRING 1

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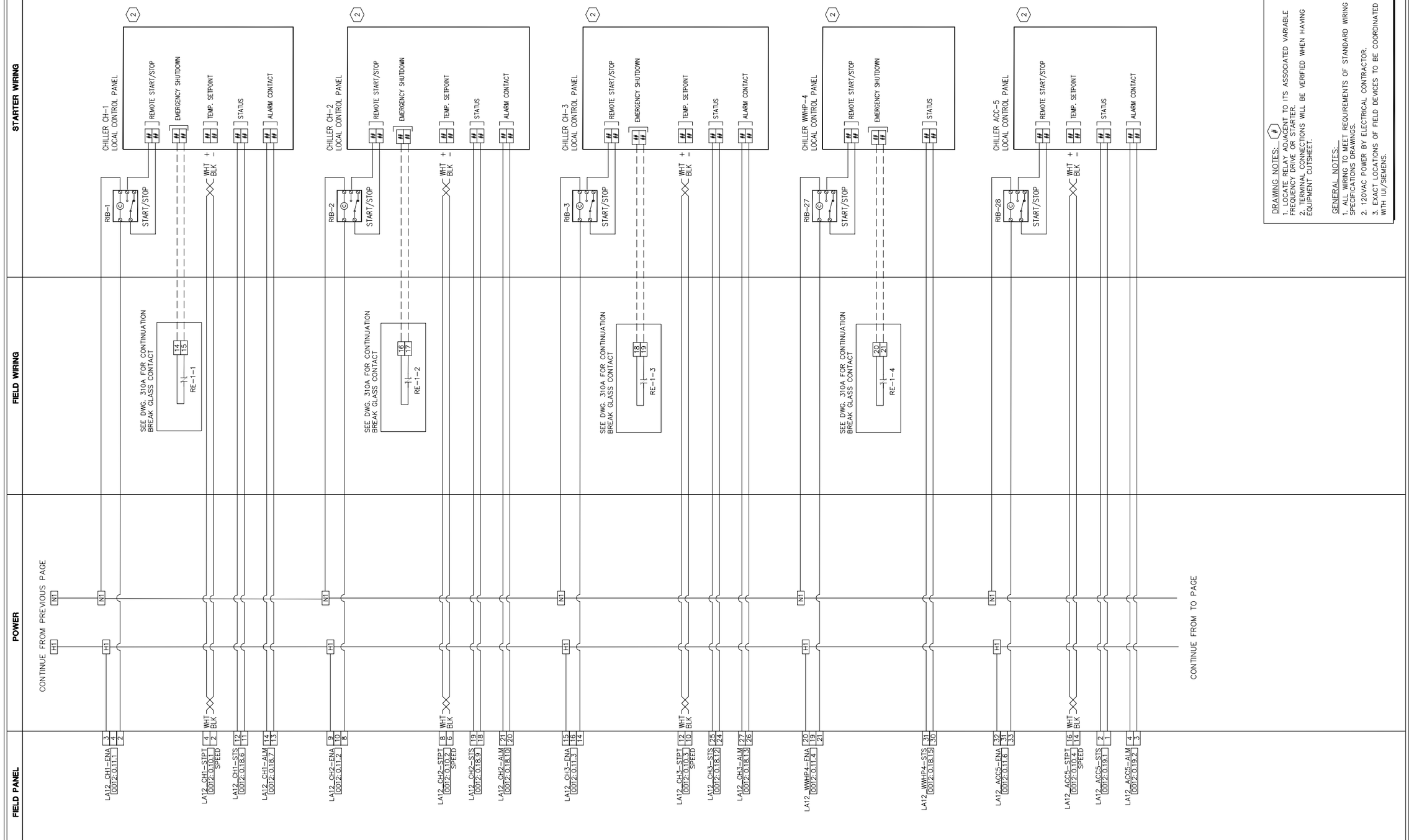

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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CHW SYS ELEC. WIRING 2

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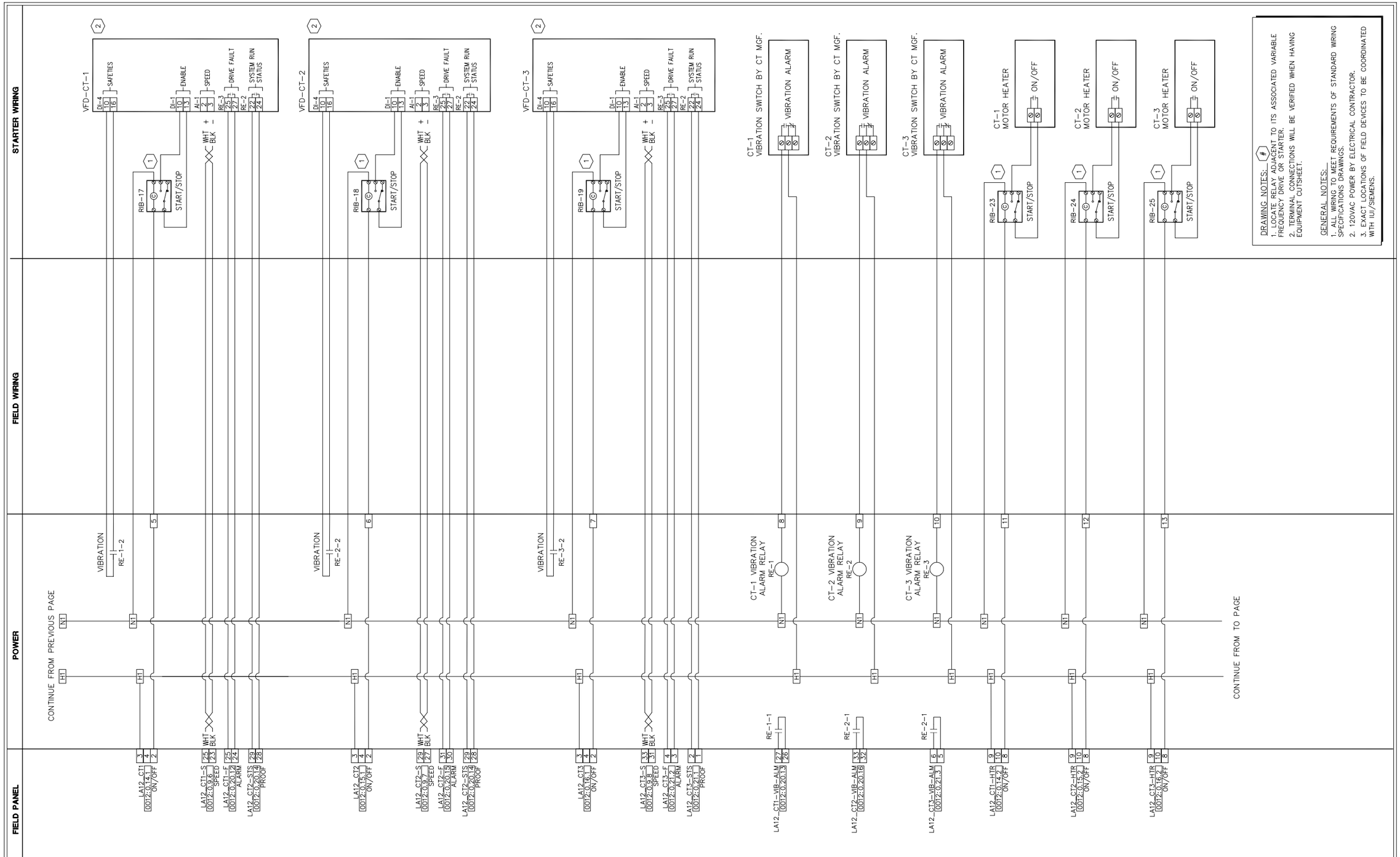

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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CHW SYS ELEC. WIRING 3

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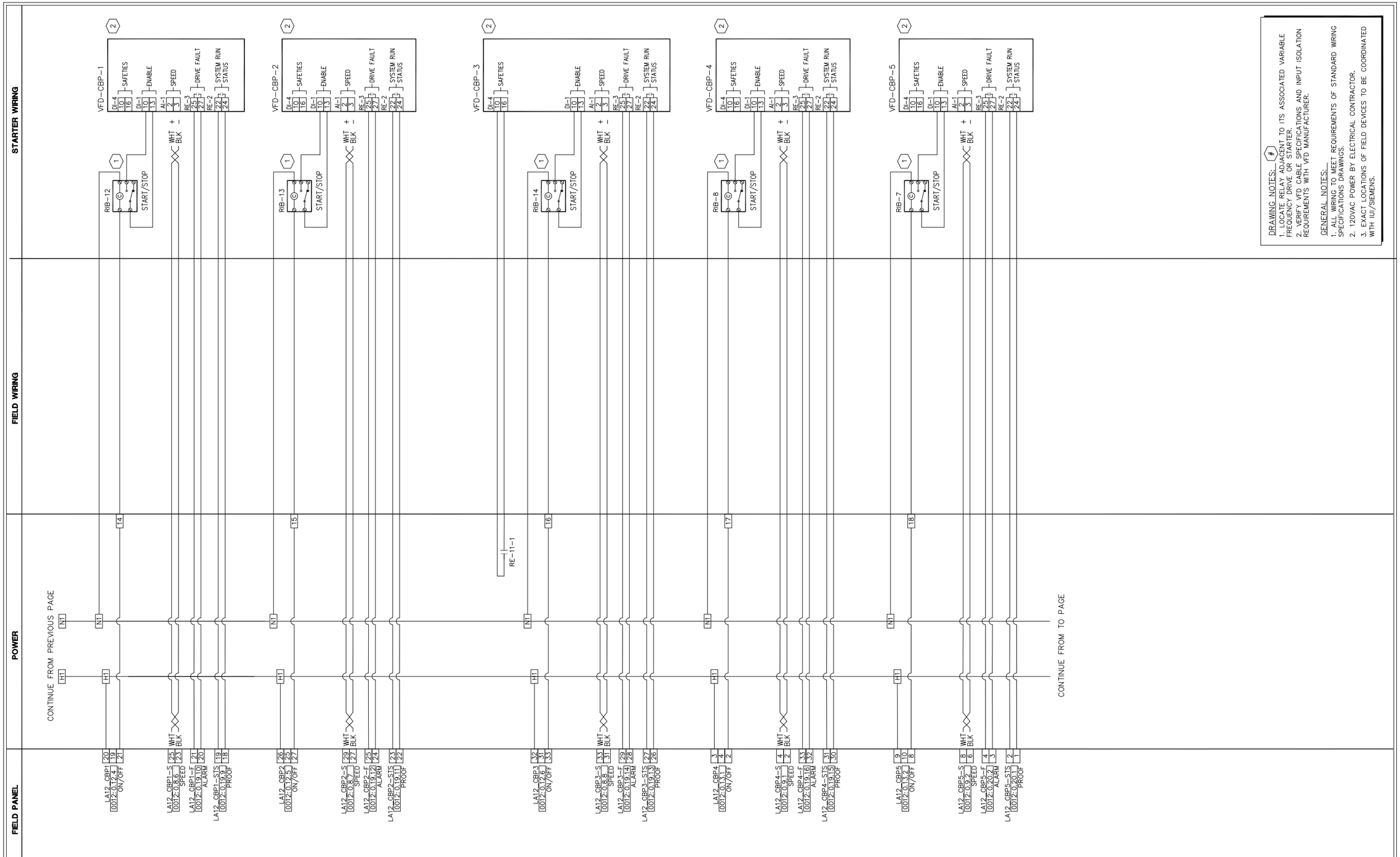

DRAWING NOTES: (#)
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2. VERIFY VFD CABLE SPECIFICATIONS AND INPUT ISOLATION REQUIREMENTS WITH VFD MANUFACTURER.

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	

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

CHW SYS ELEC. WIRING 4

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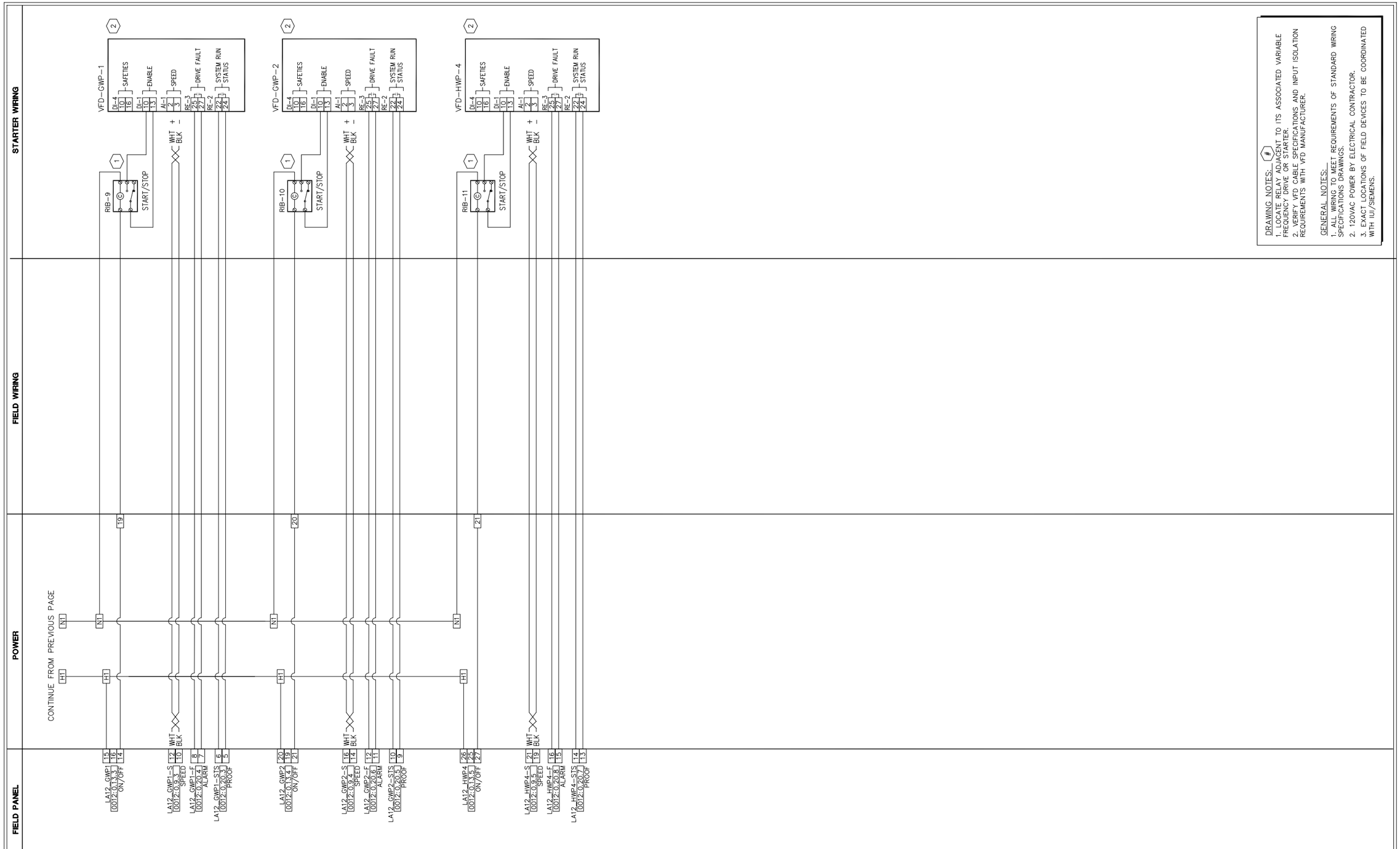

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CHW SYS ELEC. WIRING 5

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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

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CHW SYS ELEC. WIRING 6

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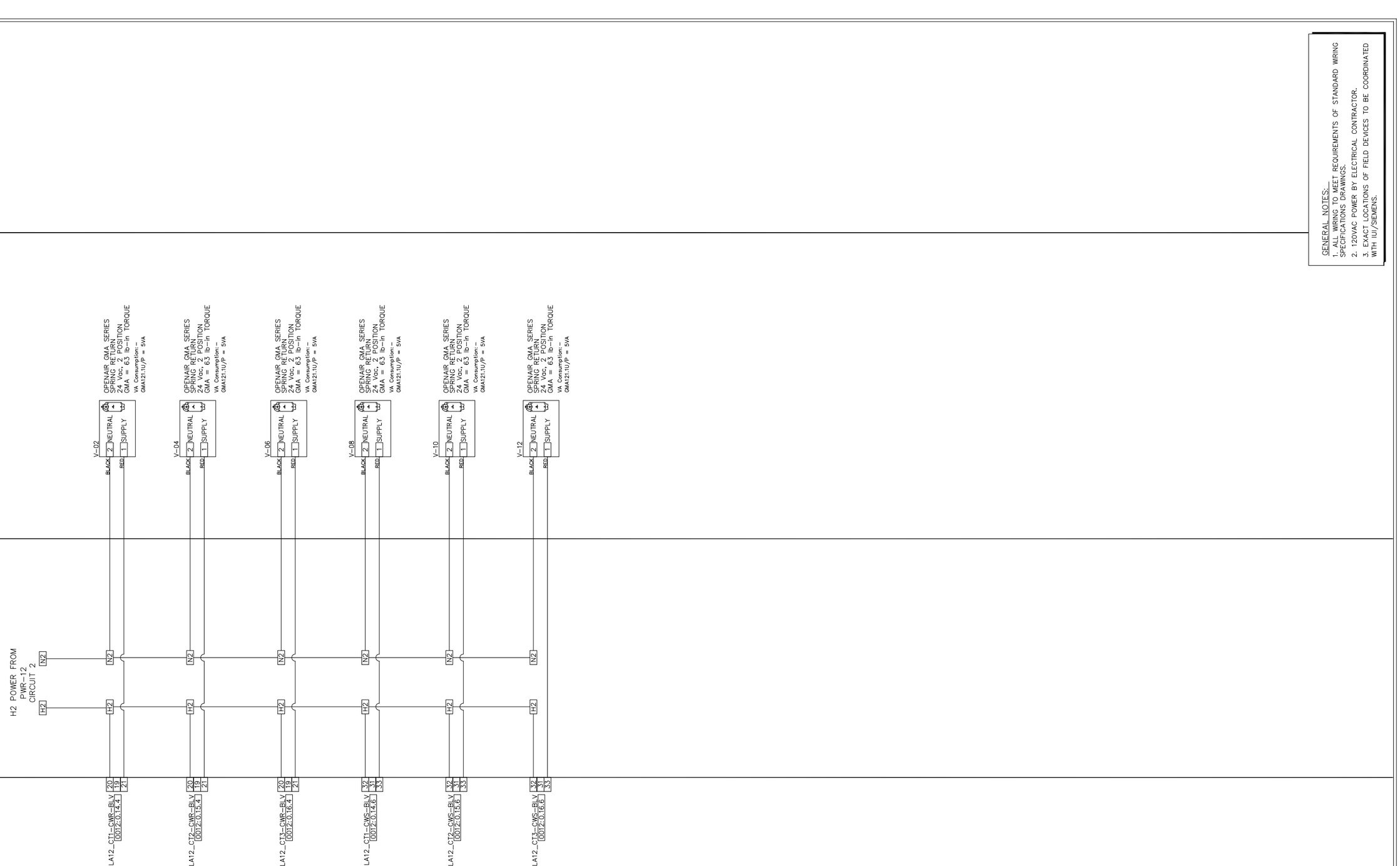
FIELD WIRING | **STARTER WIRING**



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CHW SYS ELEC. WIRING 7

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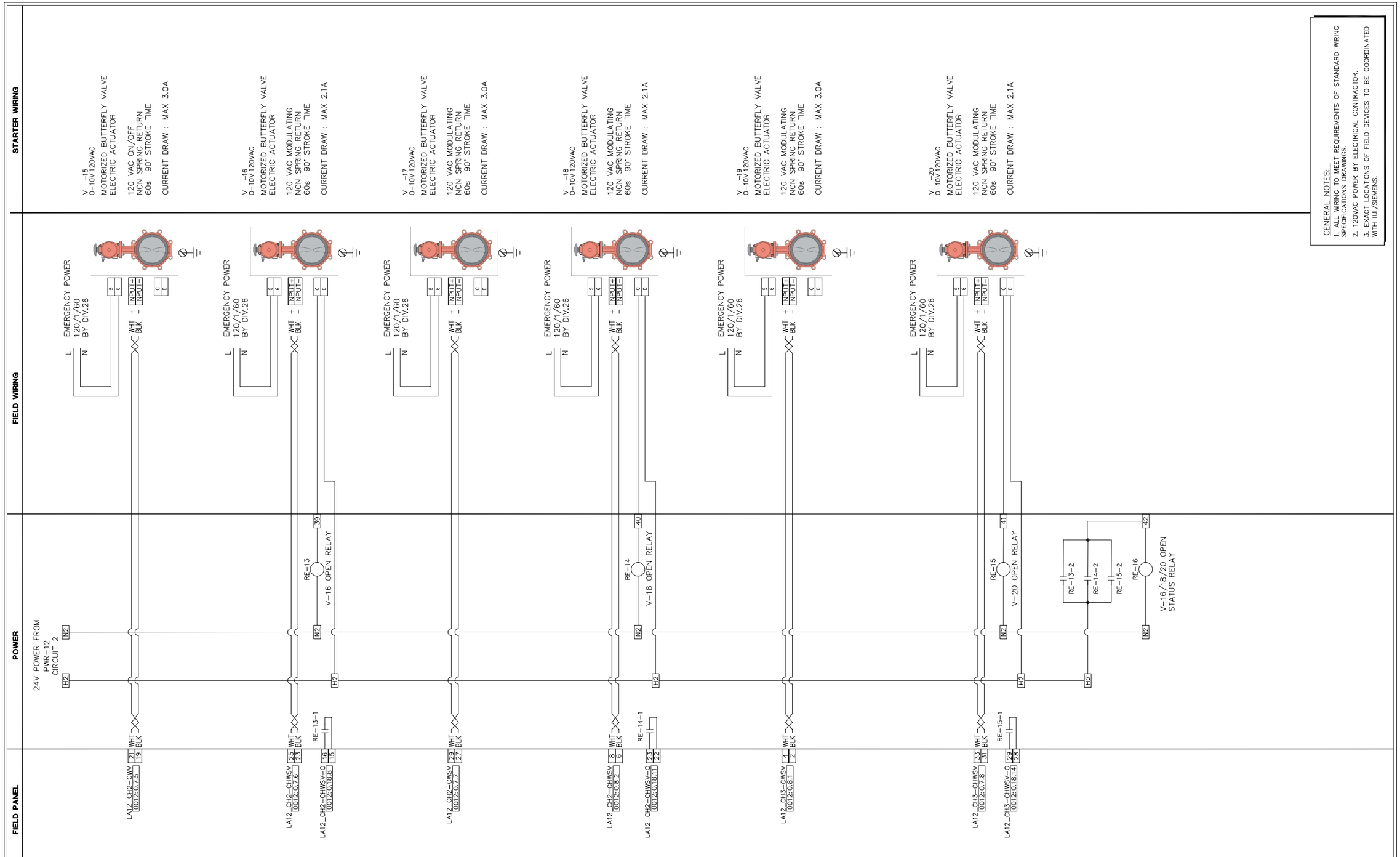

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CHW SYS ELEC. WIRING 8

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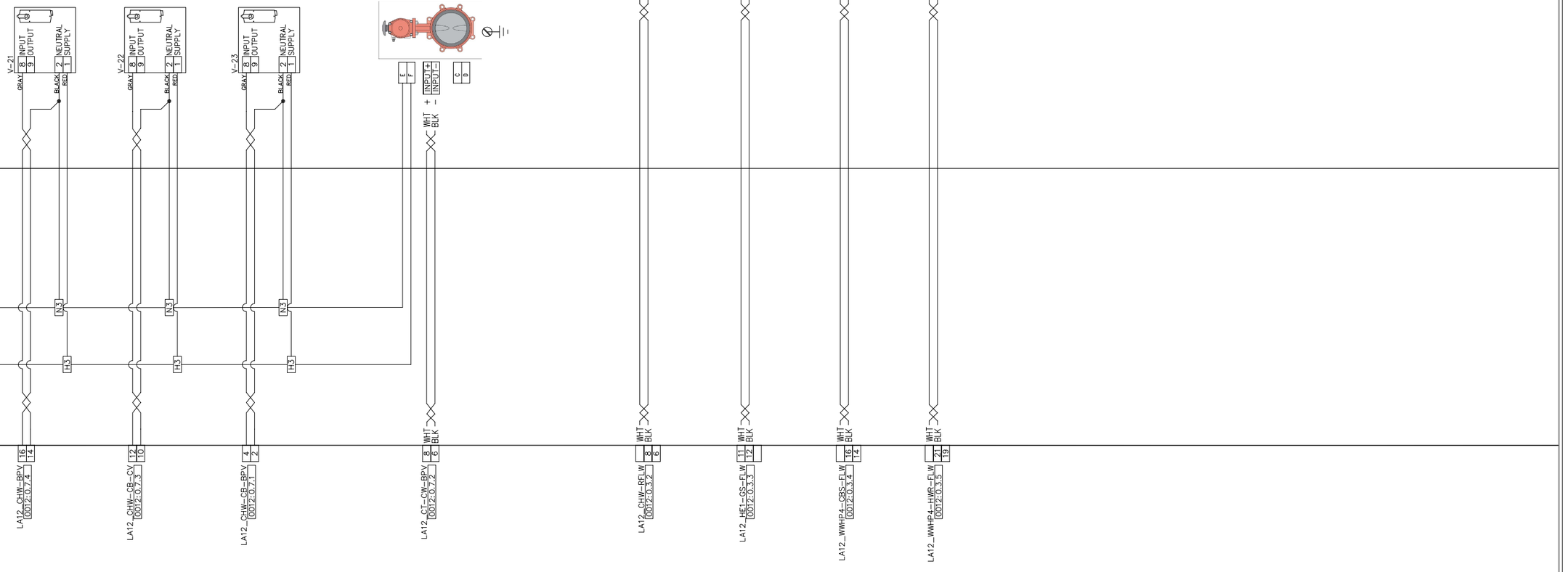
FIELD WIRING | **STARTER WIRING**



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CHW SYS ELEC. WIRING 9

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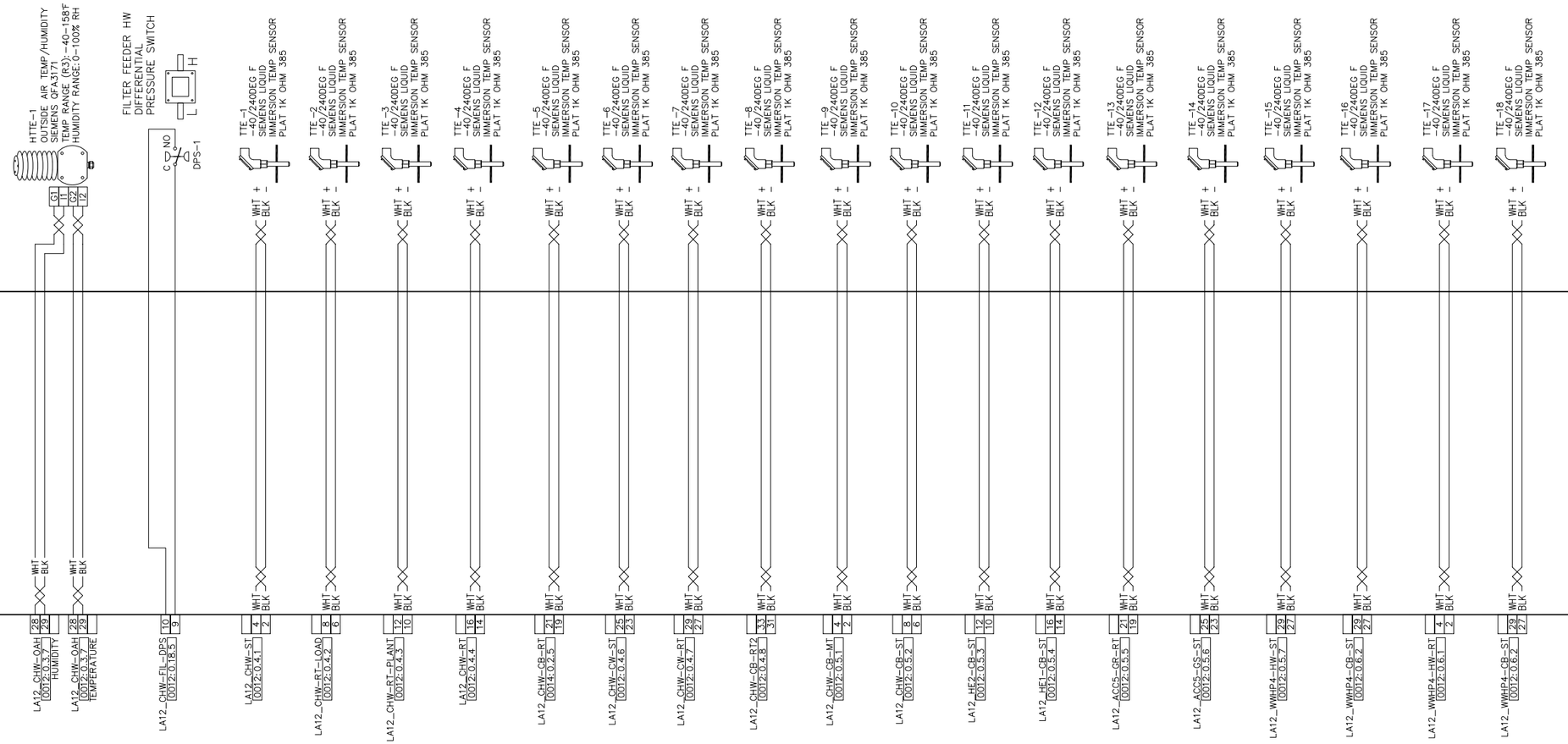
FIELD WIRING | **STARTER WIRING**



POWER

FIELD PANEL

GENERAL NOTES:
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CHW SYS ELEC. WIRING 10

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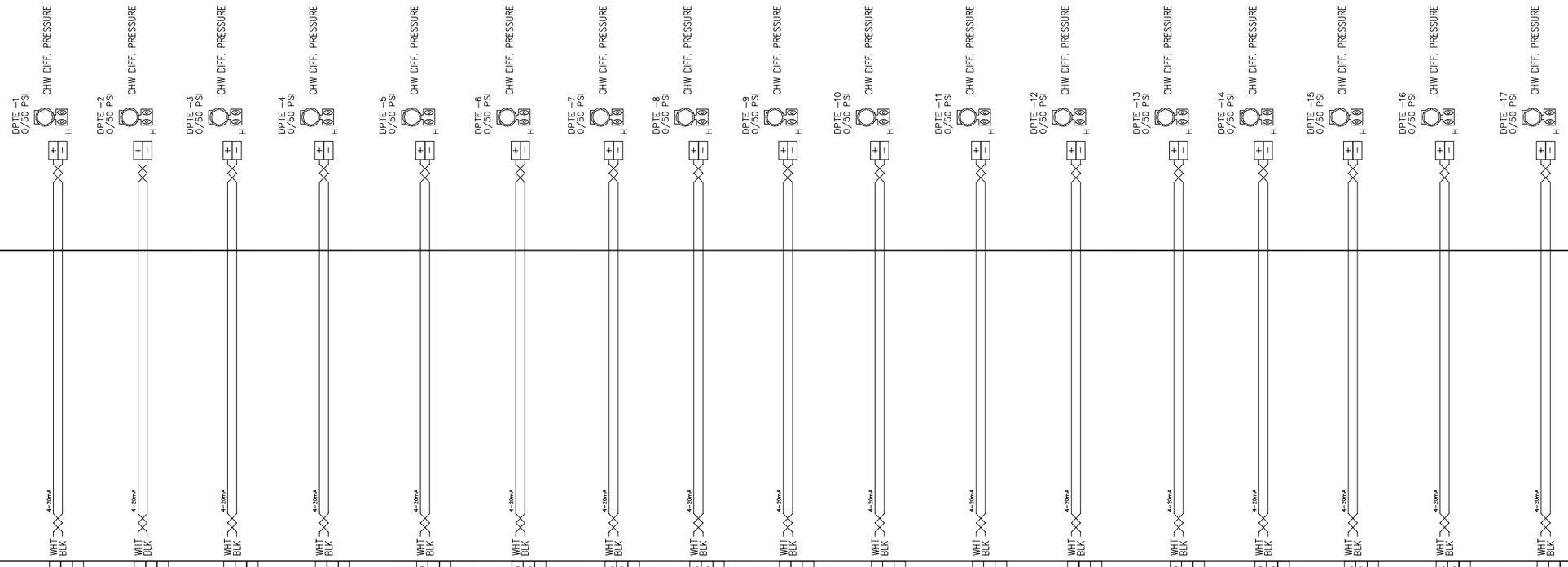
FIELD WIRING | **STARTER WIRING**



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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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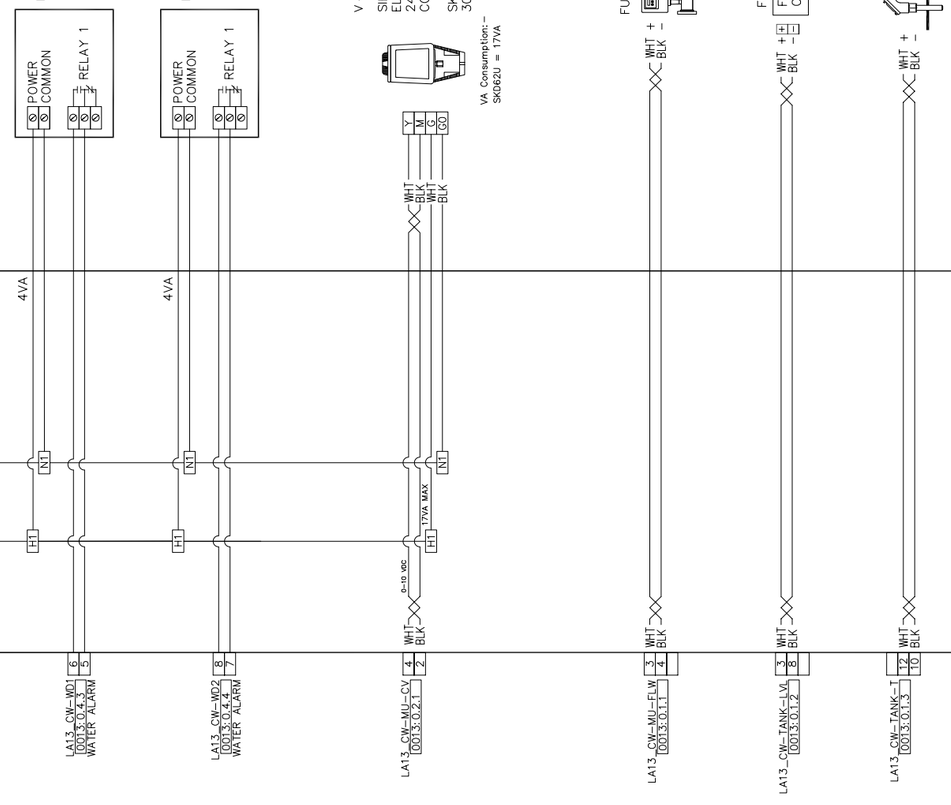
FIELD WIRING | **STARTER WIRING**



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CW SYS ELEC WIRING 2

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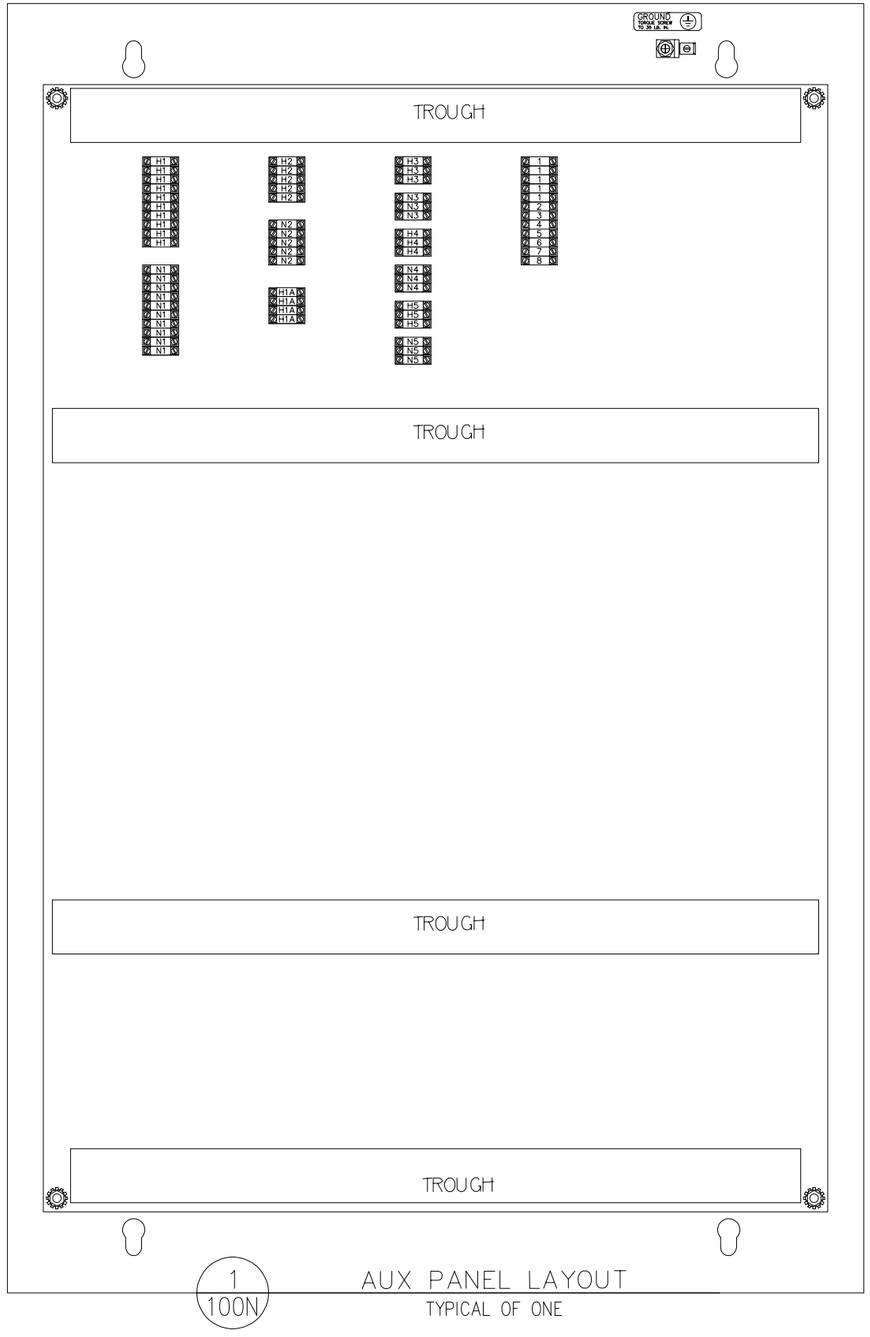
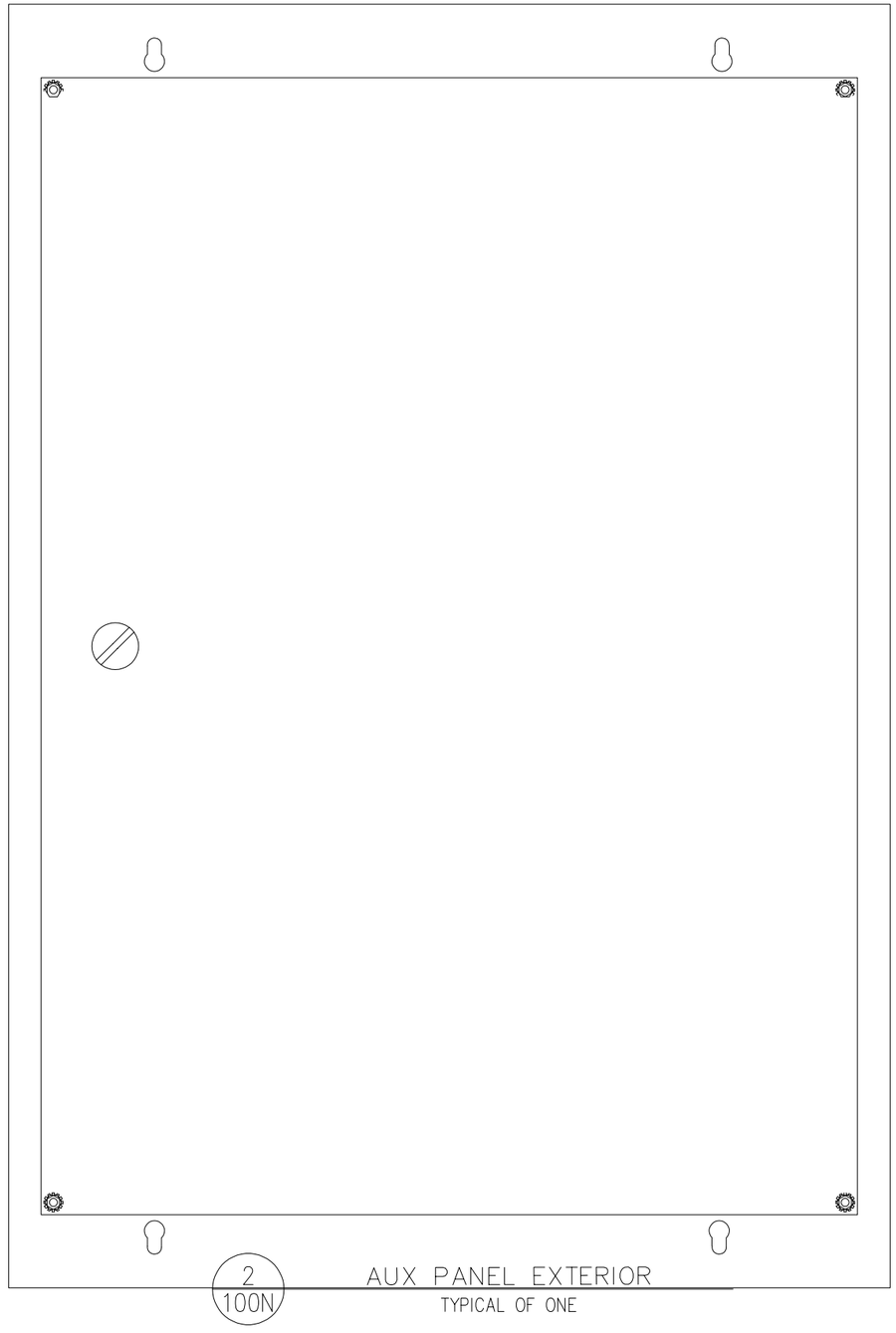


1 100N AUX PANEL LAYOUT
TYPICAL OF ONE



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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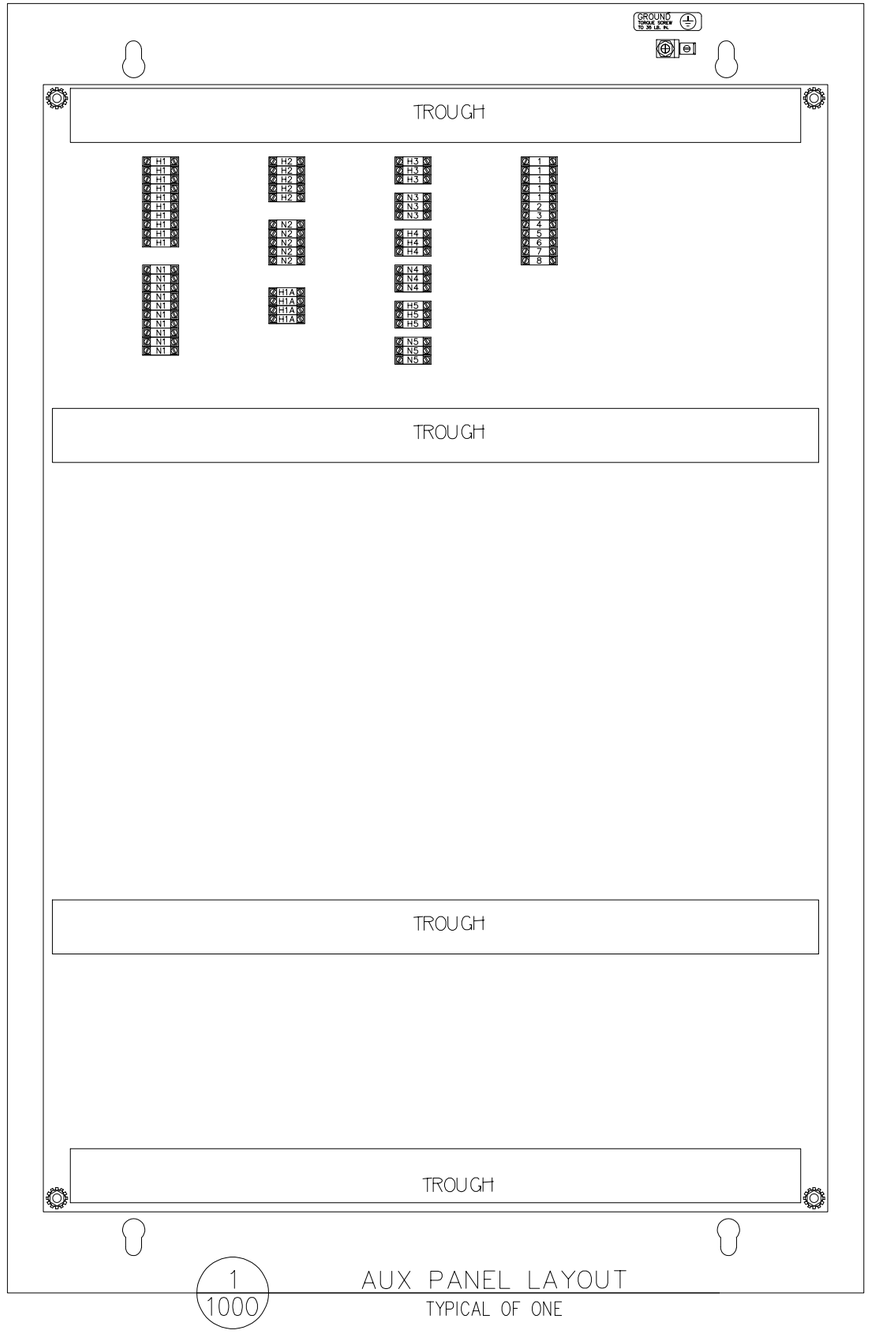

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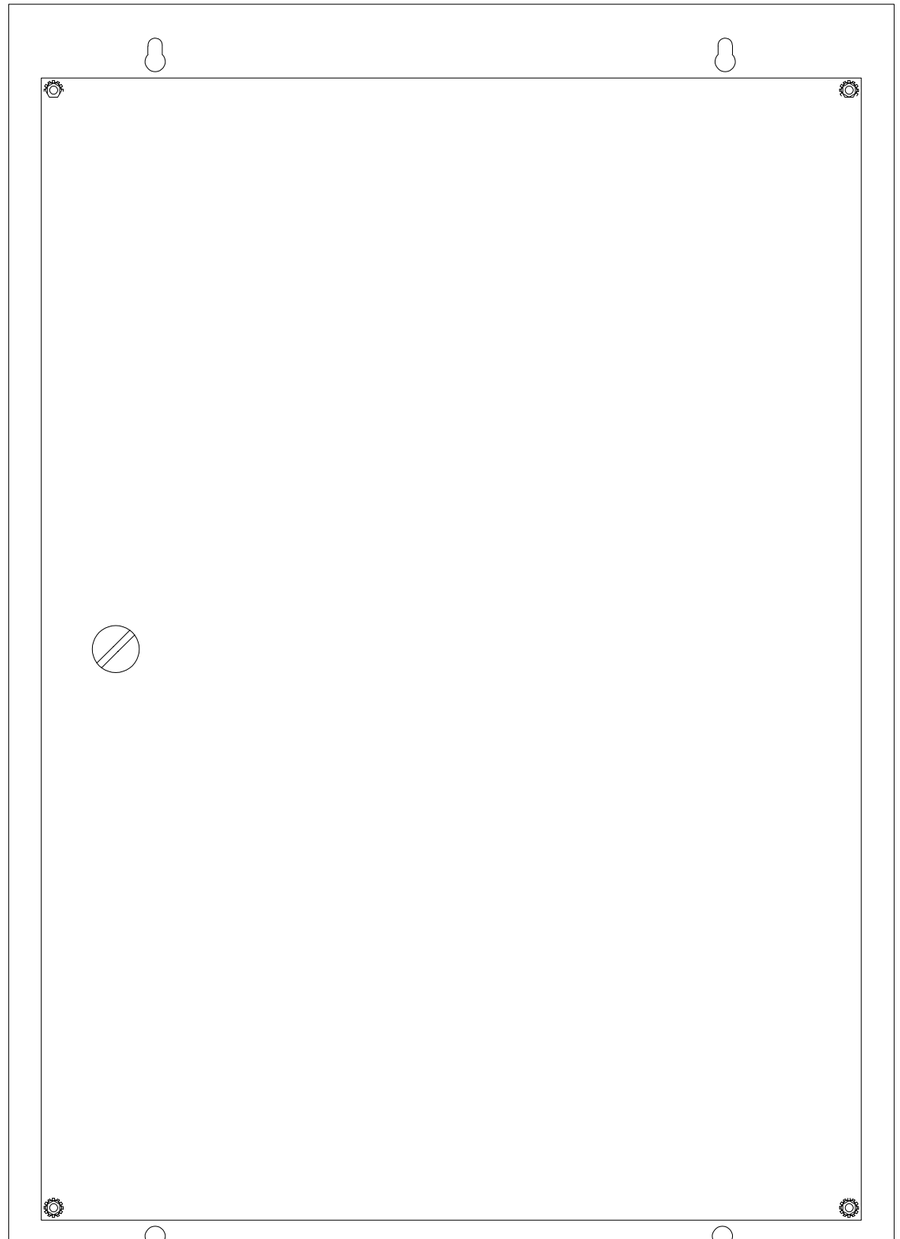
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

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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

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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).**

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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

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HB	HB	KR	04/02/26	04/02/26

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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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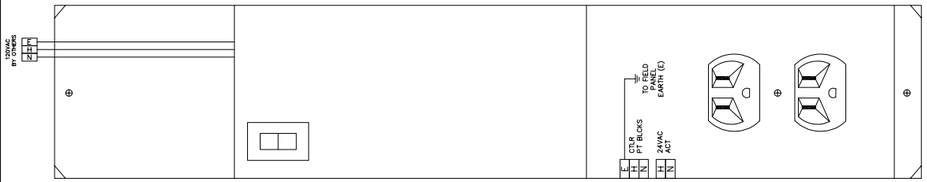
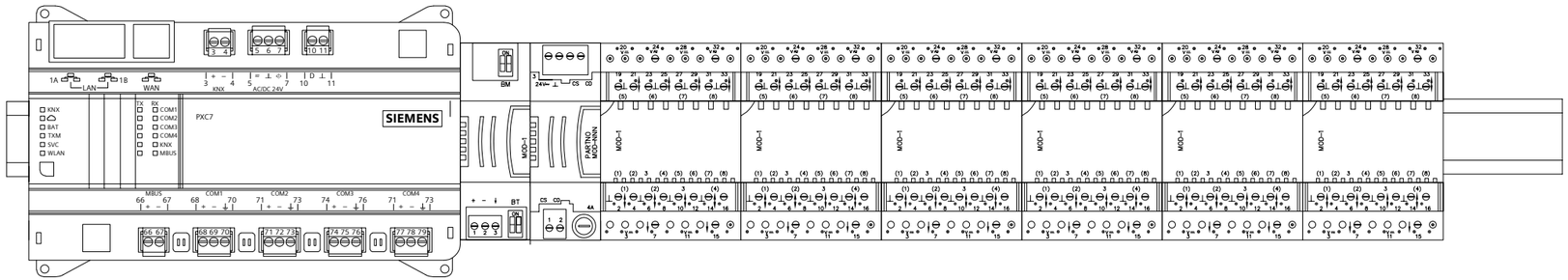
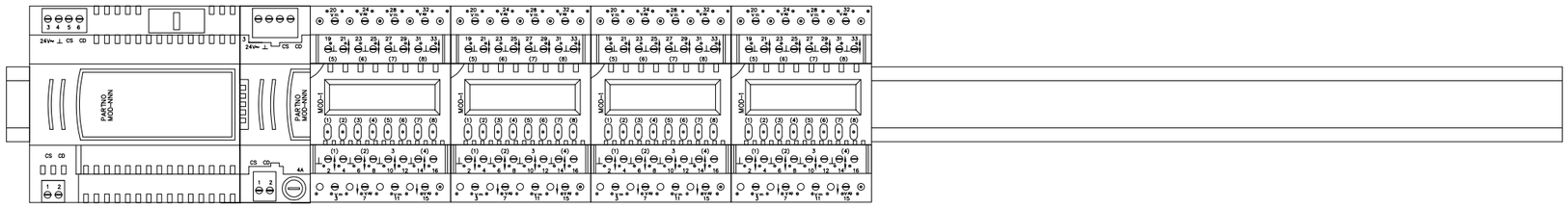
INSTALLATION NOTES:

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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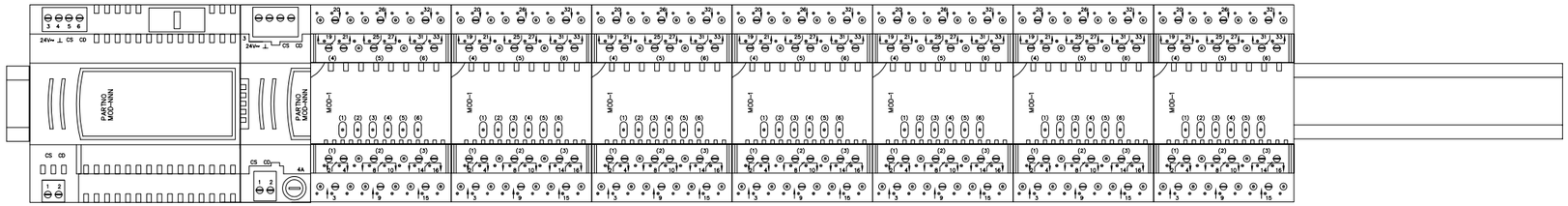

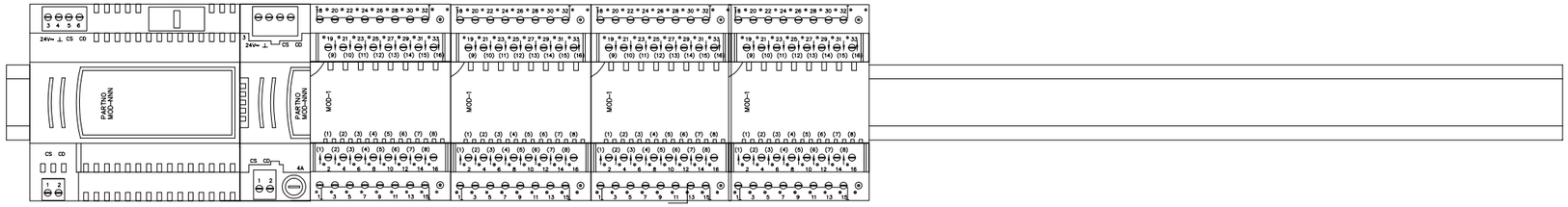

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Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

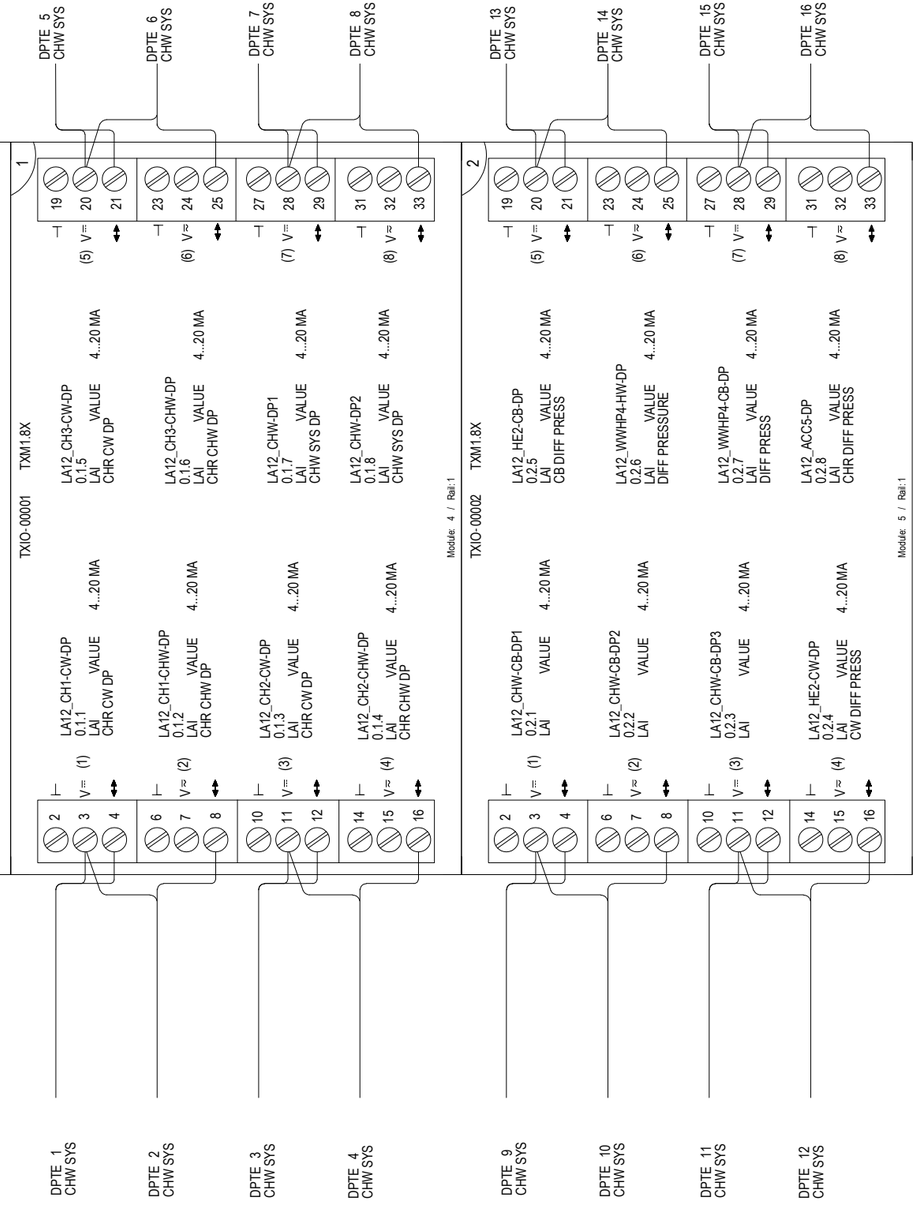
Module: 2 / Rail: 1

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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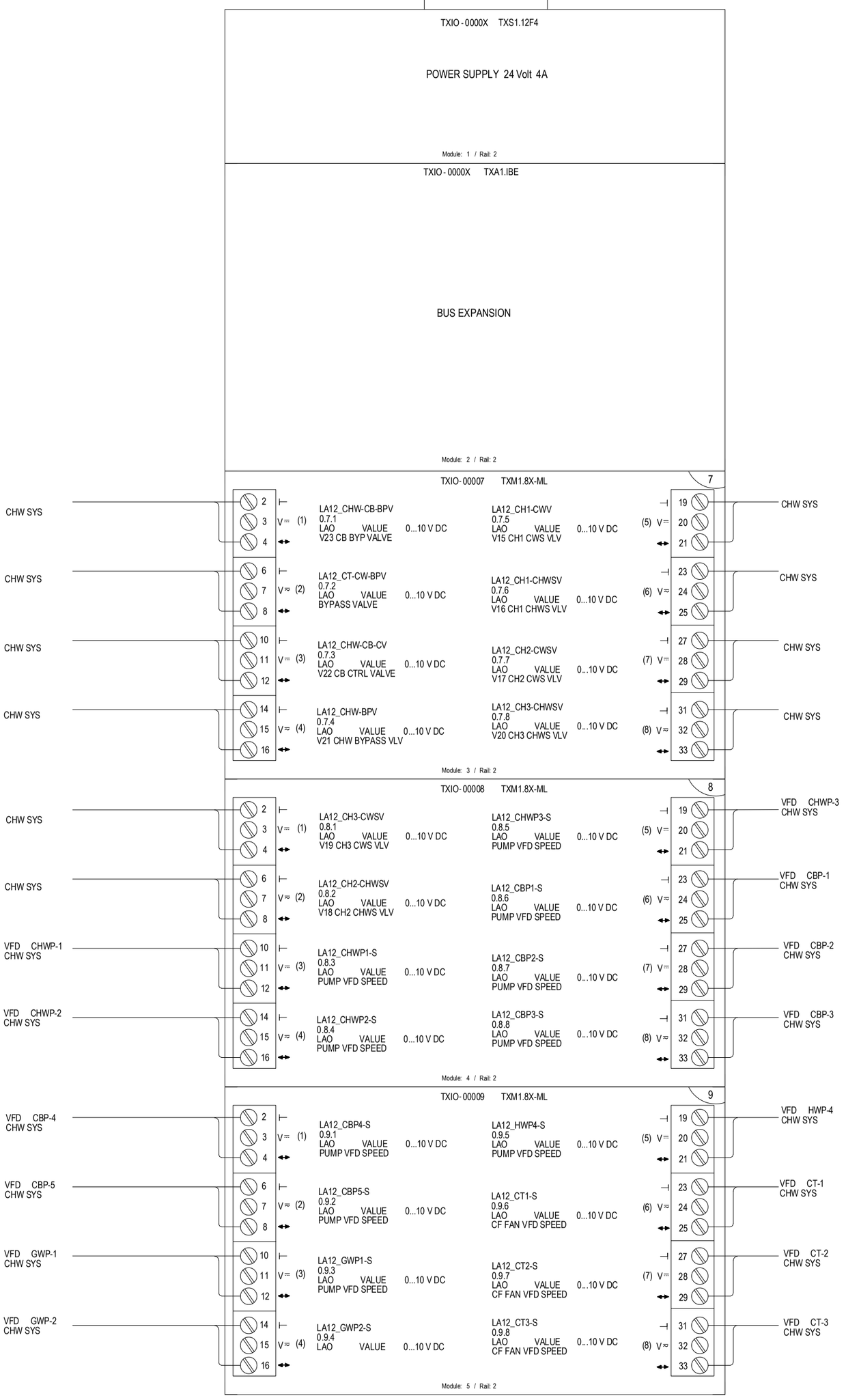

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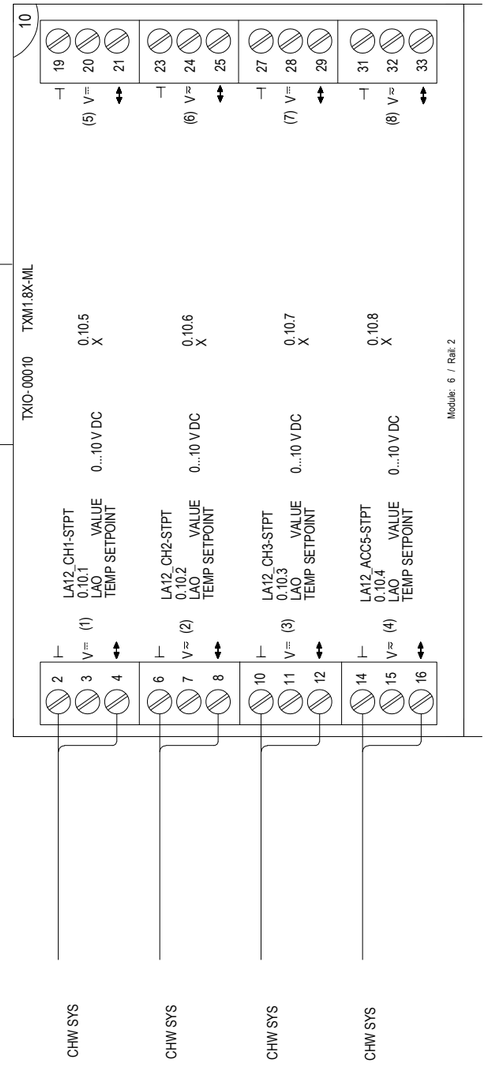

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TXIO - 0000X TXS1.12F4

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

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

LA12.PXCAp005

440P412785
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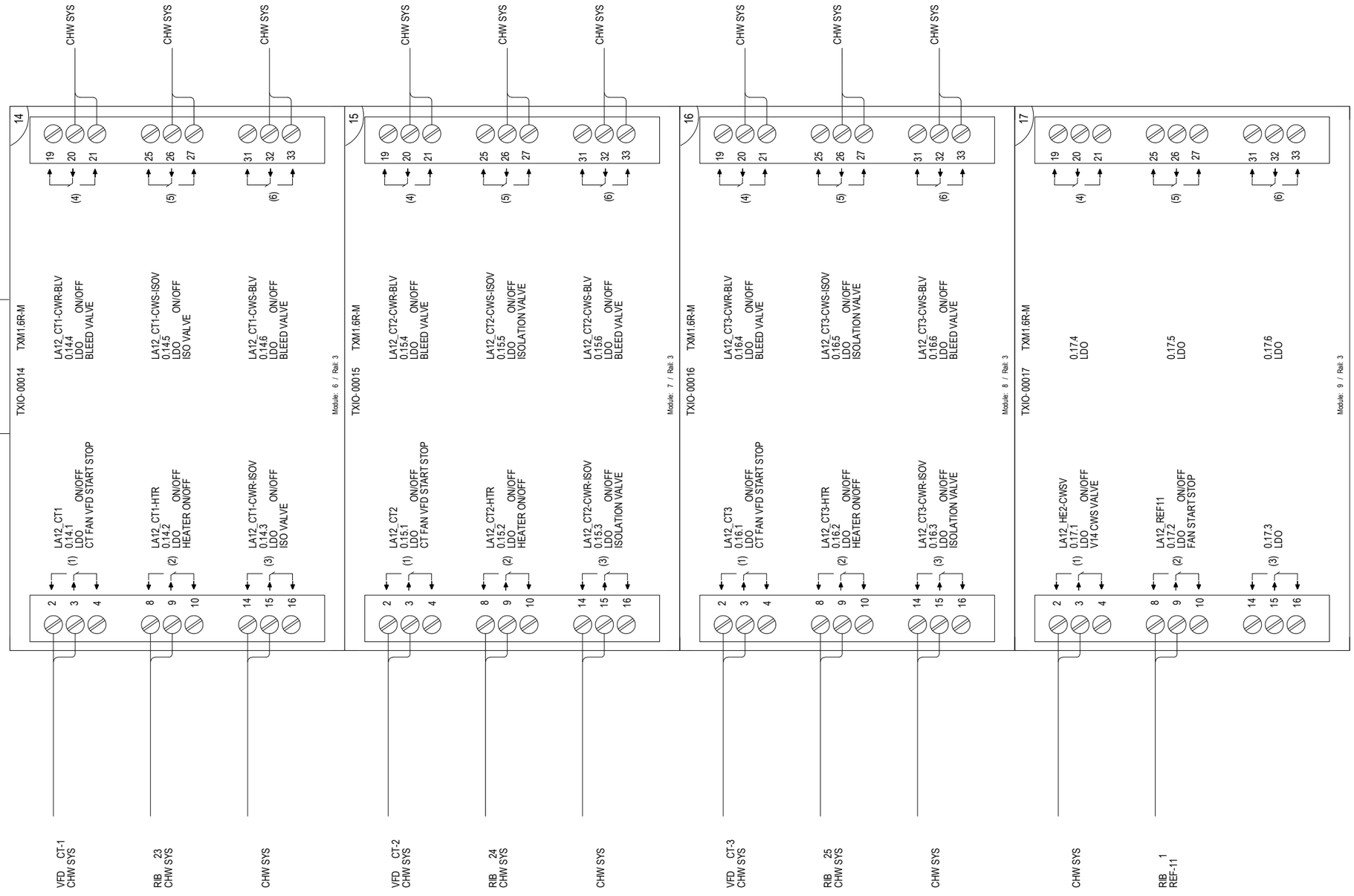

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
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TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A

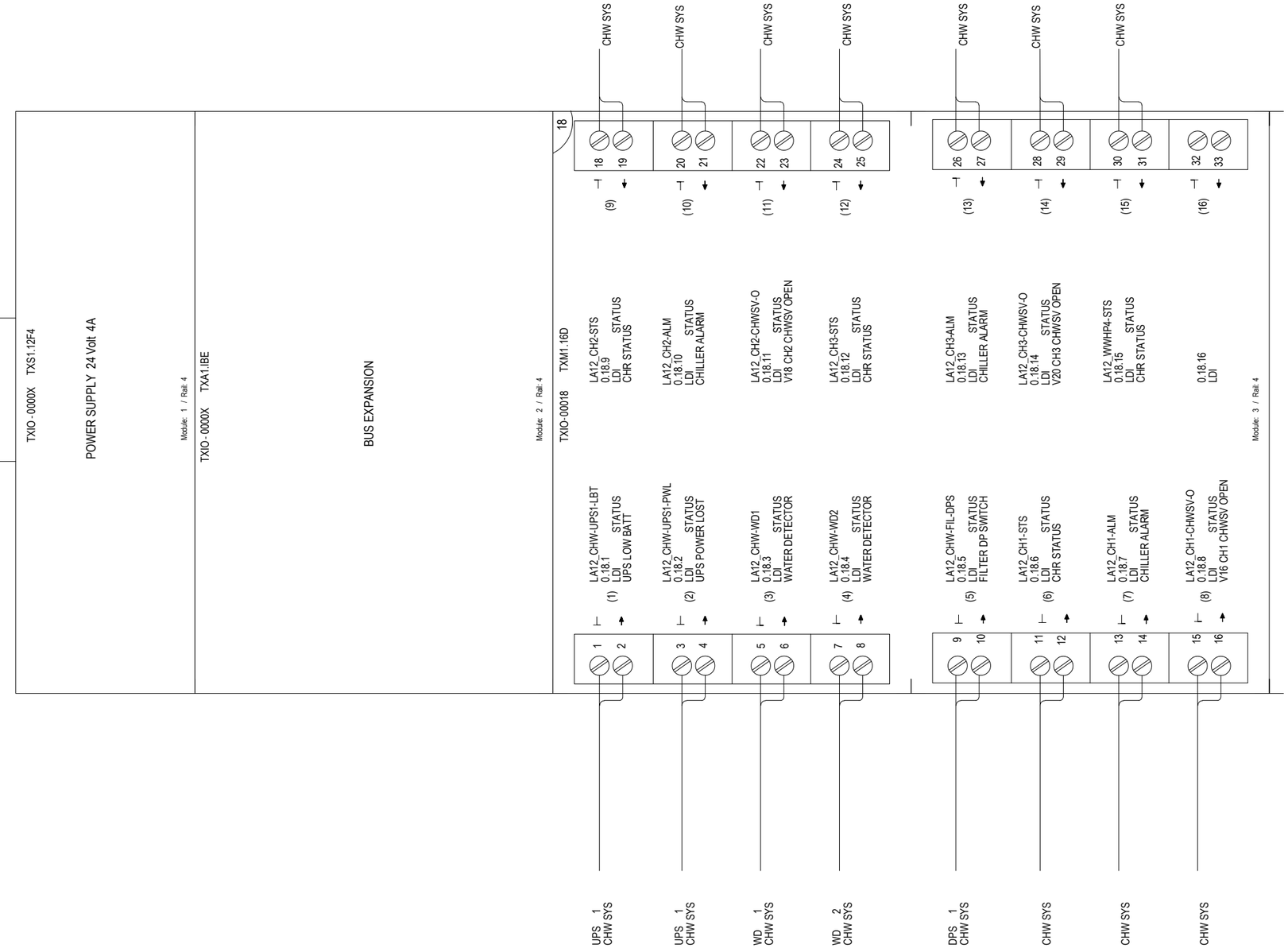
Module: 1 / Rail: 4

TXIO - 0000X TXA1.IBE

BUS EXPANSION

Module: 2 / Rail: 4

TXIO-00018 TXM1.16D



Module: 3 / Rail: 4

REVISION HISTORY

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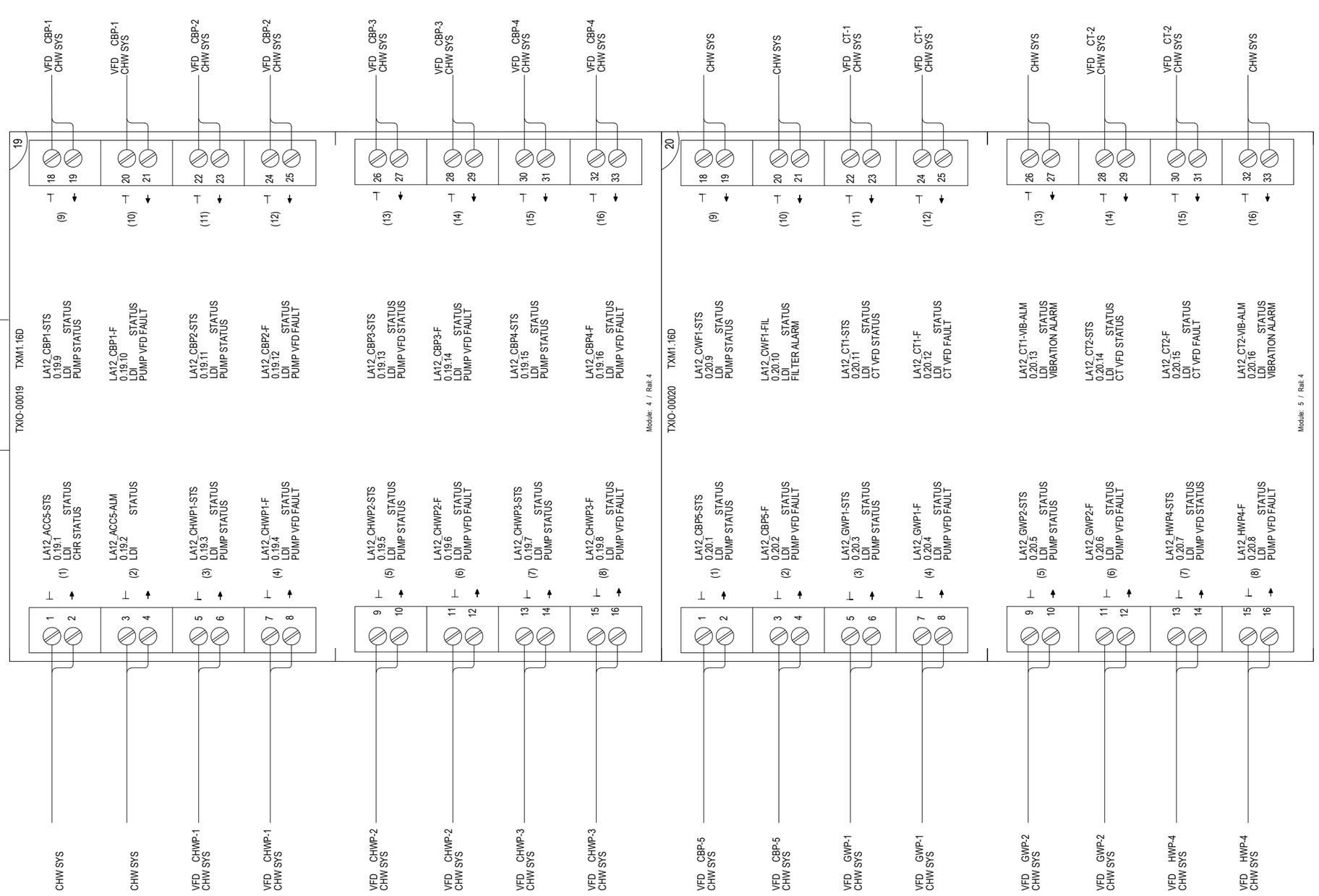

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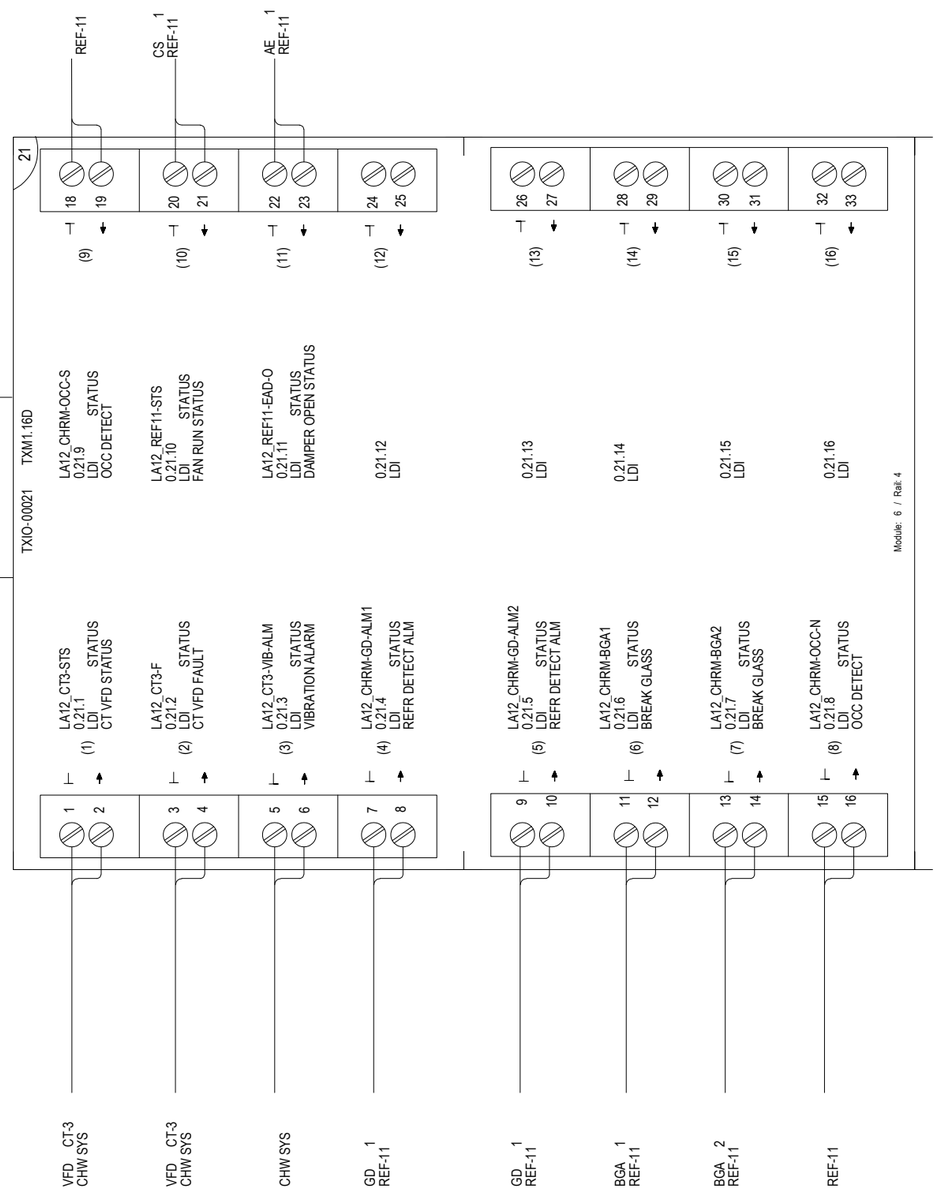

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LA12.PXCAp009

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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 LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA12.PXCA BOM

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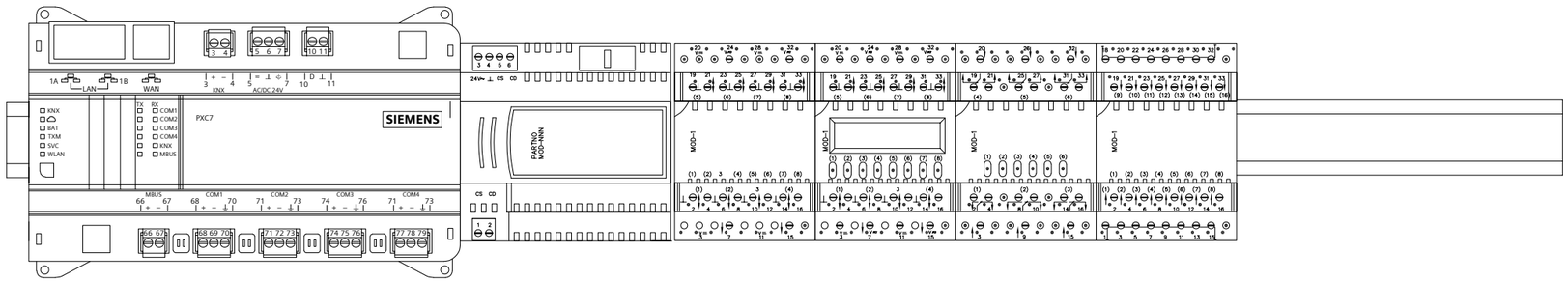
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.





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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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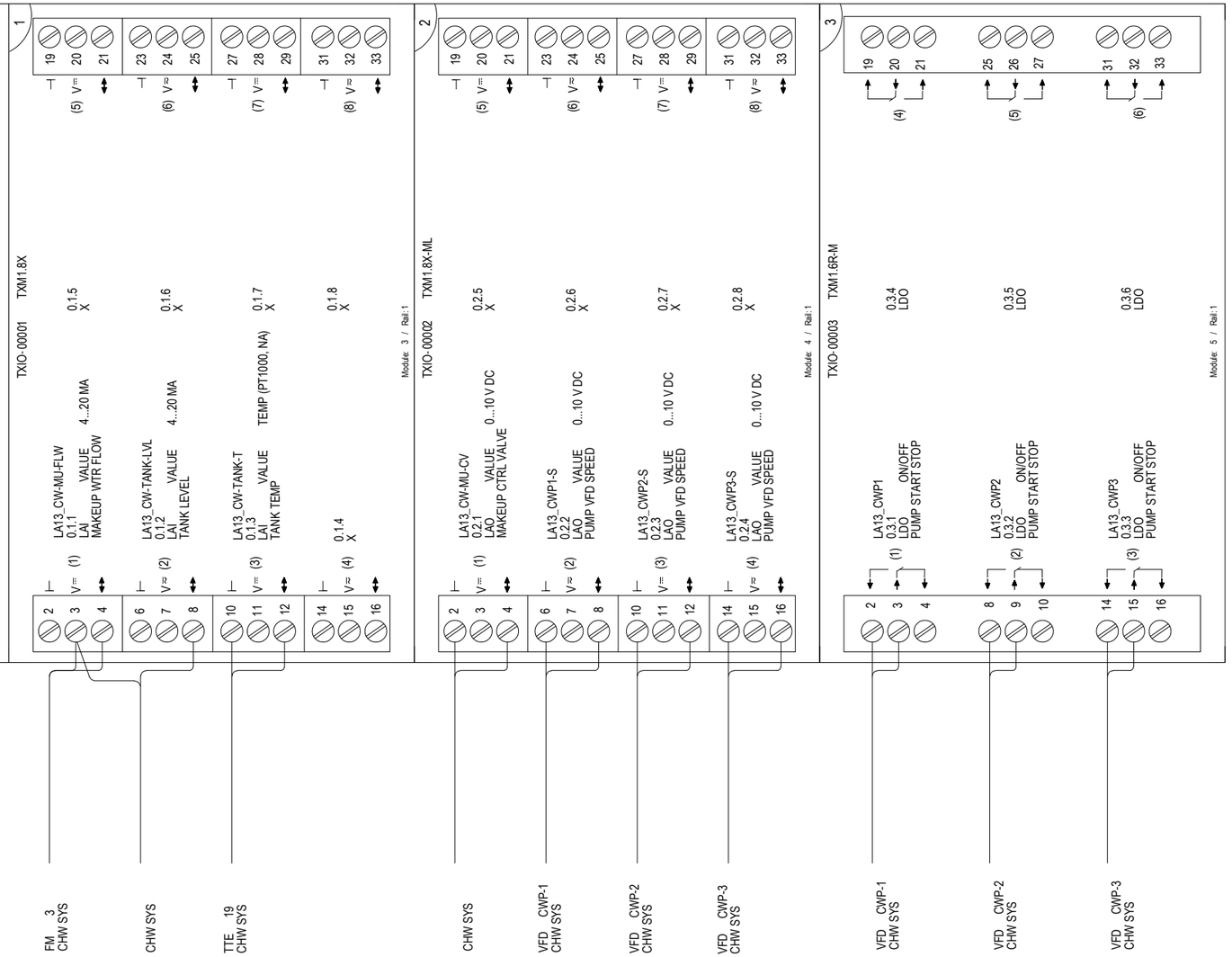
PXC7.A-00000 PXC7.E400.A

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

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CONDENSER WTR SYSTEM

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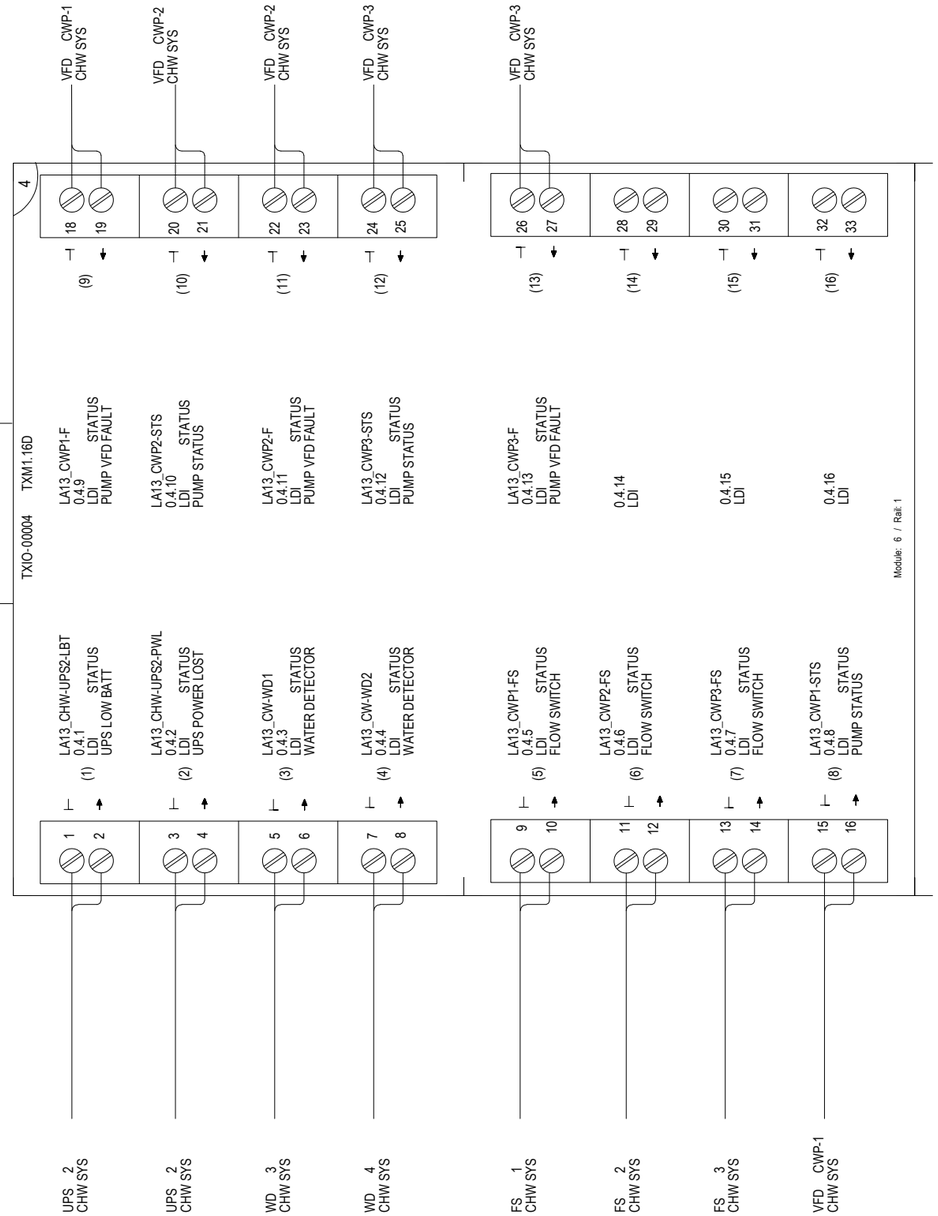

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LA13.PXCAp002

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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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FAX: 317-249-9974

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IU# 20250072, IN

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HB	KB	04/02/26	04/02/26	

HEATING HOT WATER SYSTEM

440P412785
0
110

REF #	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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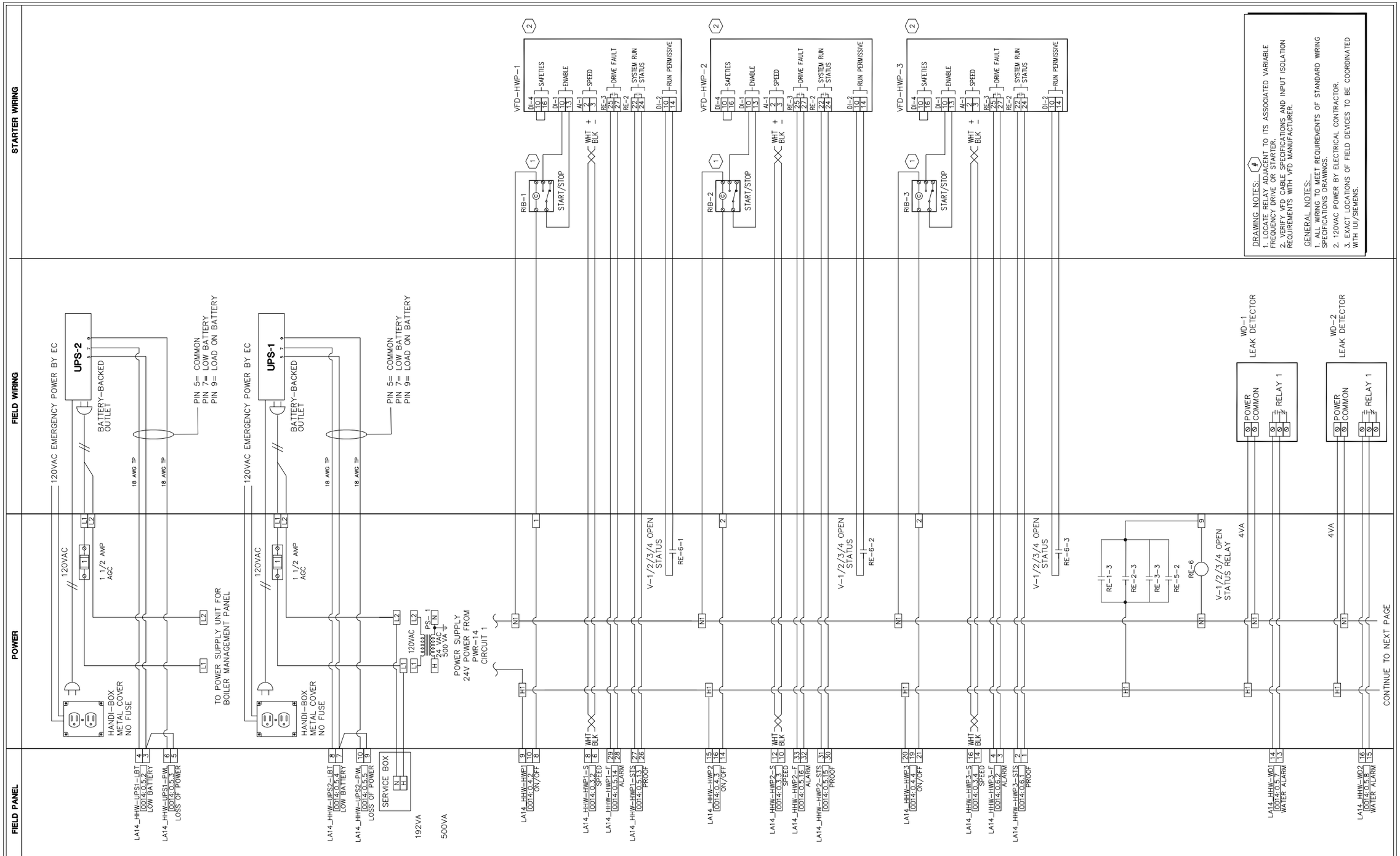

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 1

440P412785
0
110A

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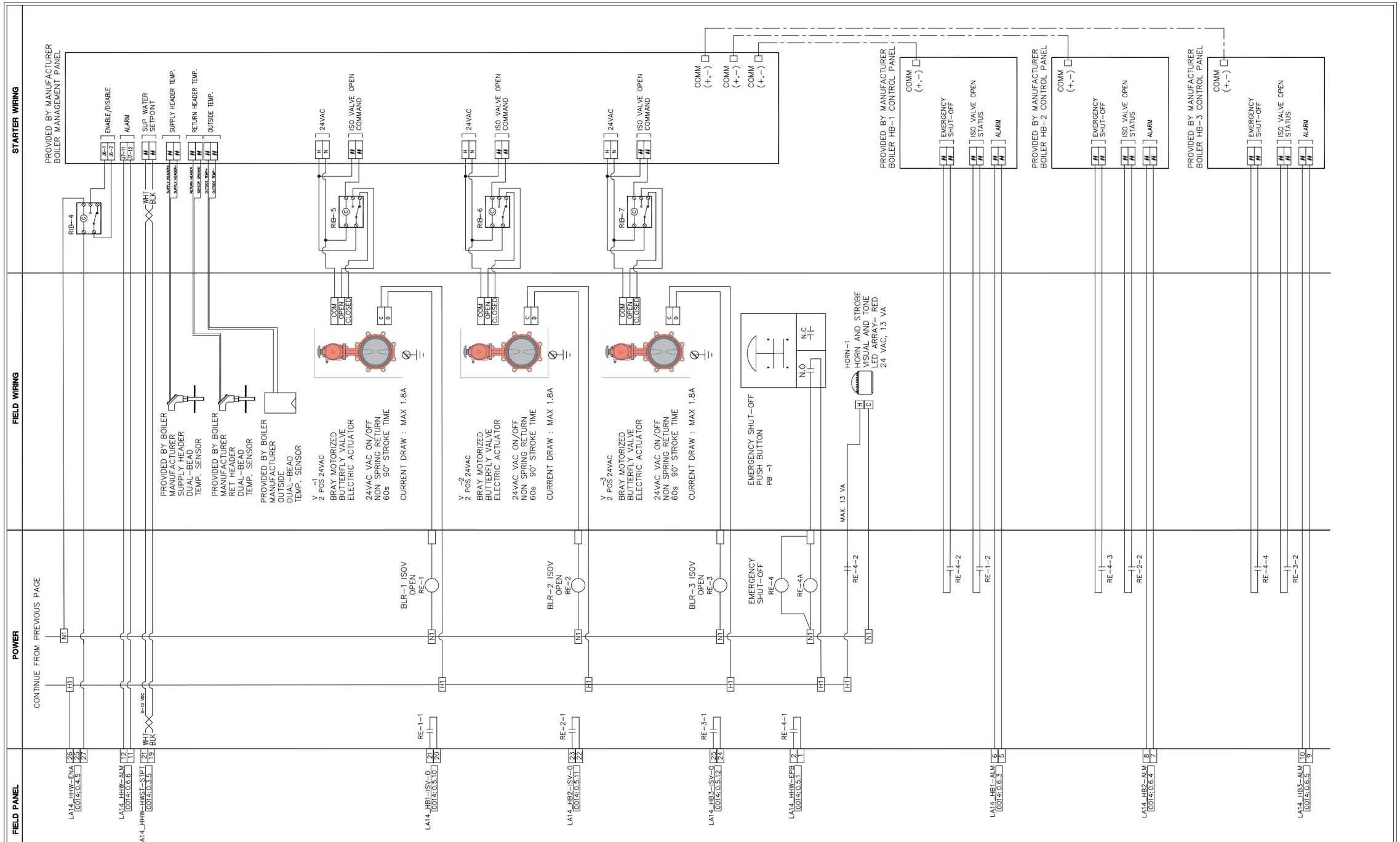

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0014	LA14.PXCA	

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HHW SYS ELEC. WIRING 2

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110B

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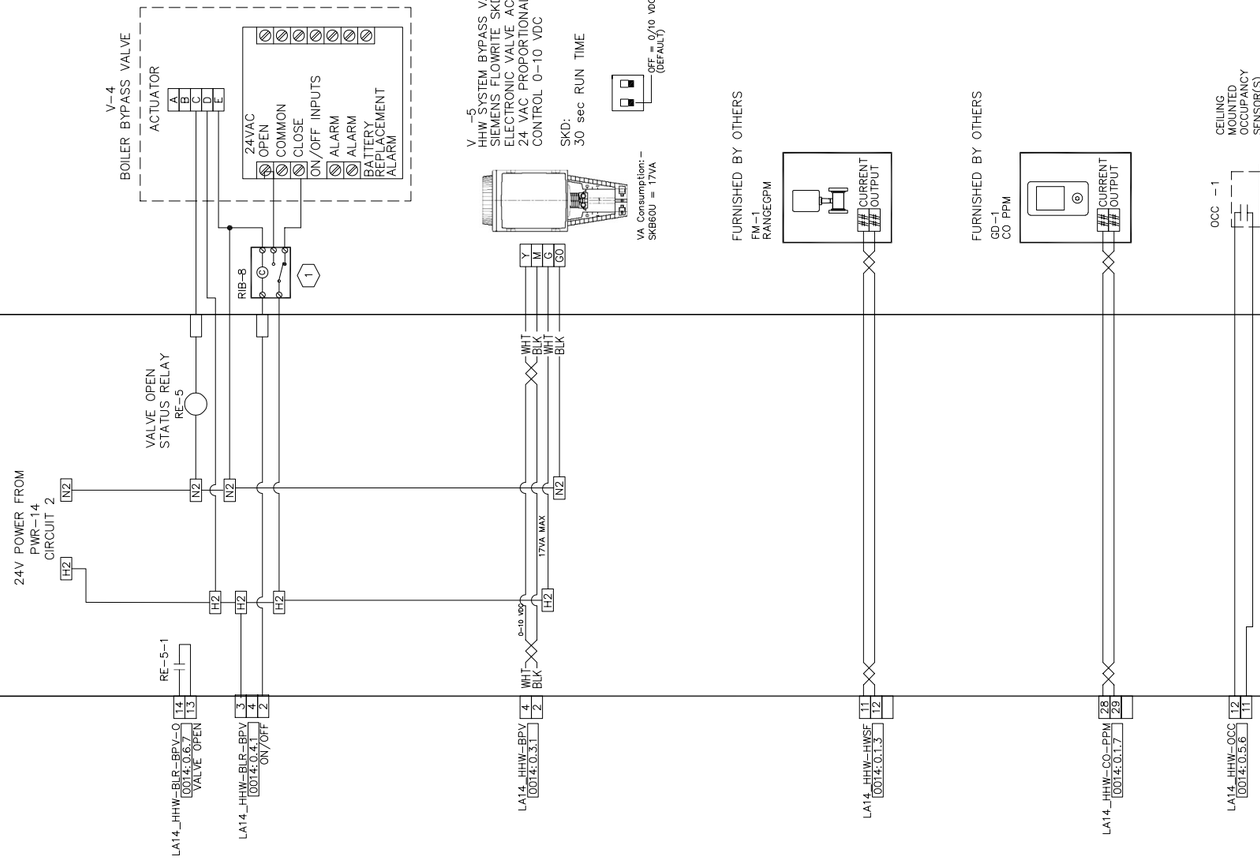
FIELD WIRING

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	

REVISION HISTORY

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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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

HHW SYS ELEC. WIRING 3

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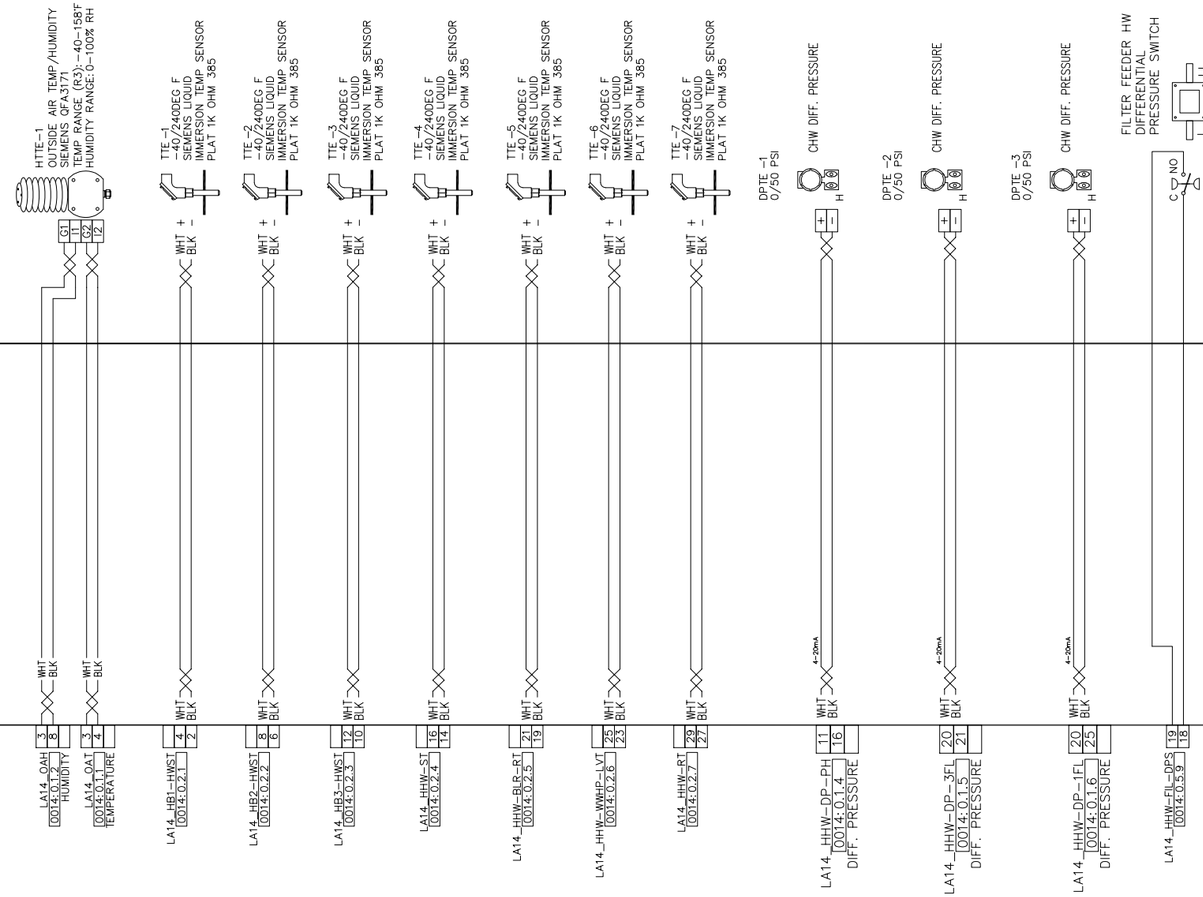
FIELD WIRING | **STARTER WIRING**



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	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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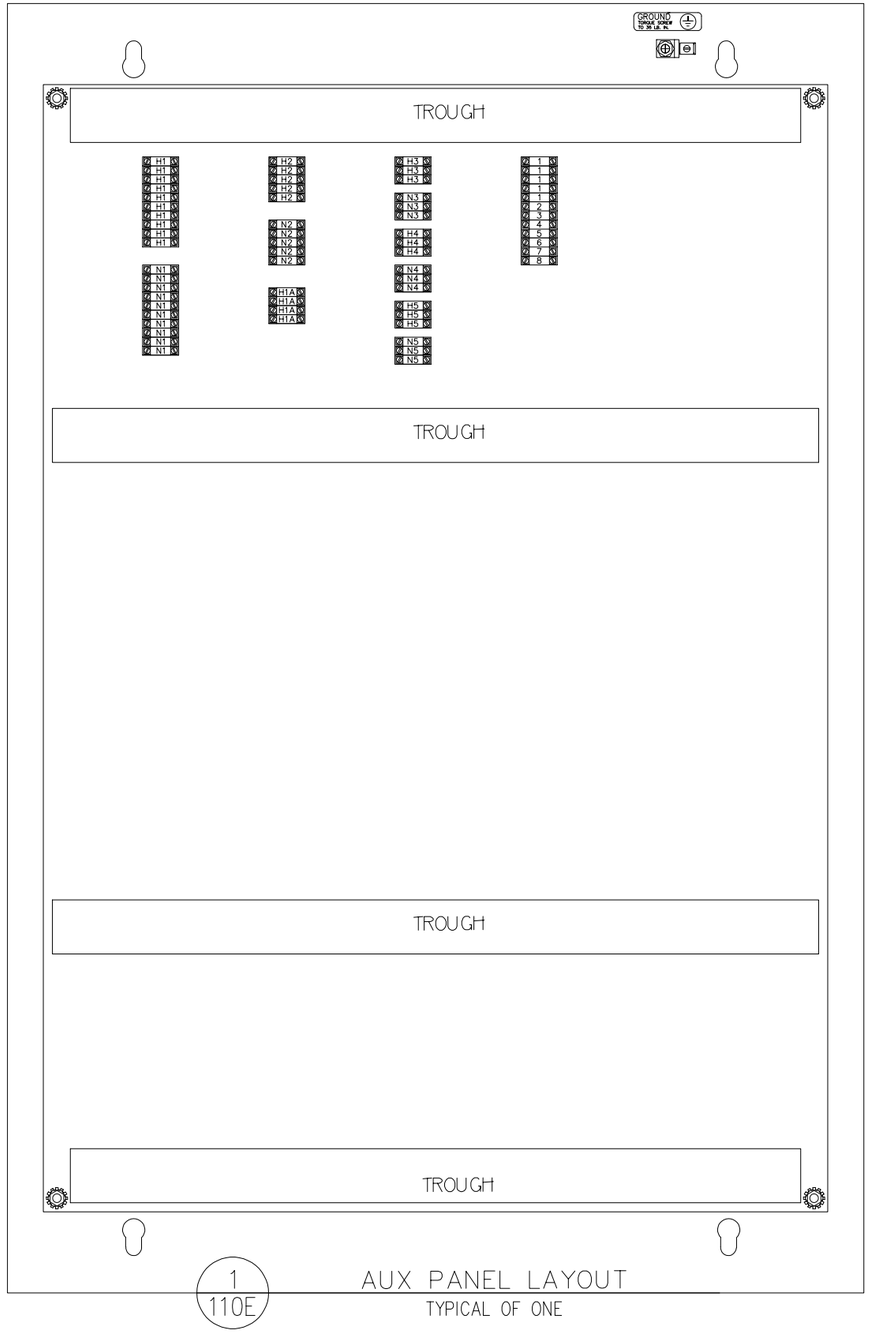

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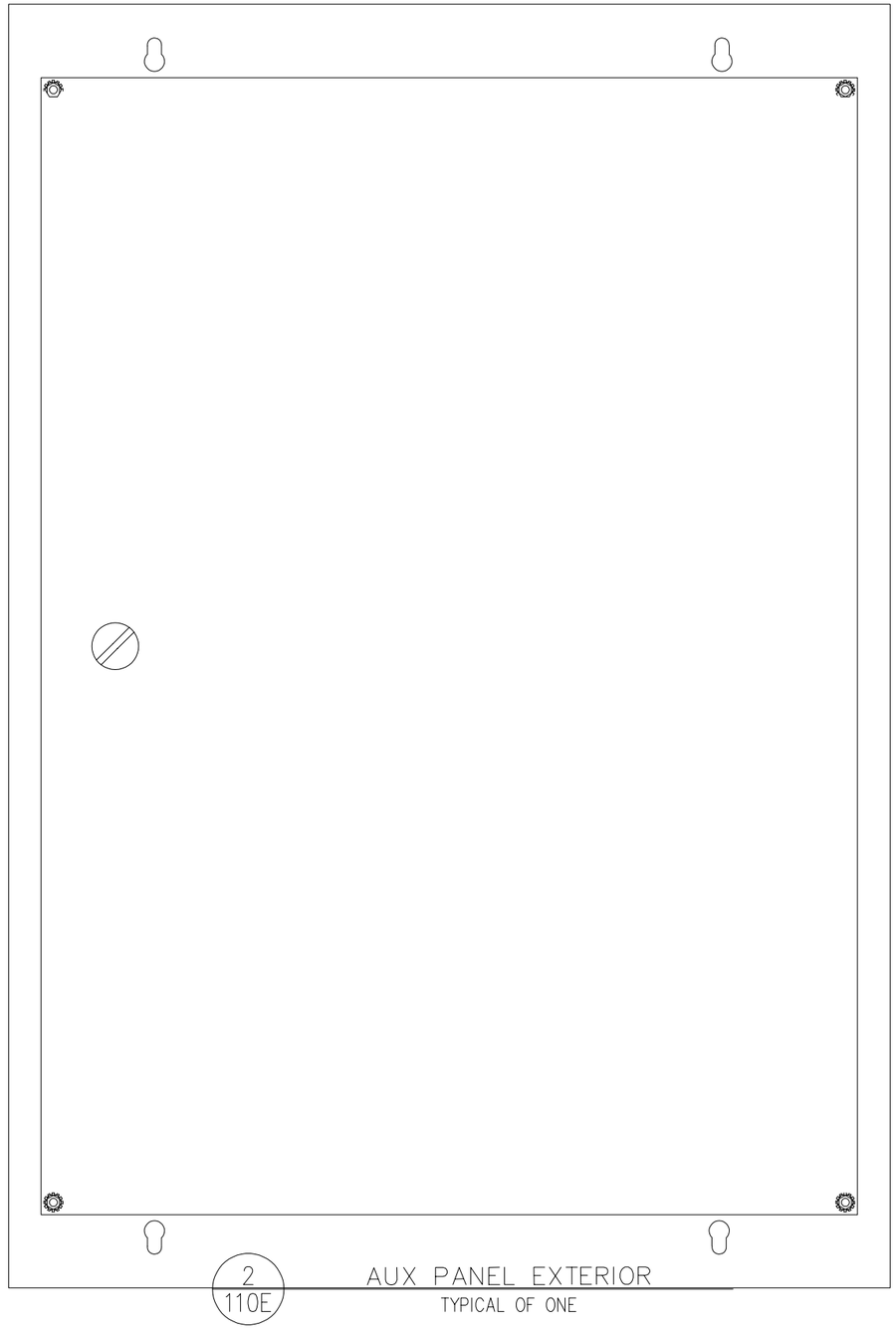
AUX PANEL LAYOUT

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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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

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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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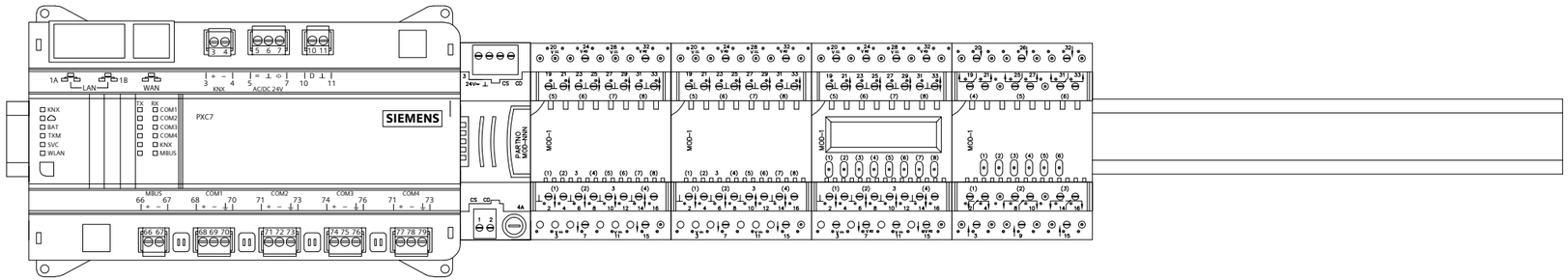
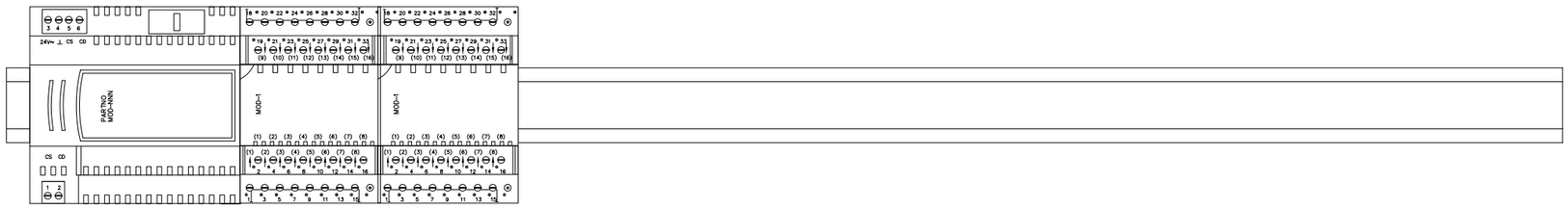
INSTALLATION NOTES:

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

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HHW SYSTEM

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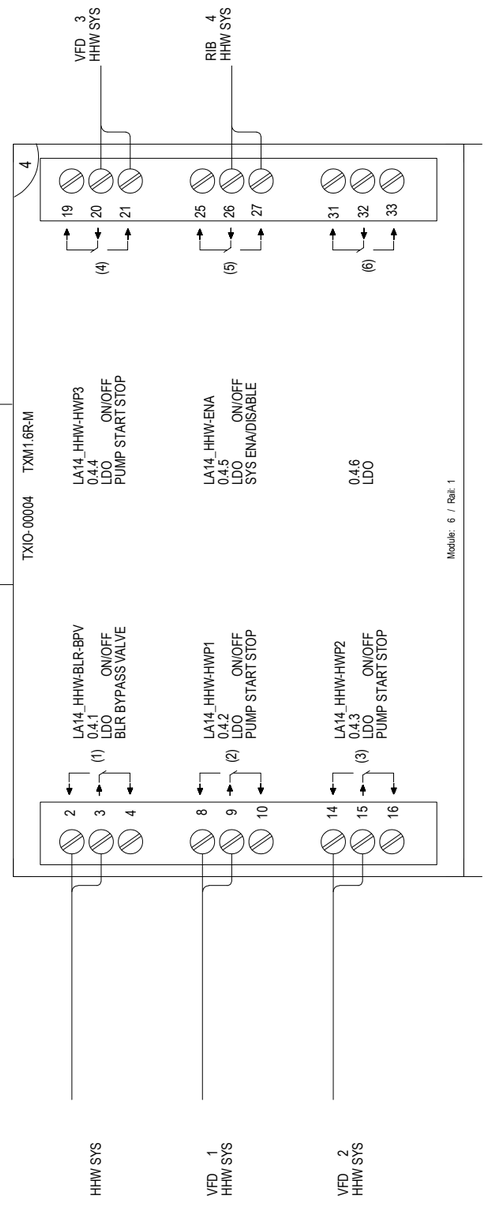

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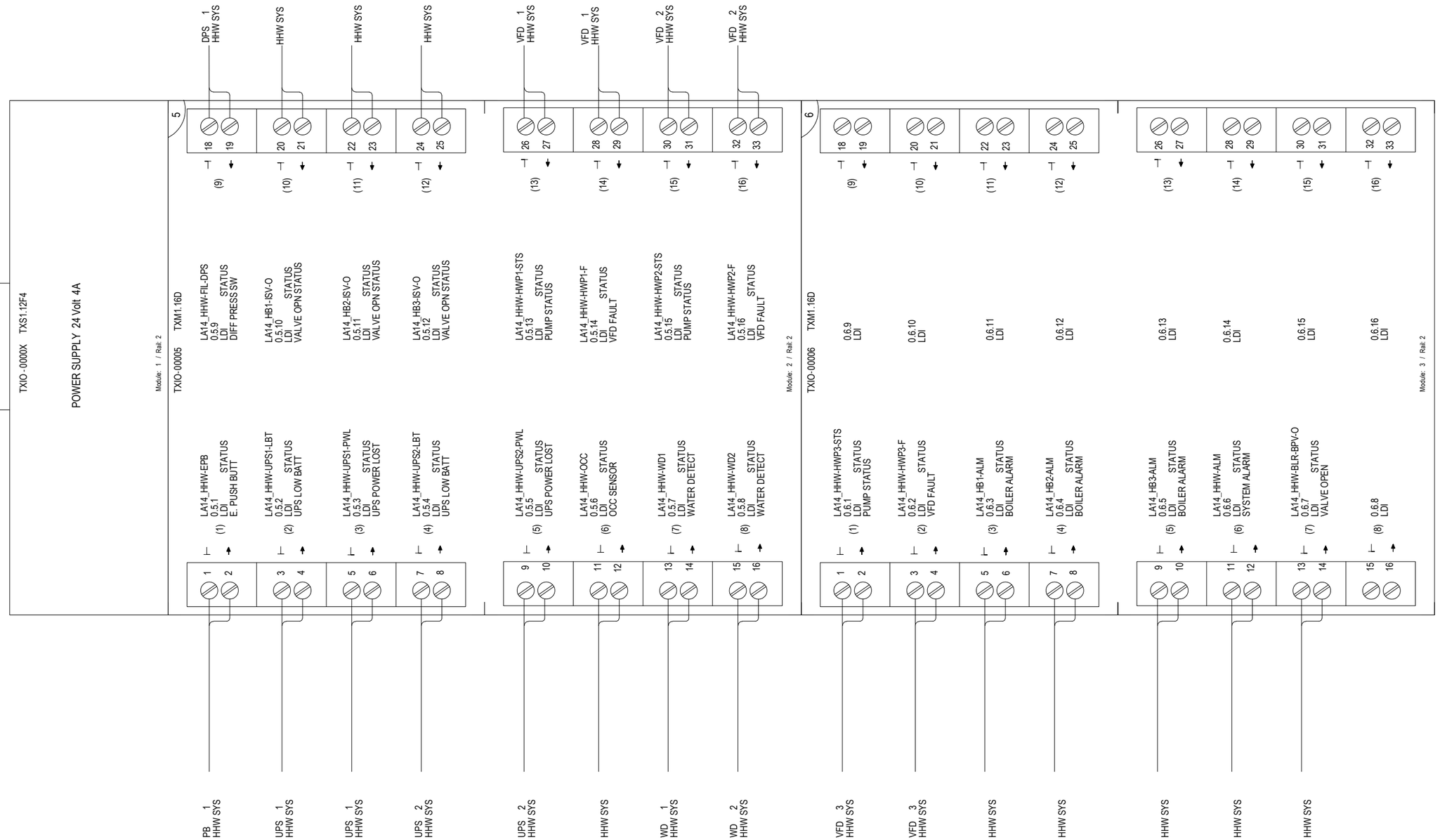
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

LA14.PXCAp003

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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

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

LA14.PXCA BOM

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E110D

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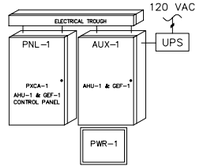
GLOBAL POINT:
OUTSIDE AIR TEMPERATURE: SEE DWG.110
OUTSIDE AIR HUMIDITY: SEE DWG.110

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

SIEMENS INDUSTRY INC.
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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
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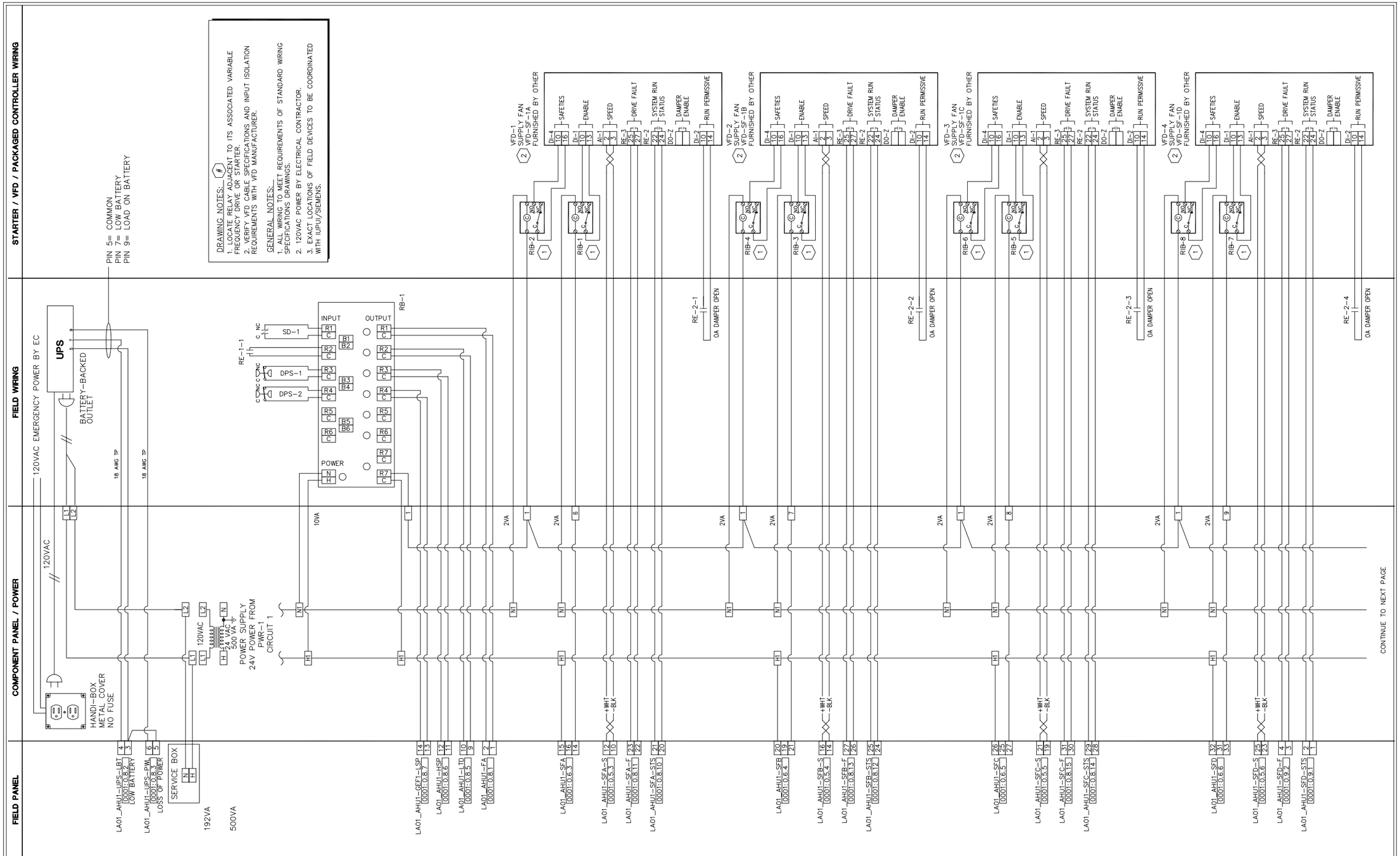

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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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

440P412785
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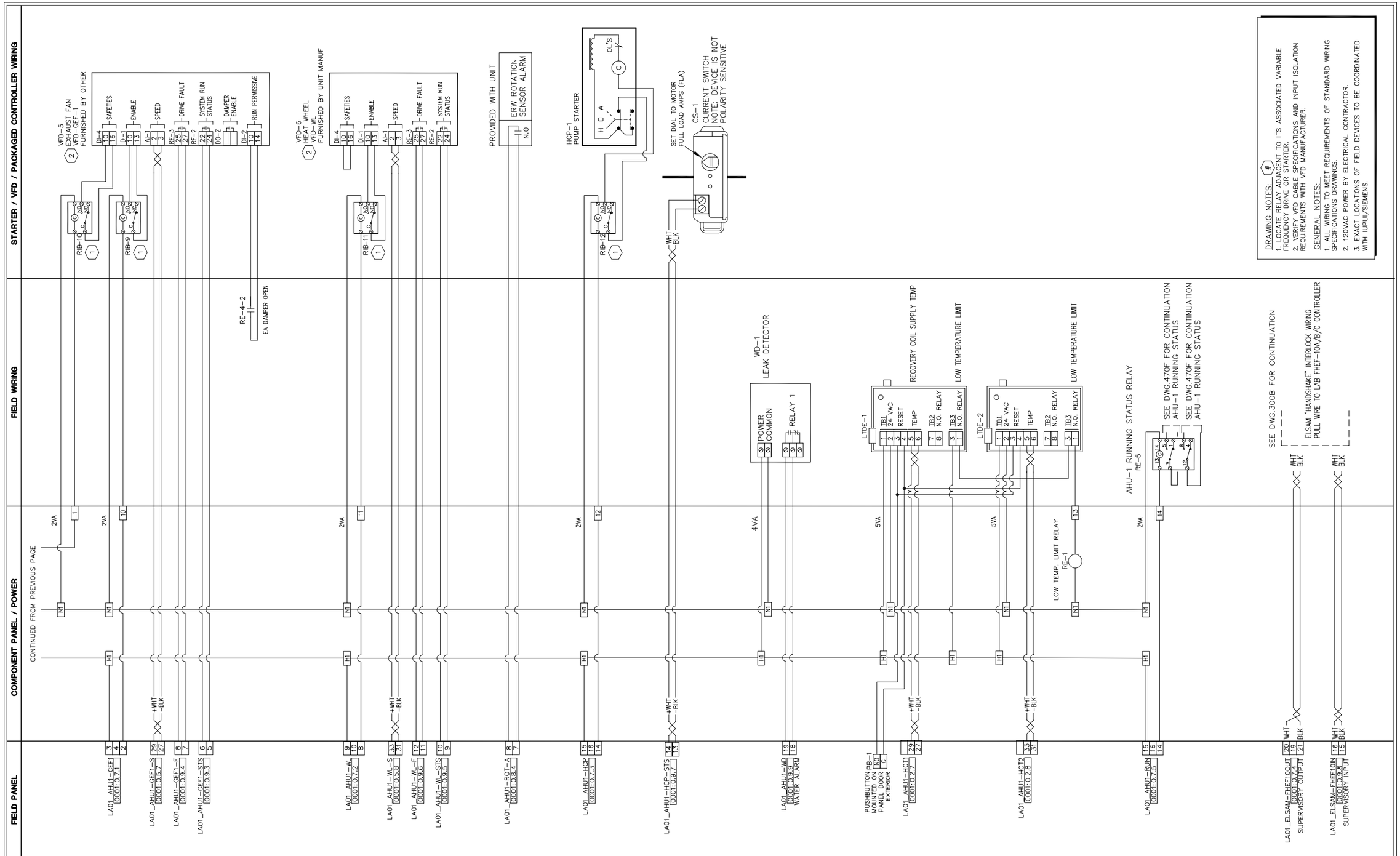

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	LA01.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-1 ELEC WIRING 2

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FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

OUTSIDE AIR DAMPER

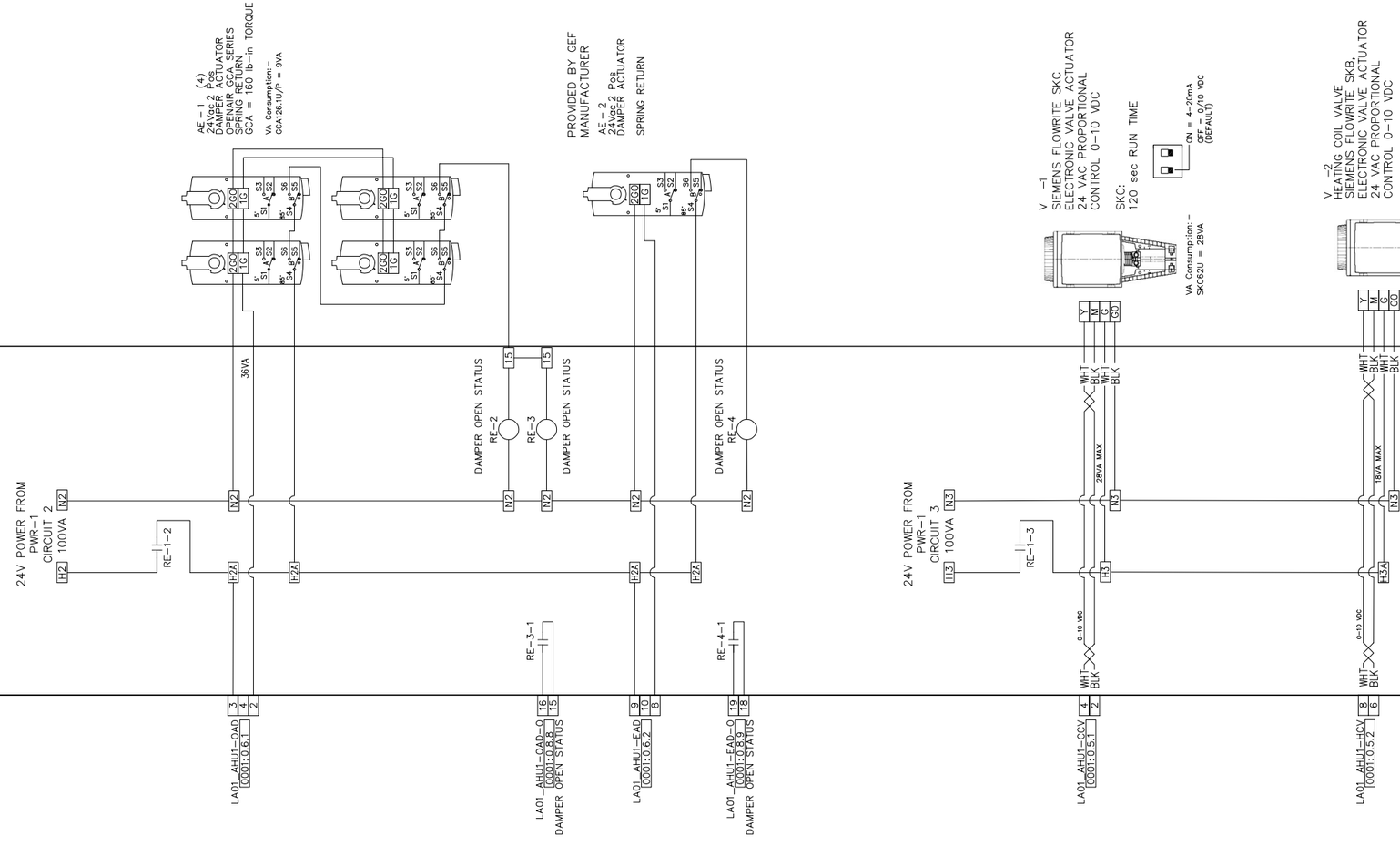
EXHAUST AIR DAMPER

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	

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 ELEC WIRING 3

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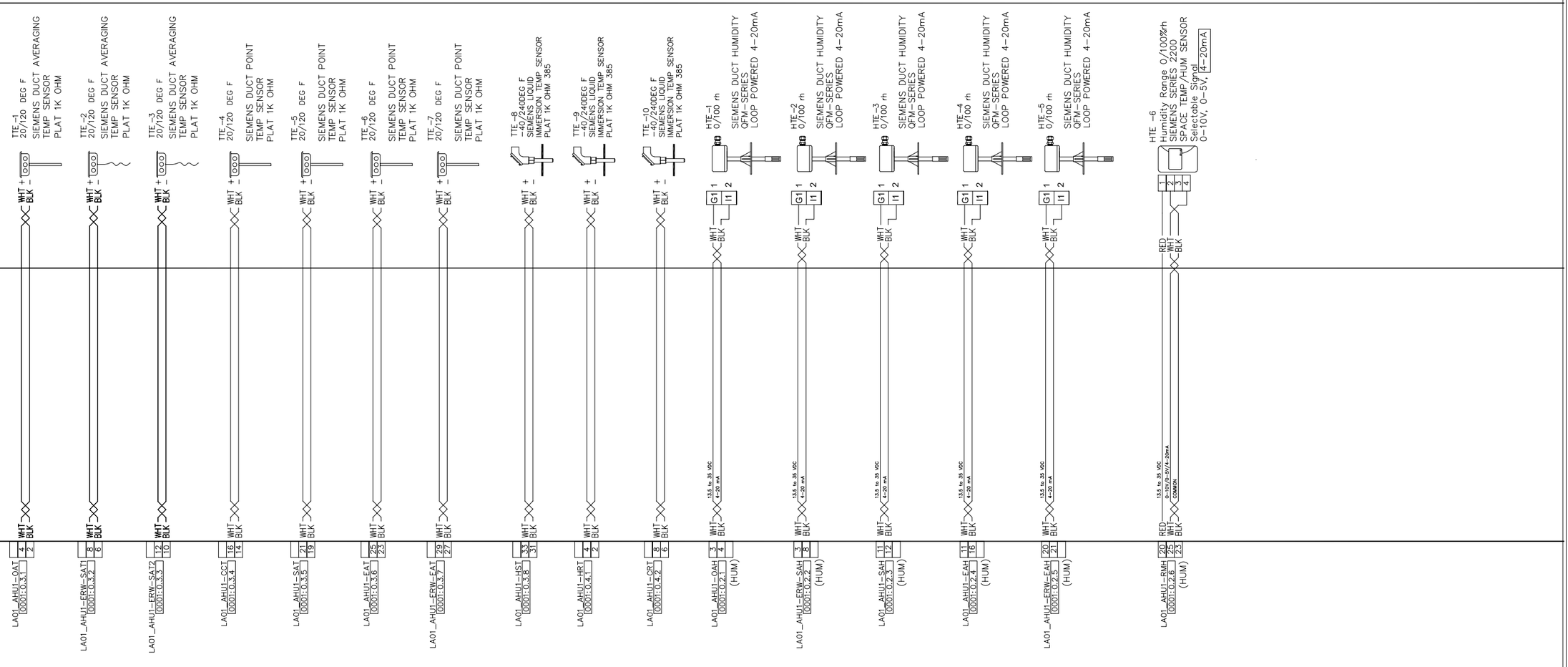
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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
0001	LA01.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

AHU-1 ELEC WIRING 4

440P412785
0
200D

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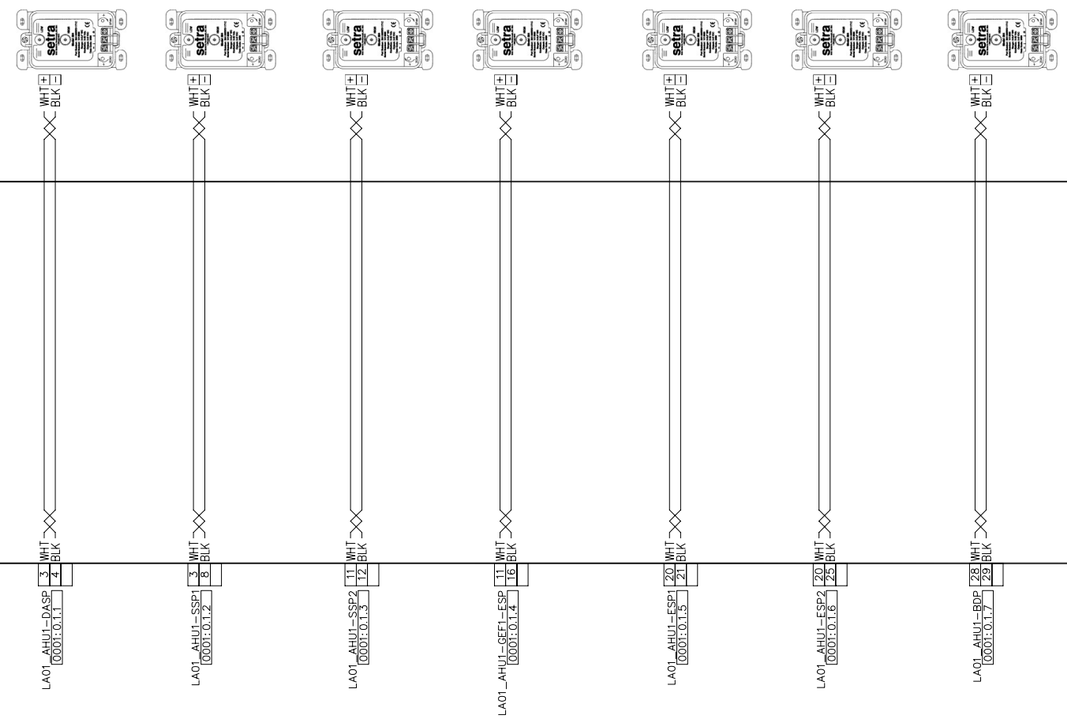
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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

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
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AHU-1 ELEC WIRING 5

440P412785
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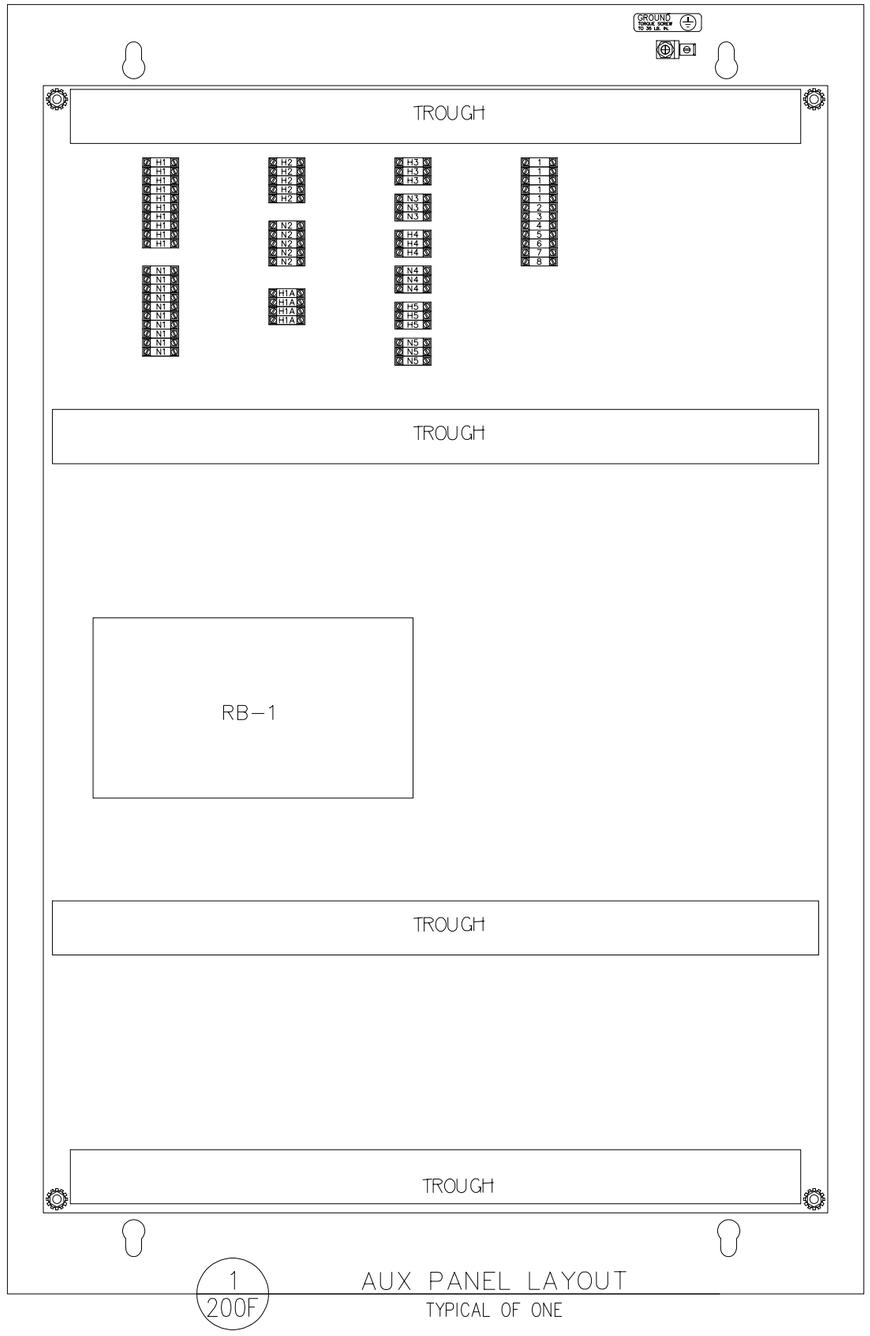
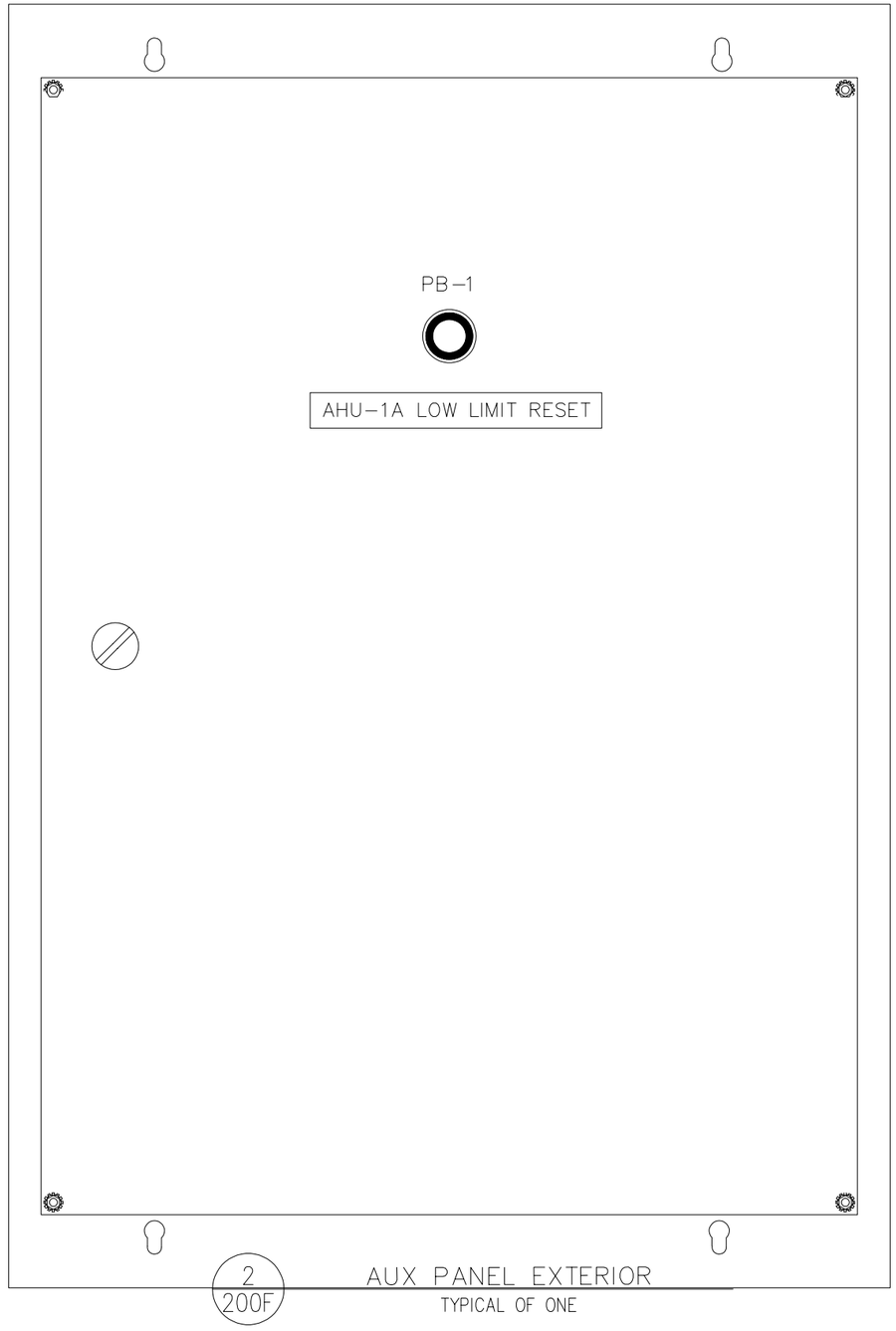


1 200F AUX PANEL LAYOUT
TYPICAL OF ONE



2 200F AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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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

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-1 CONTROL BOM

440P412785
0
200G

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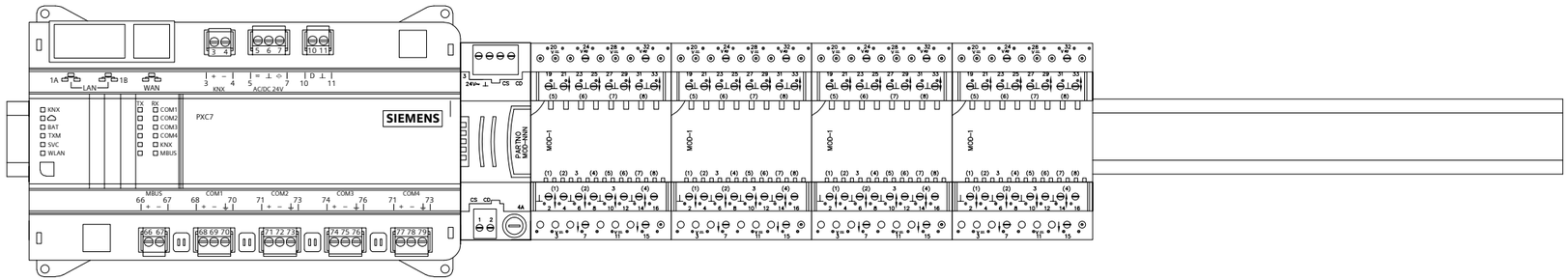
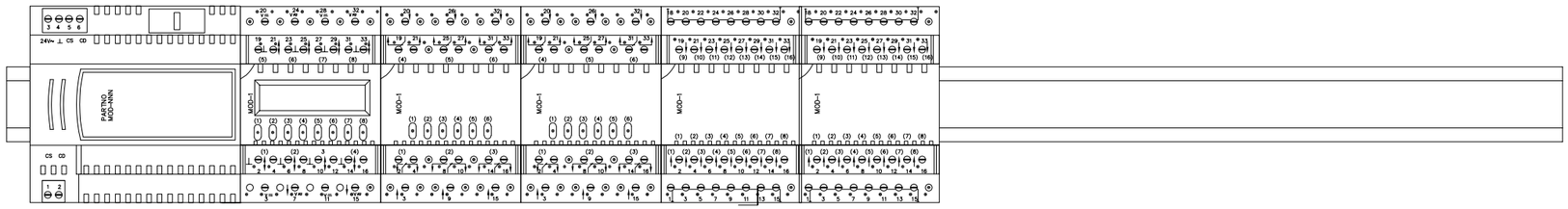
INSTALLATION NOTES:

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

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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

LA01.PXCA INSTALLATION

440P412785
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E200

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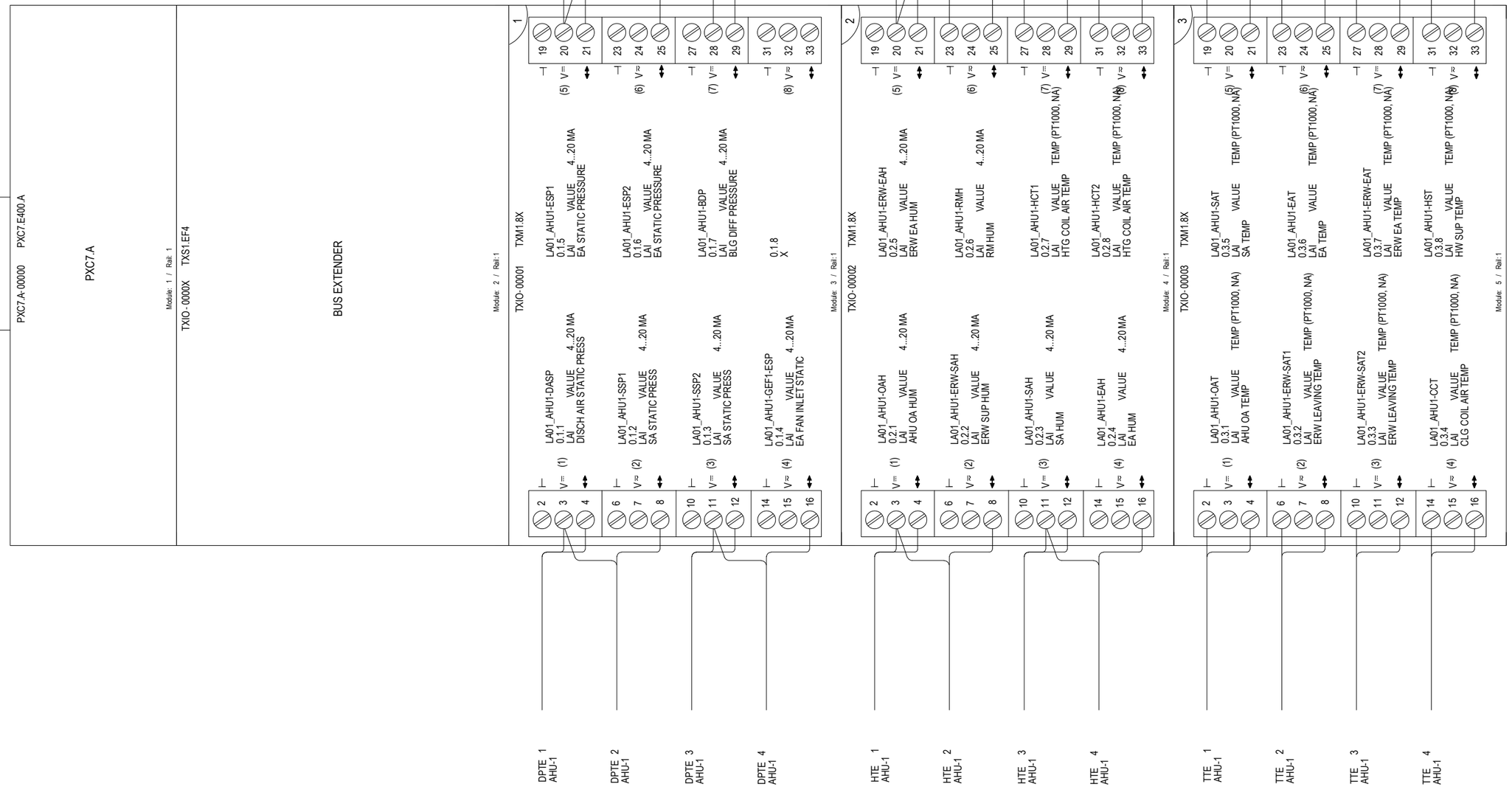
PXC7.A-00000 PXC7.E400.A

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
HB	HB	KR	04/02/26	04/02/26

AHU-1 & GEF-1

440P412785
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E200A

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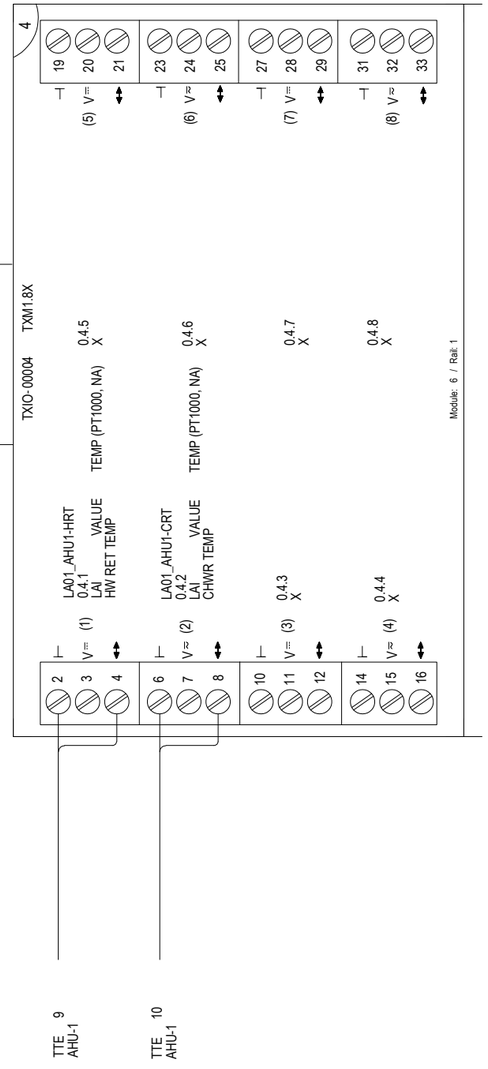

REVISION HISTORY

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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

LA01.PXCAp002

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0
E200B

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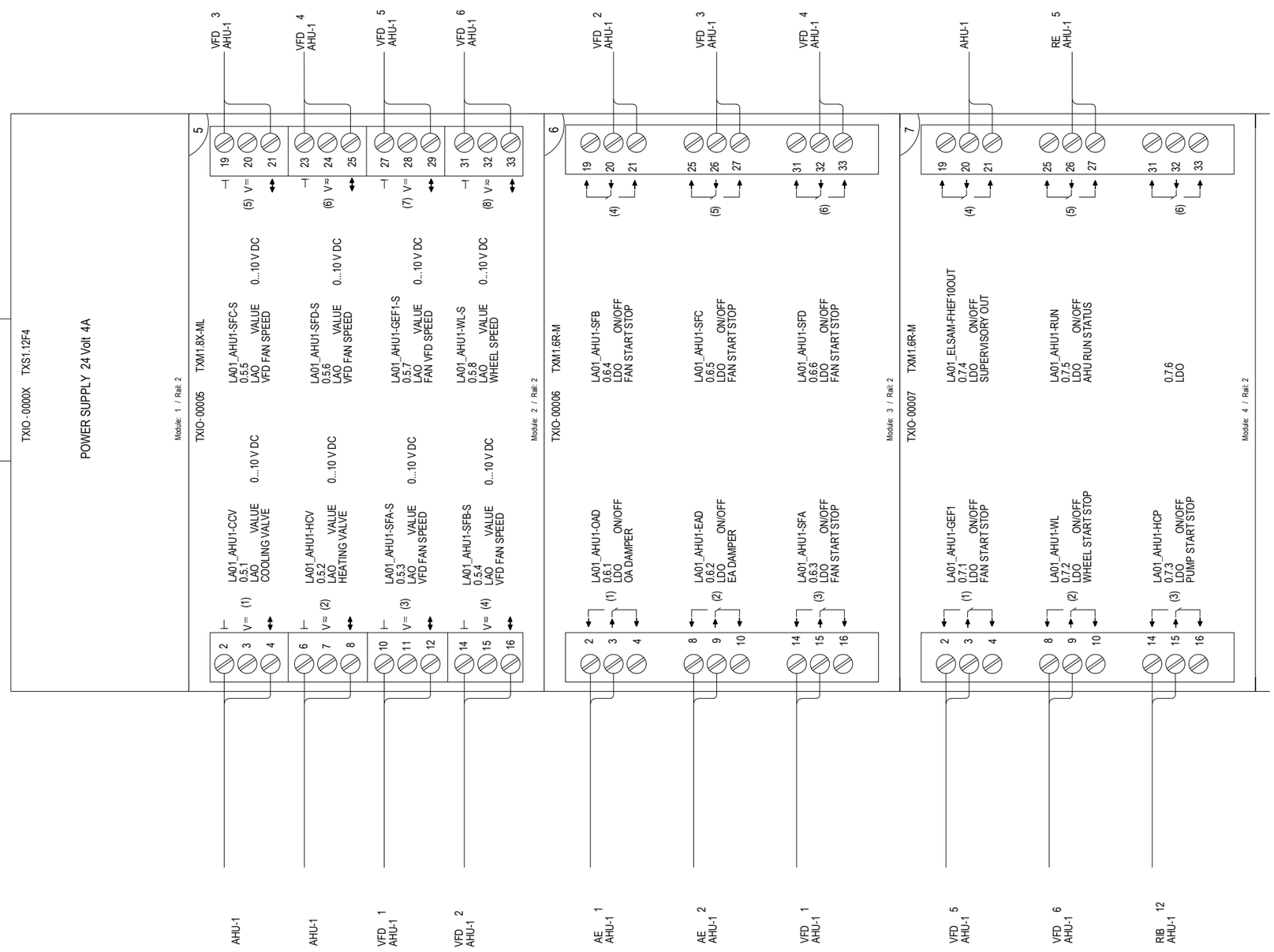
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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

LA01.PXCAp003

440P412785
0
E200C

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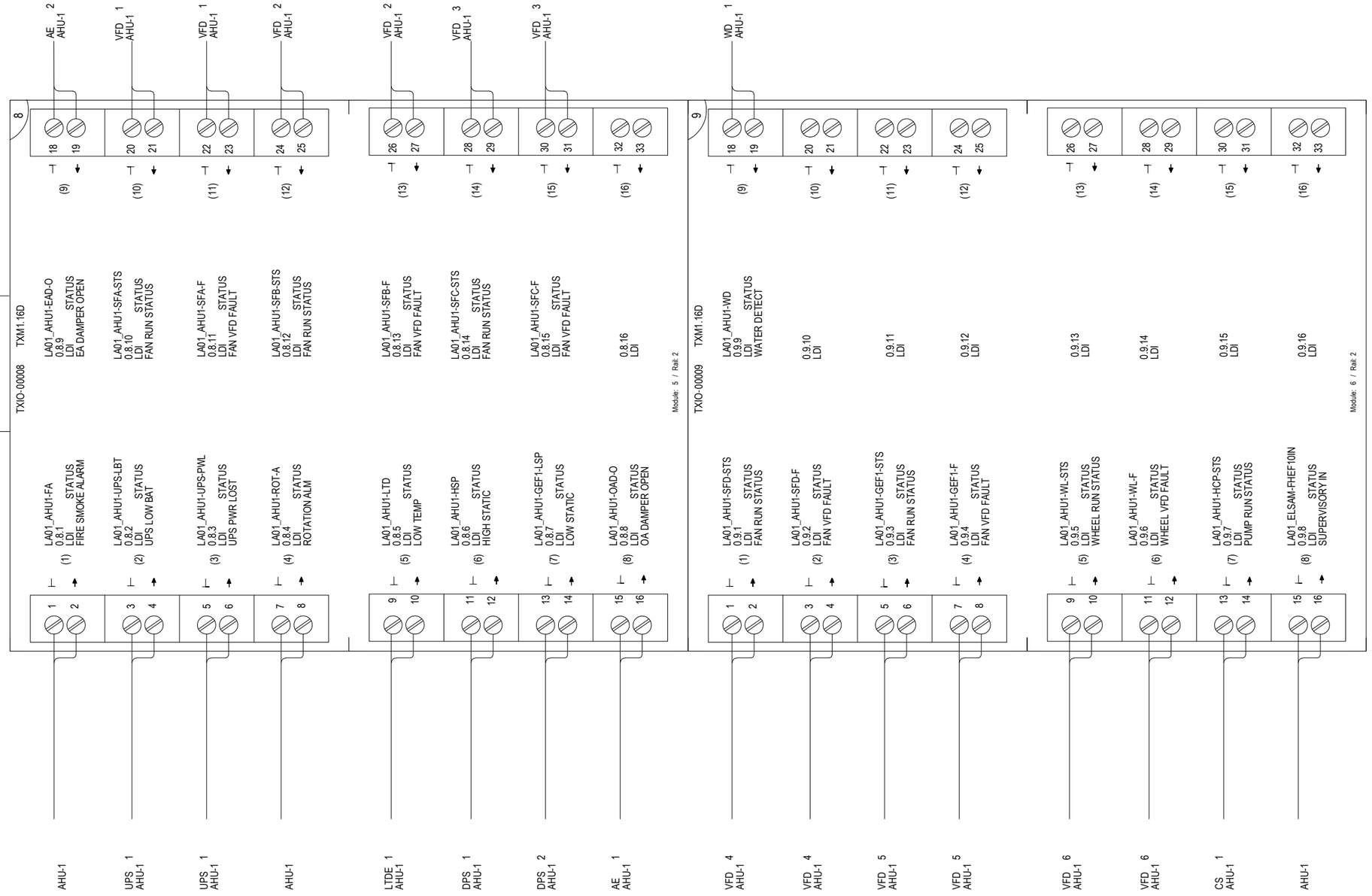

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA01.PXCAp004

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E200D

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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

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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LA01.PXCA BOM

440P412785
0
E200E

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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

SIEMENS

3602 WOODVIEW TRACE
SUITE 240
INDIANAPOLIS, IN 46268
UNITED STATES
PHONE 317-208-8980
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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

00	4/2/2026	HB	SUBMITTAL SET

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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	

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

AHU-2 ELEC WIRING 1

440P412785
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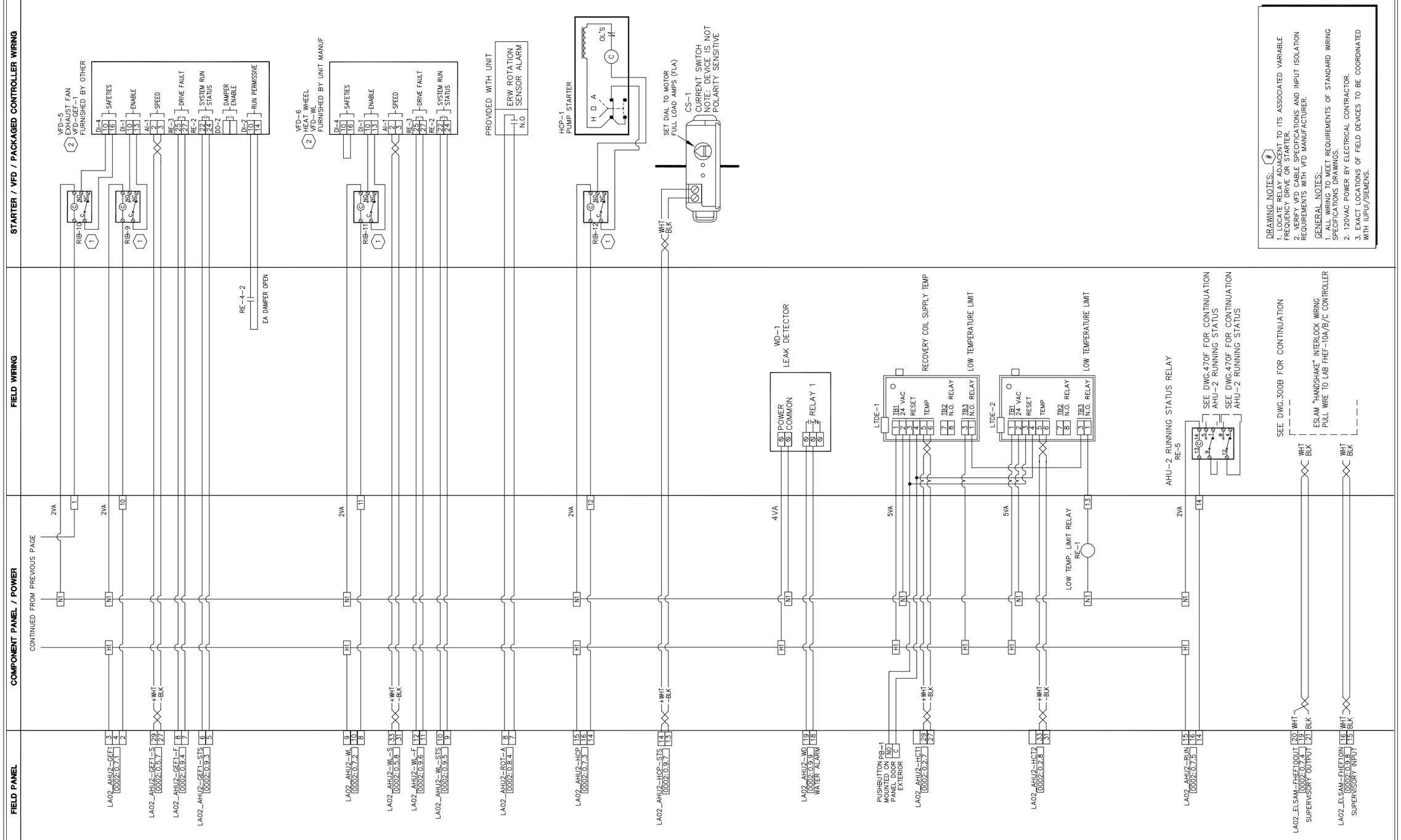

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-2 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–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

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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-2 ELEC WIRING 3

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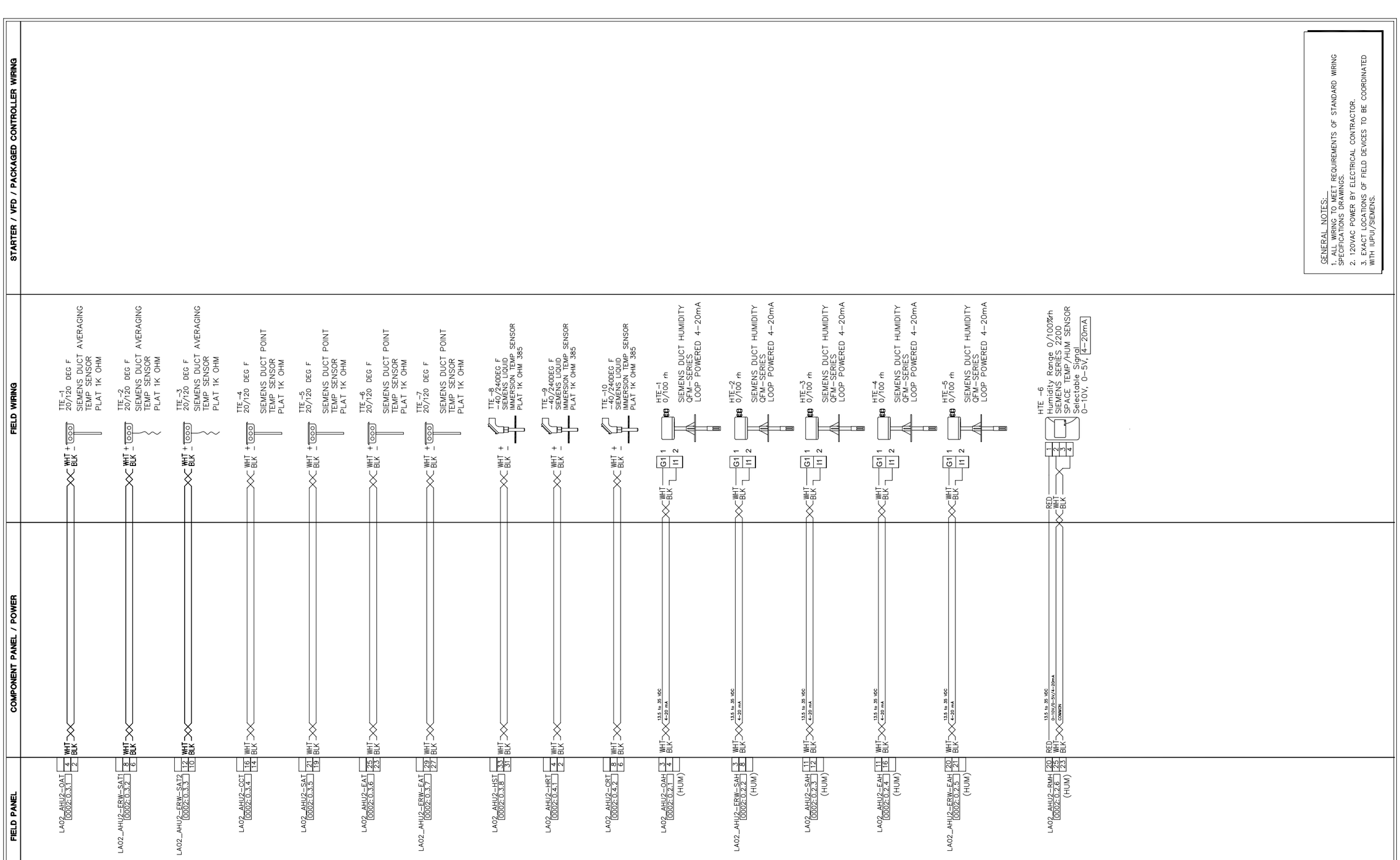

GENERAL NOTES:
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	LA02.PXCA	

REVISION HISTORY

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AHU-2 ELEC WIRING 4

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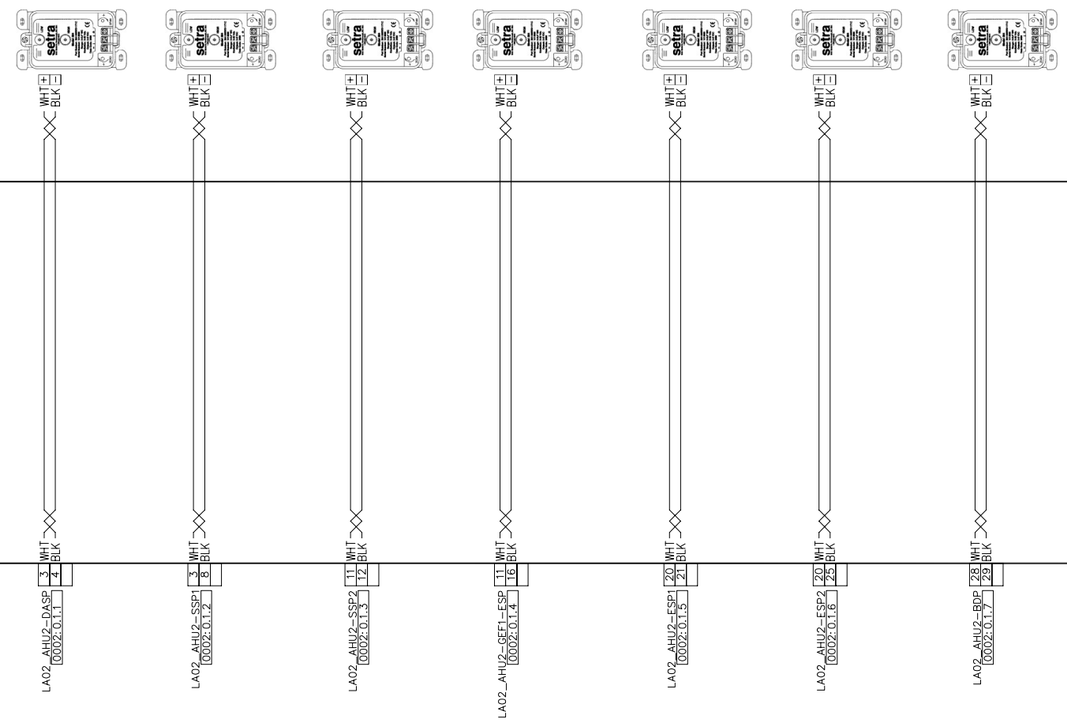
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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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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 5

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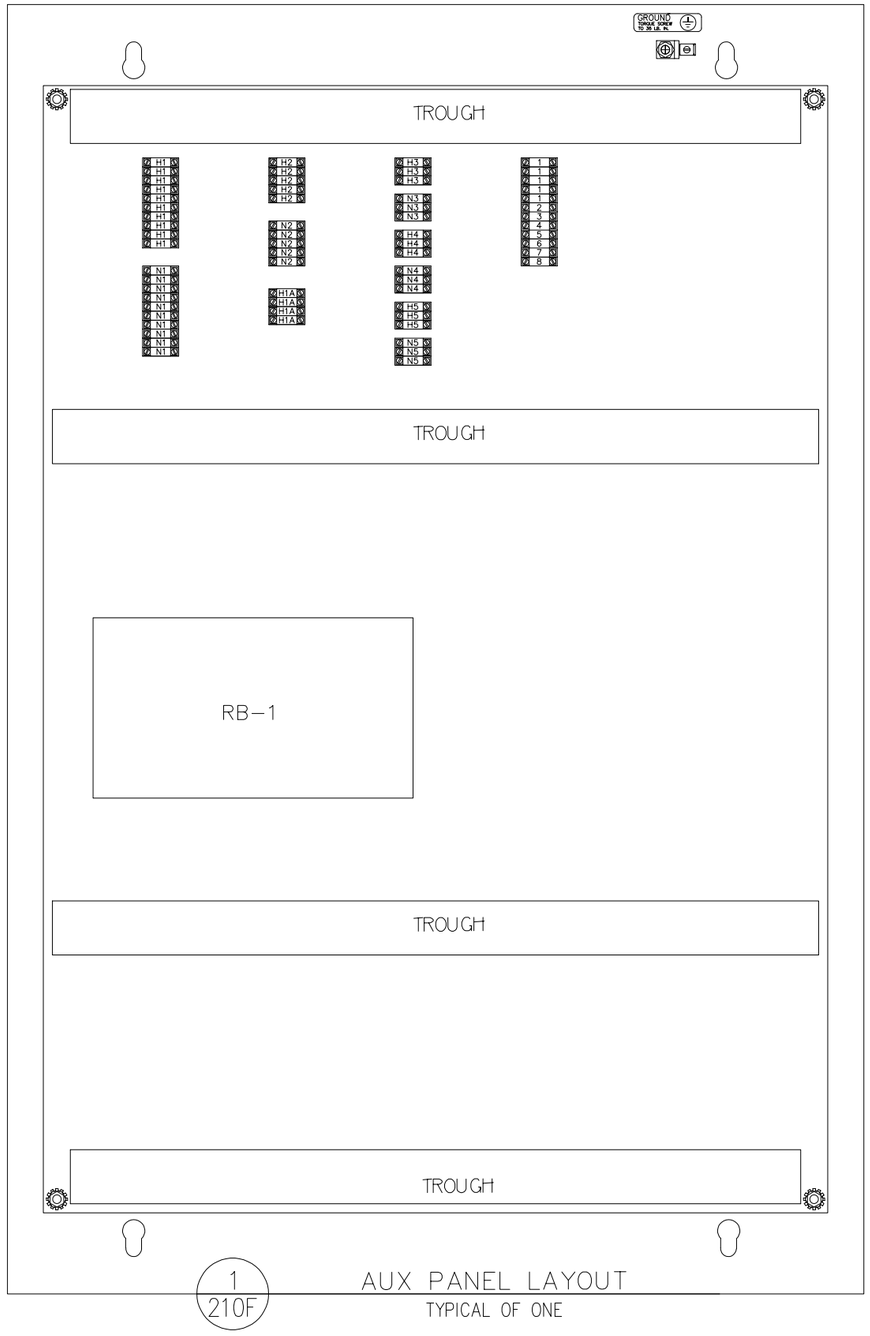

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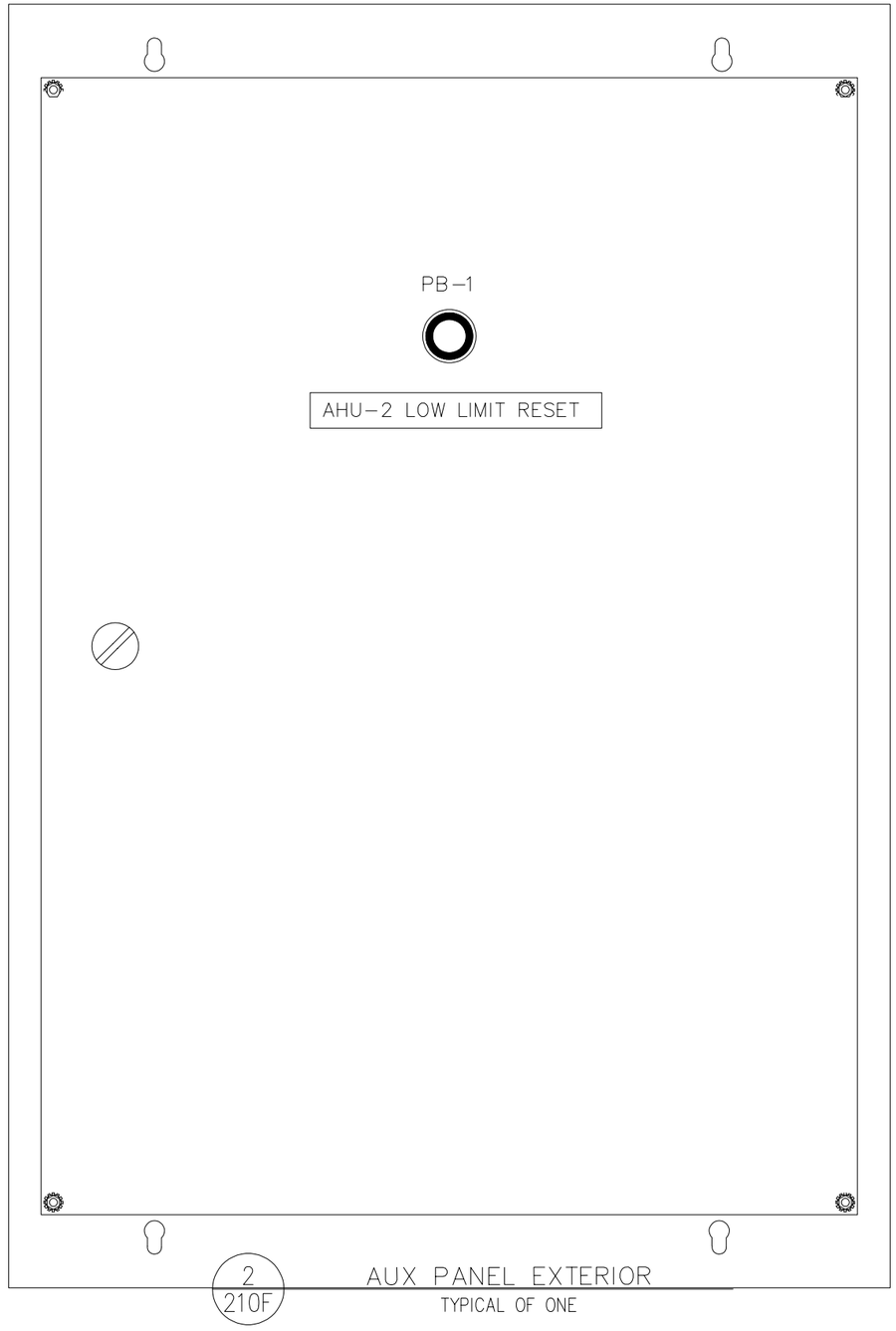
AUX PANEL LAYOUT

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 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 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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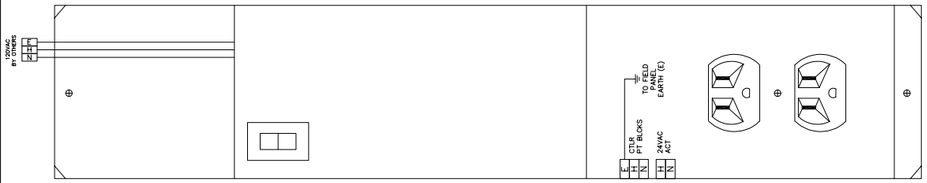
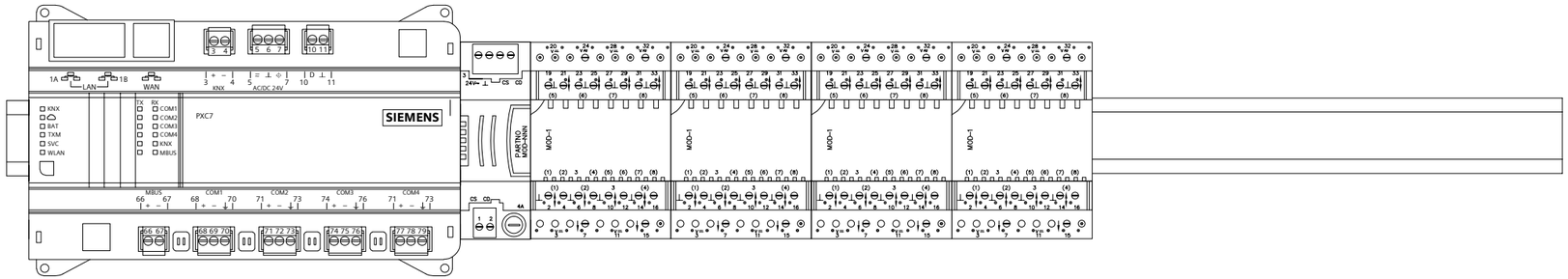
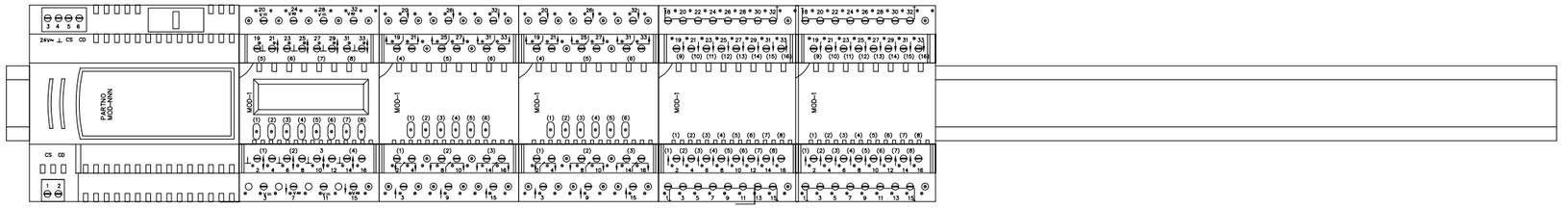
INSTALLATION NOTES:

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			
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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LA02.PXCA INSTALLATION

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PXC7.A-00000 PXC7.E400.A

PXC7.A

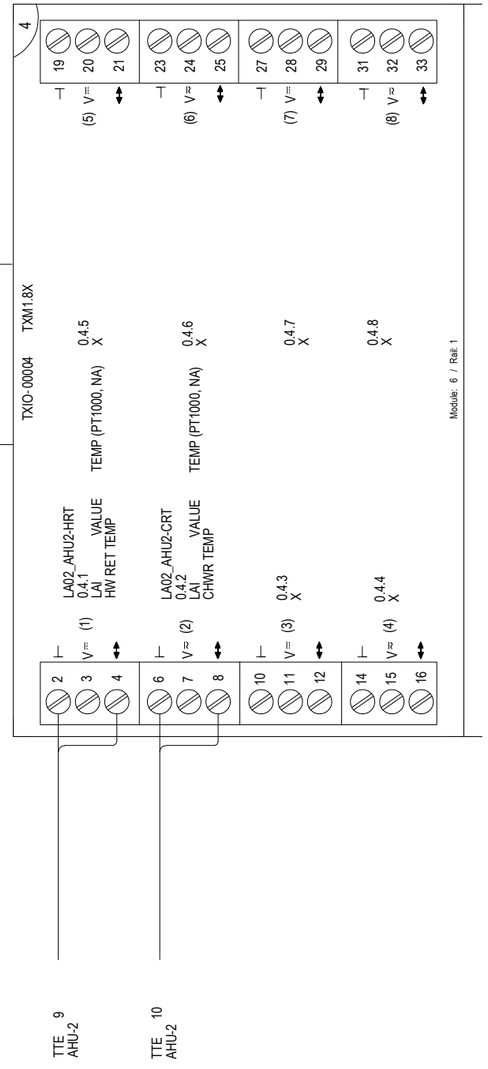
Module: 1 / Rail: 1

TXIO - 0000X TXS1.EF4

BUS EXTENDER

Module: 2 / Rail: 1

TXIO- 00001 TXM1.8X



REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA02.PXCAp002

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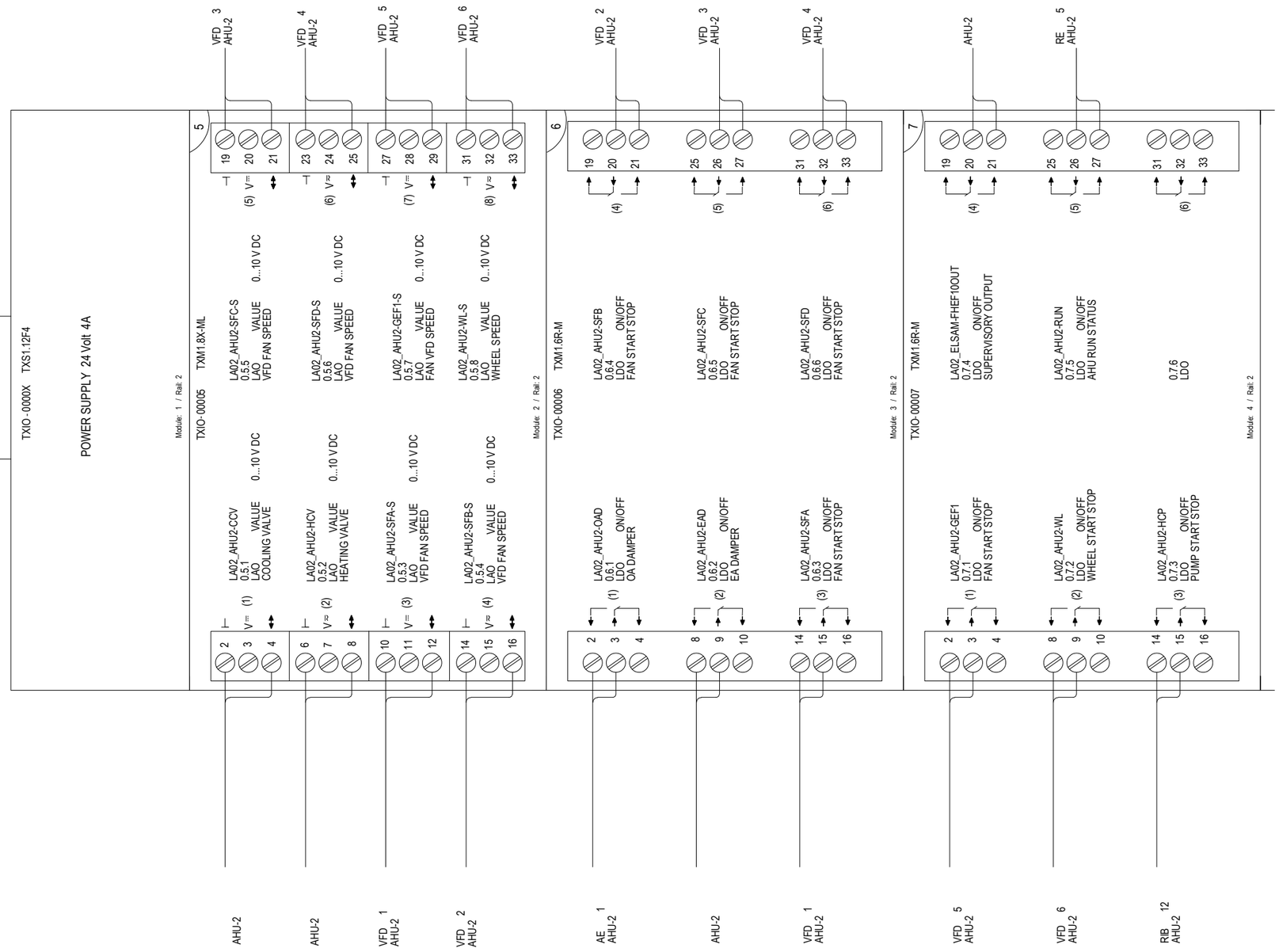
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



REVISION HISTORY

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LA02.PXCAp003

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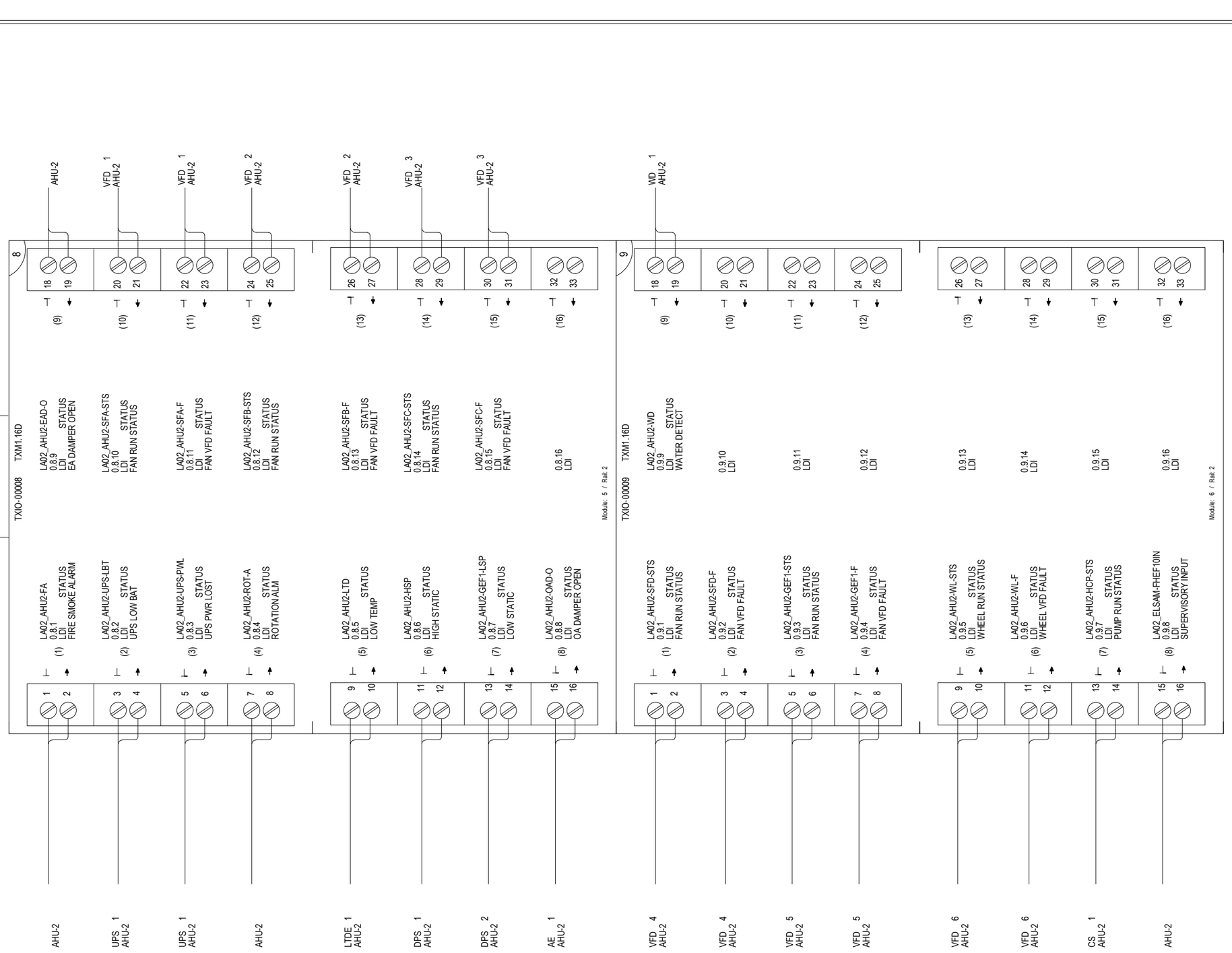

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LA02.PXCAp004

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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

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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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220

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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

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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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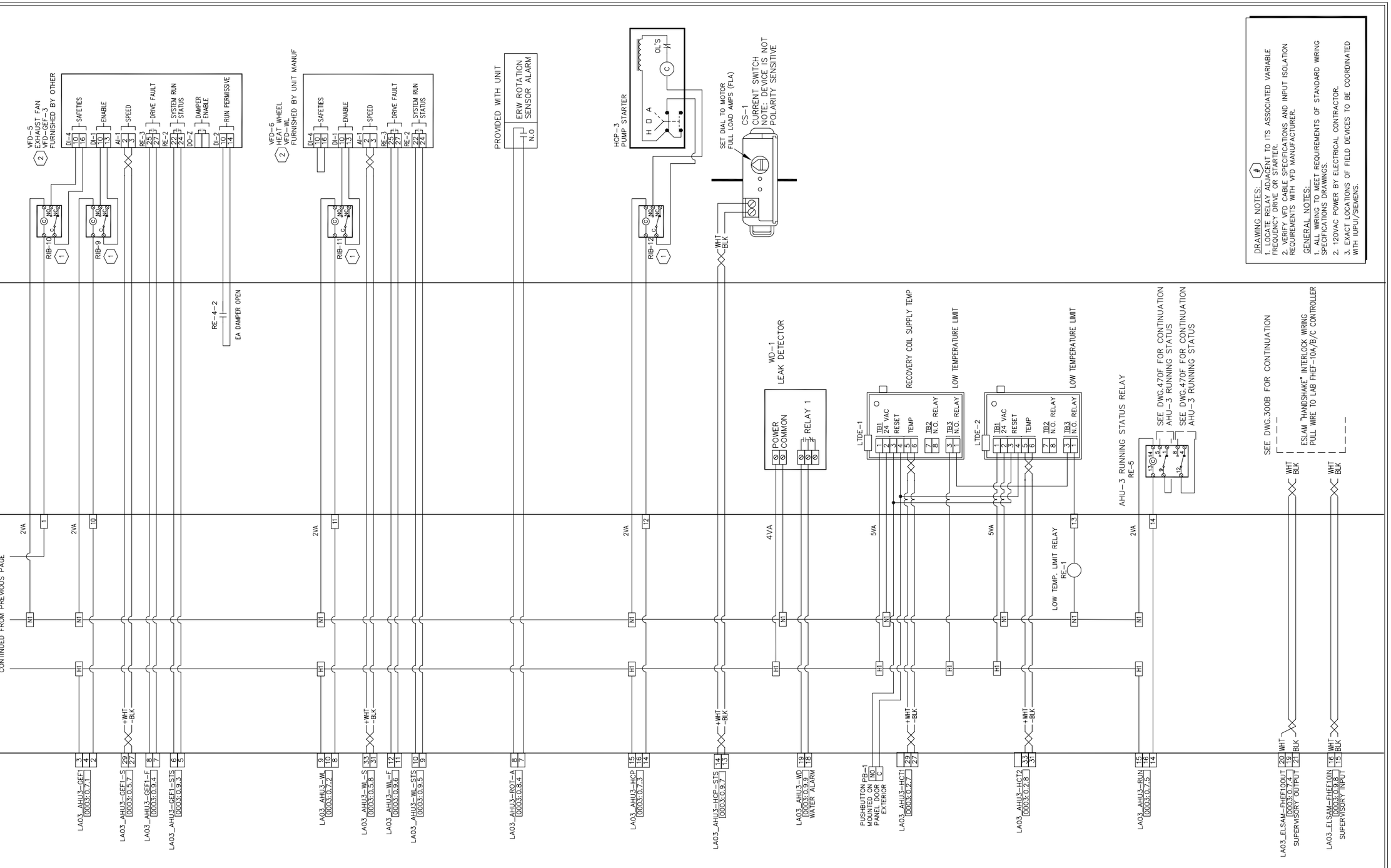
FIELD WIRING

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

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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 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

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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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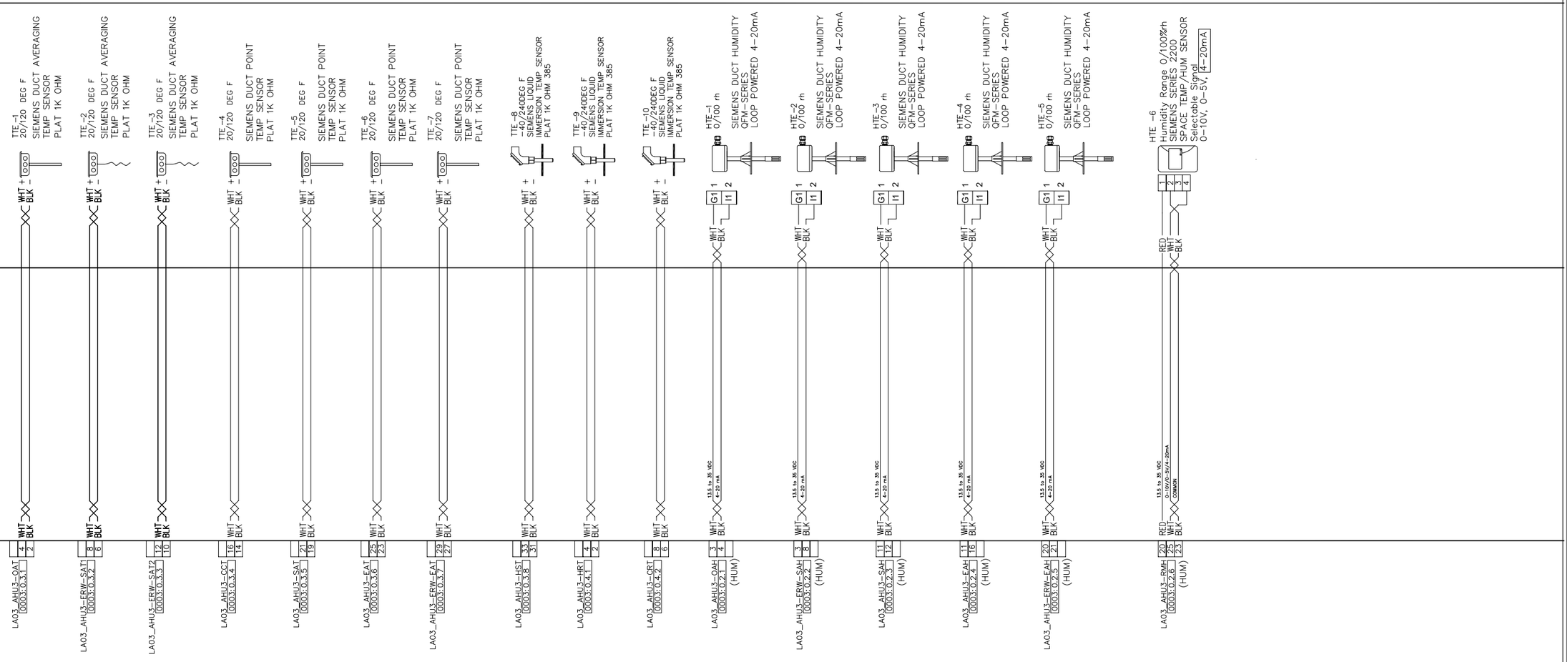
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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	

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AHU-3 ELEC WIRING 4

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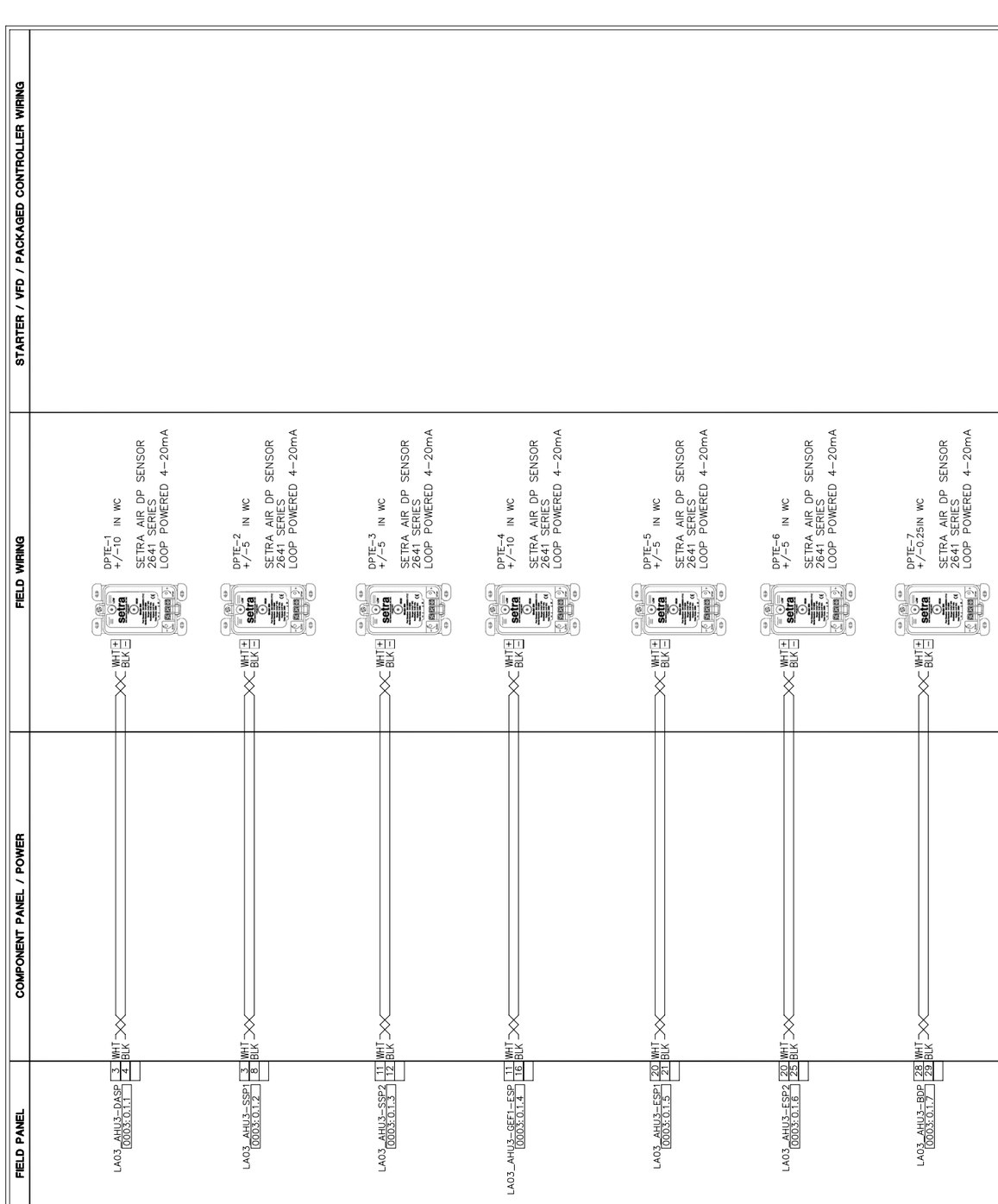

GENERAL NOTES:
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

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

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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AHU-3 ELEC WIRING 5

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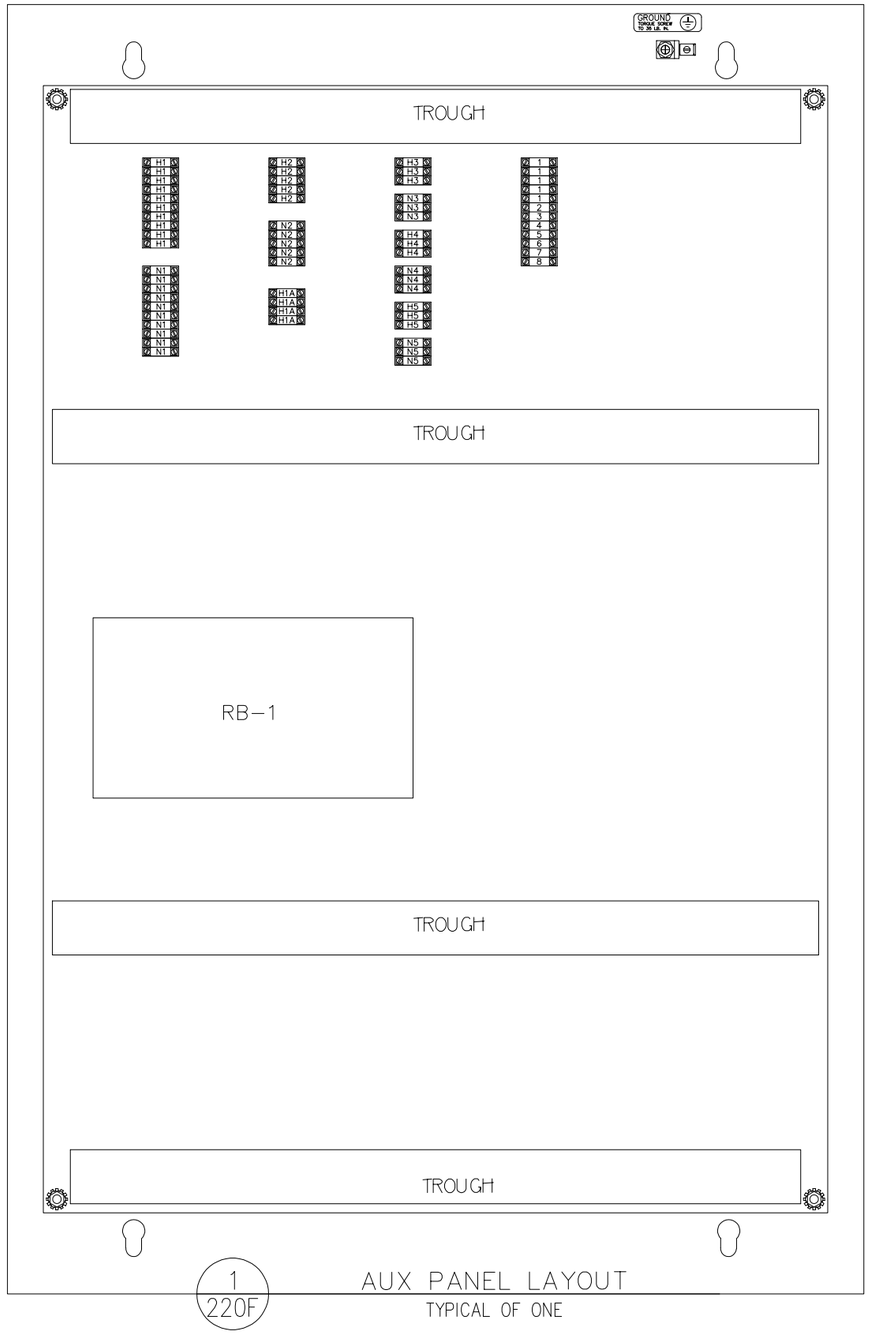

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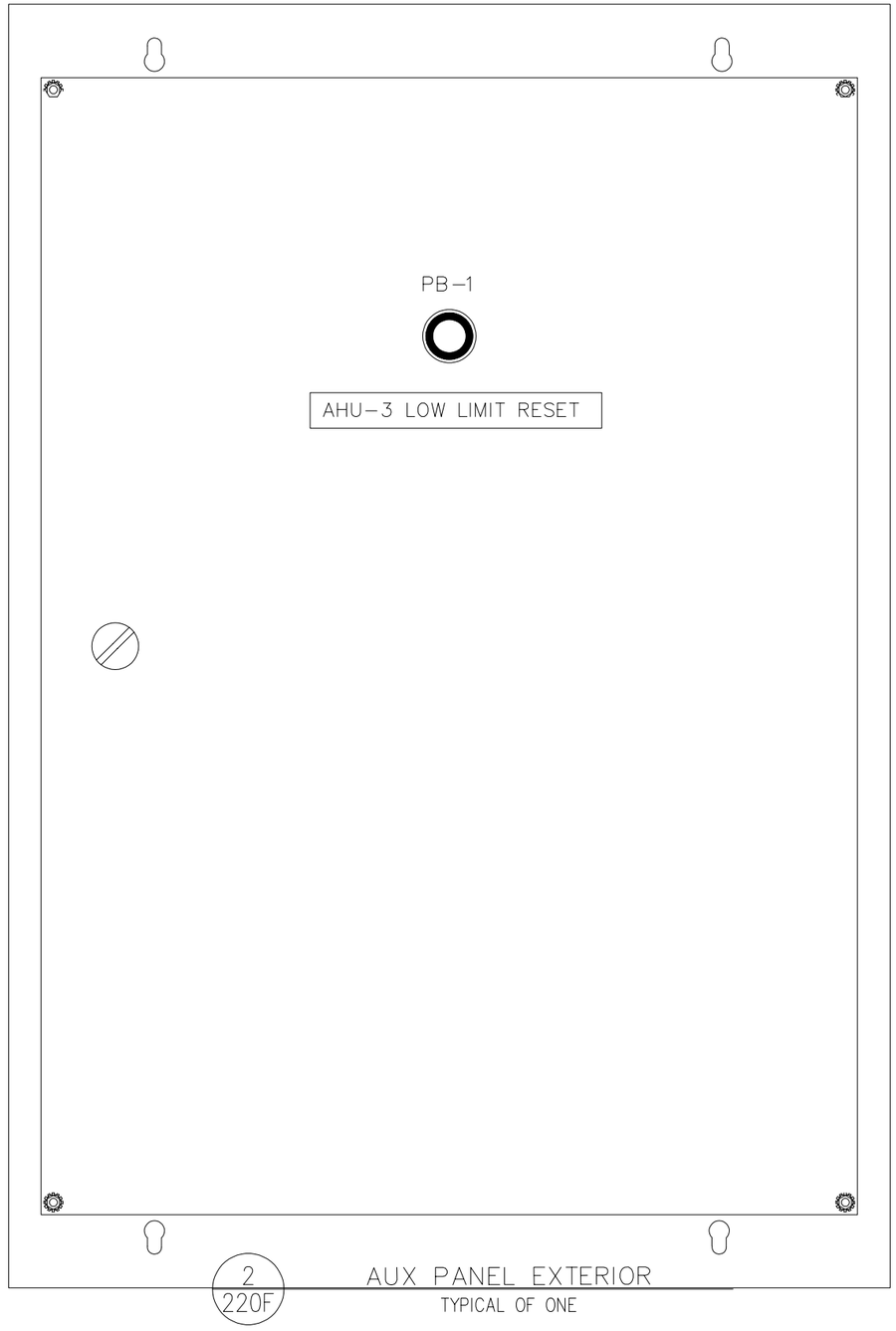
AUX PANEL LAYOUT

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

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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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-3 CONTROL BOM

440P412785
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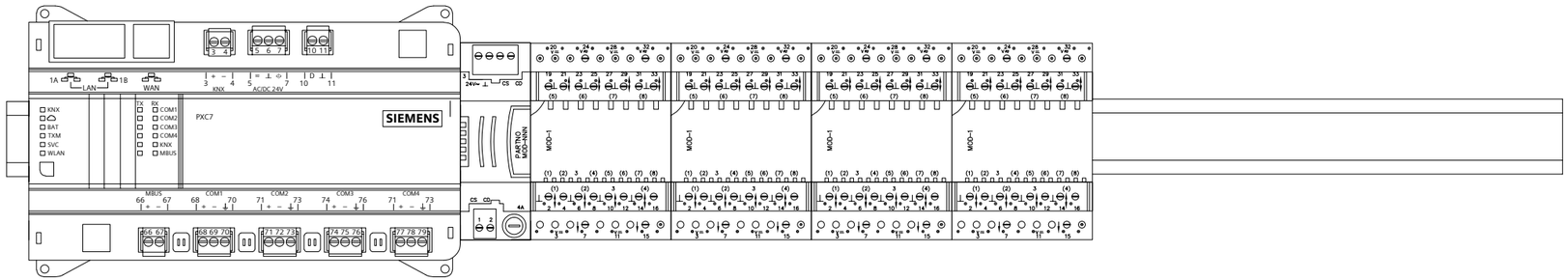
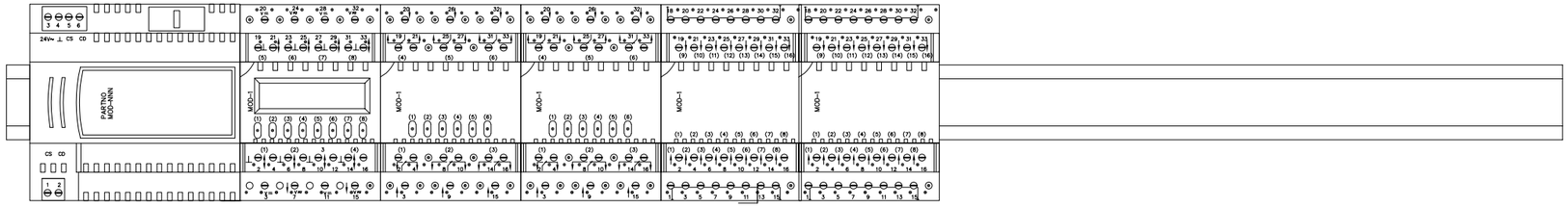
INSTALLATION NOTES:

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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IU# 20250072, IN

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LA03.PXCA INSTALLATION

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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.PXCA BOM

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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

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

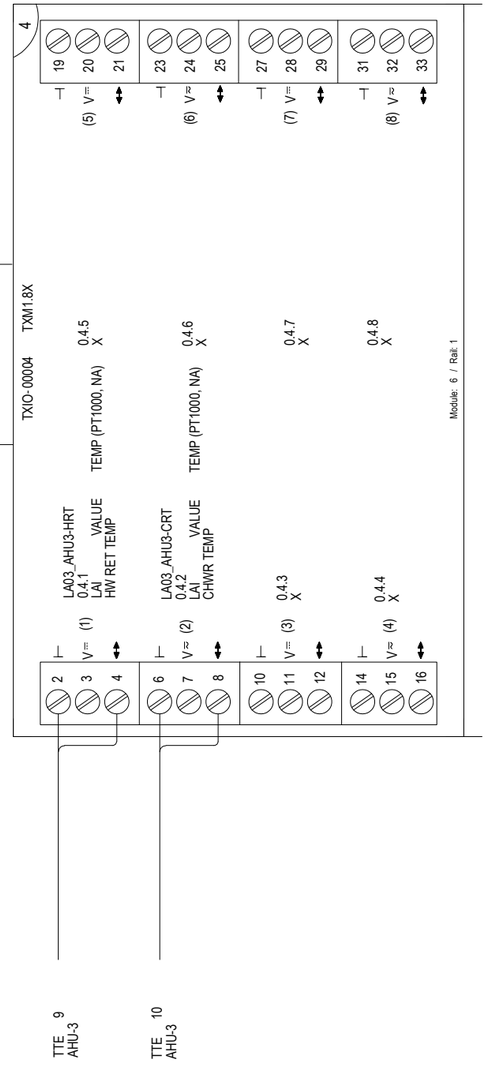
TTE 1 AHU-3
TTE 2 AHU-3
TTE 3 AHU-3
TTE 4 AHU-3

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



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

LA03.PXCAp002

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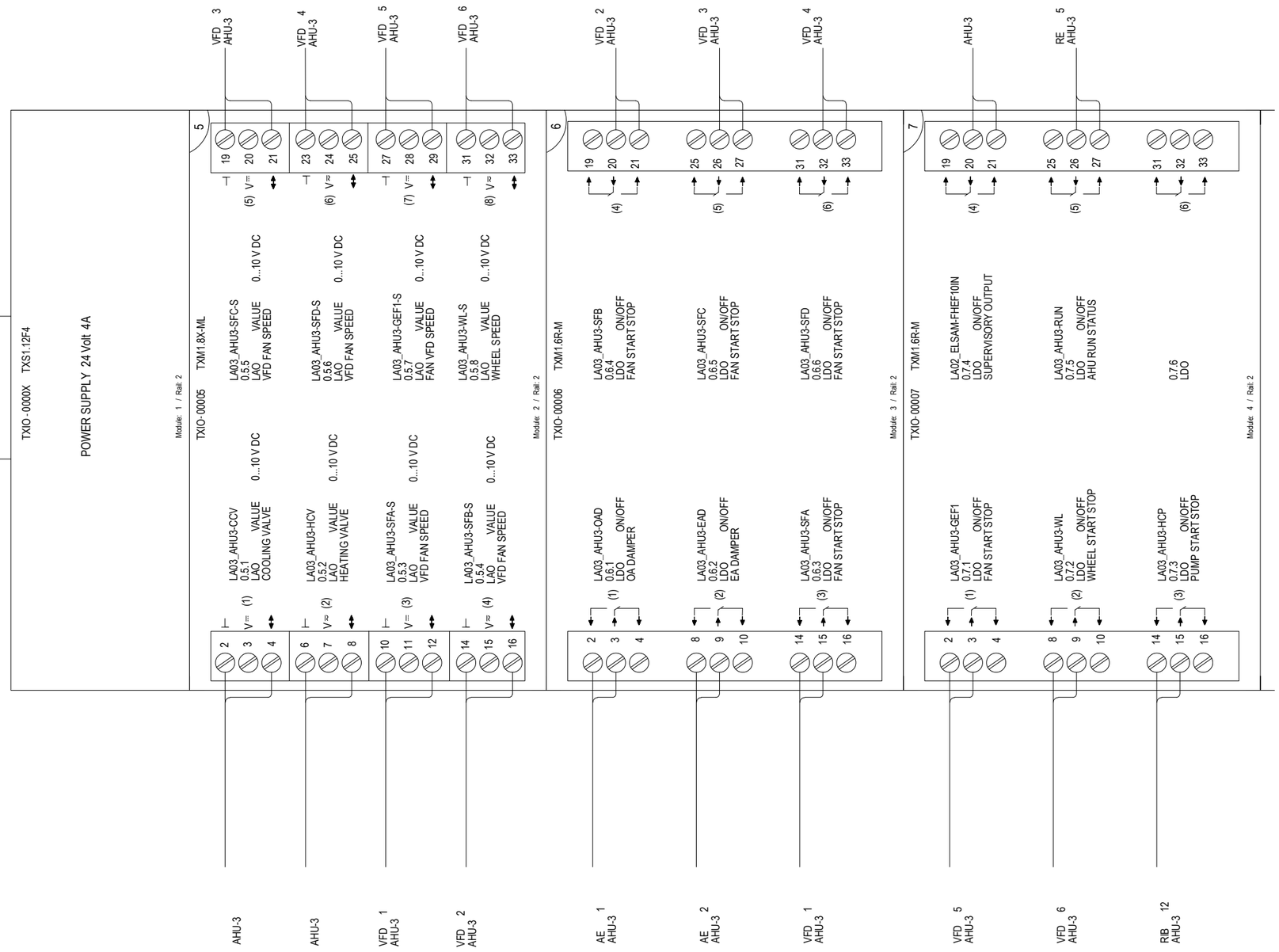
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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LA03.PXCAp003

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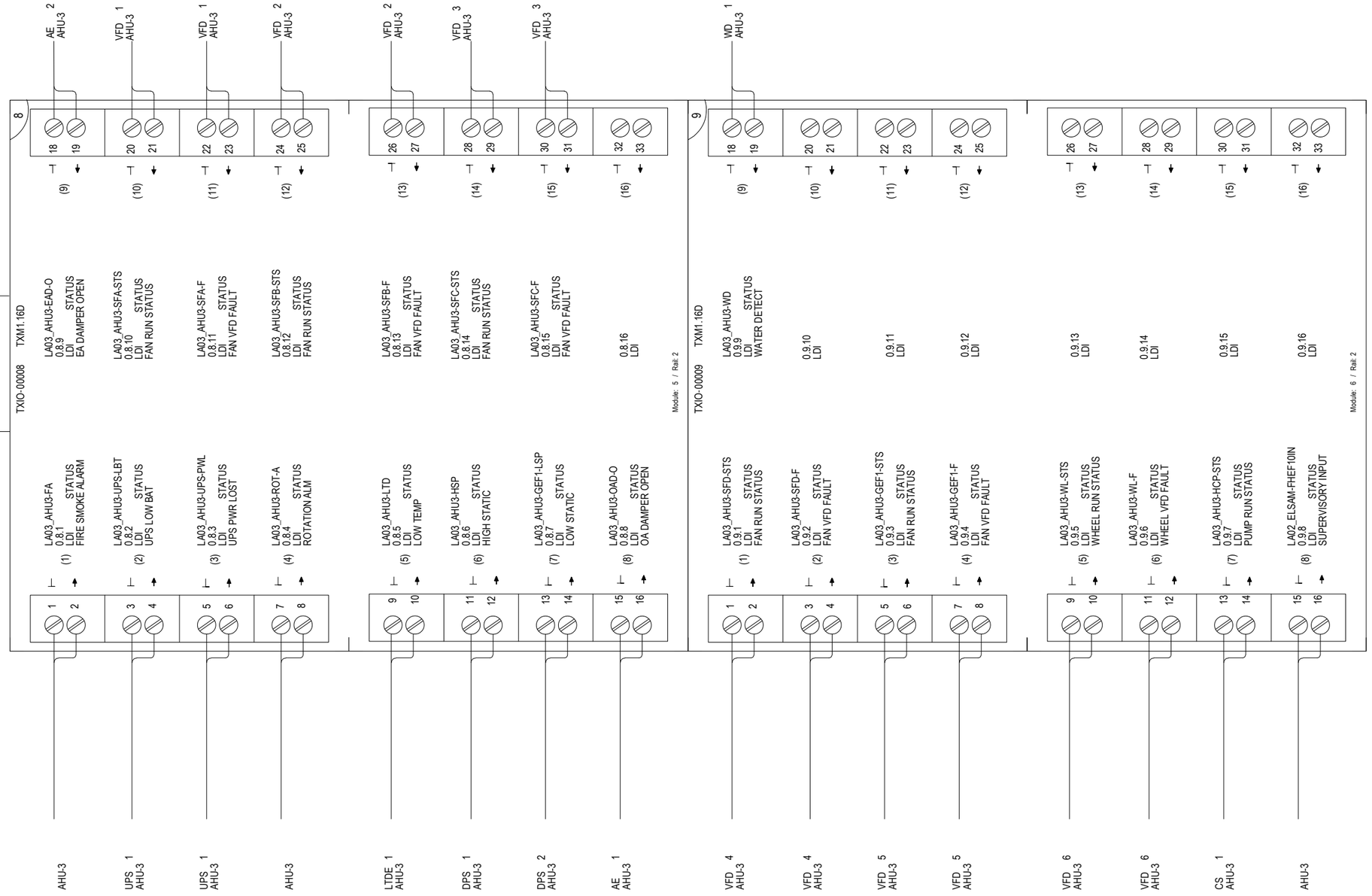

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA03.PXCAp004

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E220D

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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
IU# 20250072, IN

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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
0
230A

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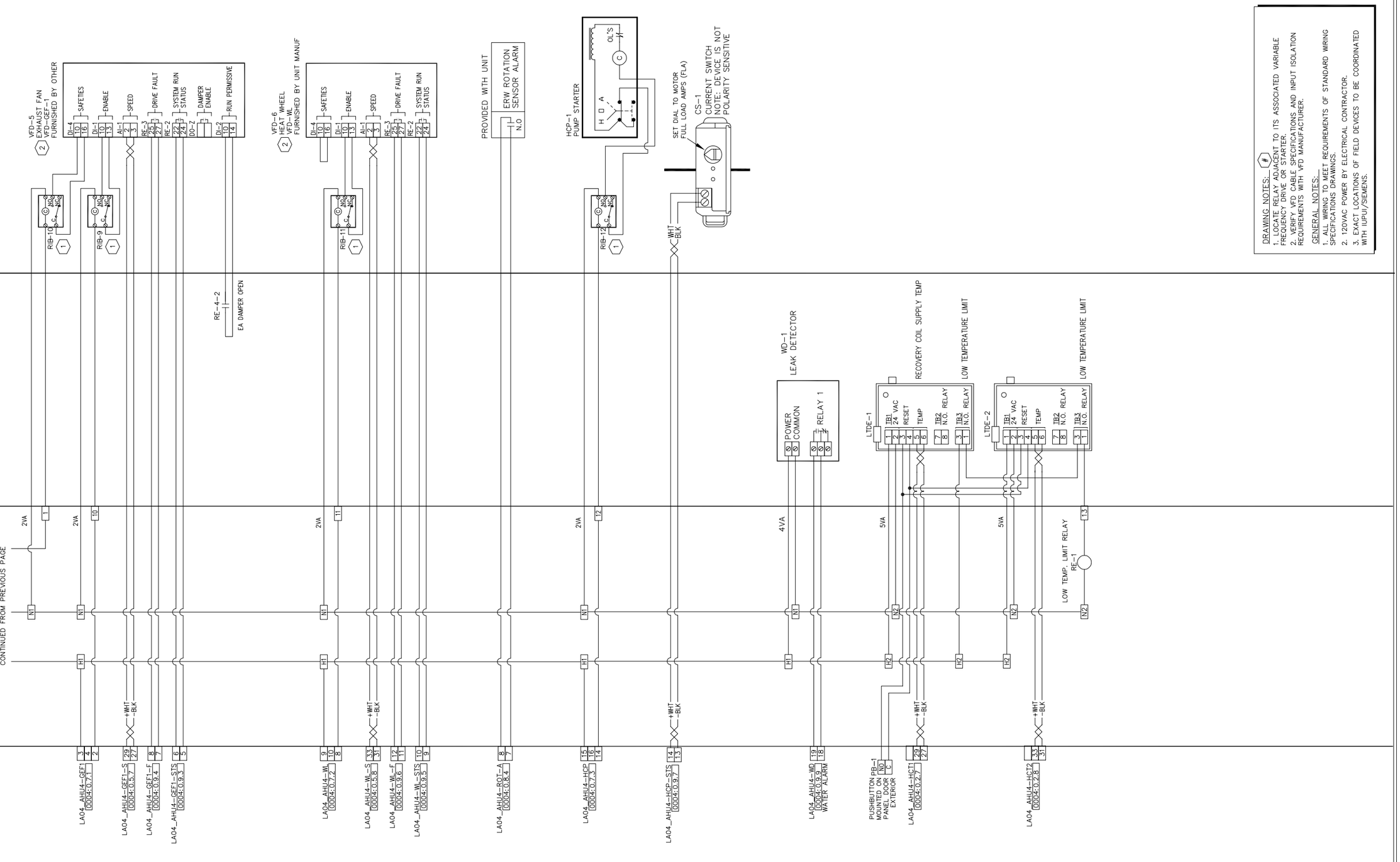
FIELD WIRING

STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

CONTINUED FROM PREVIOUS PAGE

FIELD PANEL



DRAWING NOTES: (#)

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GENERAL NOTES:

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2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

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0004	LA04.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-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:
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COMPONENT PANEL / POWER

FIELD PANEL

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0004	LA04.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-4 ELEC WIRING 3

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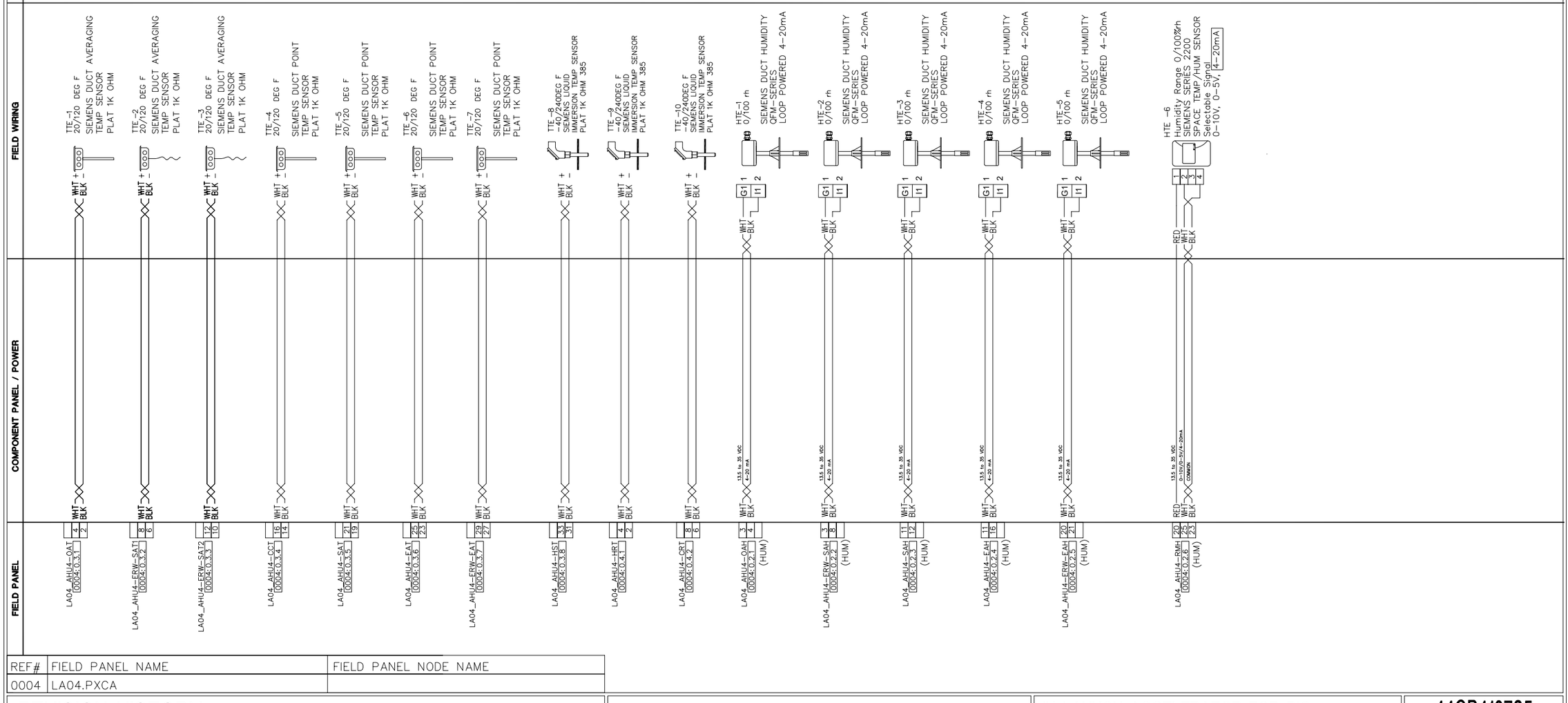
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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.

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0004	LA04.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
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AHU-4 ELEC WIRING 4

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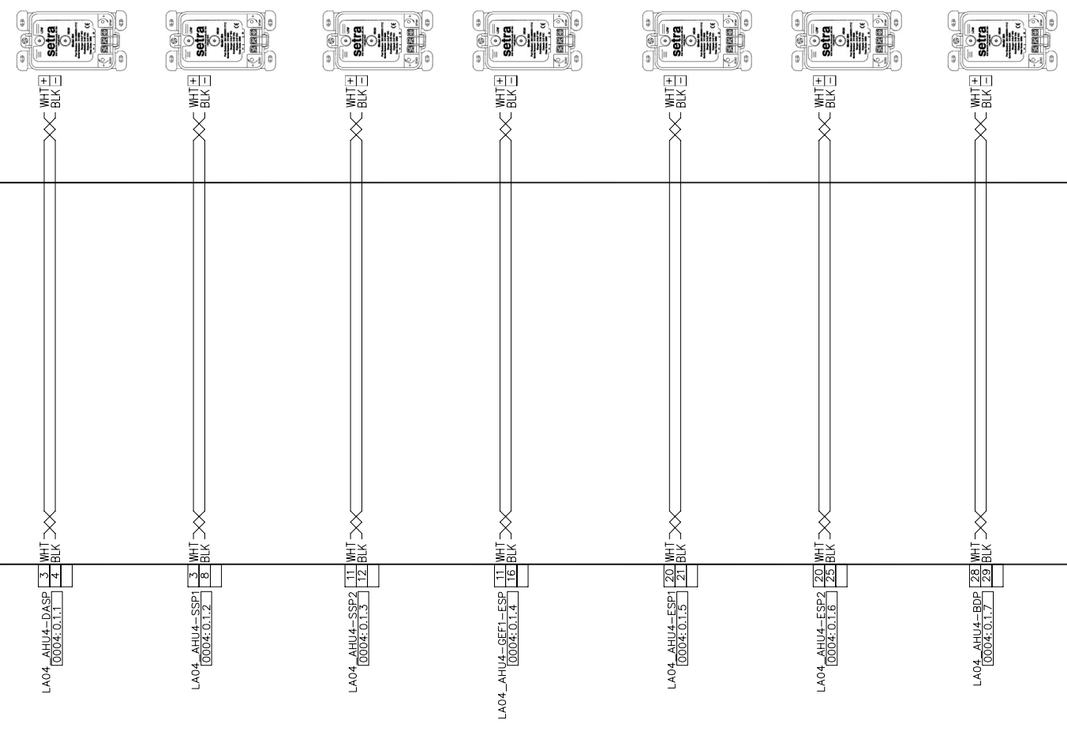
FIELD WIRING | STARTER / VFD / PACKAGED CONTROLLER WIRING

COMPONENT PANEL / POWER

FIELD PANEL



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3. EXACT LOCATIONS OF FIELD DEVICES TO BE COORDINATED WITH IUPUI/SIEMENS.

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0004	LA04.PXCA	

REVISION HISTORY

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AHU-4 ELEC WIRING 5

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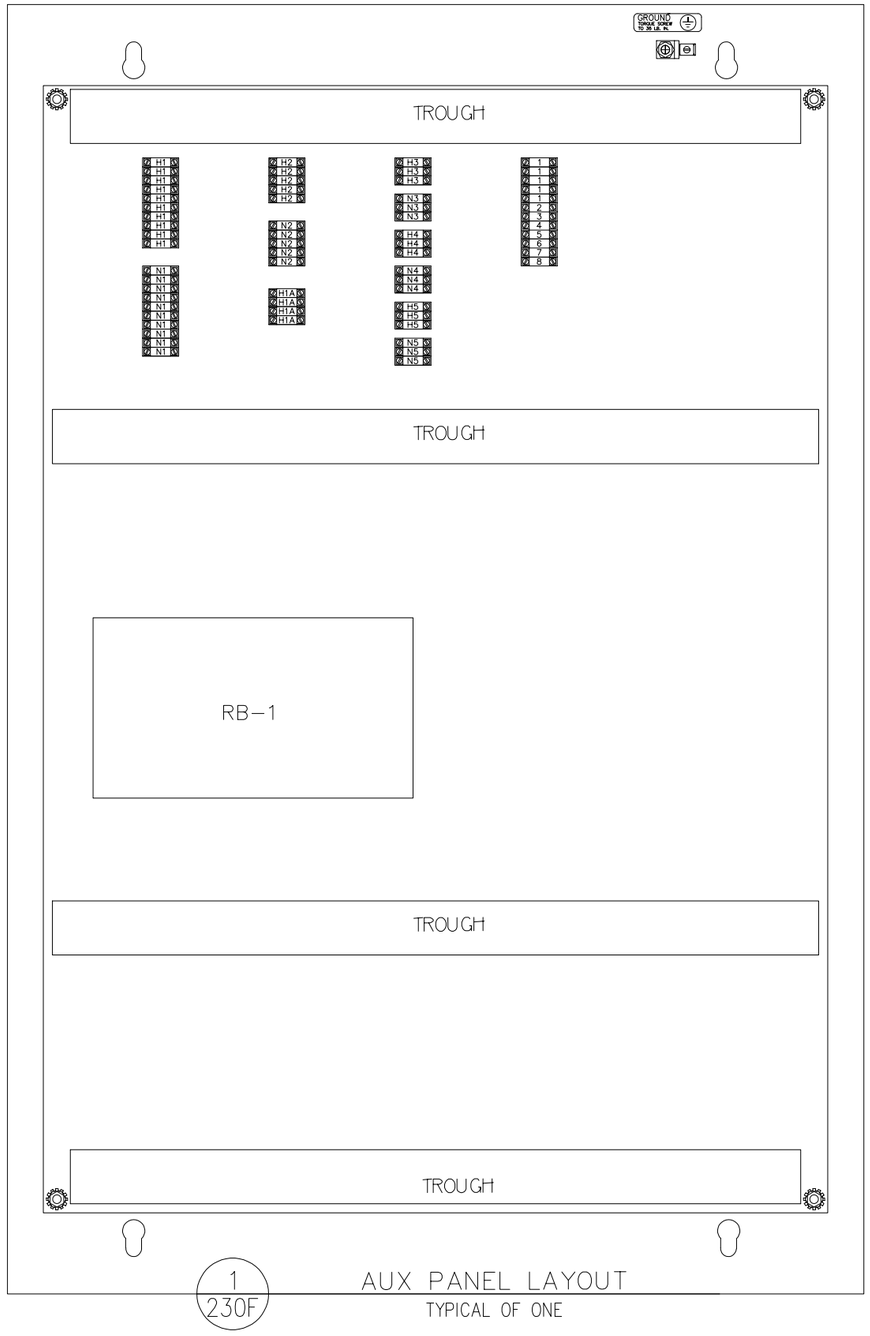
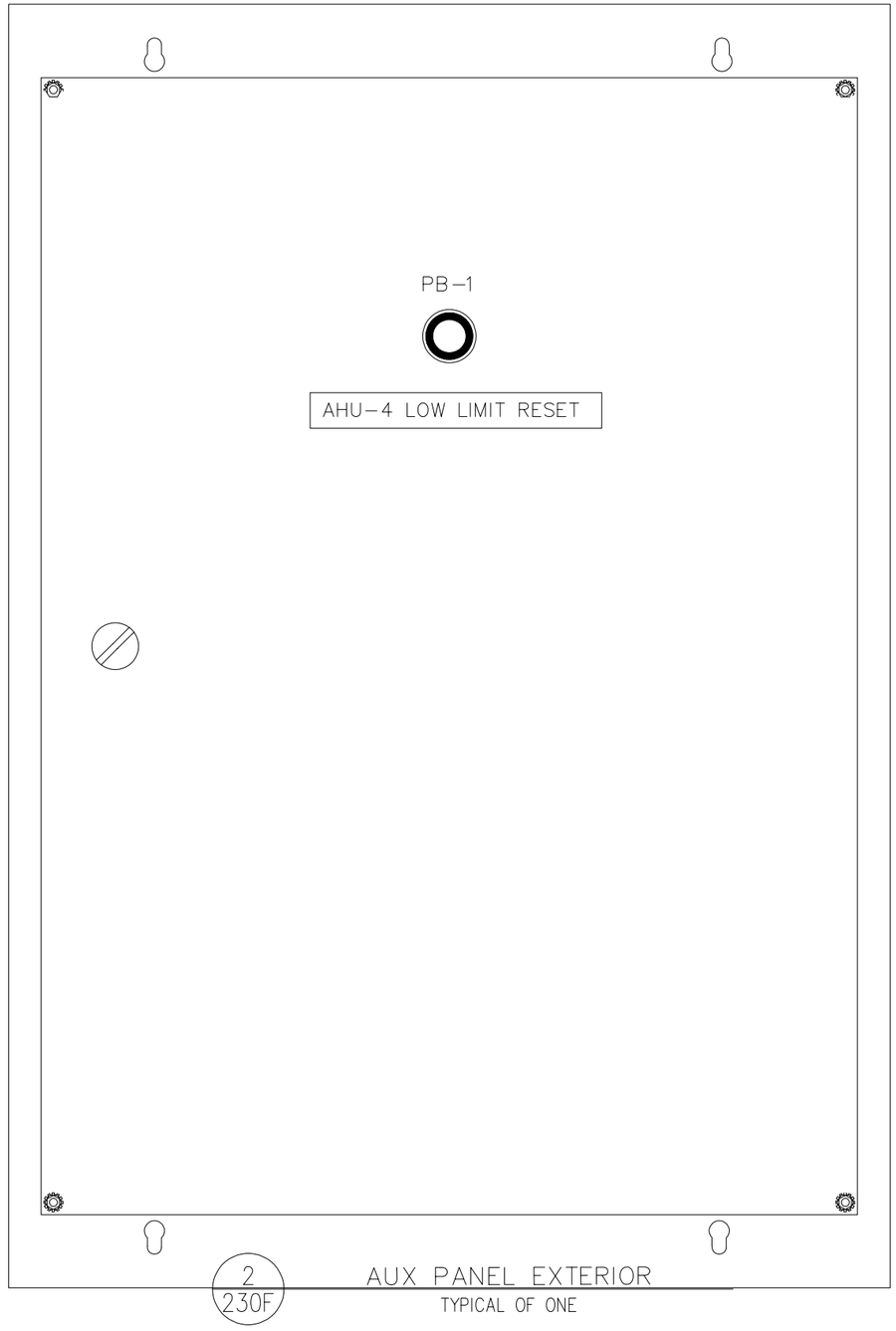


1 230F AUX PANEL LAYOUT
TYPICAL OF ONE



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

440P412785
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230F

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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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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

AHU-4 CONTROL BOM

440P412785
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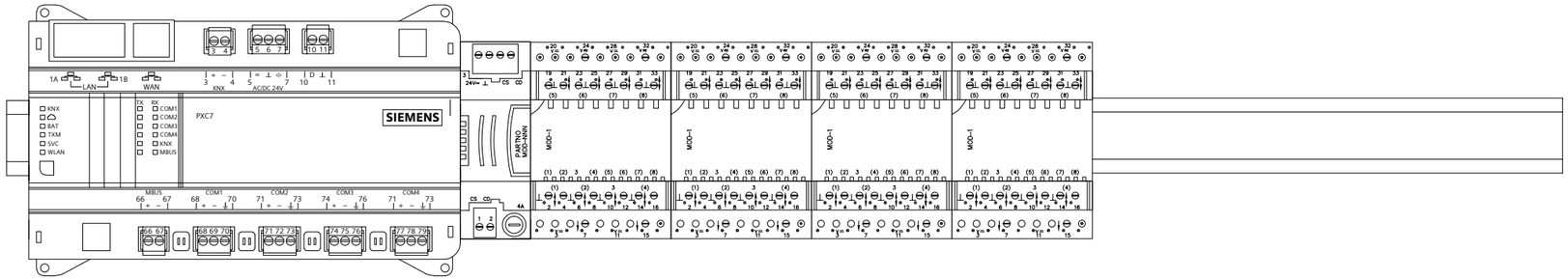
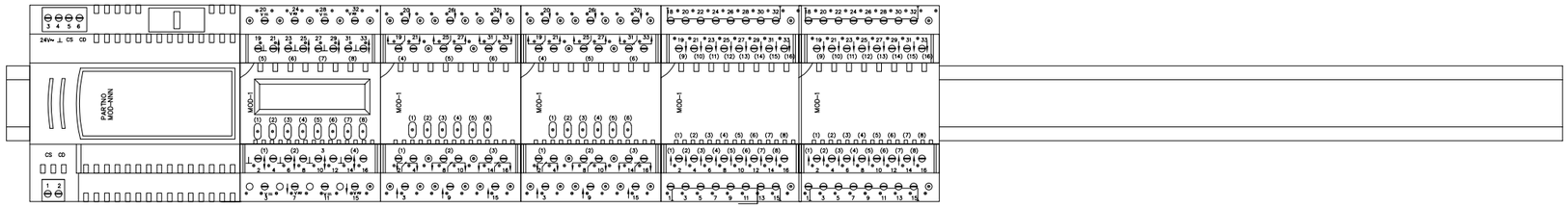
INSTALLATION NOTES:

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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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA04.PXCA INSTALLATION

440P412785
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E230

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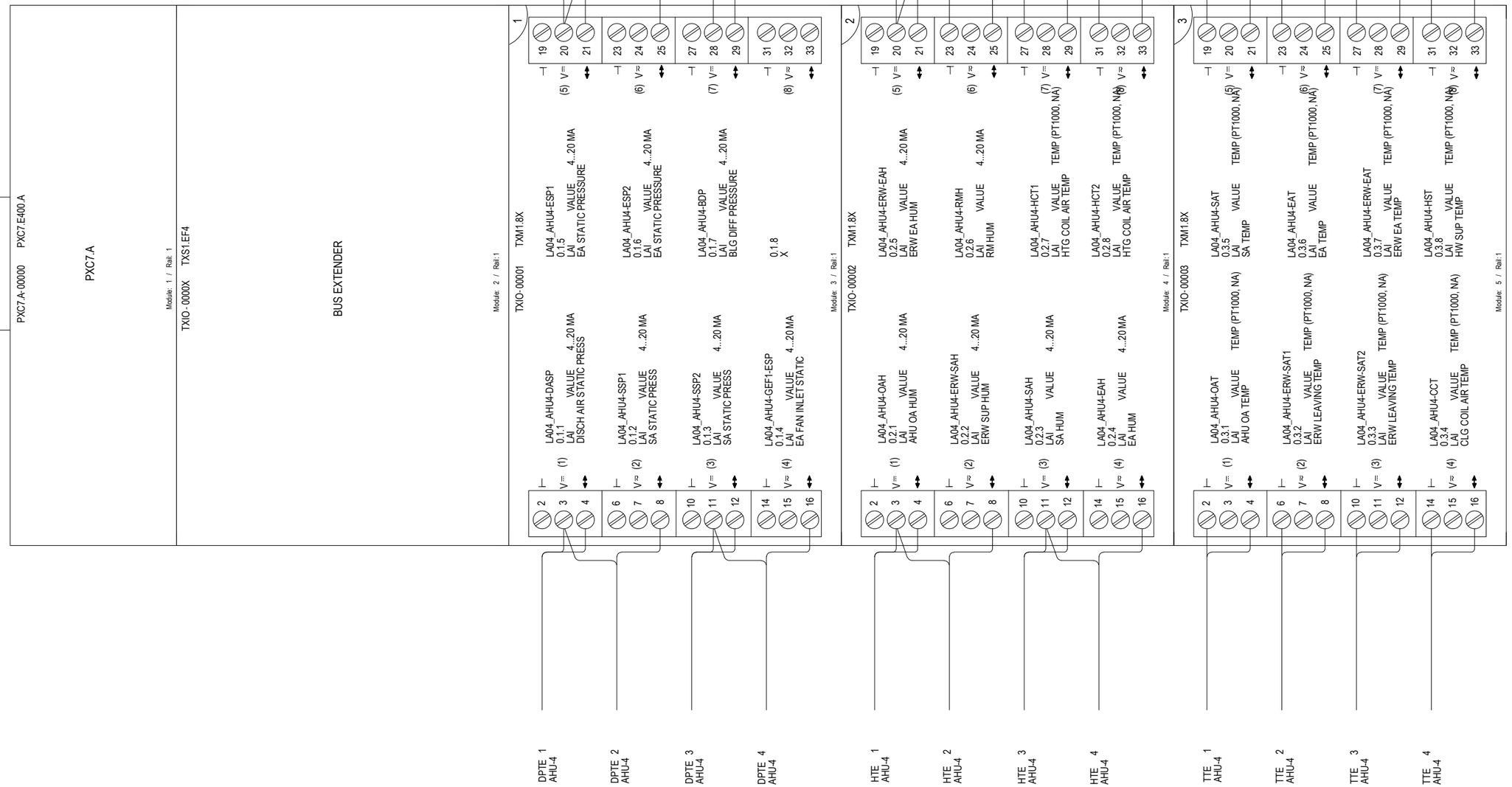
PXC7.A-00000 PXC7.E400.A

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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E230A

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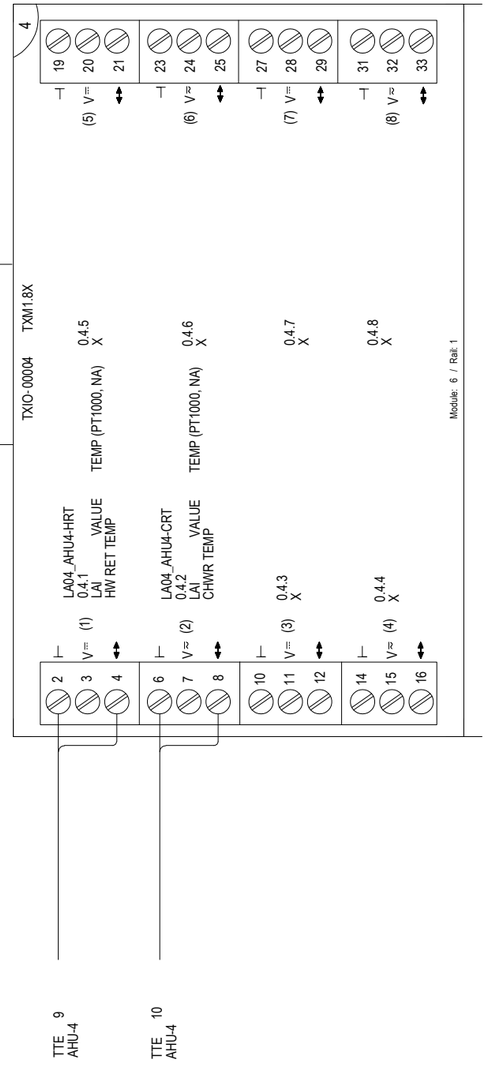

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LA04.PXCAp002

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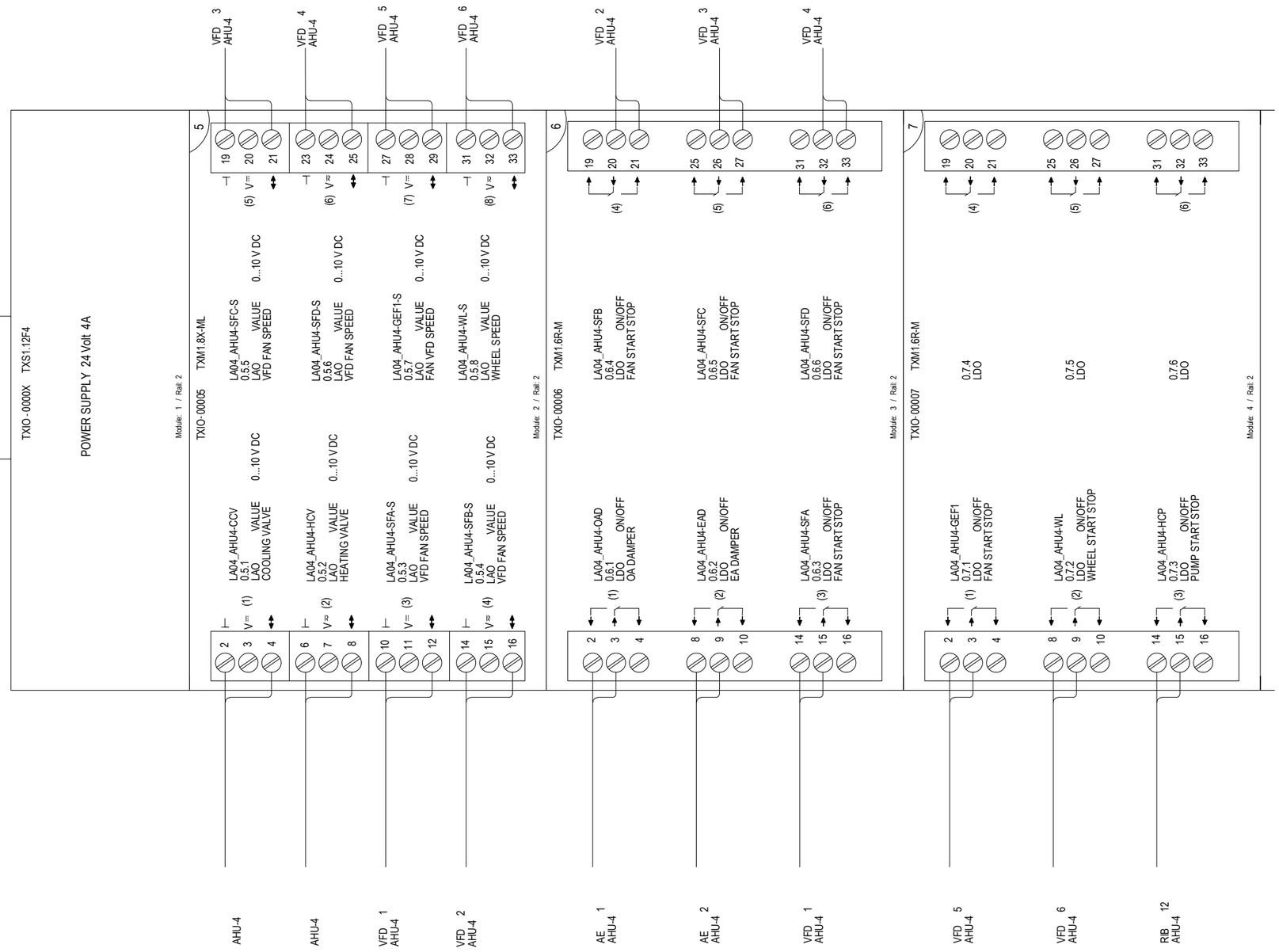
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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LA04.PXCAp003

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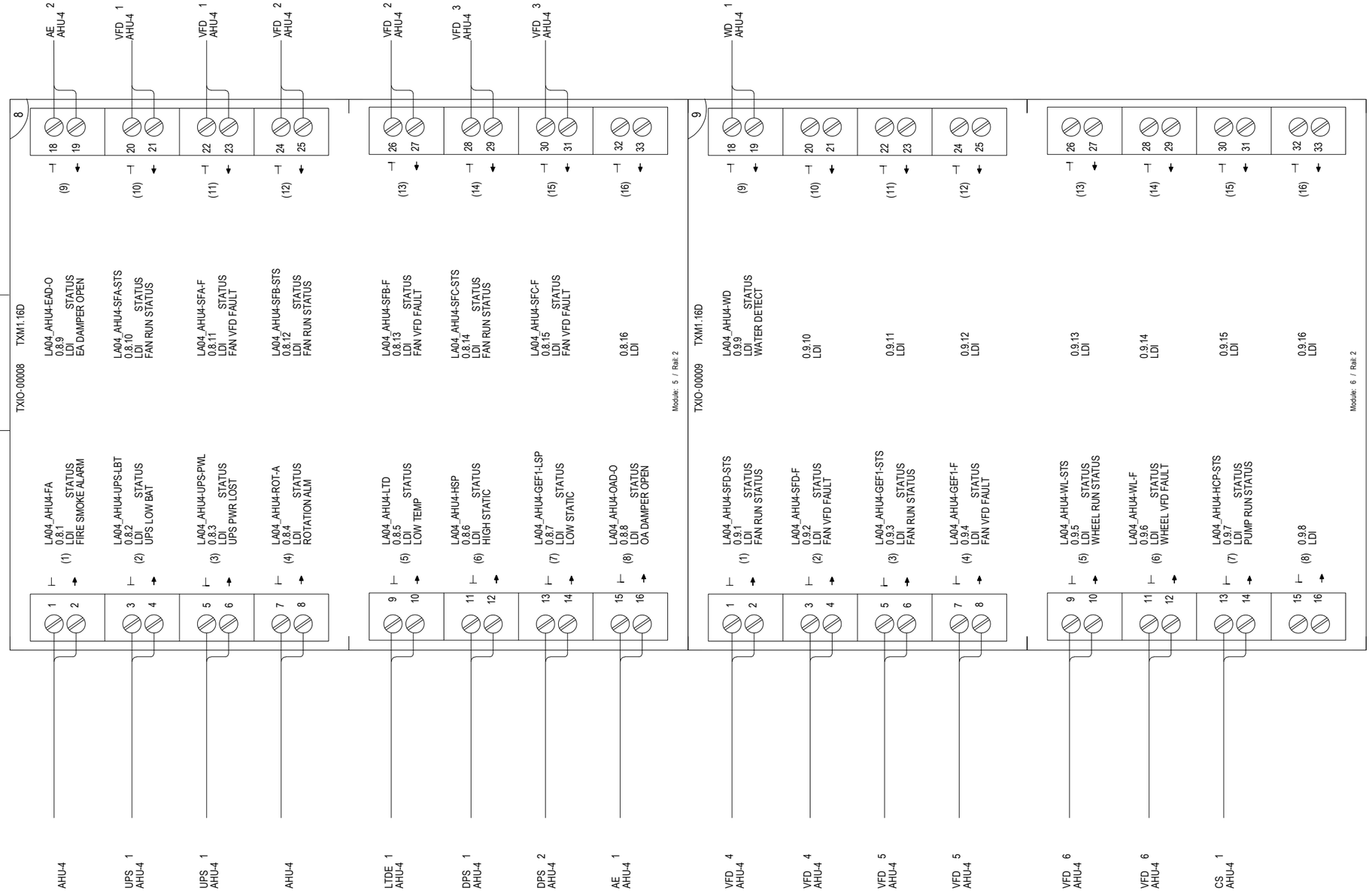

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LA04.PXCAp004

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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

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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

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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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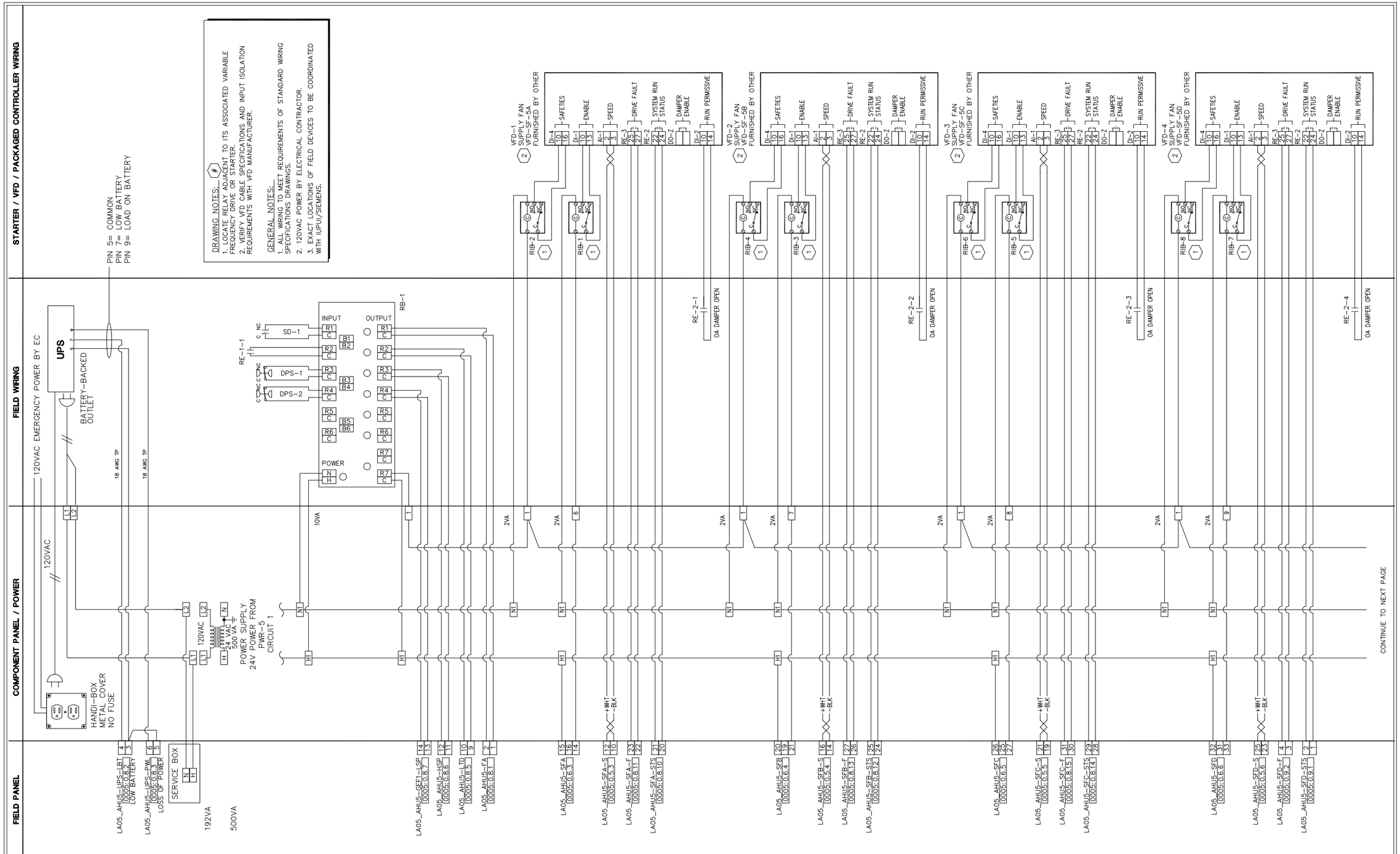

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0005	LA05.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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

AHU-5 ELEC WIRING 1

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240A

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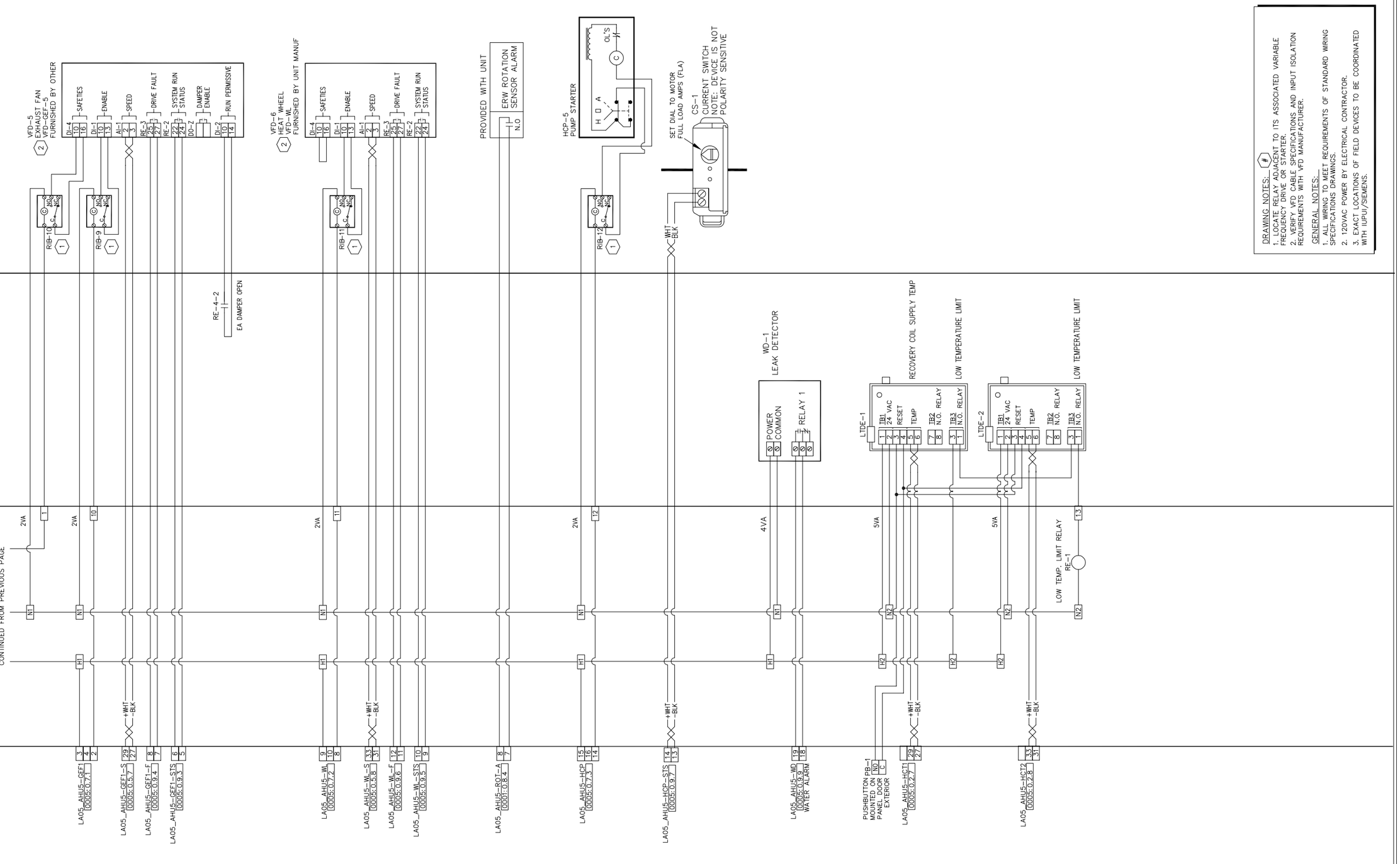
FIELD WIRING

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	

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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

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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 3

440P412785
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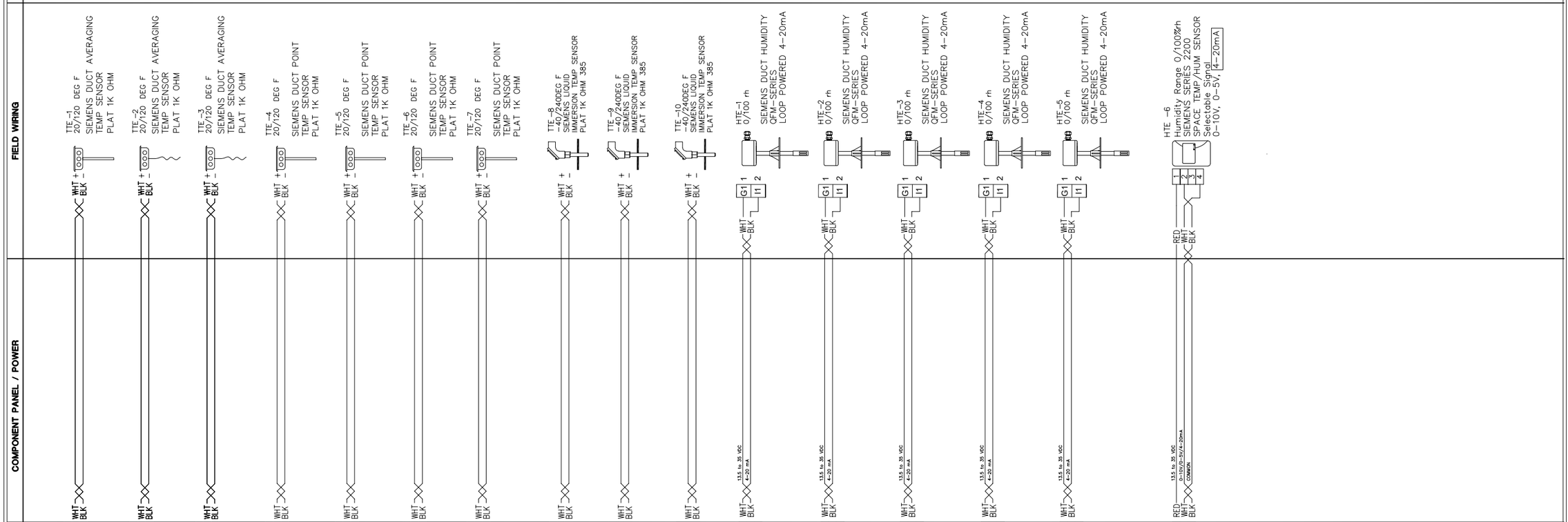
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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

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AHU-5 ELEC WIRING 4

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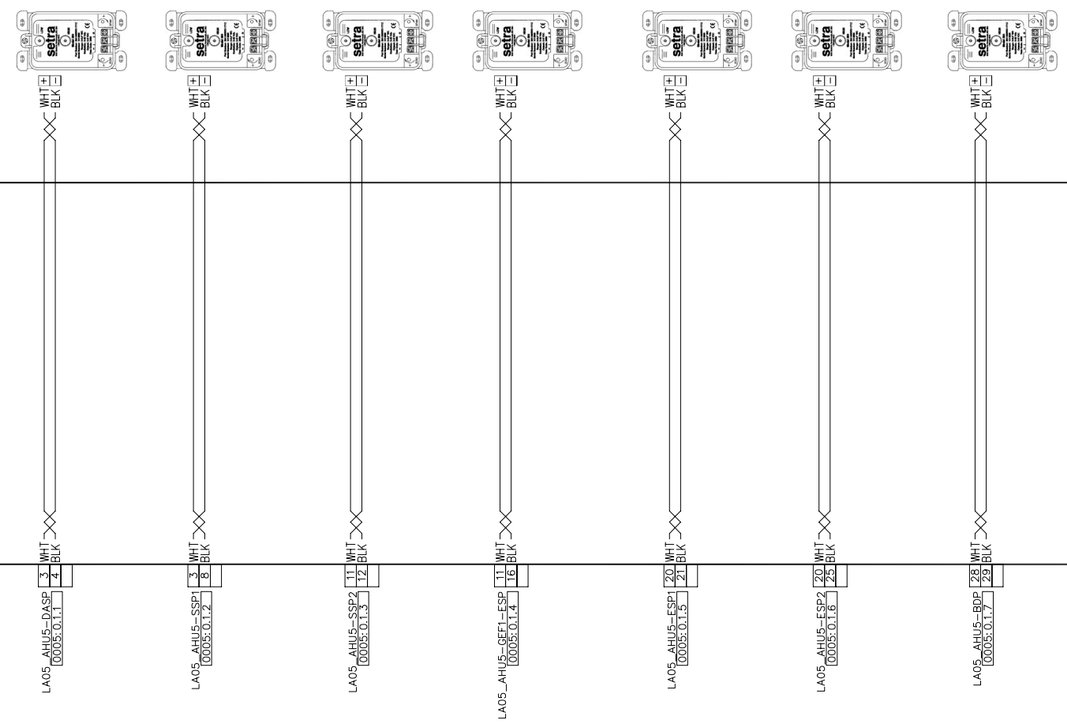
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

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	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-5 ELEC WIRING 5

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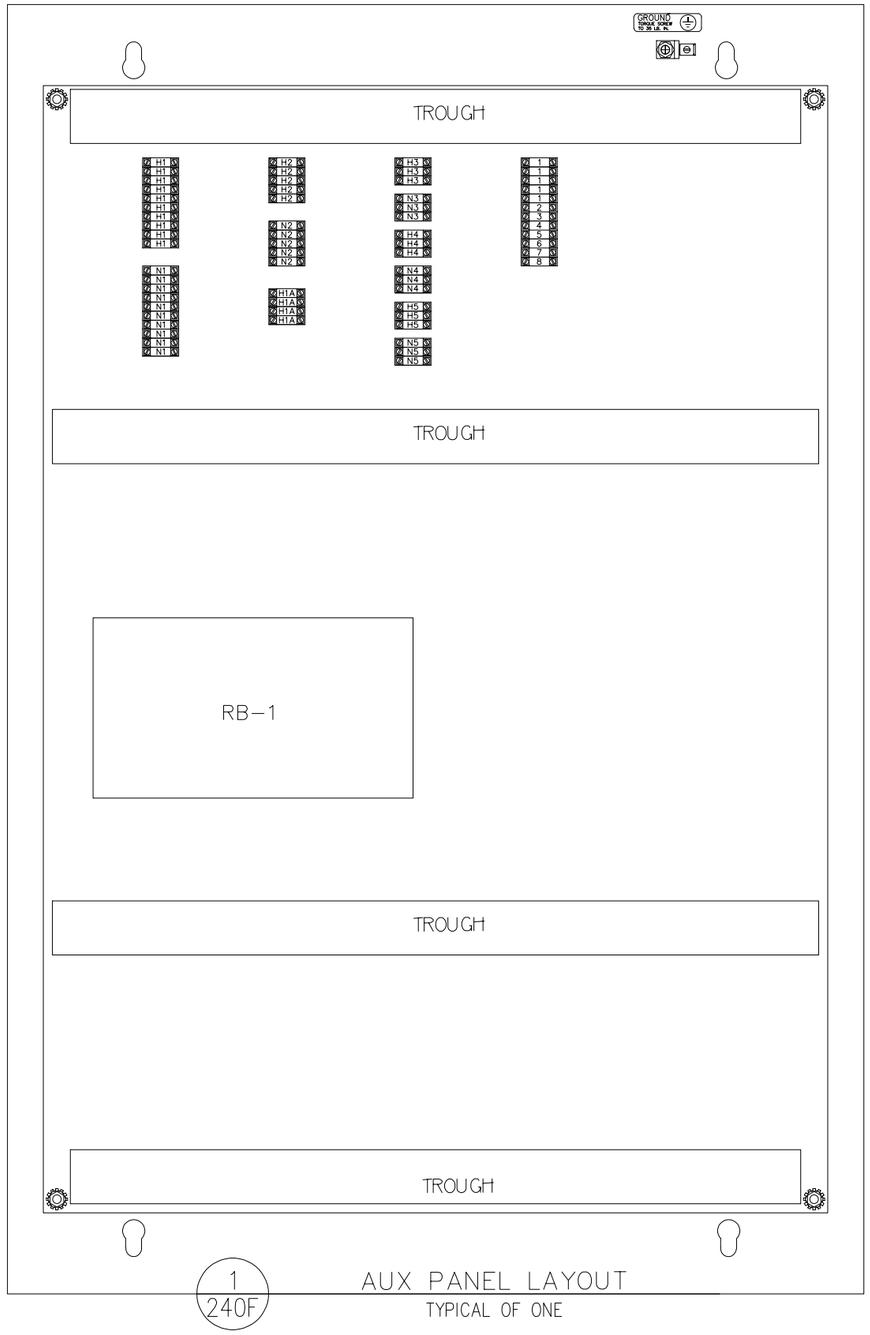

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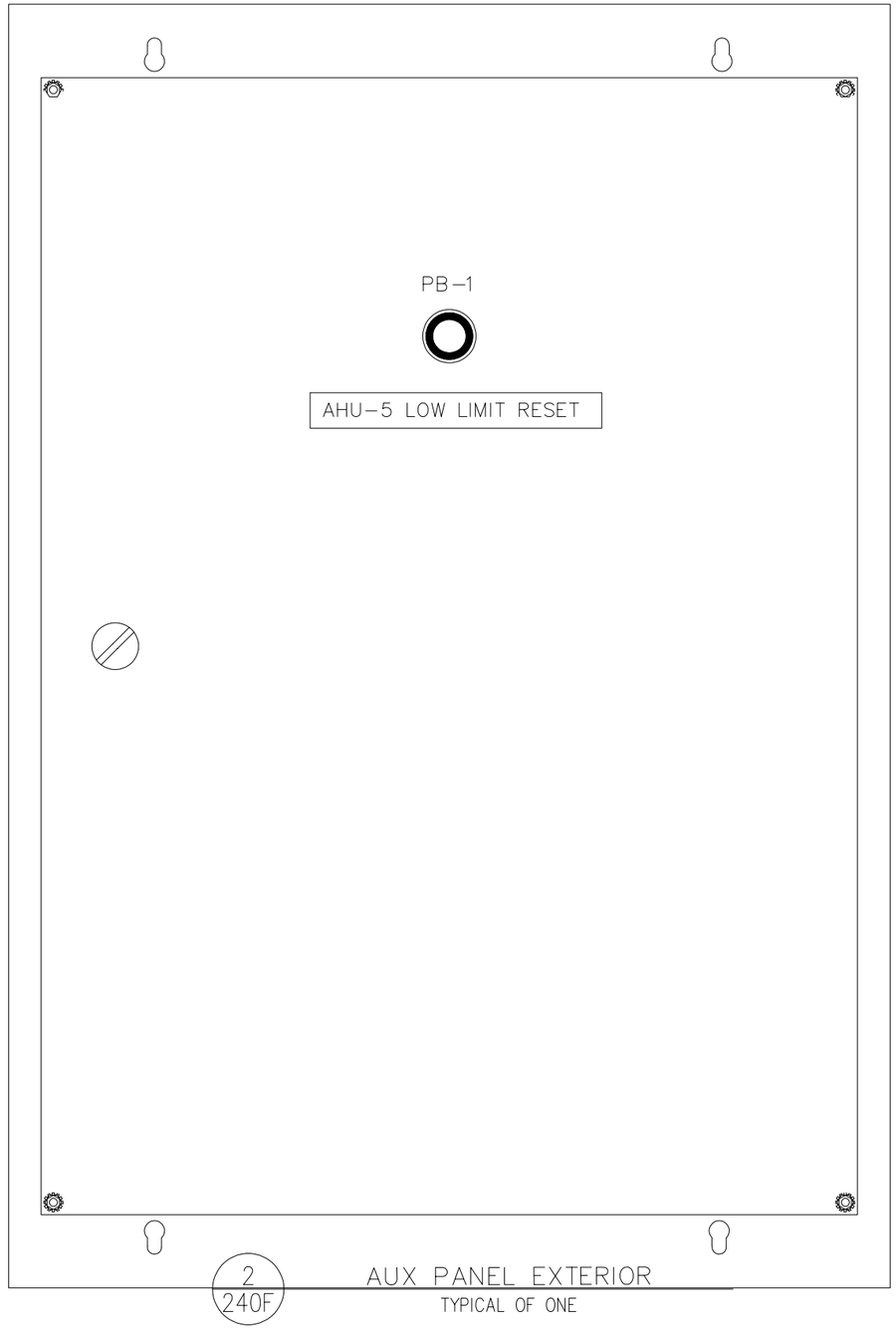
AUX PANEL LAYOUT

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 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
HB	HB	KR	04/02/26	04/02/26

AHU-5 CONTROL BOM

440P412785
0
240G

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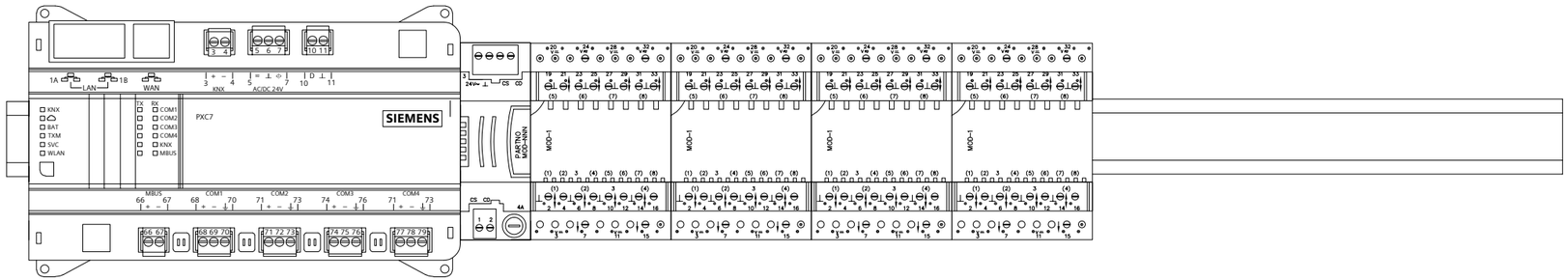
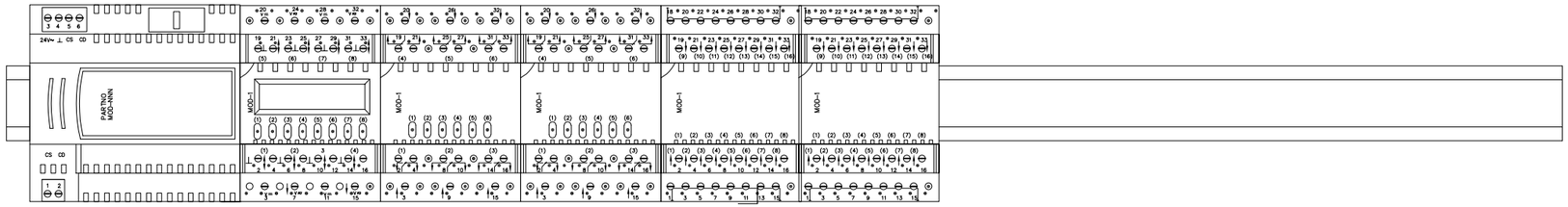
INSTALLATION NOTES:

1. DO NOT POWER ANY EXTERNAL DEVICES (VALVES, DAMPERS, AFMS, ETC.) OFF THE TX/IO BLOCKS. INCLUDE A SEPARATE AND INDEPENDENT TRANSFORMER AS REQUIRED.







REVISION HISTORY			
00	4/2/2026	HB	SUBMITTAL SET

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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

LA05.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)	
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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AHU-5 & GEF-5

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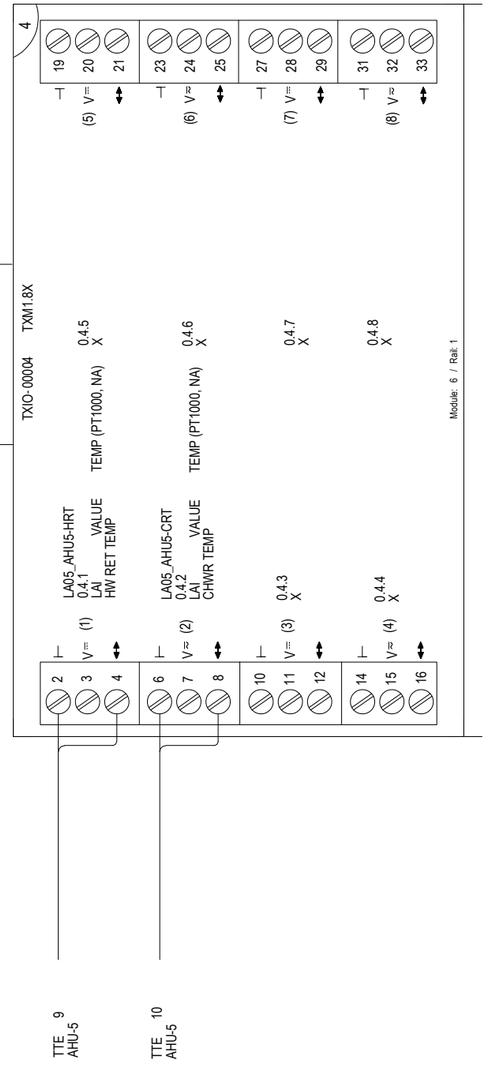

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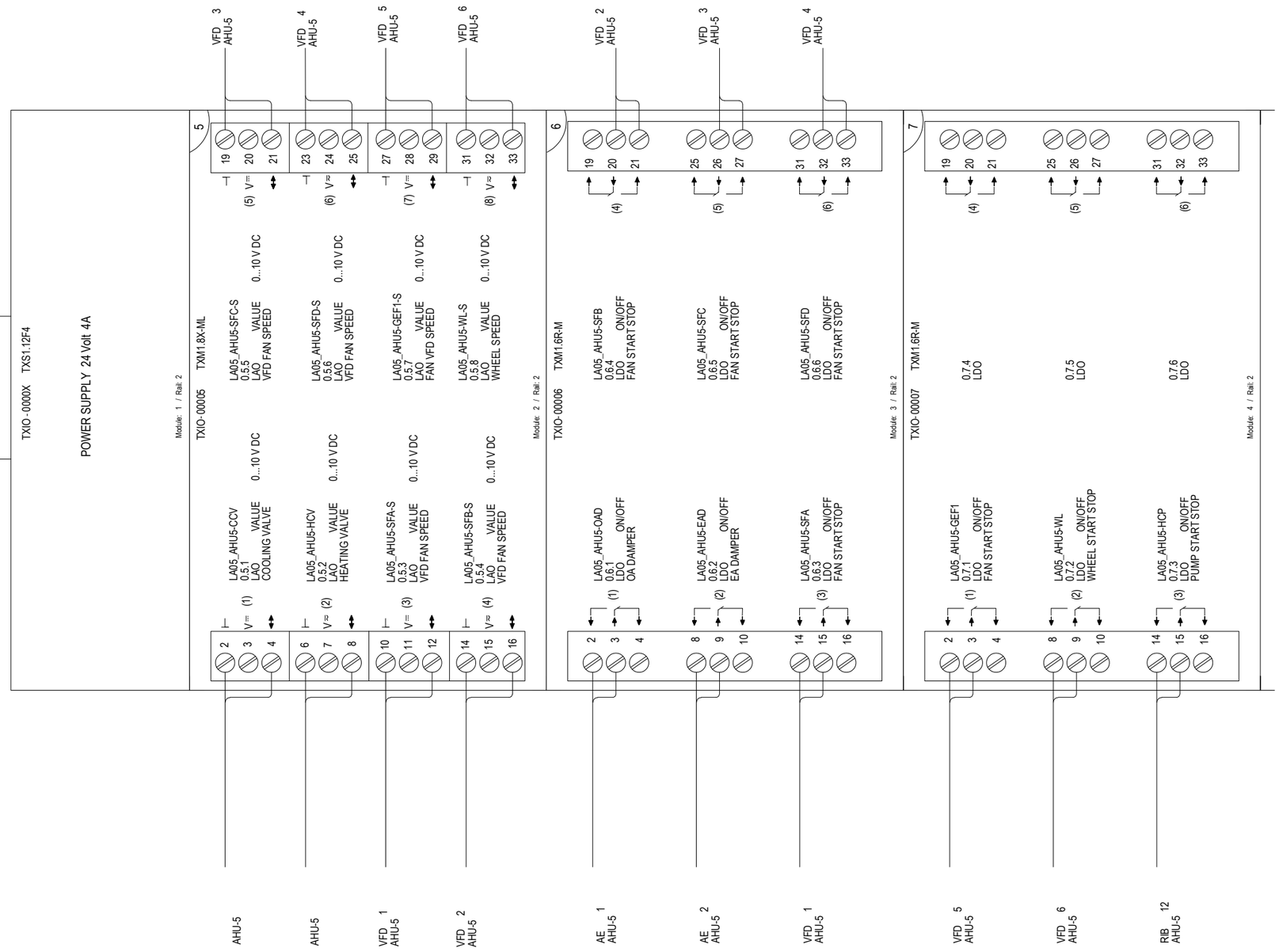
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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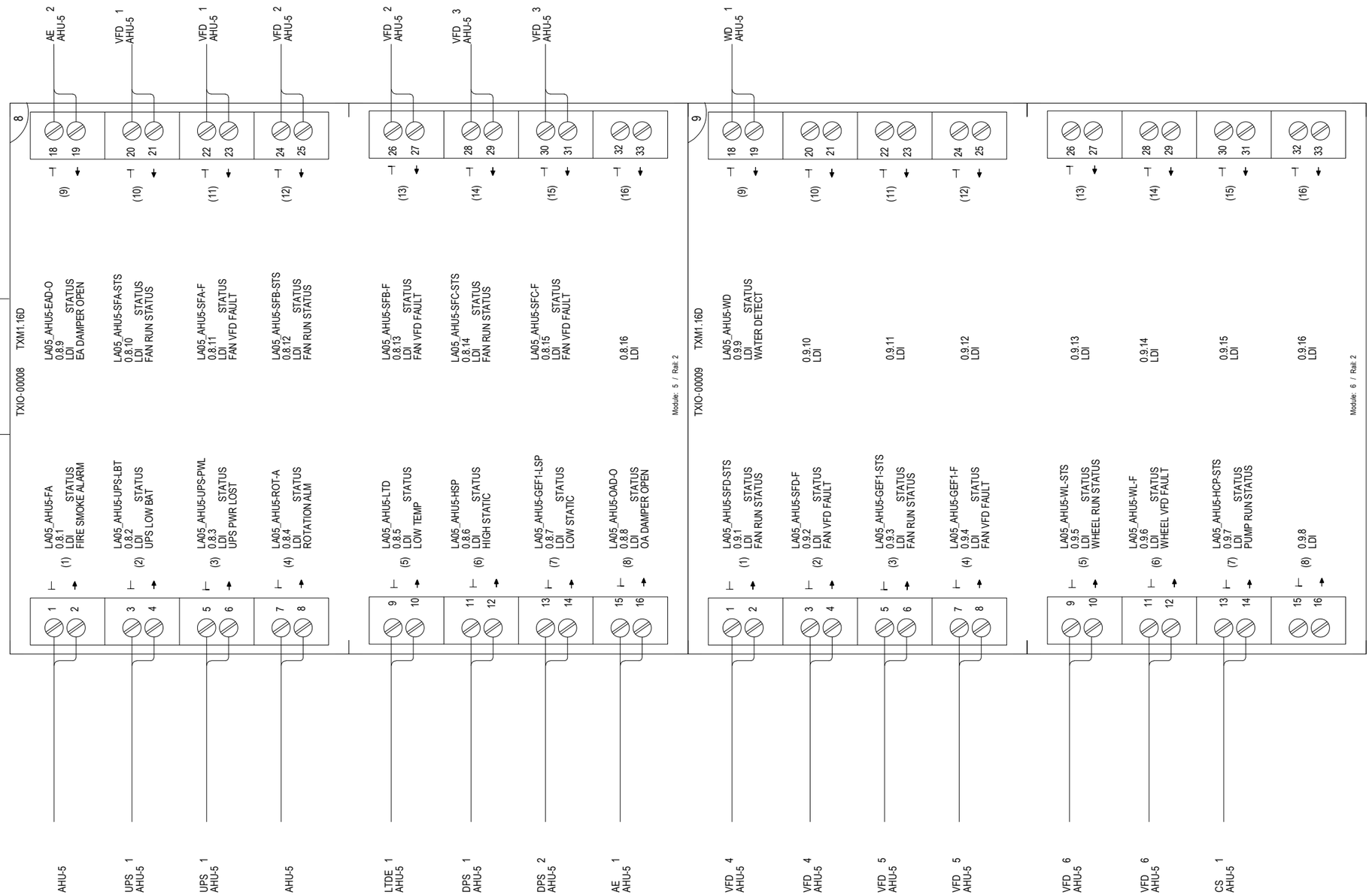

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	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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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.

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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

440P412785
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REF#	FIELD PANEL NAME
0006	LA06.PXCA

FIELD PANEL NODE NAME

REVISION HISTORY

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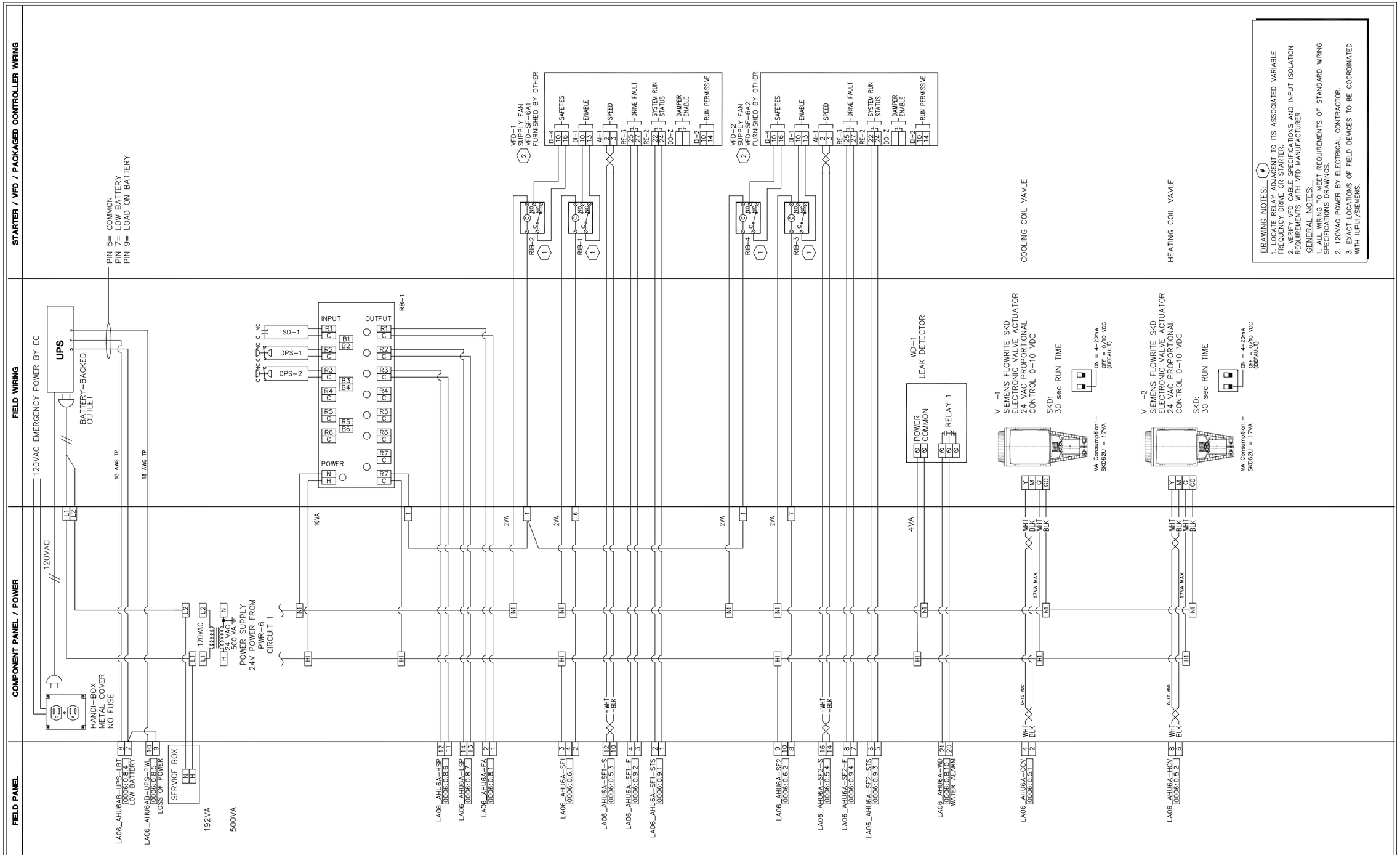
FIELD WIRING

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

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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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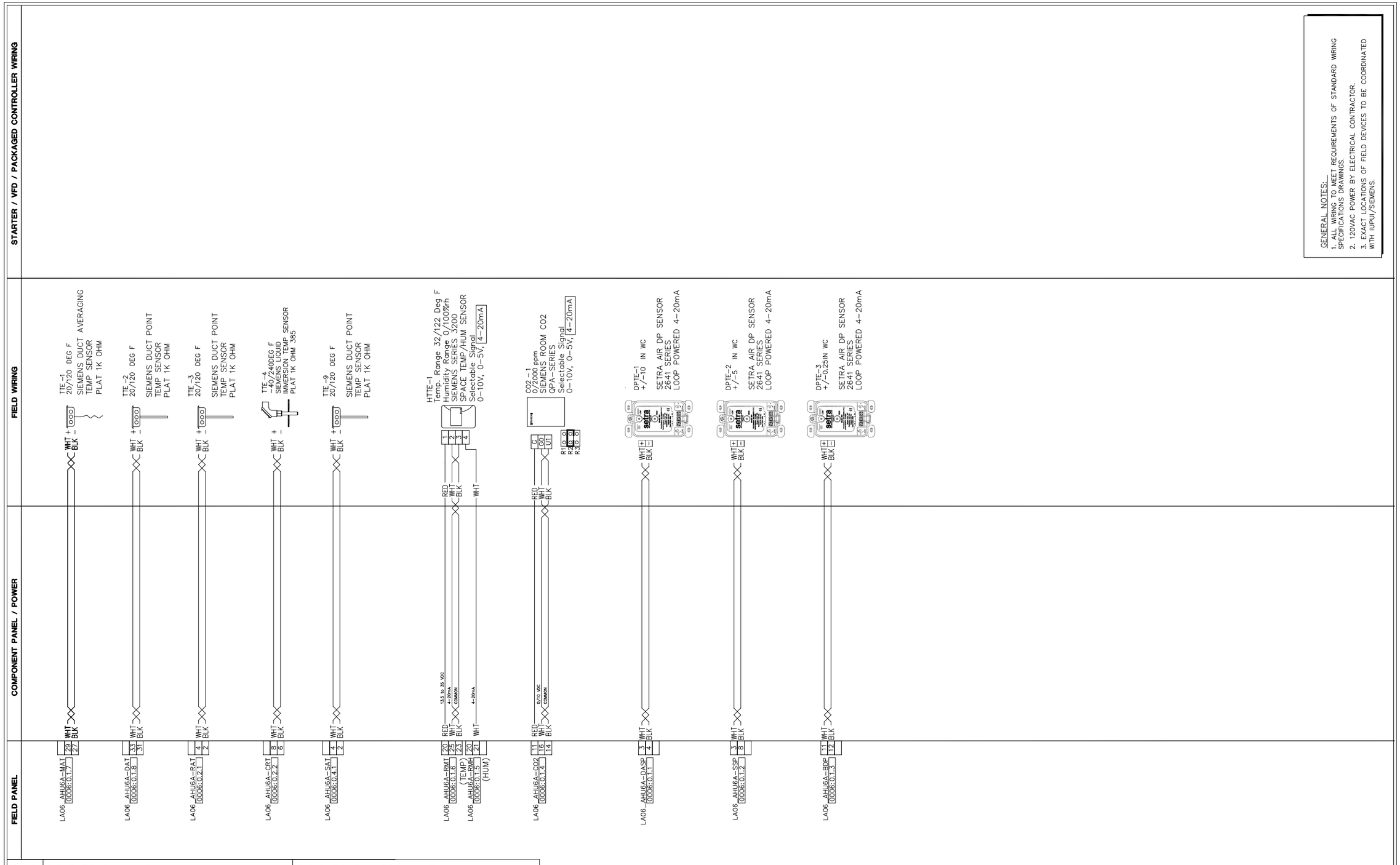

GENERAL NOTES:
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2. 120VAC POWER BY ELECTRICAL CONTRACTOR.
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AHU-6A ELEC. WIRING 2

440P412785
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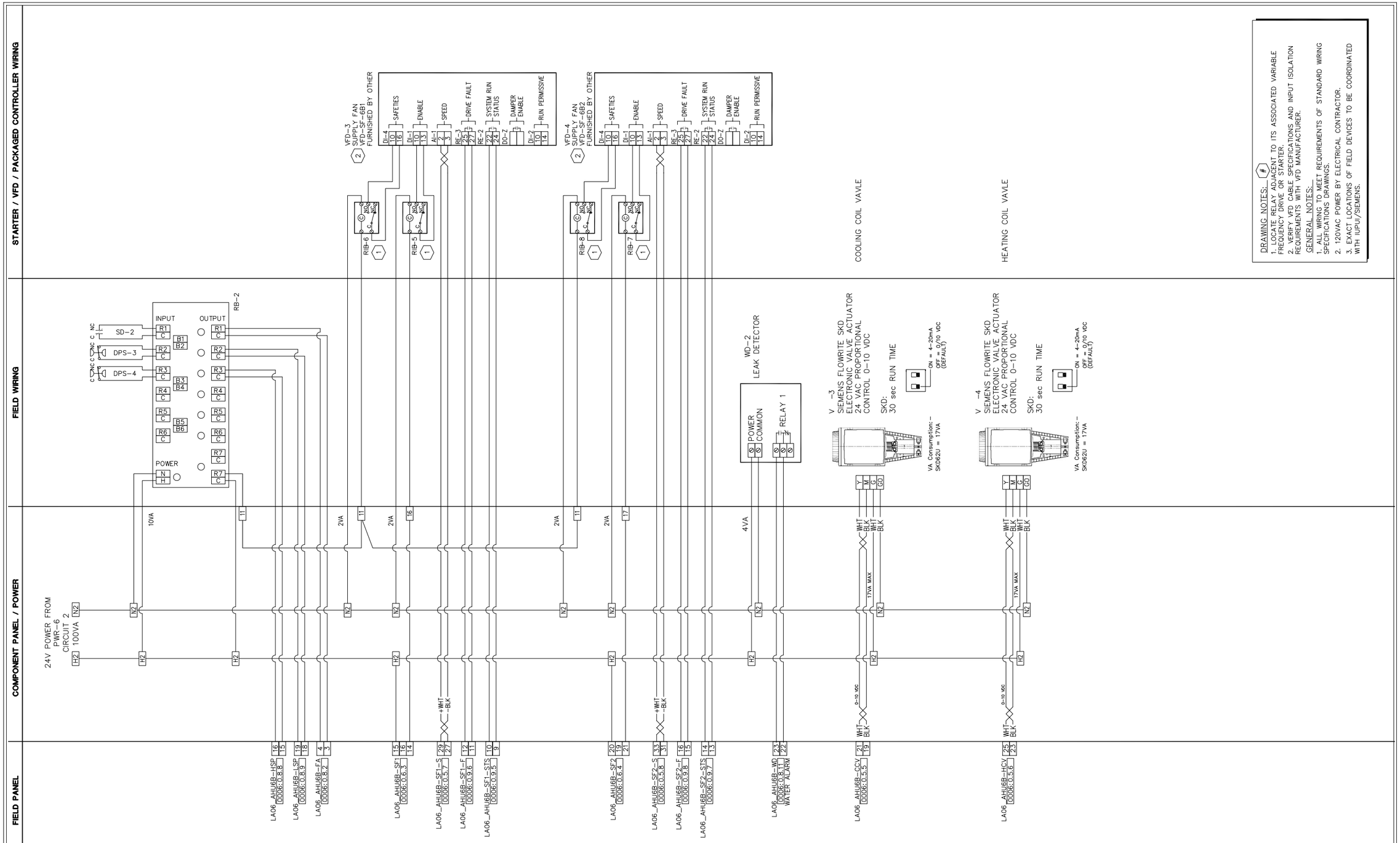

DRAWING NOTES: #

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 IUPUI/SIEMENS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
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 1

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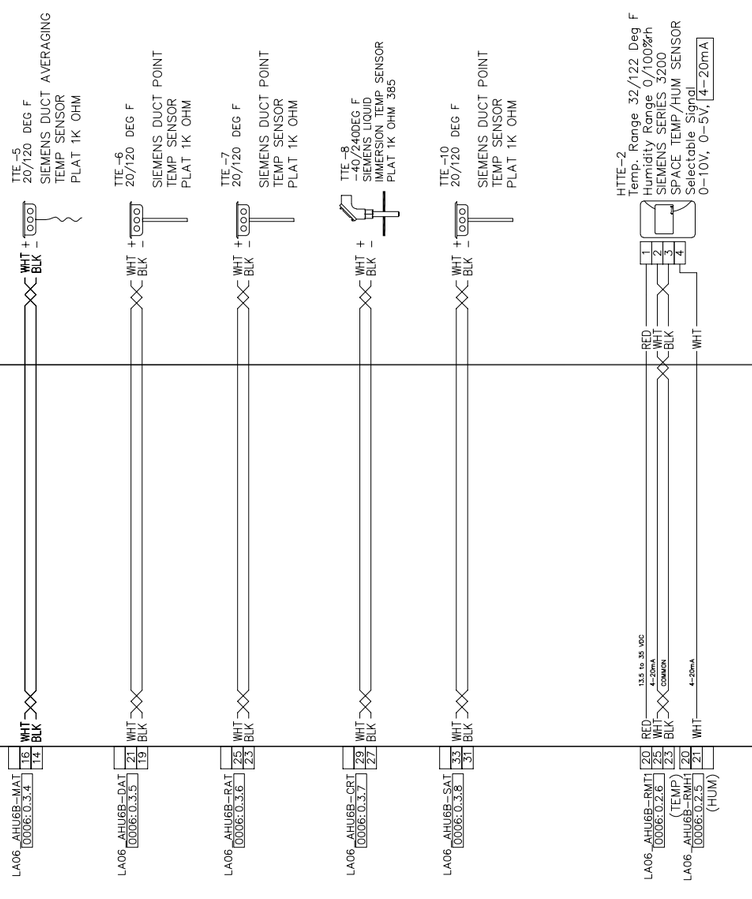
FIELD WIRING | STARTER / VFD / PACKAGED CONTROLLER WIRING



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

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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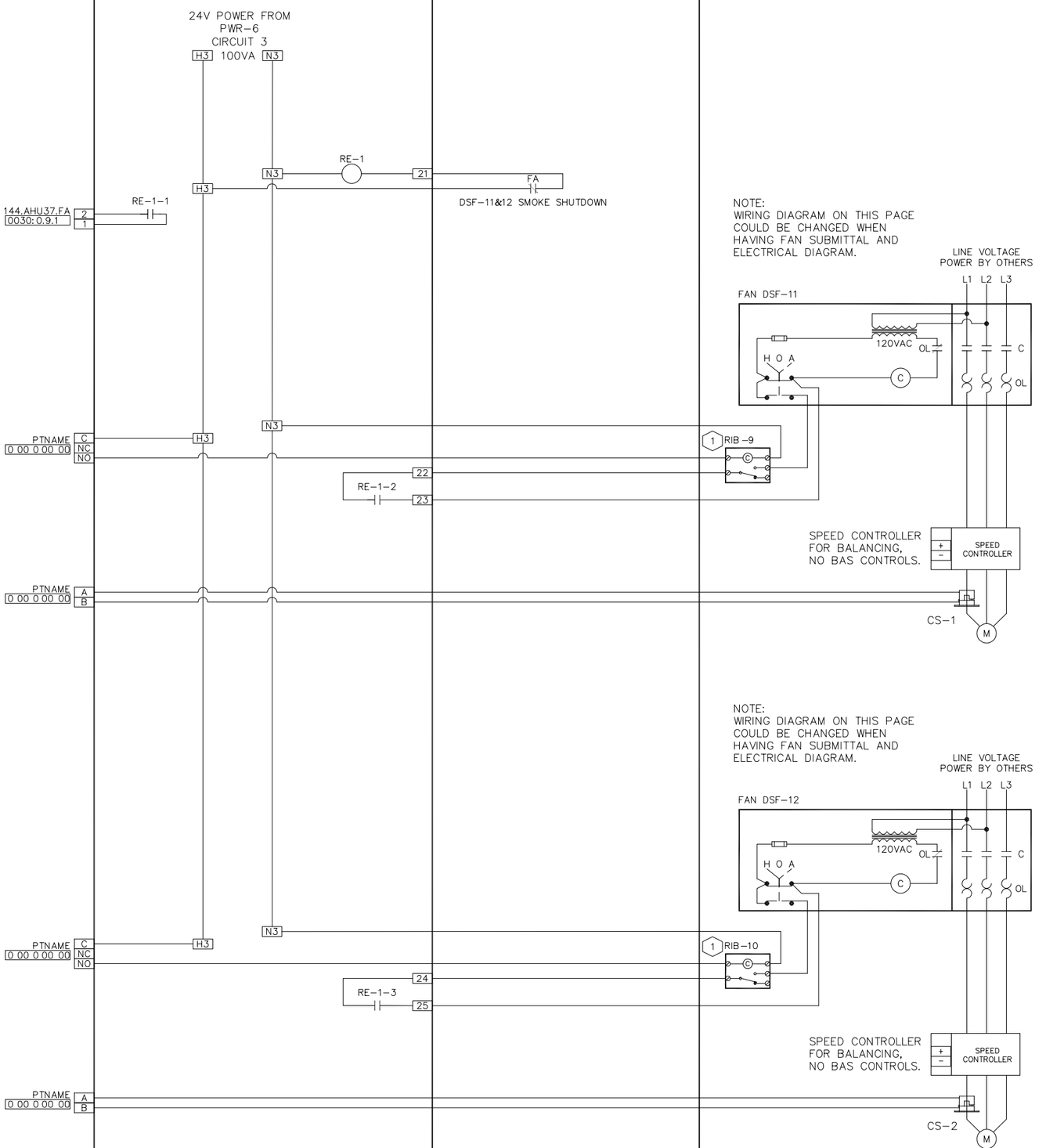
FIELD PANEL	AUX PANEL / POWER	FIELD WIRING	STARTER WIRING



DRAWING NOTES: (#)

1. LOCATE RELAY ADJACENT TO ITS ASSOCIATED VARIABLE FREQUENCY DRIVE OR STARTER.

GENERAL NOTES:

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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

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DSF-11&12 ELEC WIRING

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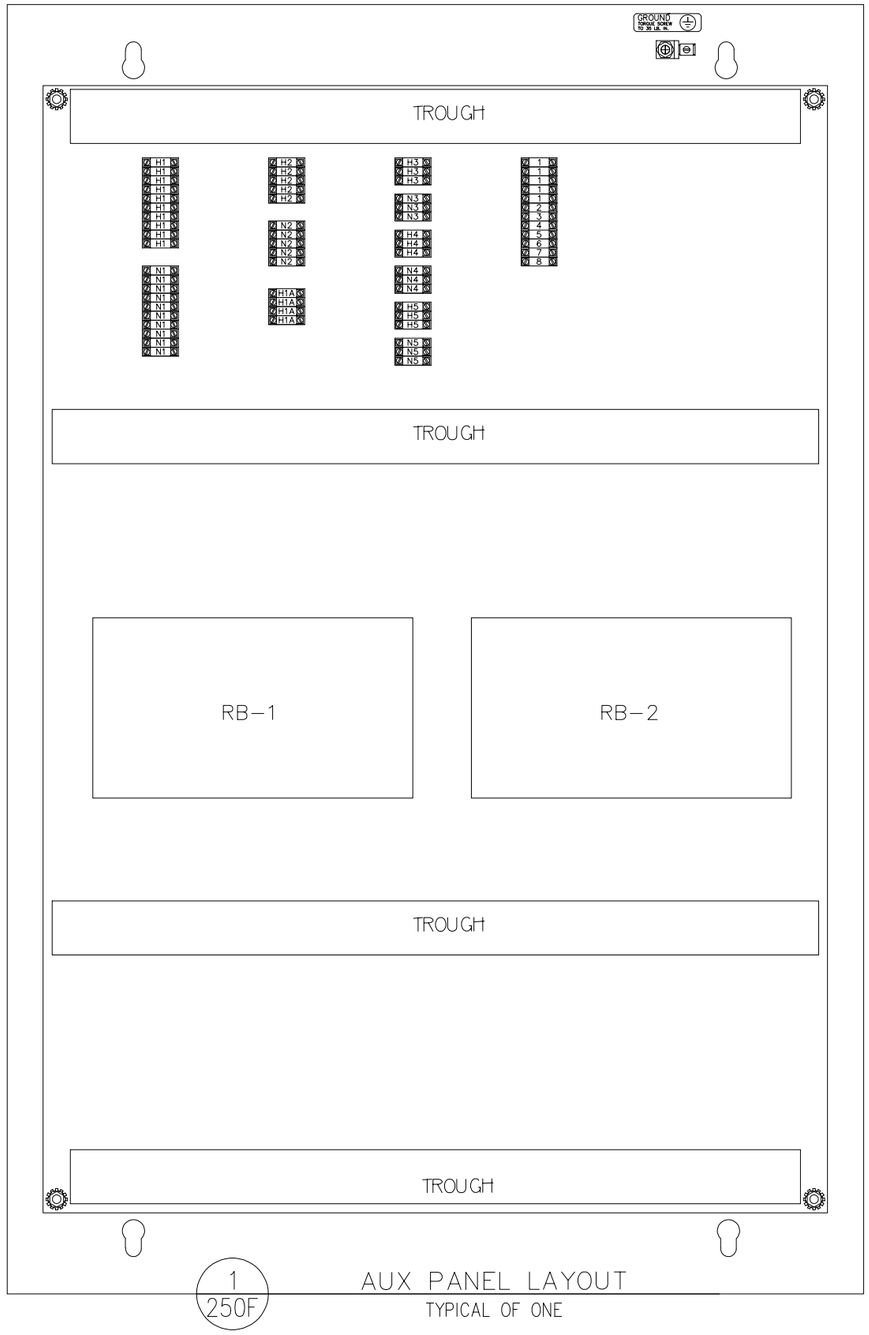

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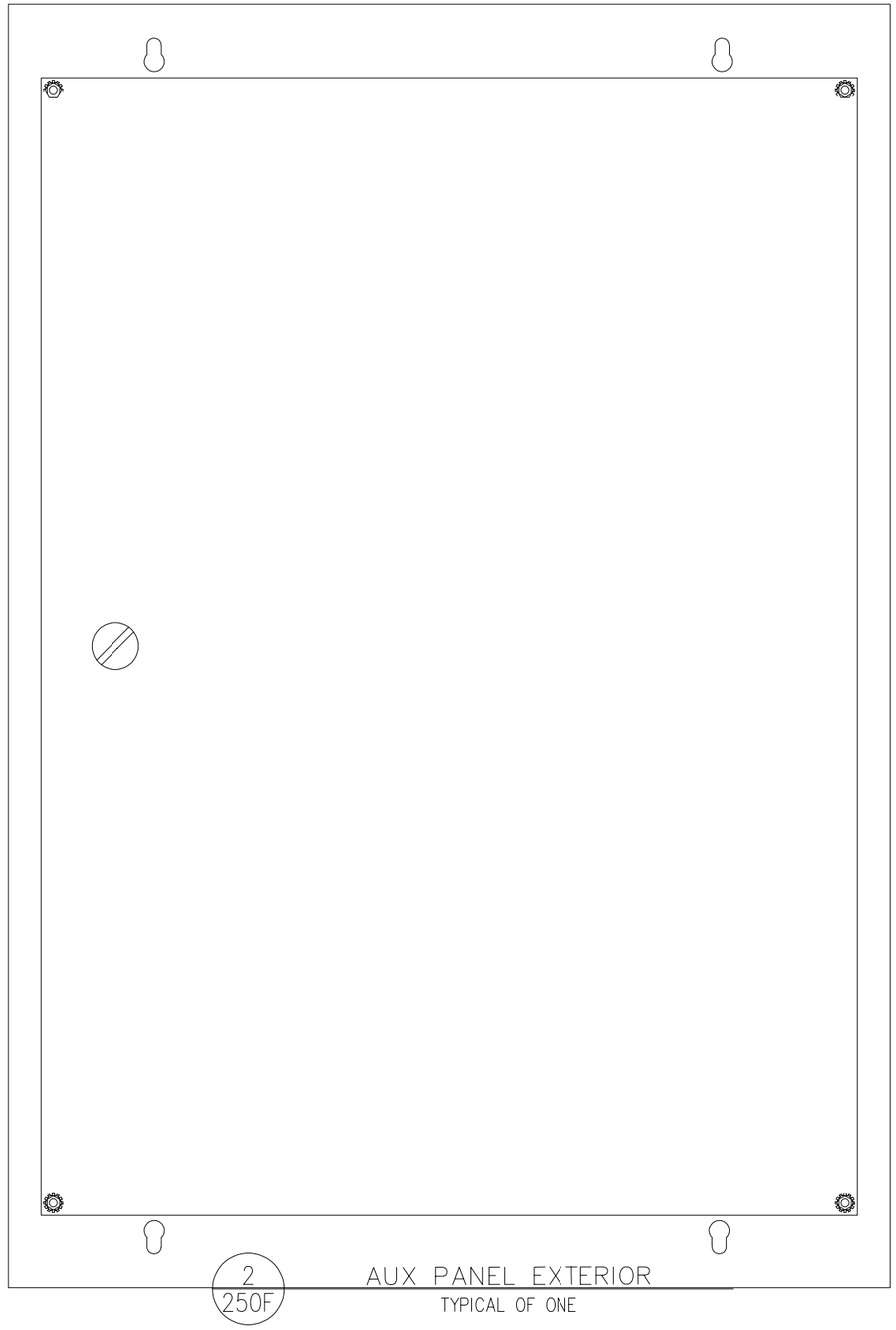
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

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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

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 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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AHU-6A/B CONTROL SOO 2

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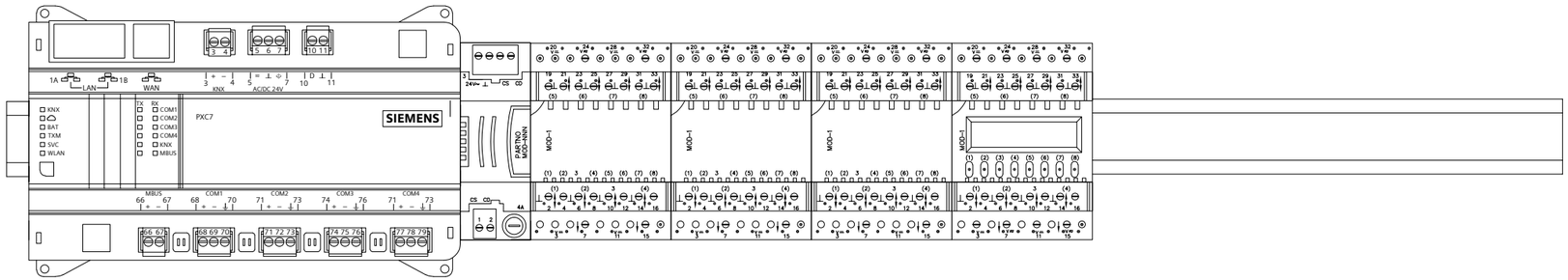
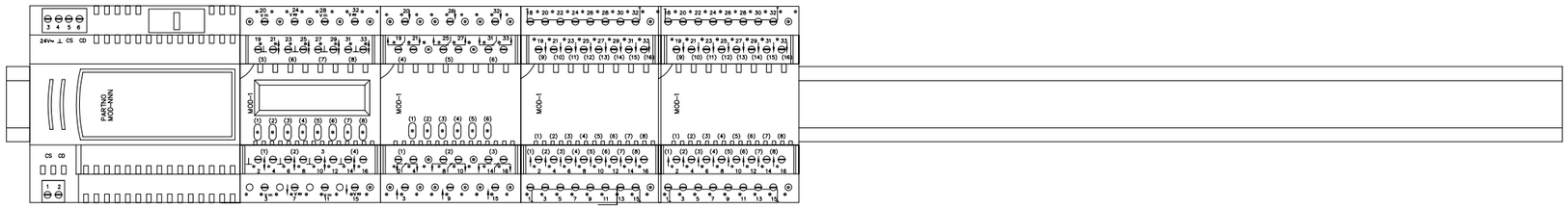
INSTALLATION NOTES:

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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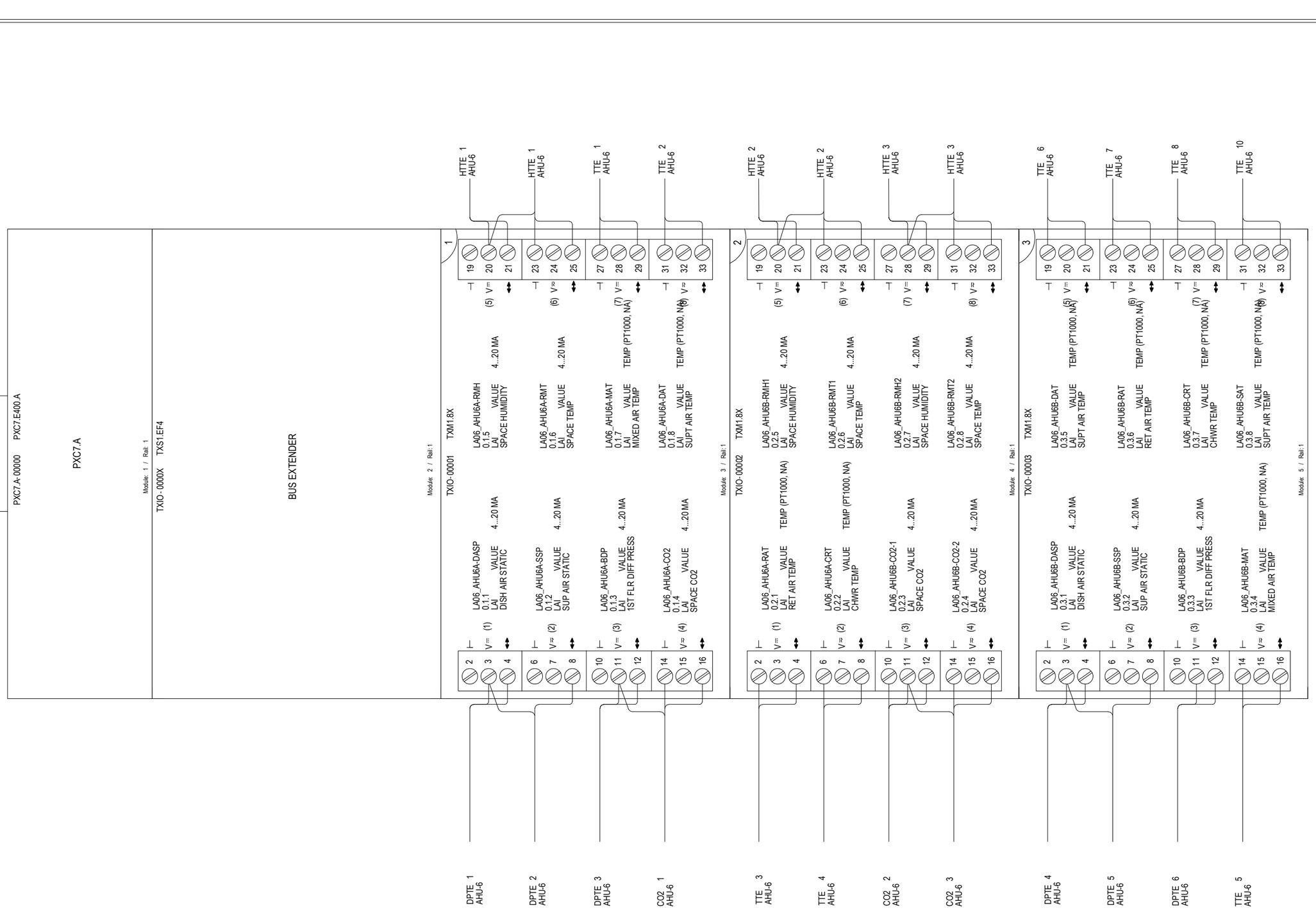

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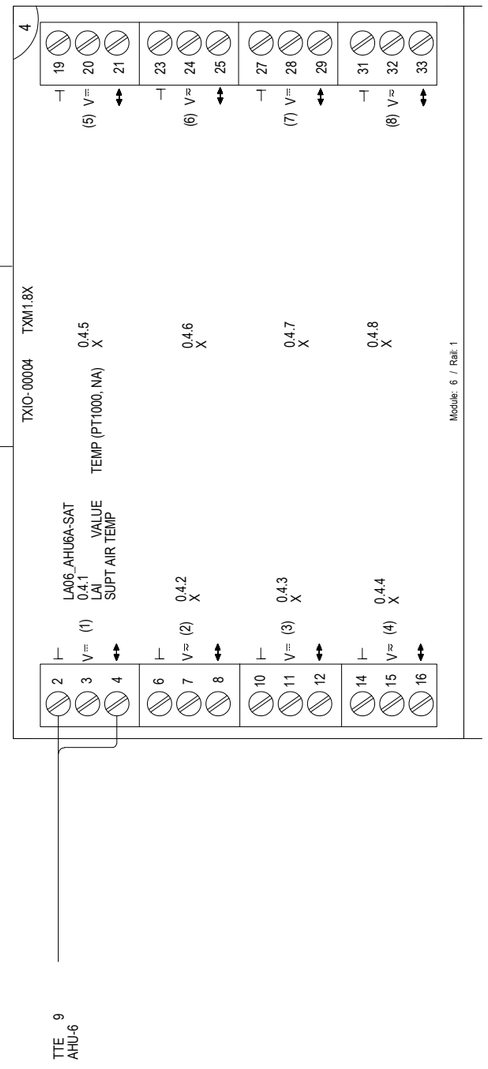

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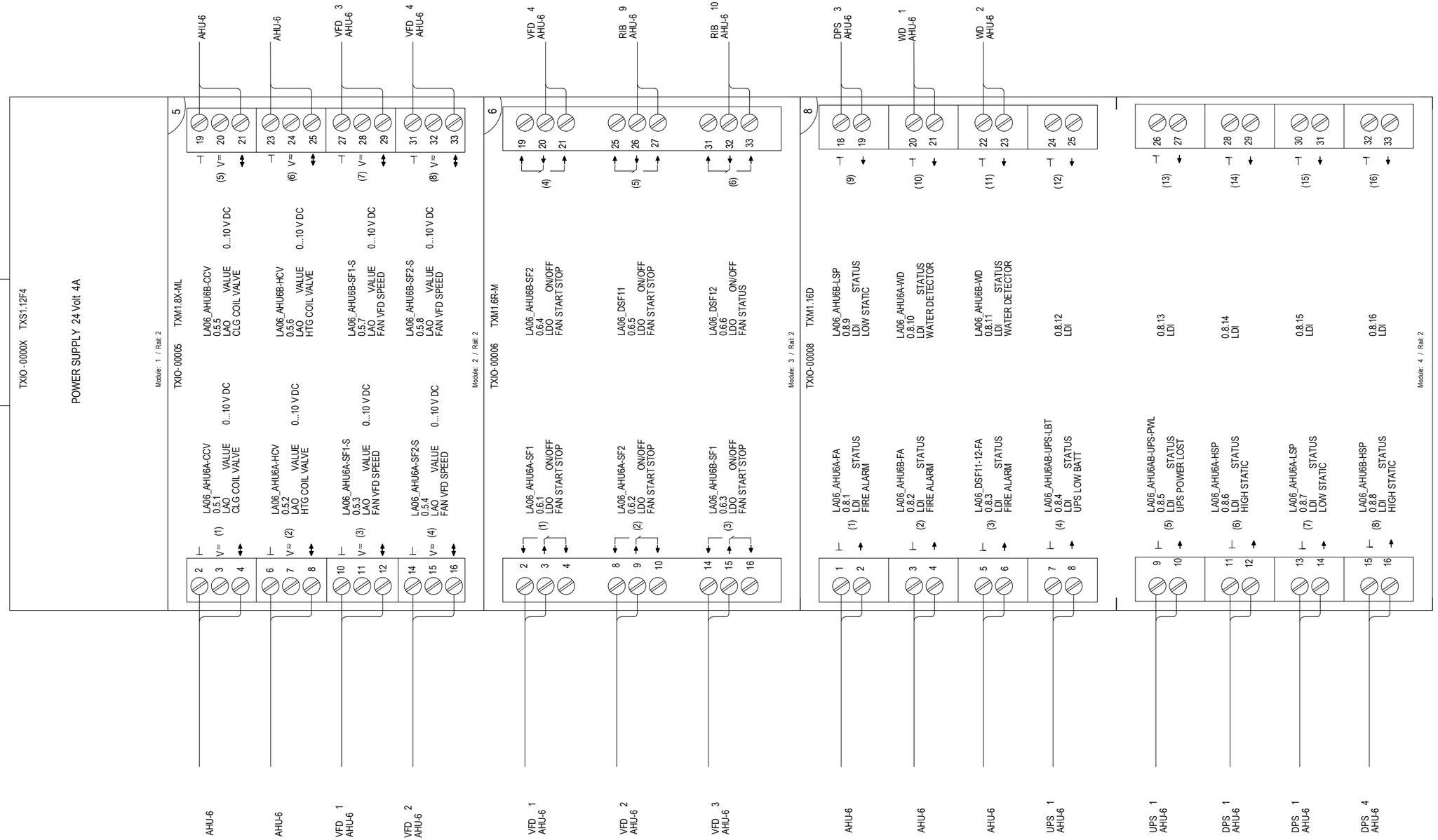
TXIO -0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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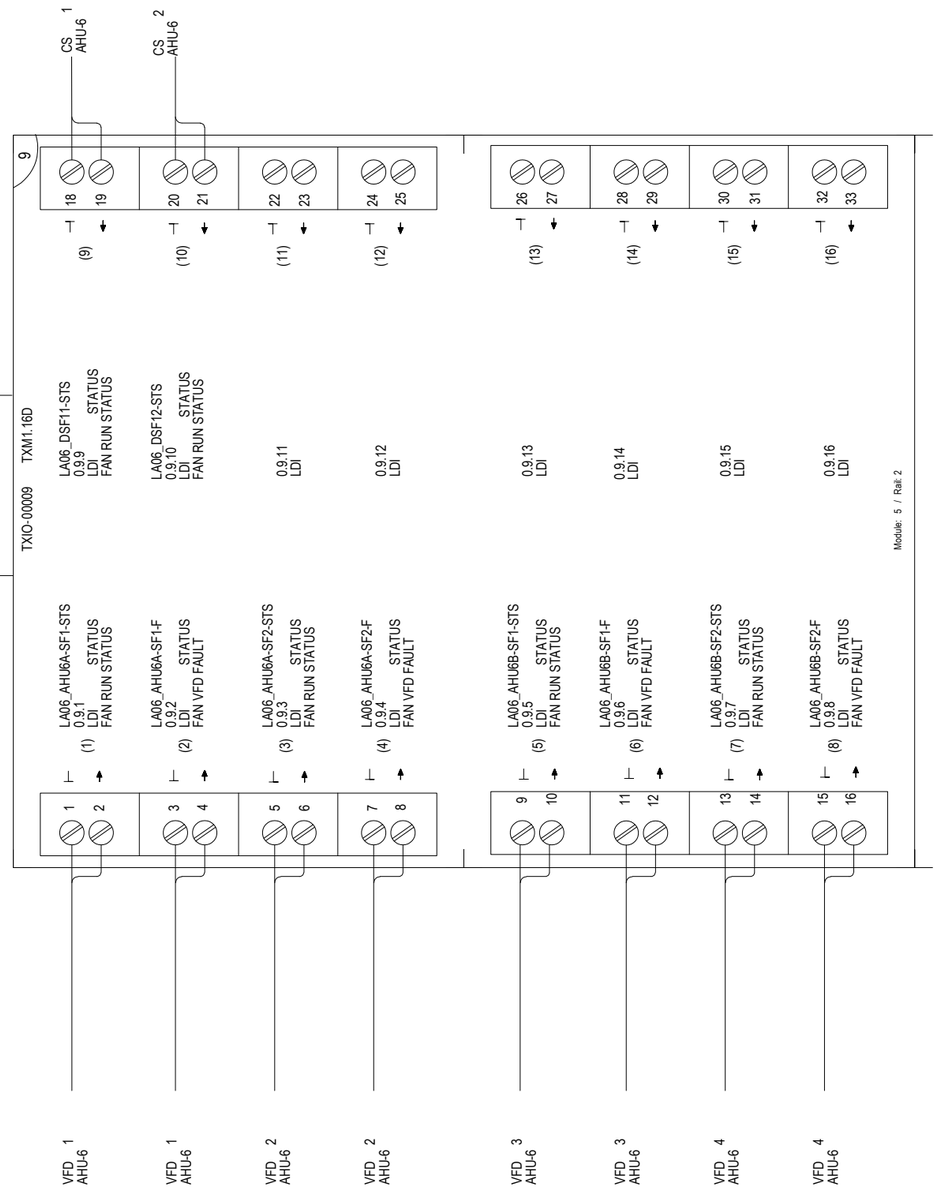

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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

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

LA06.PXCA BOM

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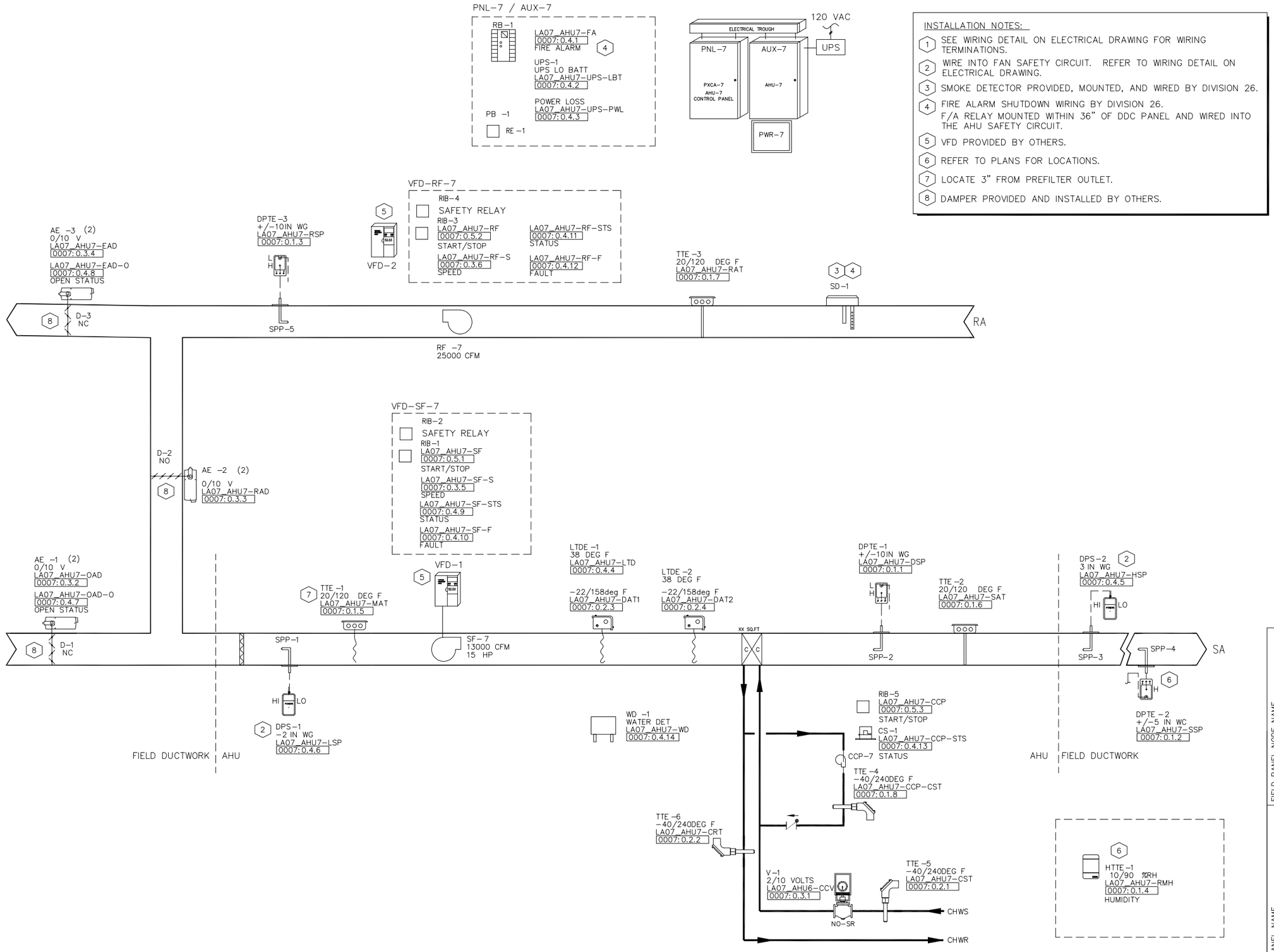

1/260 AHU-7 CONTROL DIAGRAM

REF #	FIELD PANEL NAME
0007	LA07.PXCA

FIELD PANEL NODE NAME

REVISION HISTORY

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

AHU-7 CONTROL

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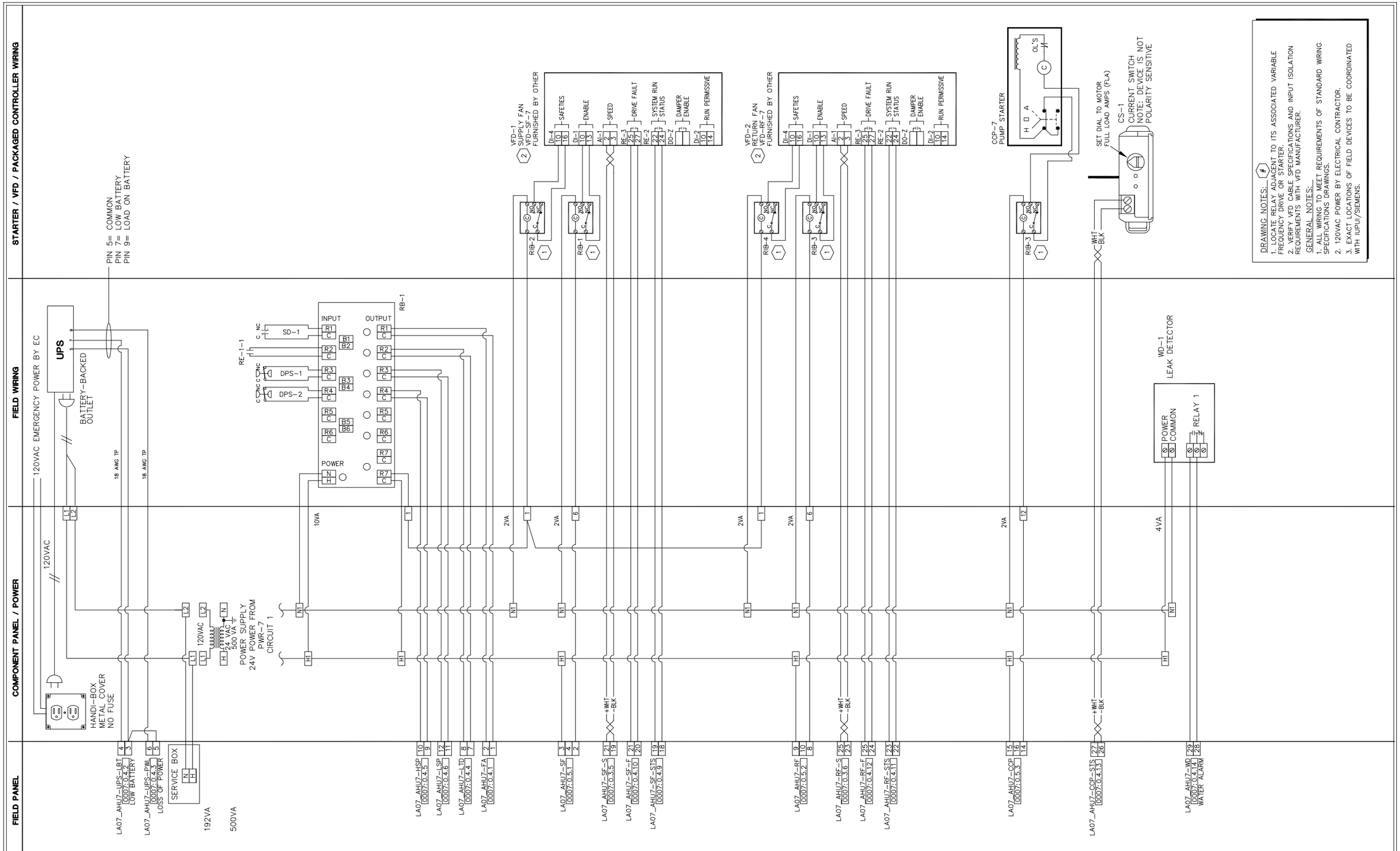

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0007	LA07.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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AHU-7 ELEC WIRING 1

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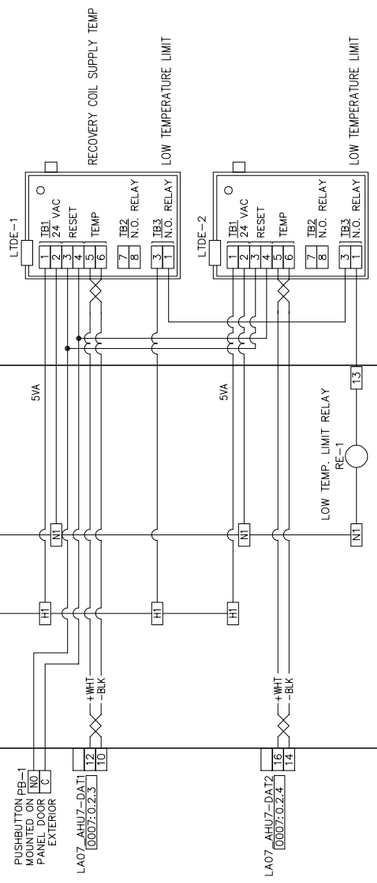
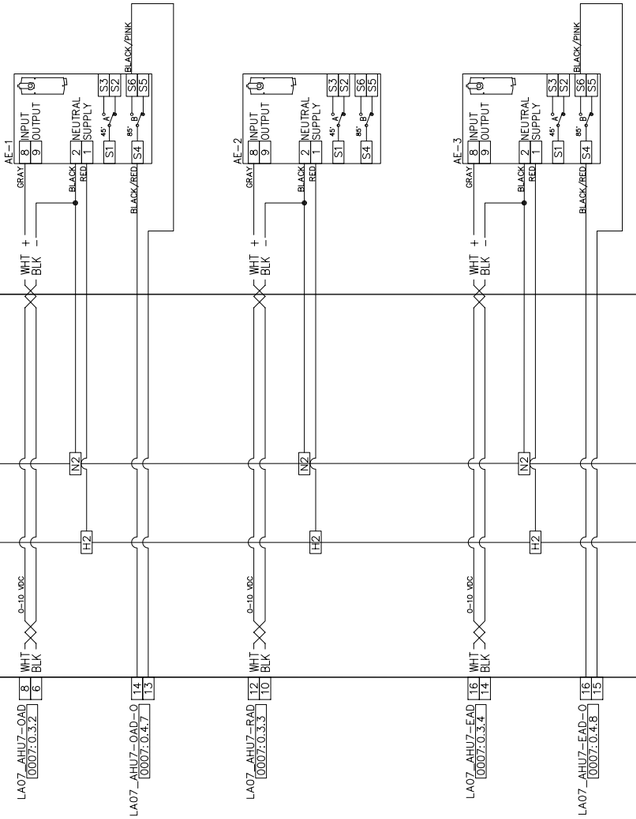
FIELD WIRING

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

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-7 ELEC WIRING 2

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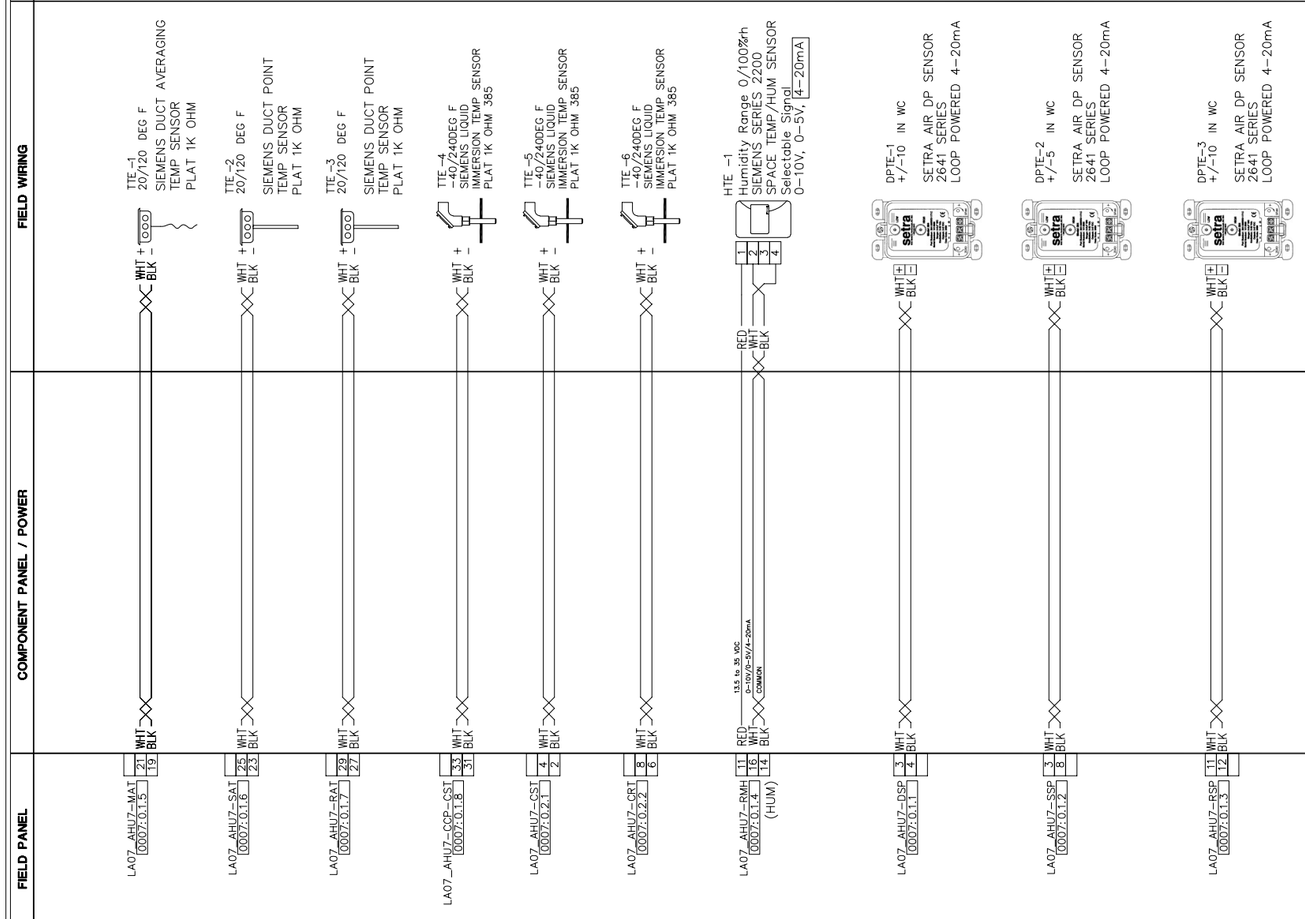
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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
0007	LA07.PXCA	

REVISION HISTORY

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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AHU-7 ELEC WIRING 3

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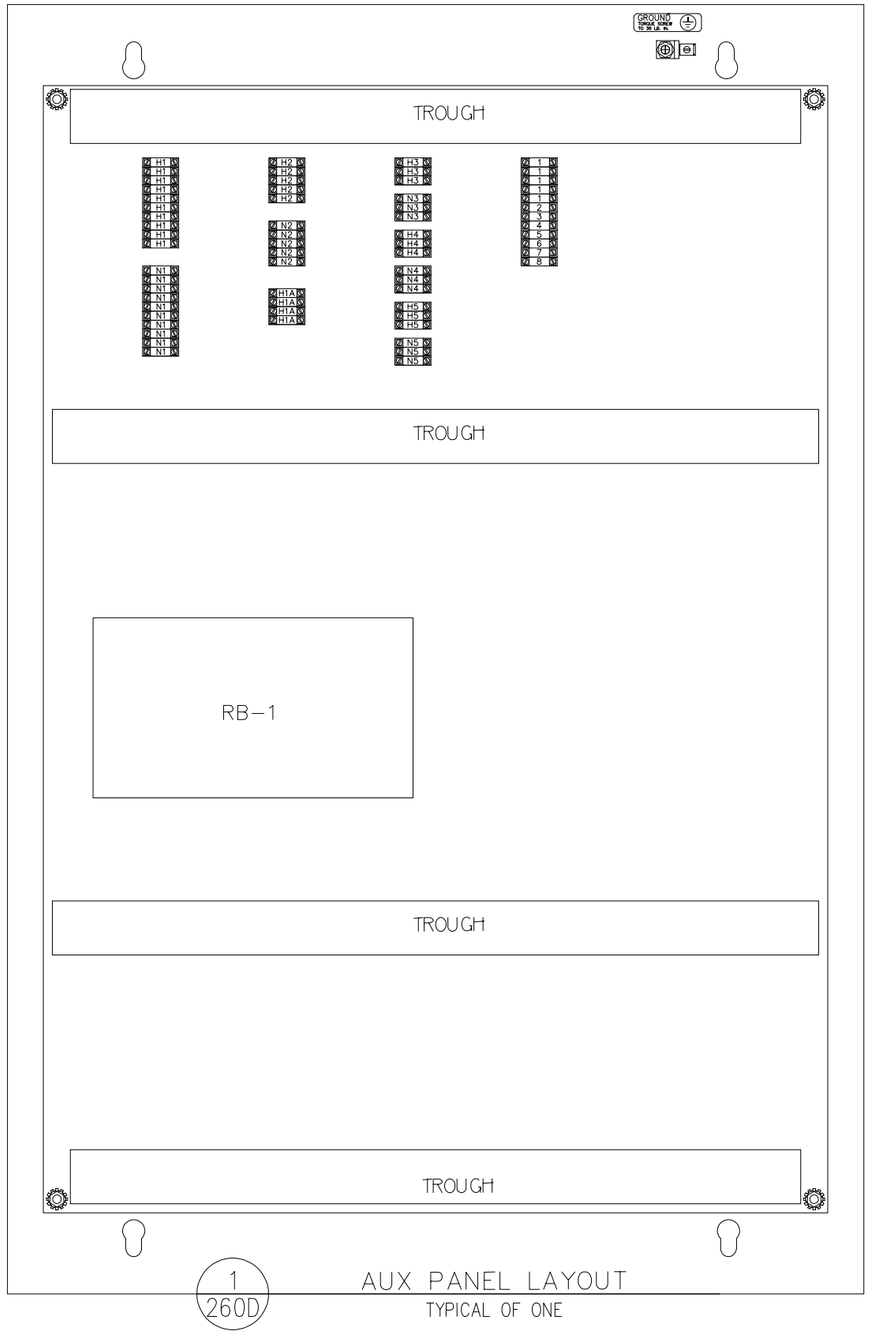
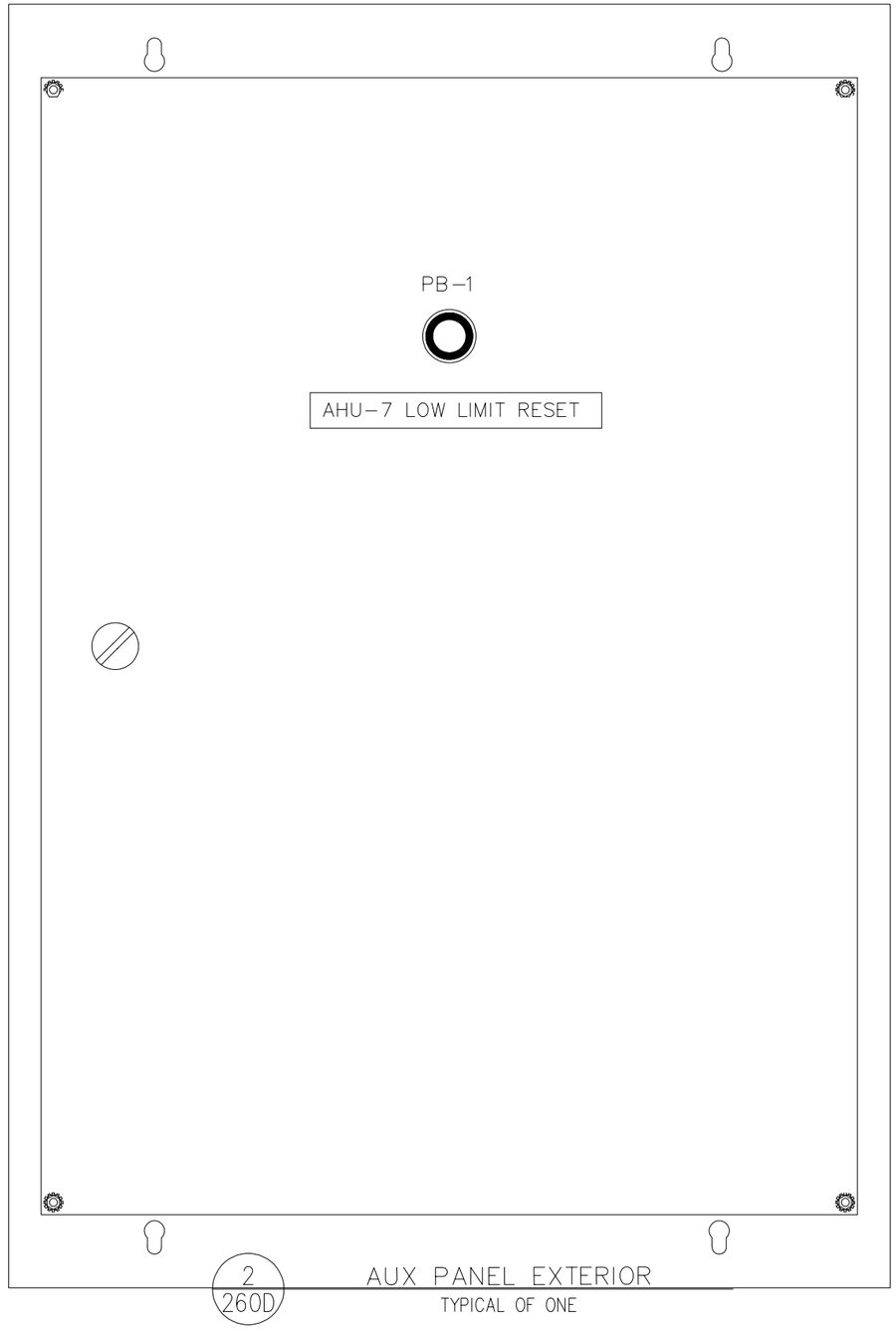


1 260D AUX PANEL LAYOUT
TYPICAL OF ONE



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

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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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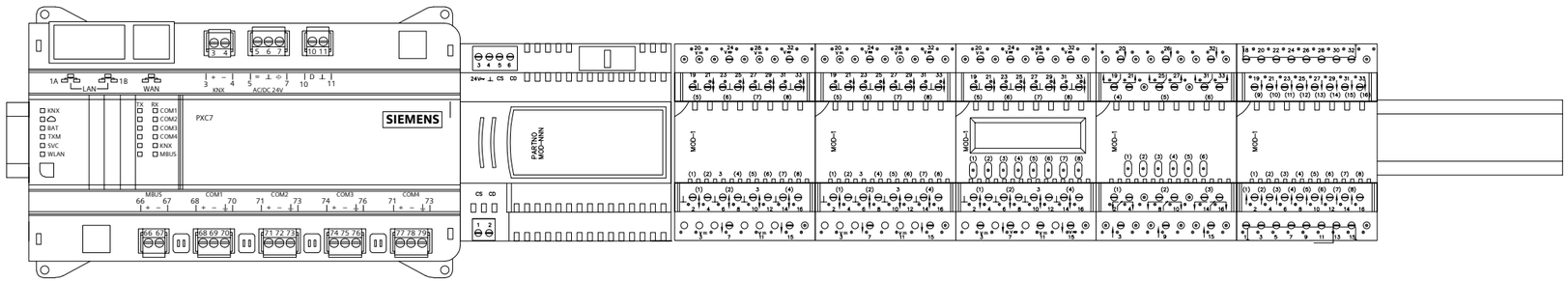
INSTALLATION NOTES:

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

AHU-7

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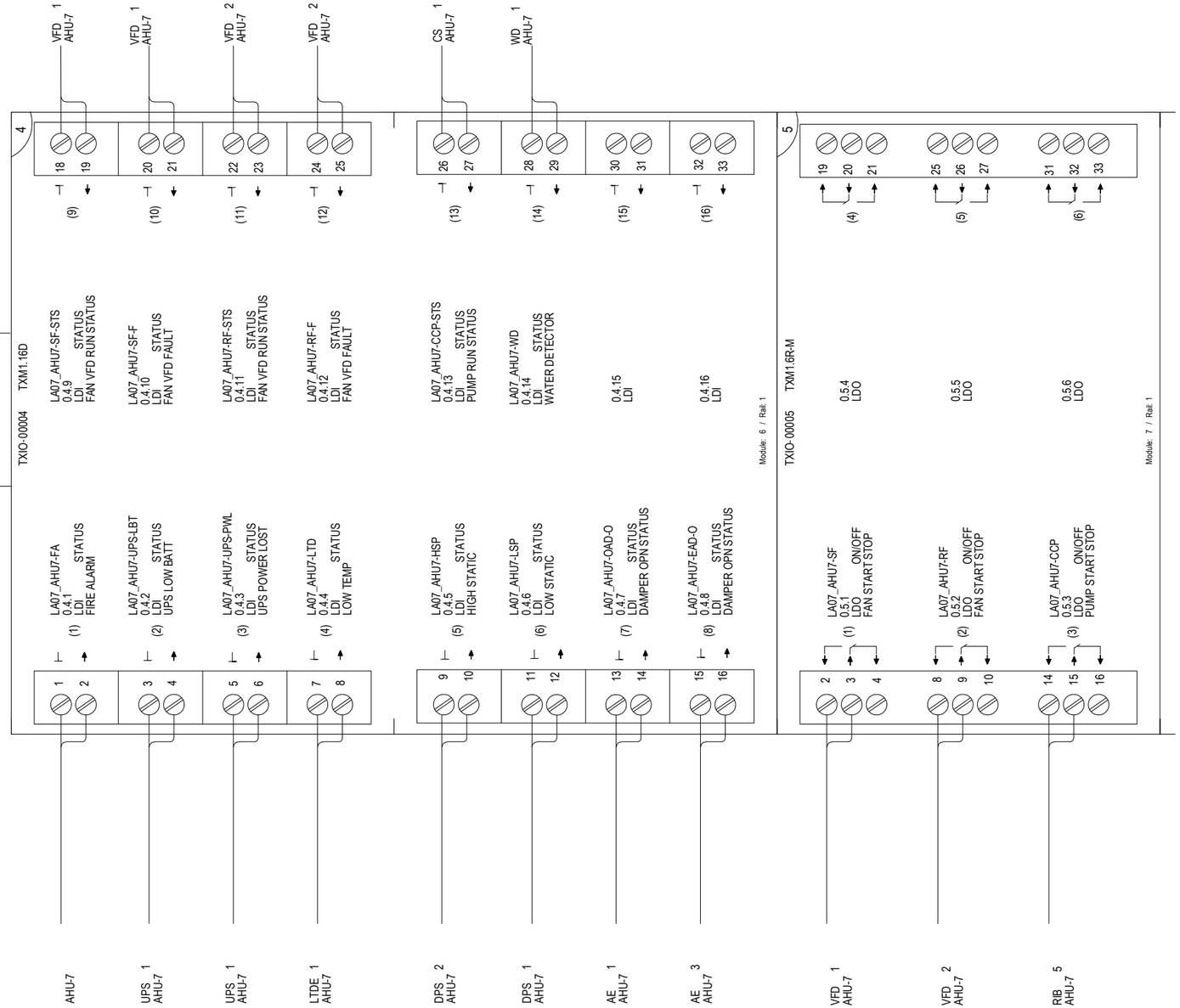

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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

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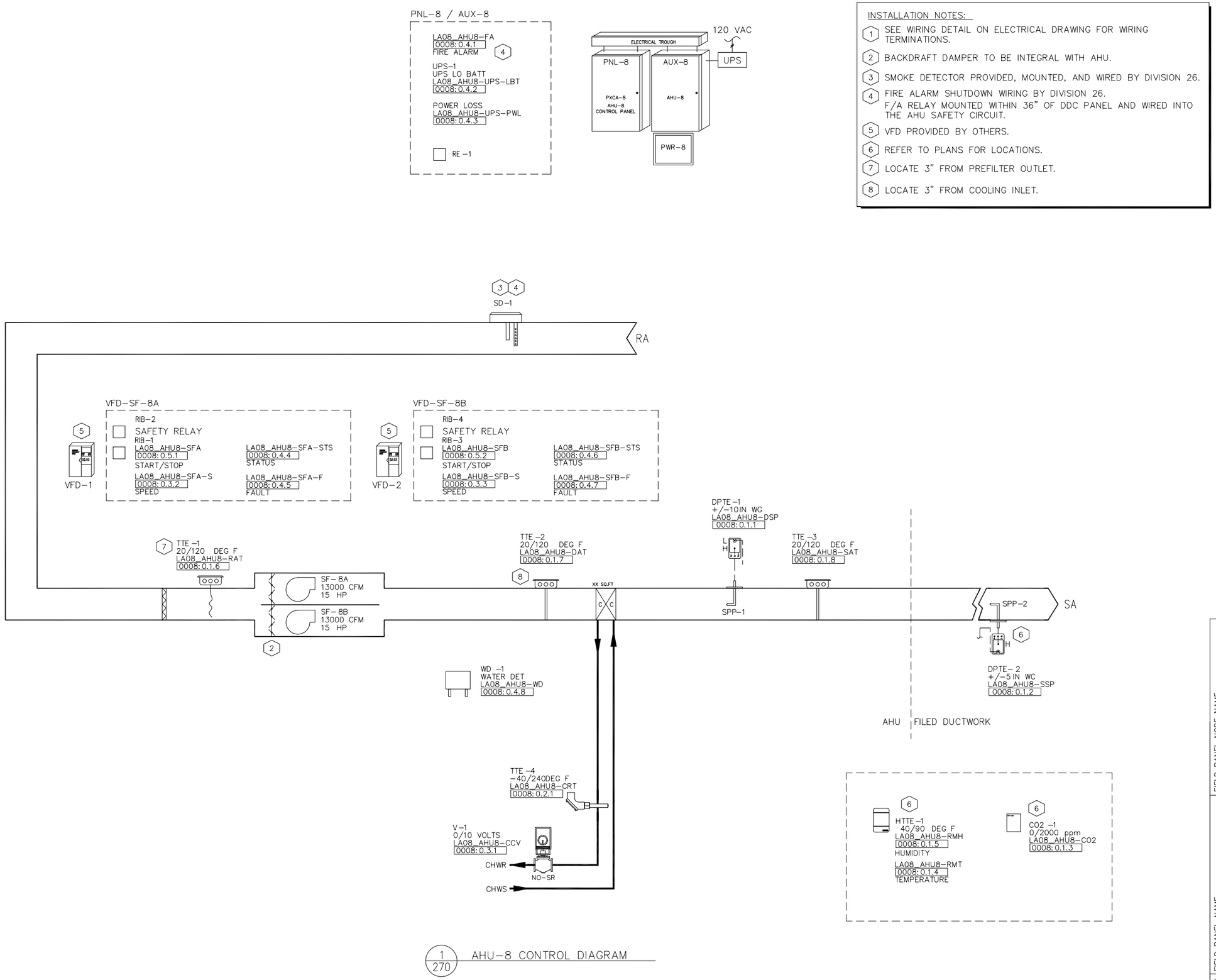

1 270 AHU-8 CONTROL DIAGRAM

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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REVISION HISTORY

REF#	FIELD PANEL NAME
0008	LA08.PXCA

FIELD PANEL NODE NAME

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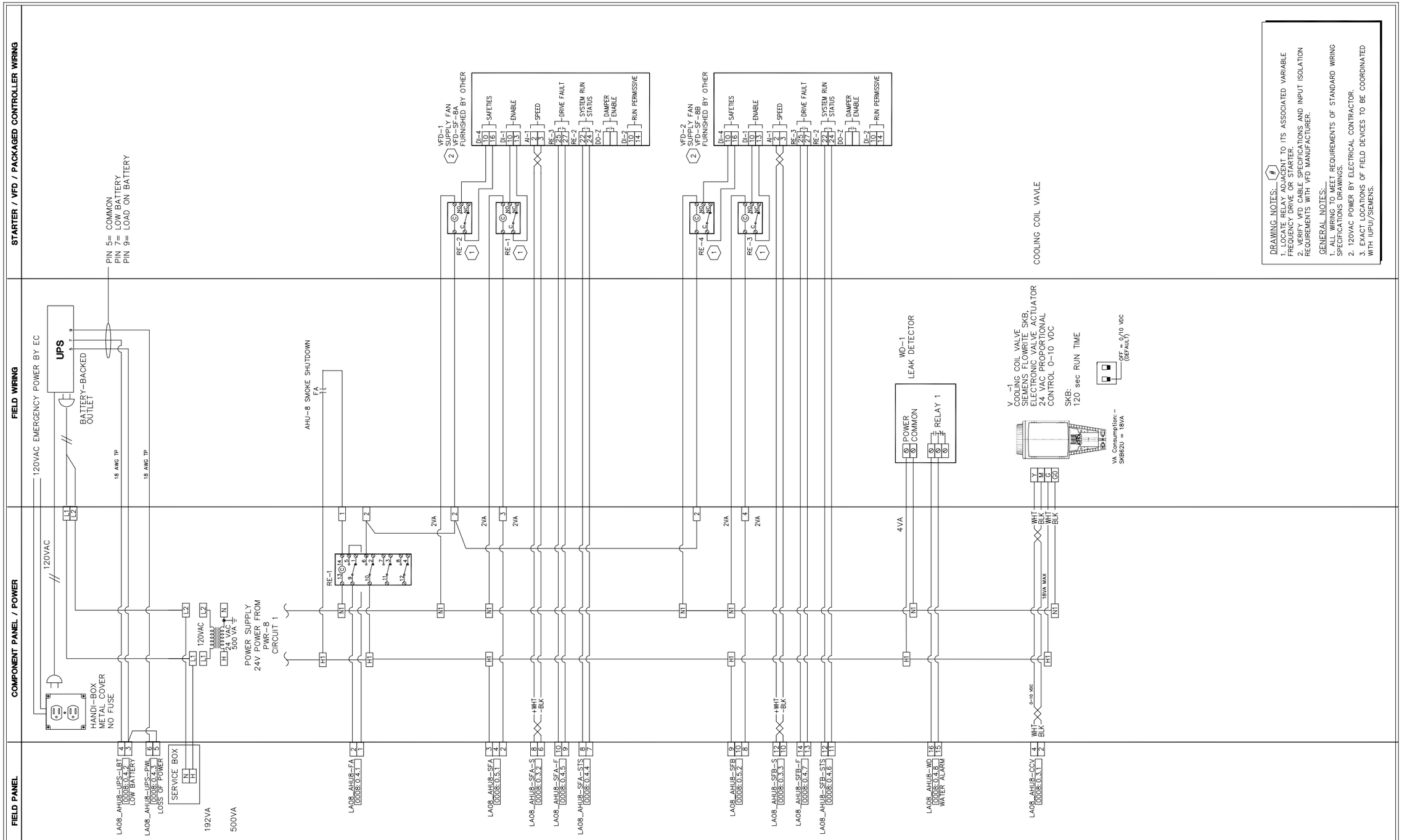
FIELD WIRING

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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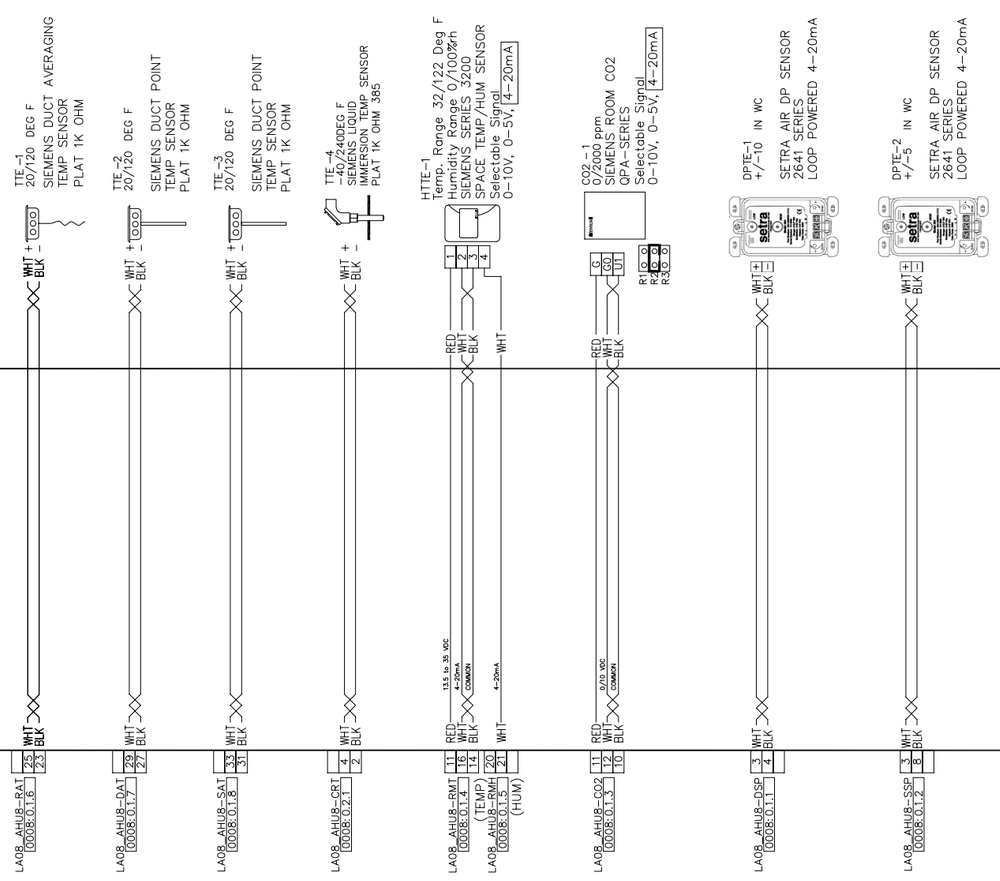
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**



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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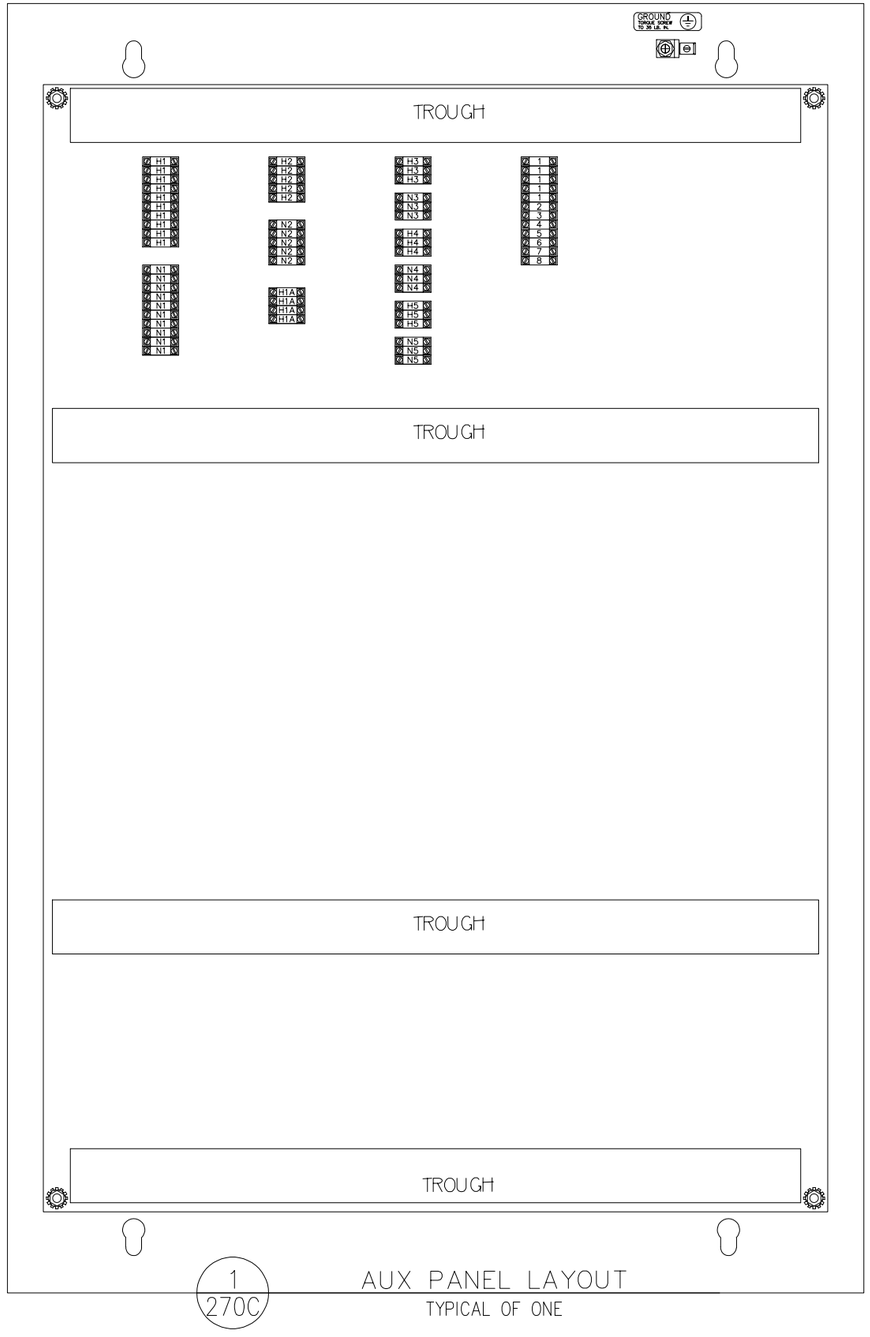

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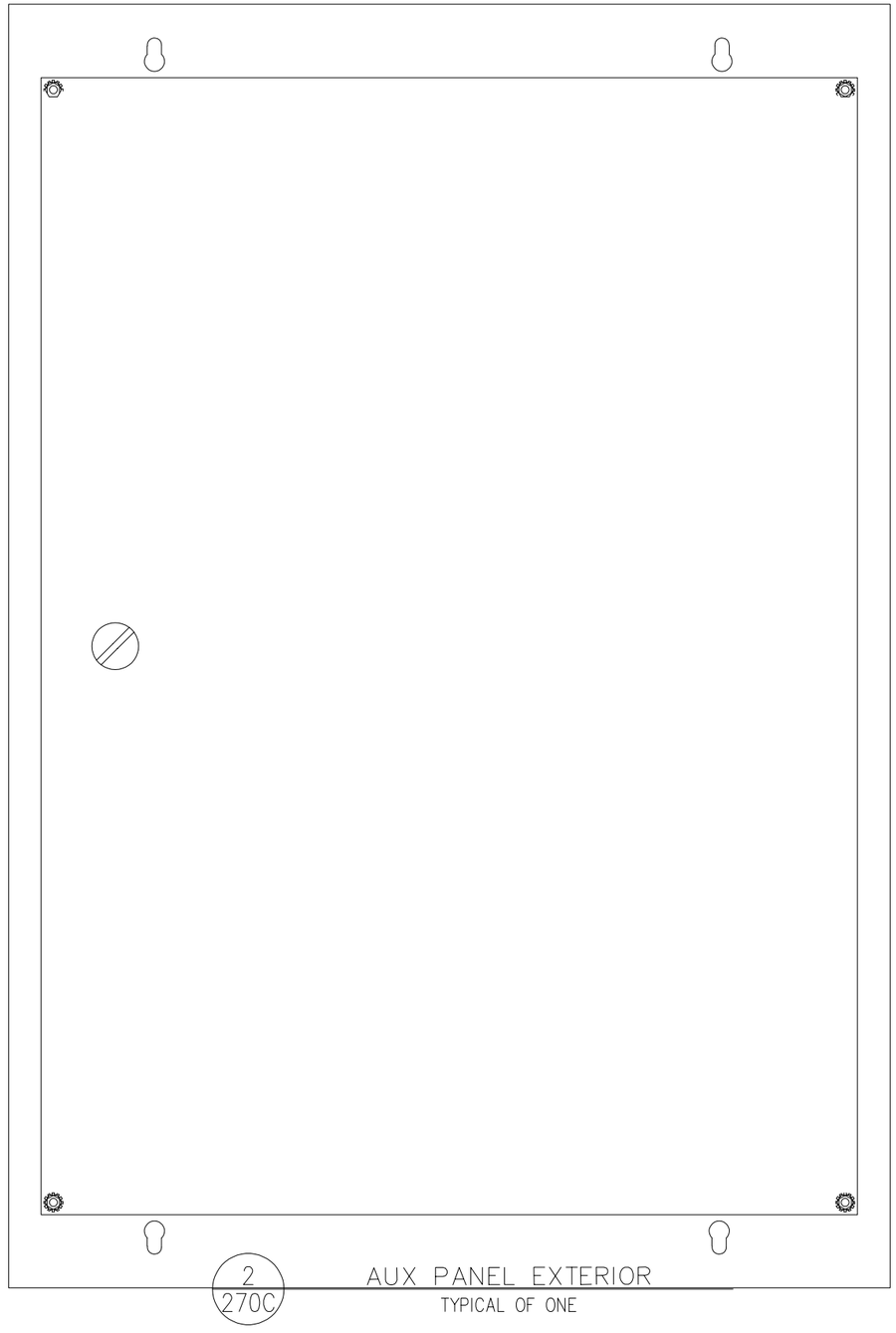
AUX PANEL LAYOUT

TYPICAL OF ONE



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AUX PANEL EXTERIOR

TYPICAL OF ONE

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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.
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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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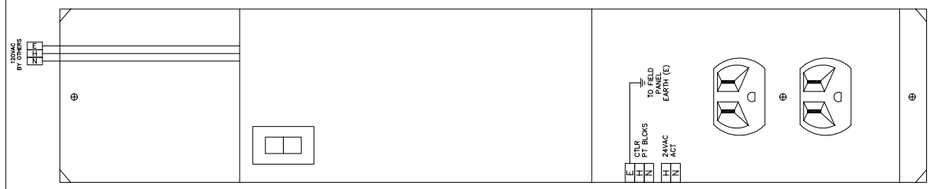
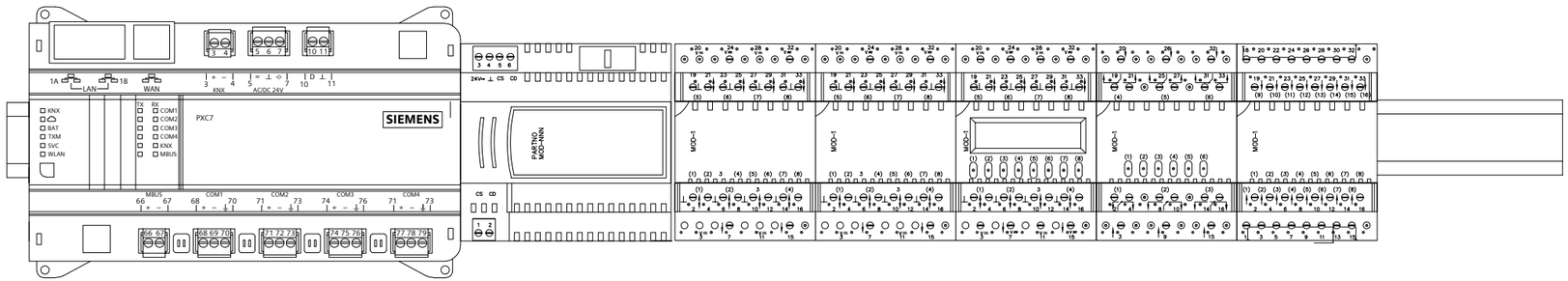
INSTALLATION NOTES:

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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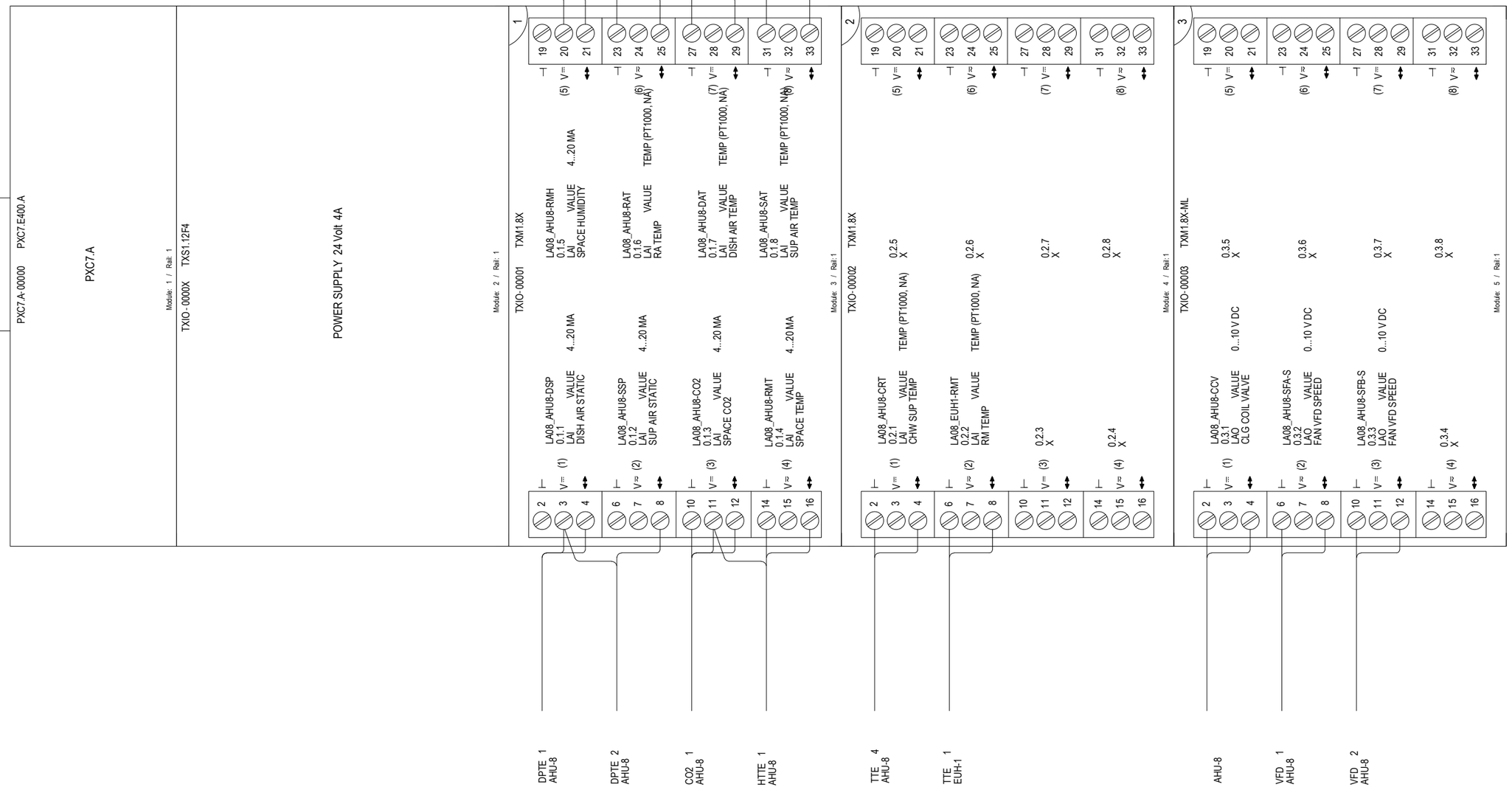
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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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-8

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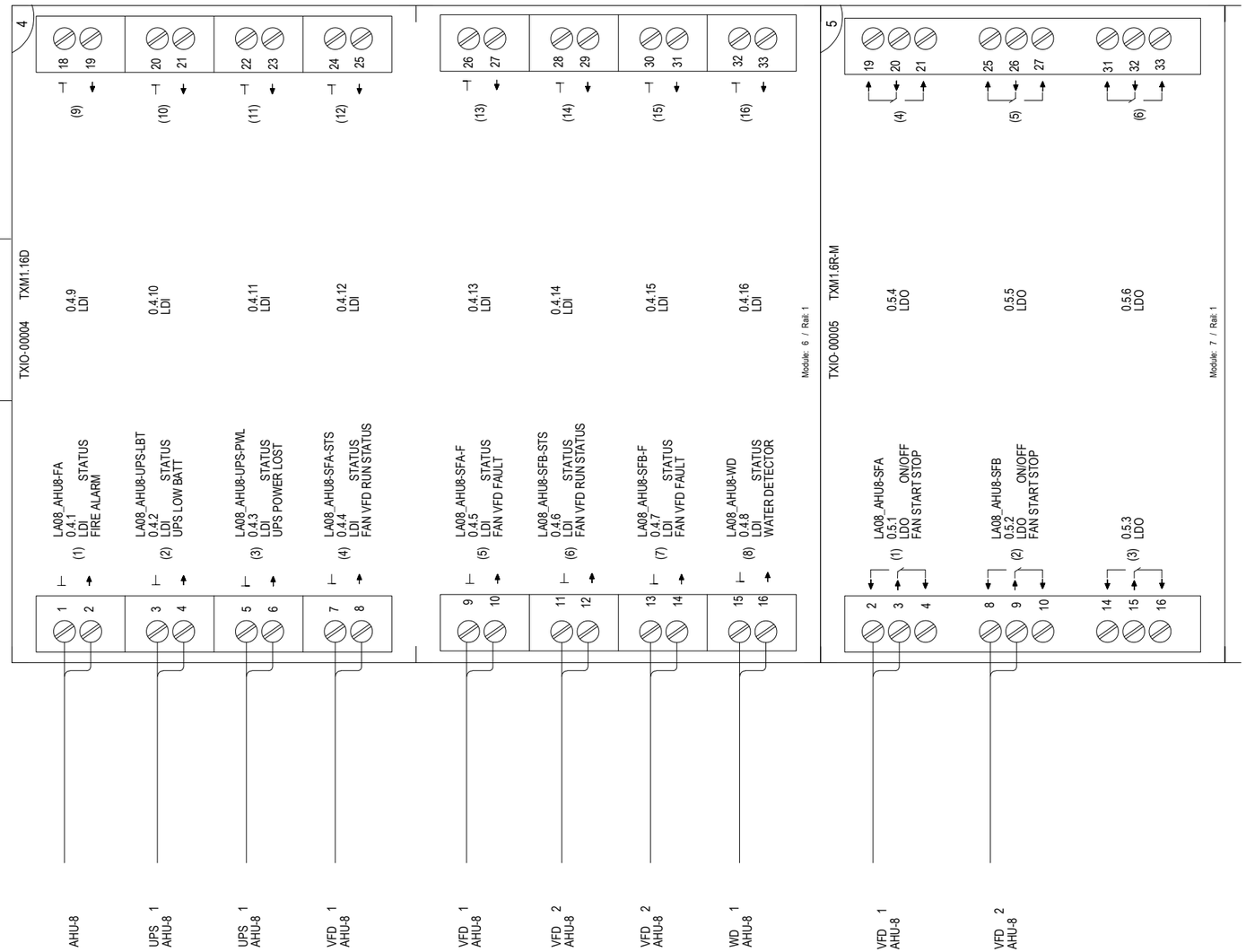

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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SMART INFRASTRUCTURE DIVISION

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LA08.PXCAp002

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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

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LA08.PXCA BOM

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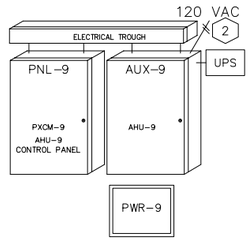
INSTALLATION NOTES:

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

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FUTURE AHU-9

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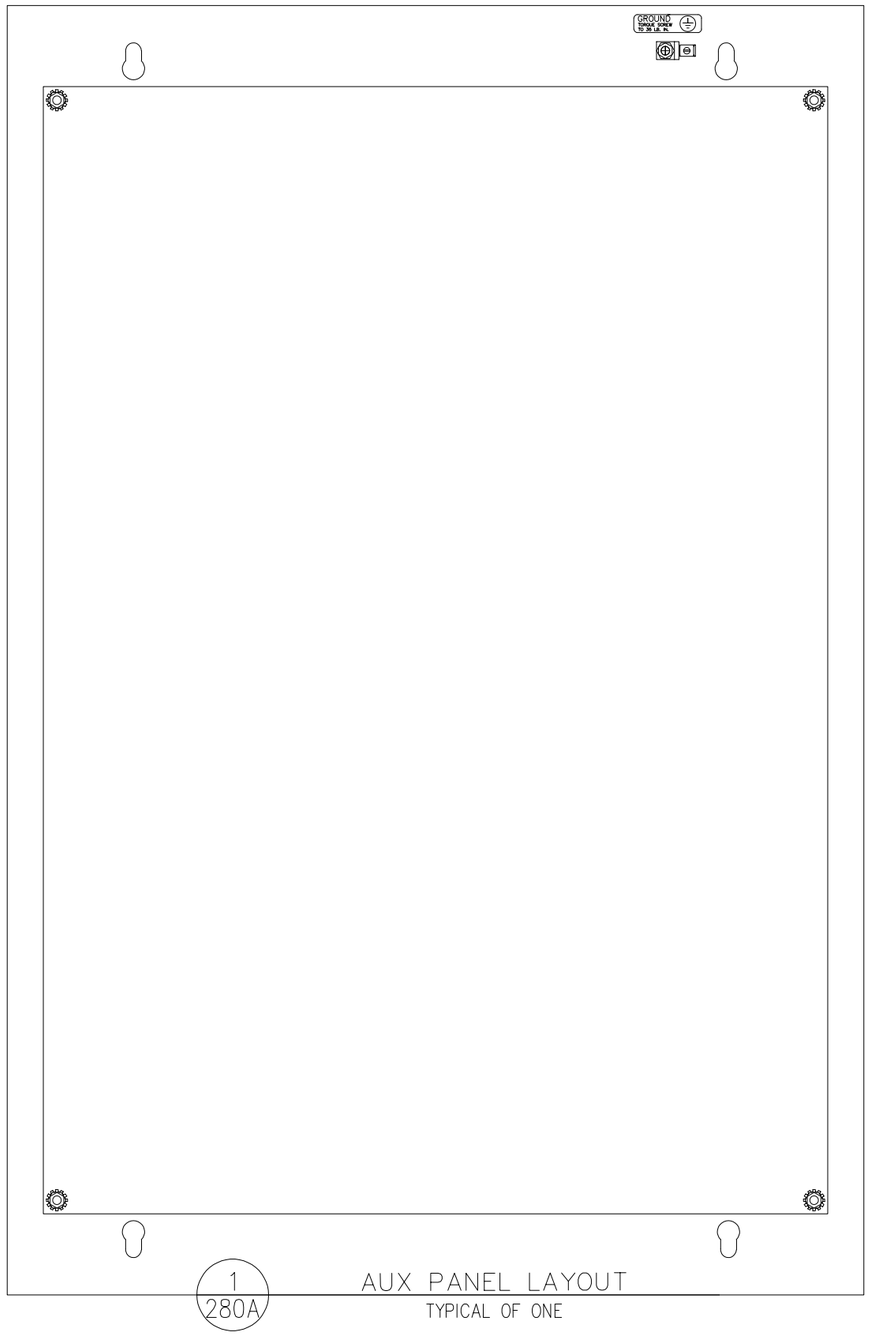
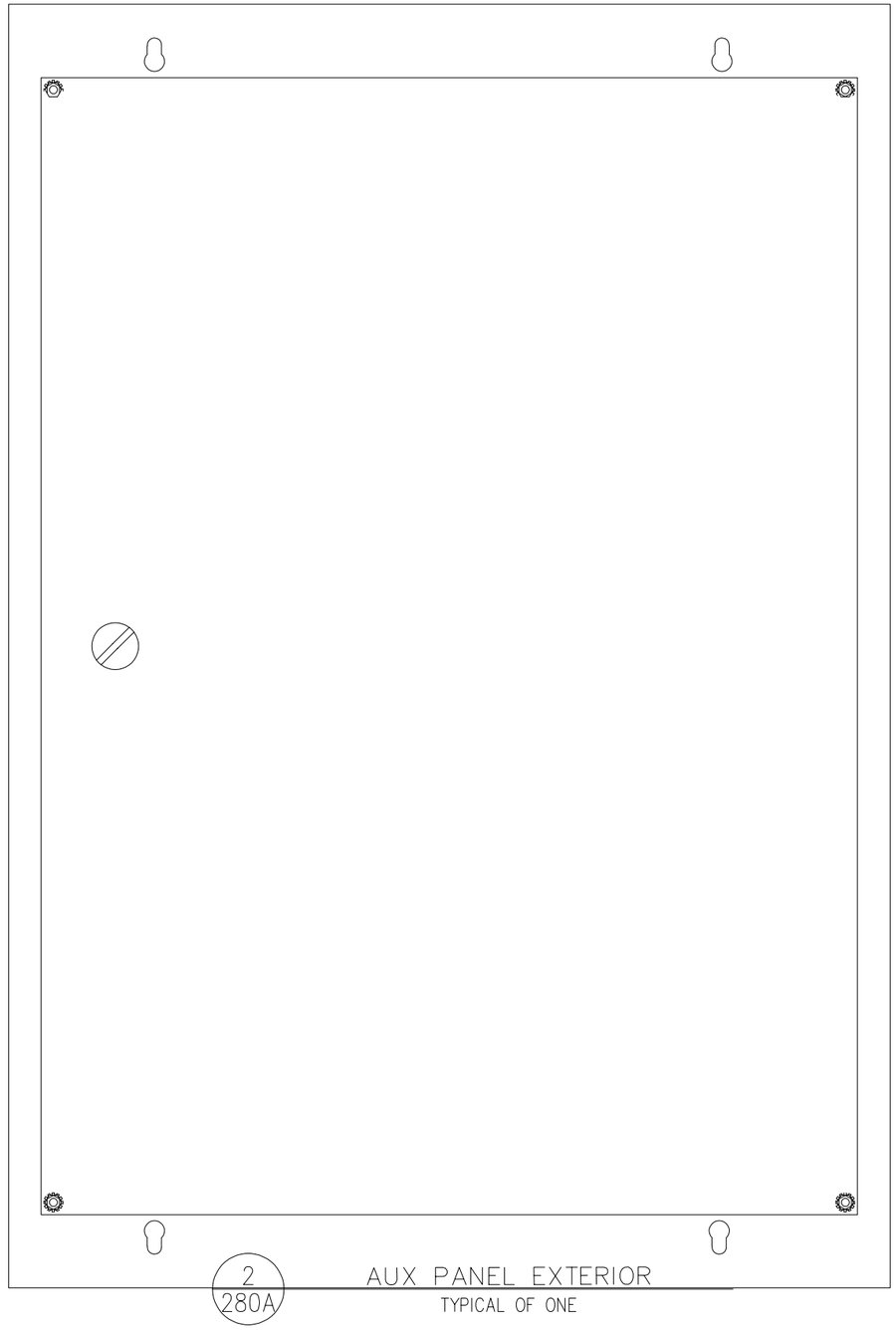


1 280A AUX PANEL LAYOUT
TYPICAL OF ONE



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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FUTURE AHU-9 CONTROL

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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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FUTURE AHU-9 BOM

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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

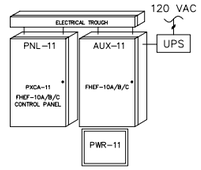
LA11_ELSAMEF10-A3IN
0011:0.4.7
SUPERVISORY INPUT

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
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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

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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FH EXH FAN ELEC. WIRING 1

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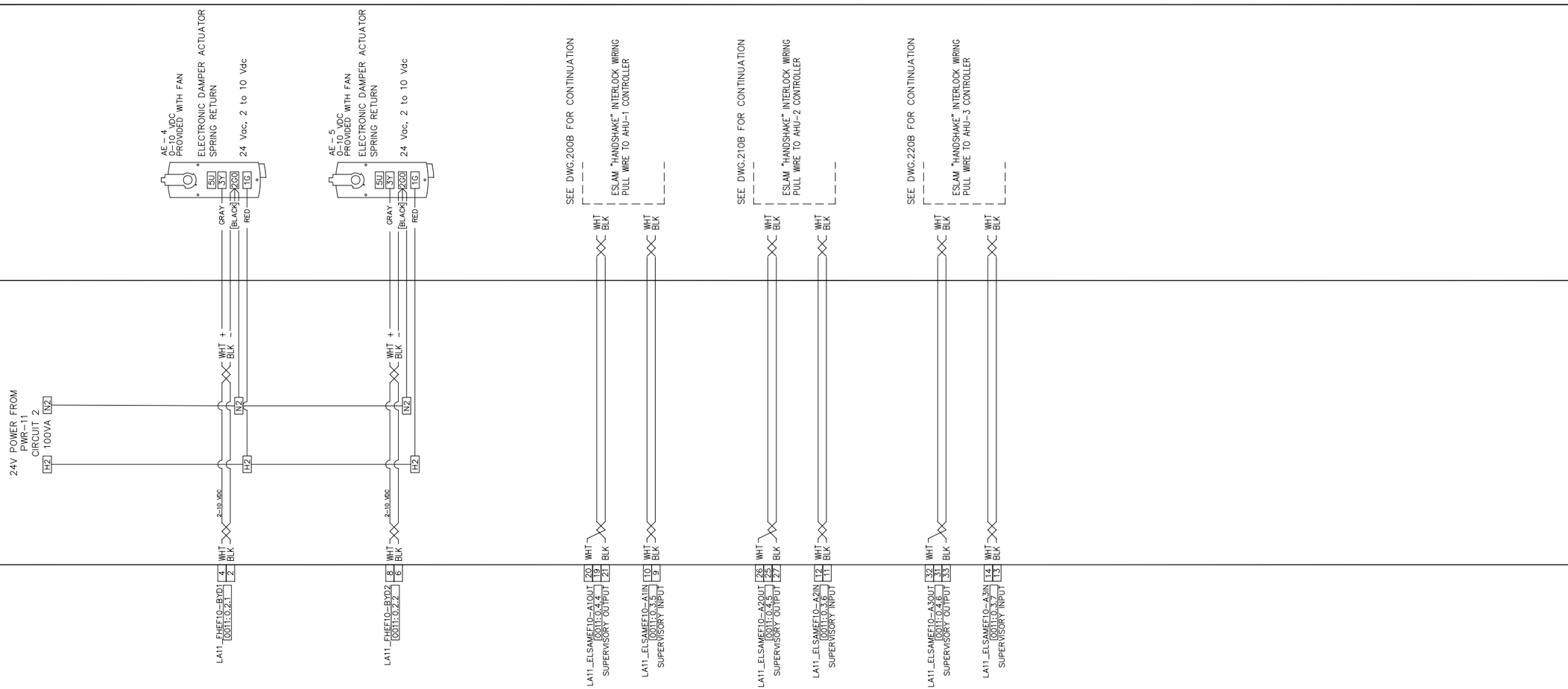
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

COMPONENT PANEL / POWER

FIELD PANEL



GENERAL NOTES:

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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
0011	LA11.PXCA	

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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FH EXH FAN ELEC. WIRING 2

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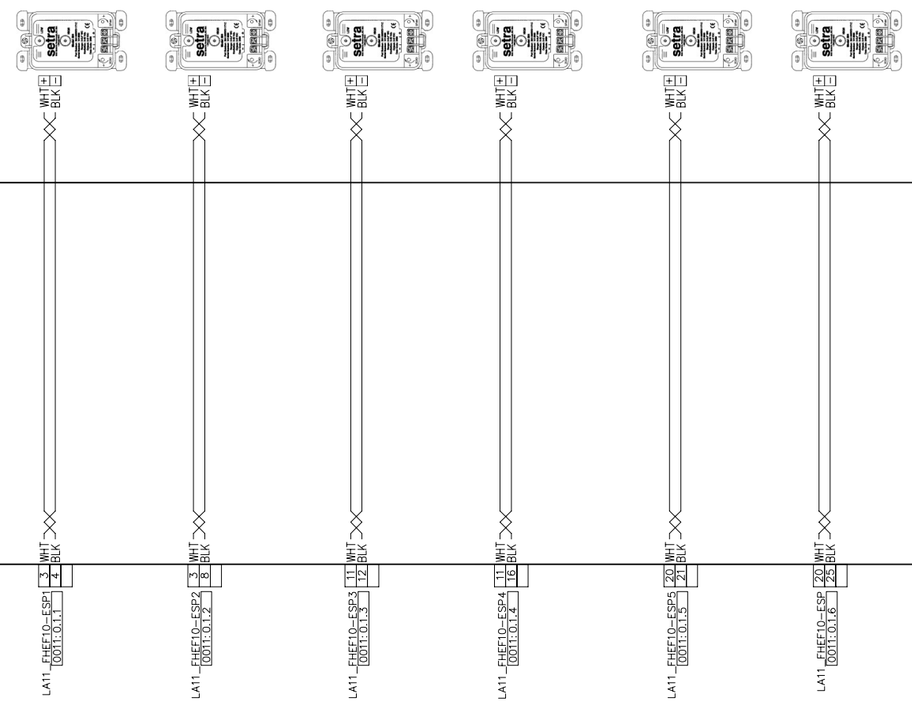
FIELD WIRING | **STARTER / VFD / PACKAGED CONTROLLER WIRING**

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.
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REVISION HISTORY

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FH EXH FAN ELEC. WIRING 3

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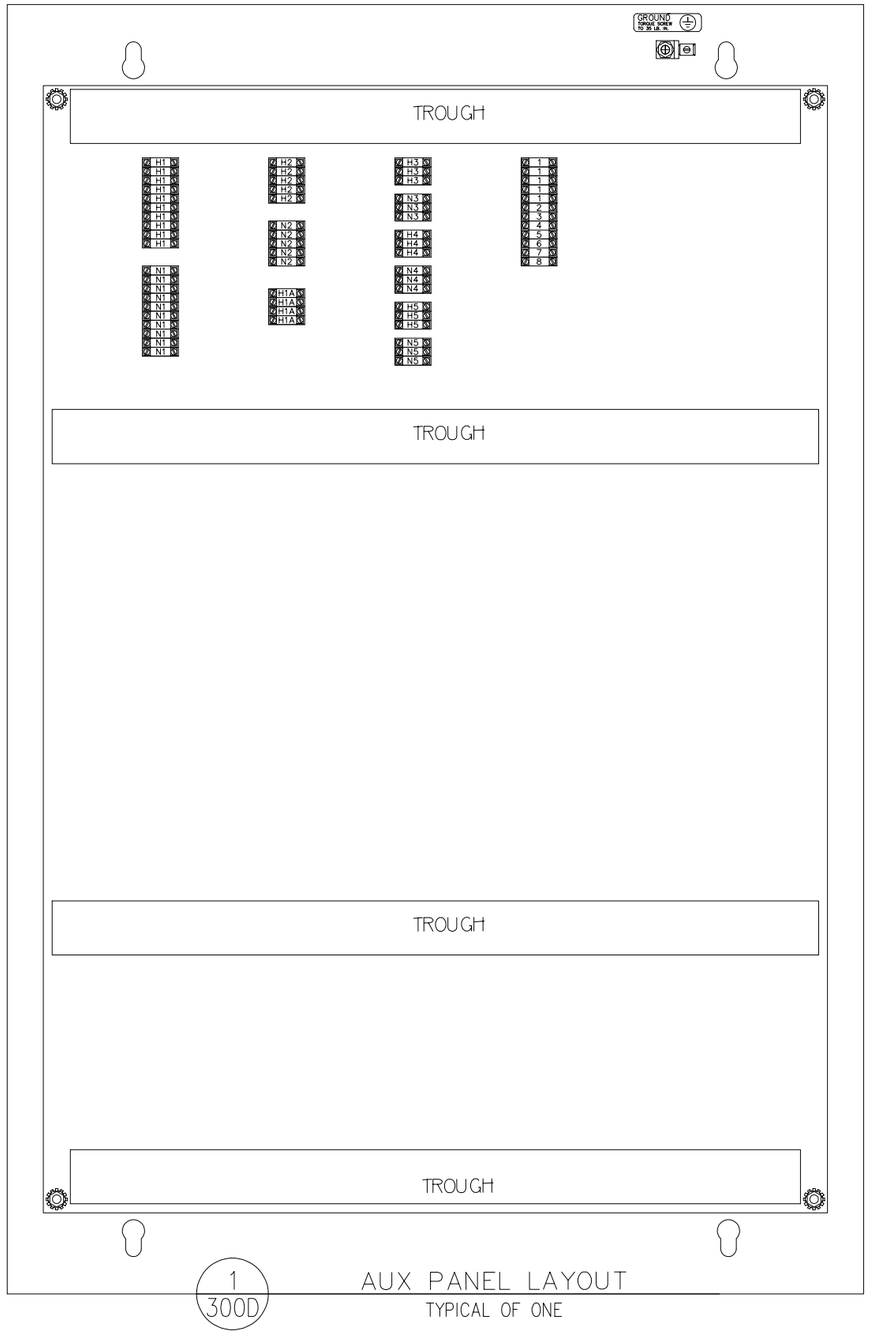

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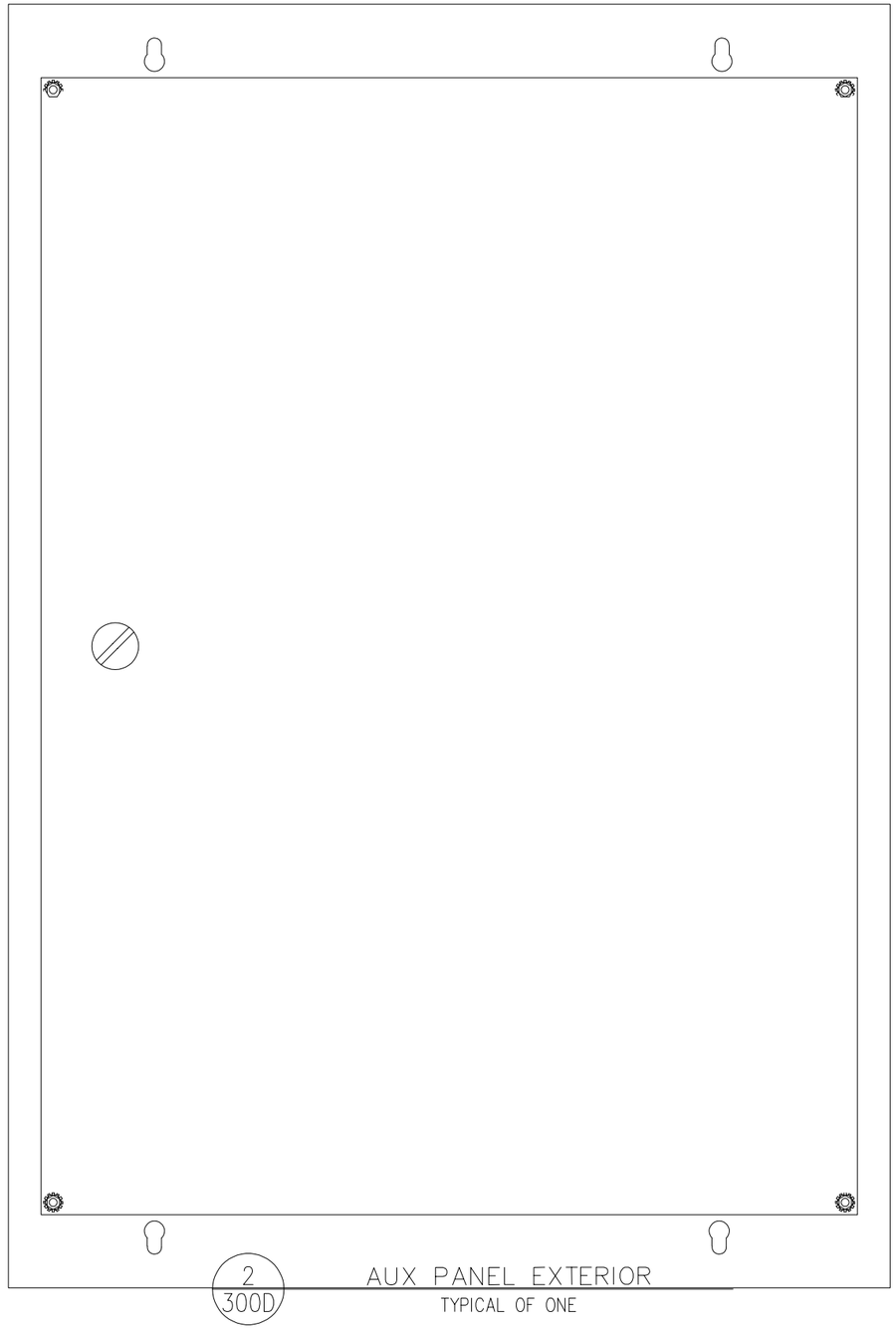
AUX PANEL LAYOUT

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

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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

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

FH EXH FAN SYS BOM & SOO

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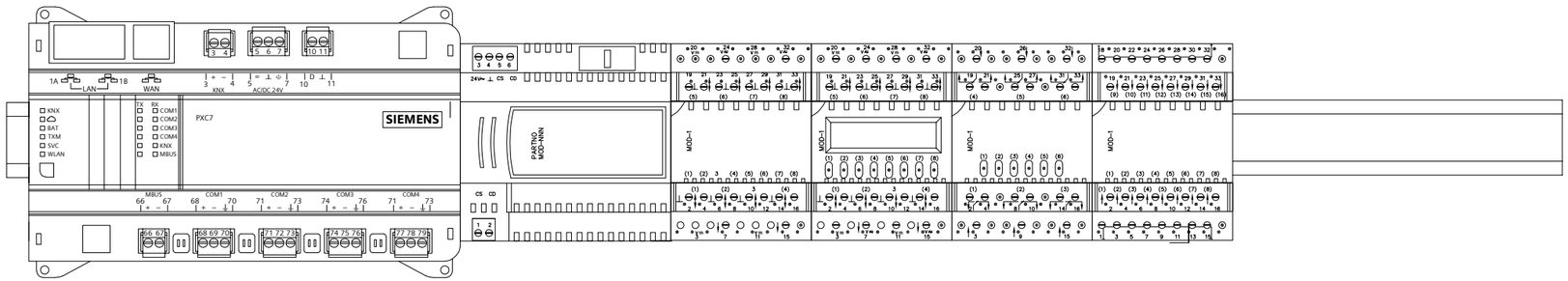
INSTALLATION NOTES:

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

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LA11.PXCA INSTALLATION

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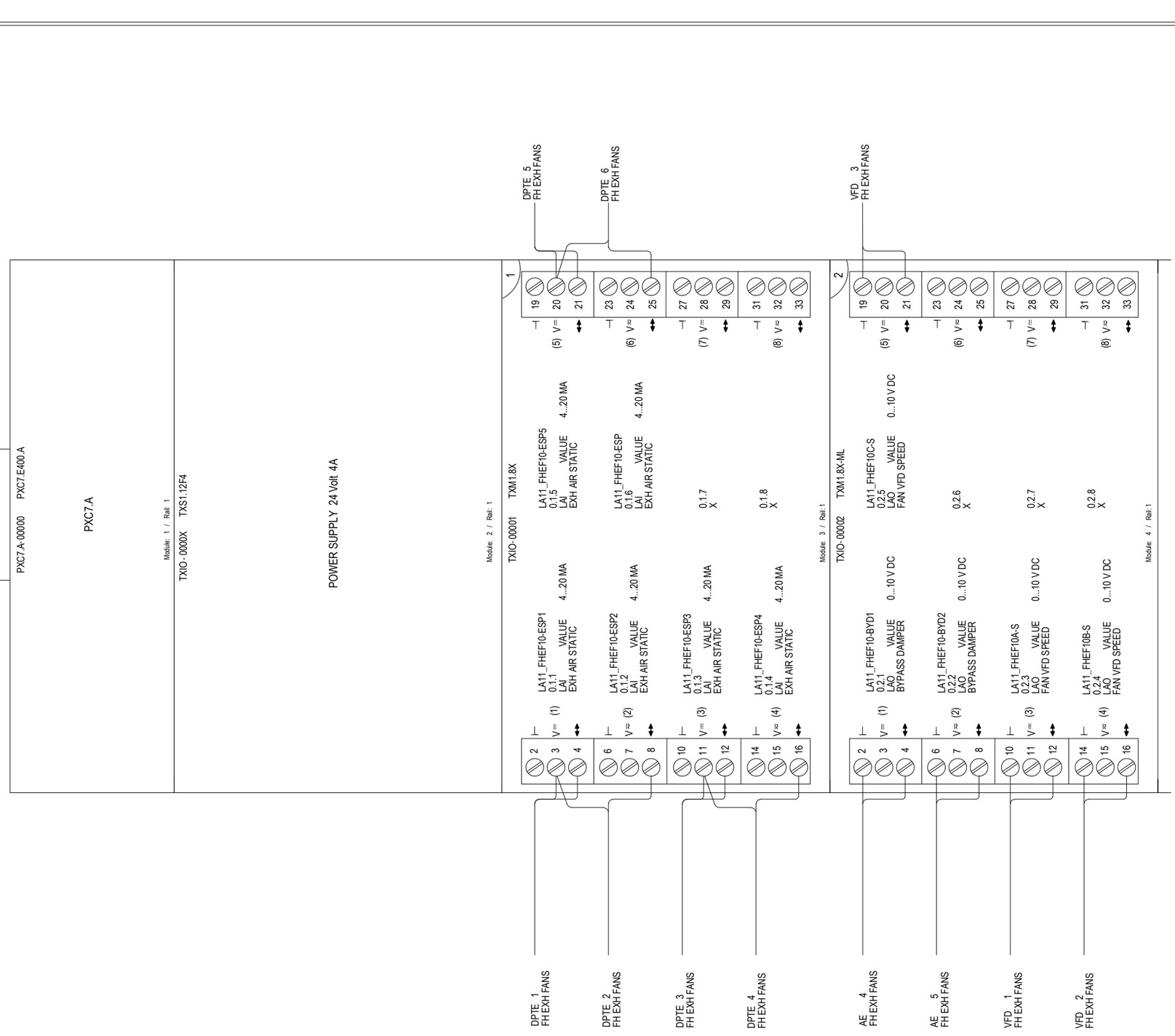
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

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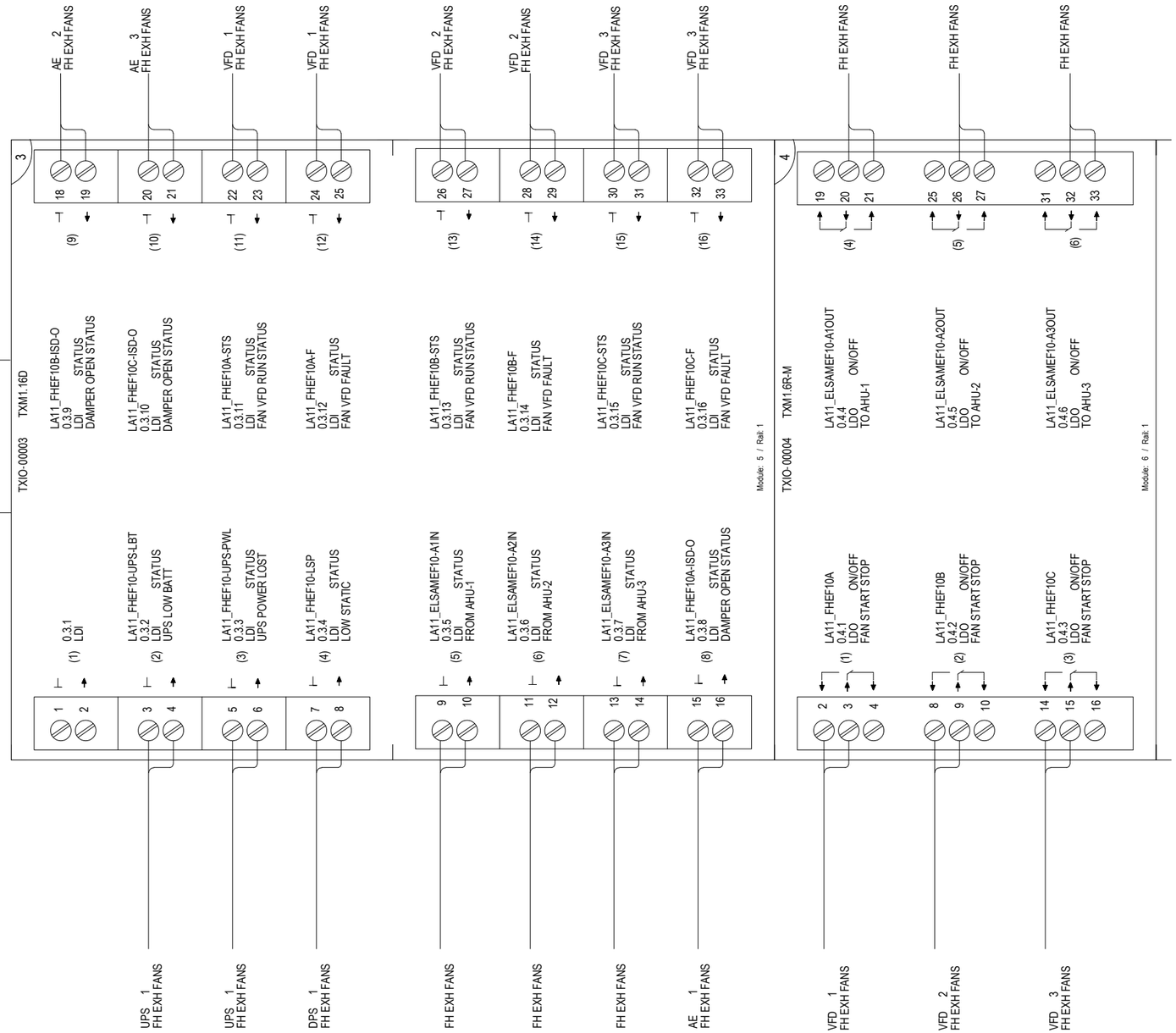

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IU LAUNCH ACCELERATOR FOR BIO
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted 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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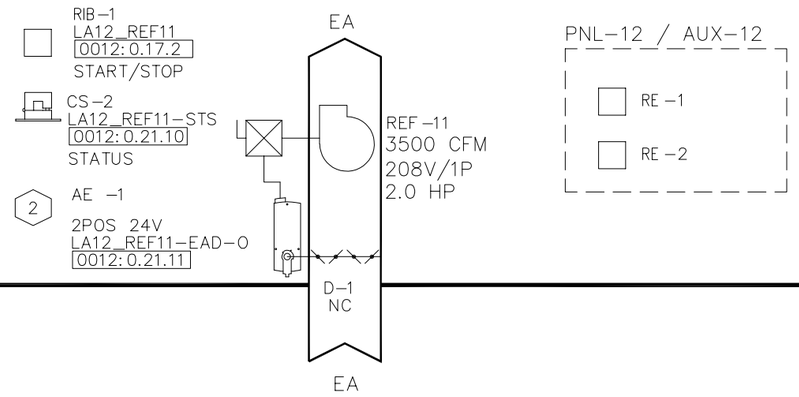
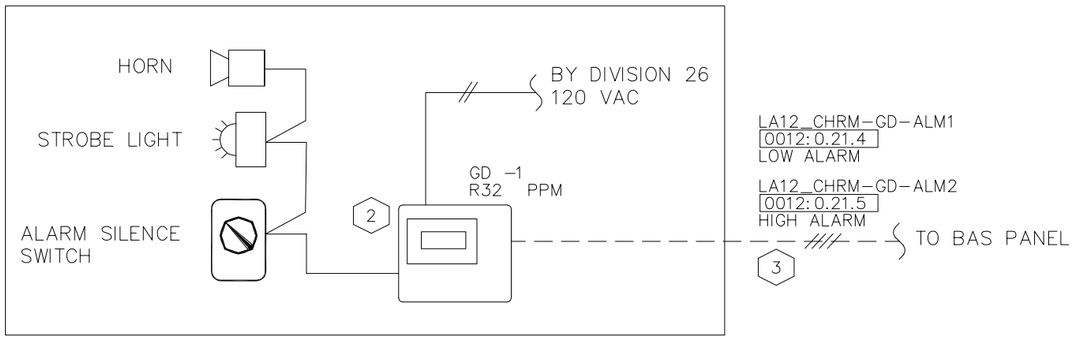
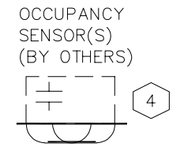
INSTALLATION NOTES:

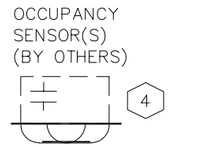
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.
2. FURNISHED BY OTHERS / MECHANICAL CONTRACTOR.
3. WIRED BY C.I.C
4. OCCUPANCY SENSORS PROVIDED BY DIV 26 WITH AUXILIARY CONTACT. TTC WIRE ALL OCCUPANCY SENSORS IN RESPECTIVE SPACE IN PARALLEL. SEE ELECTRICAL PLAN FOR OC/VC SENSORS NEED FOR SPACE SERVED.

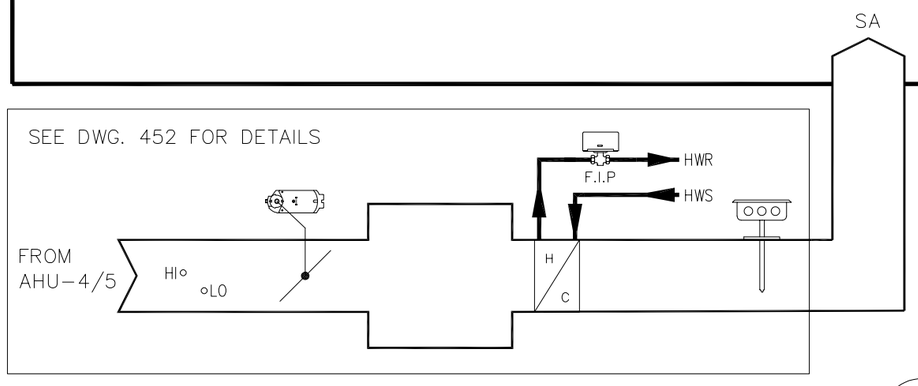


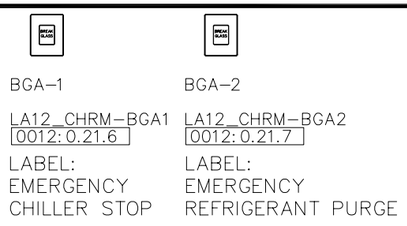
REFRIGERANT MONITOR, HORN, STROBE LIGHT, ALARM SILENCE SWITCH, WIRED, TESTING BY OTHERS.











1/310 REF-11 CHILLER ROOM REFRIGERANT EXHAUST

LOCATION: PENTHOUSE

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	LA12.PXCA	

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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CH ROOM FAN CONTROL

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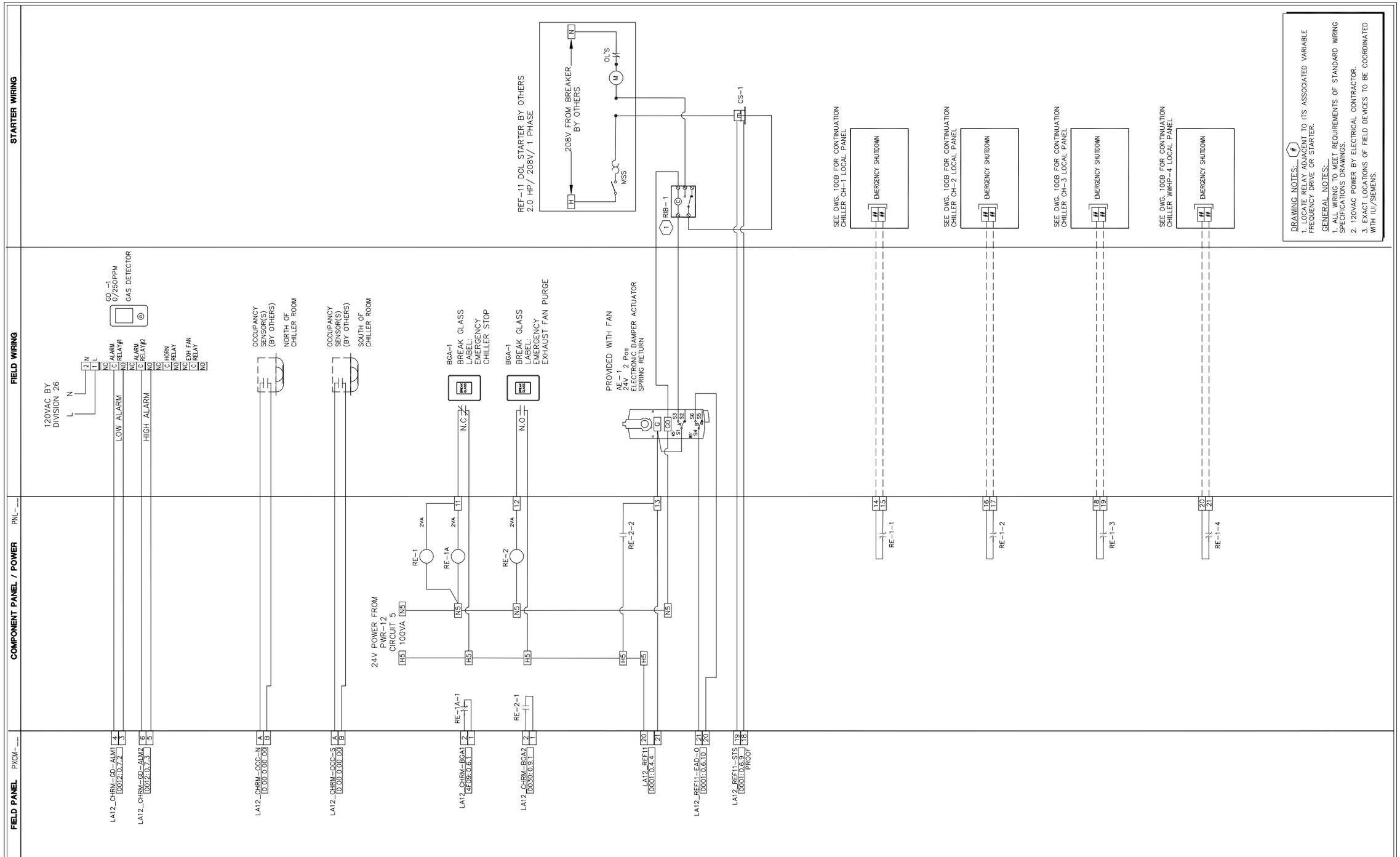

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0012	IT12_CH1_PXCM	IT12CH1PXCM

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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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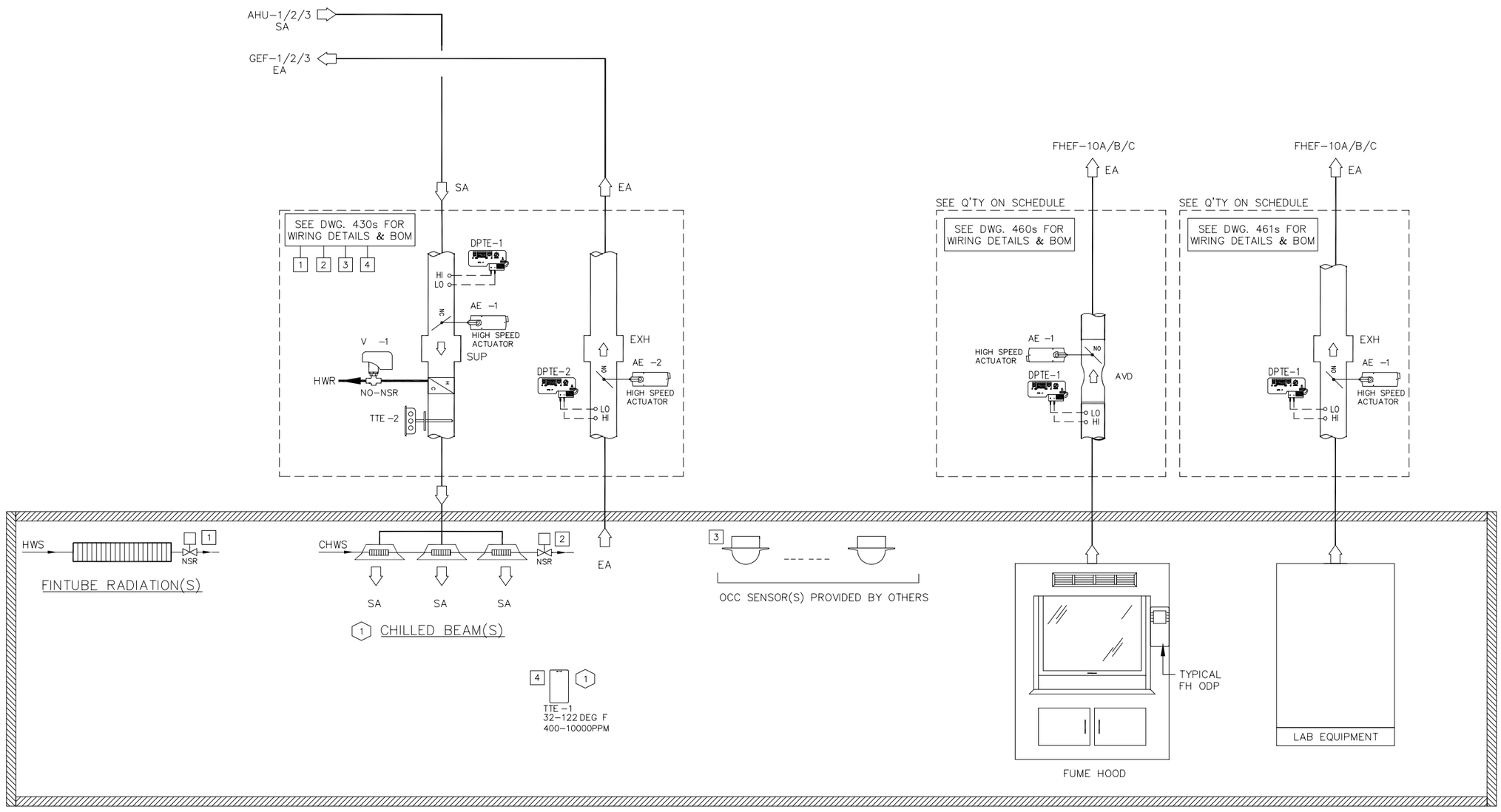
INSTALLATION NOTES:

(1) LOCATE AS SHOWN ON FLOOR PLANS/ CONTRACT DOCUMENTS.



1/410 LAB ROOM SCENARIO_1

TYPICAL OF Q'TY : (5)

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IU LAUNCH ACCELERATOR FOR BIO
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LAB ROOM SCENARIO_1

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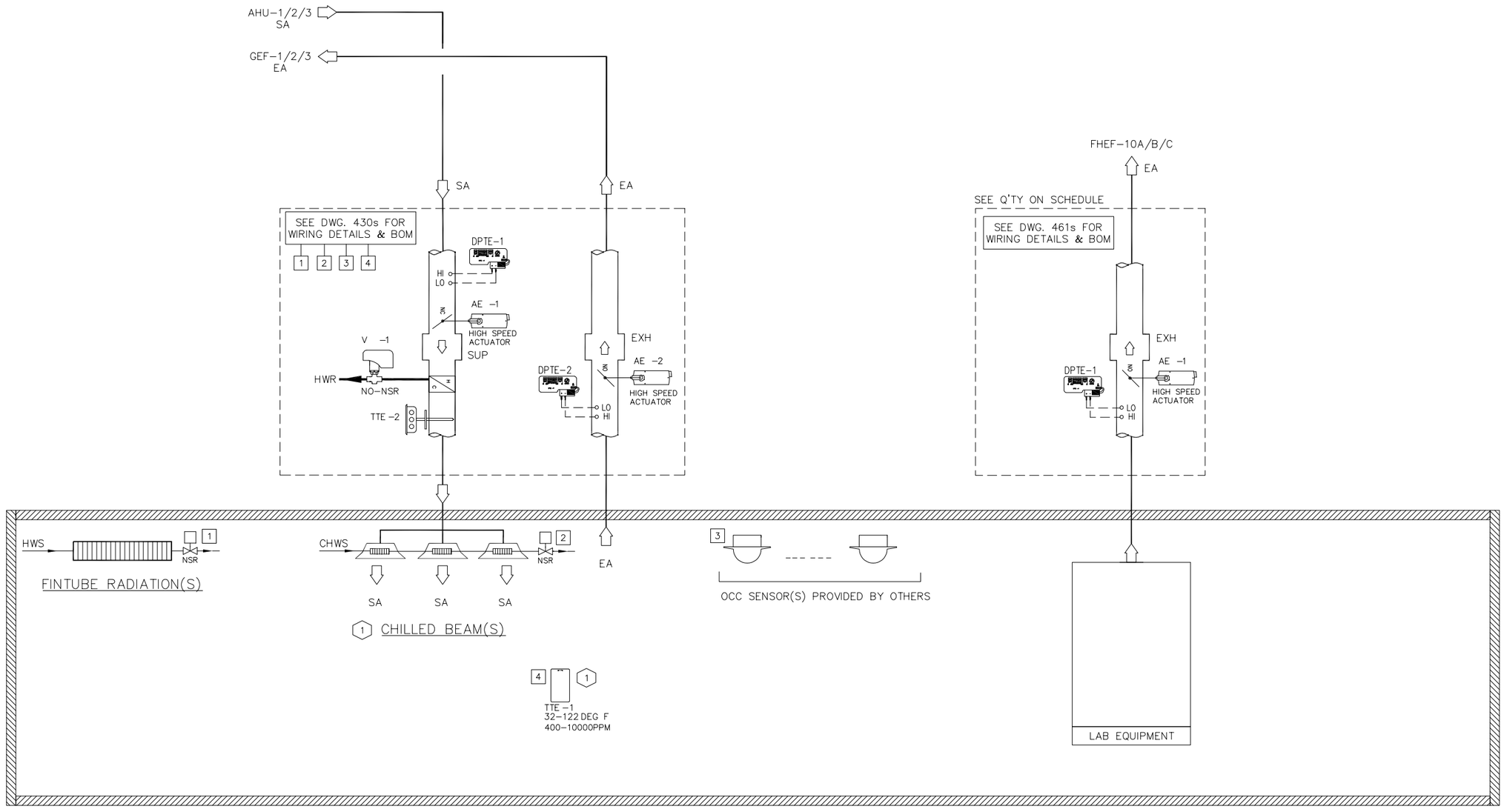

1/410 LAB ROOM SCENARIO_2

TYPICAL OF Q'TY : (2)

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IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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LAB ROOM SCENARIO_2

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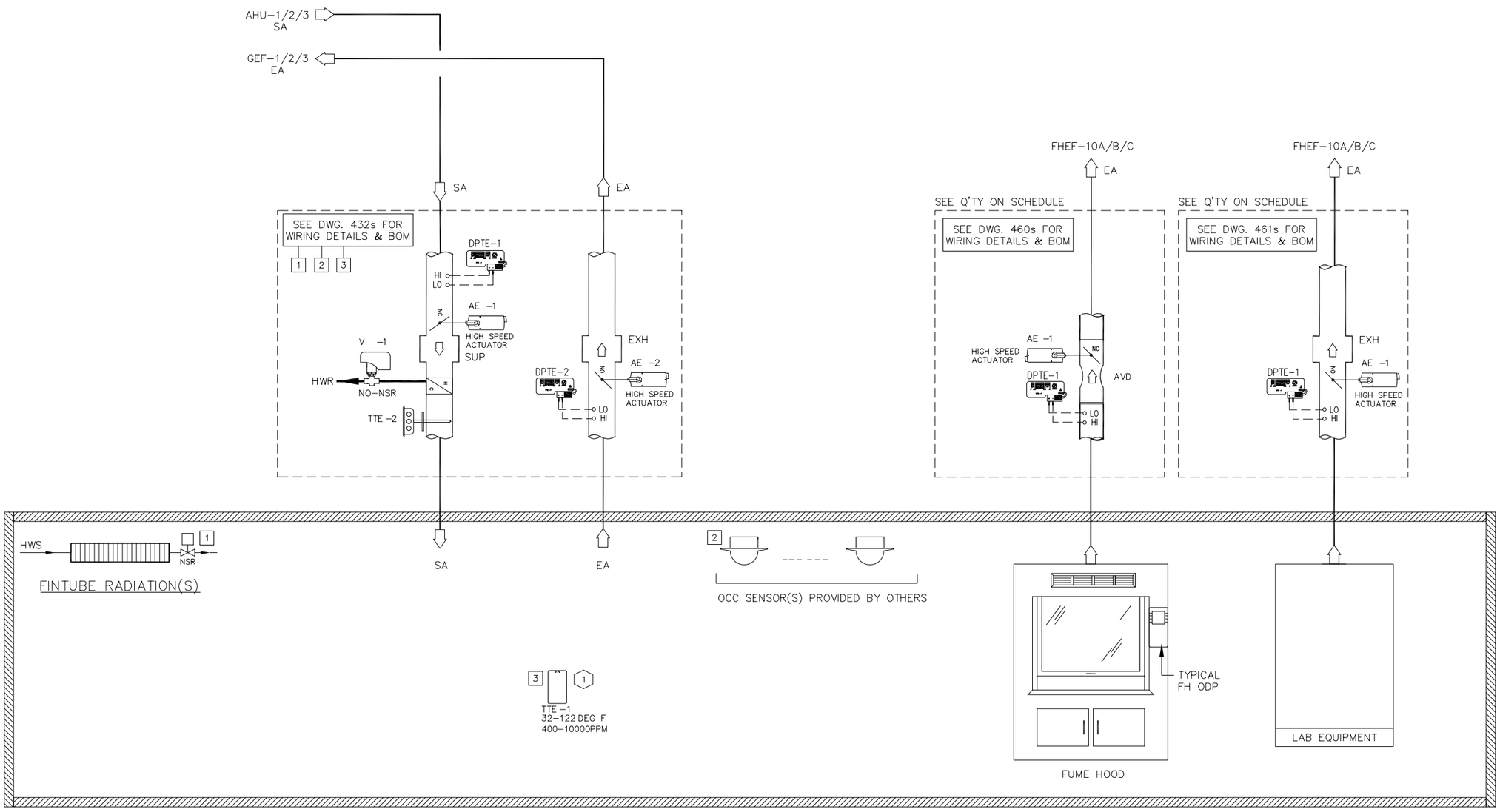

1/410 LAB ROOM SCENARIO_3

TYPICAL OF Q'TY : (1)

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LAB ROOM SCENARIO_3

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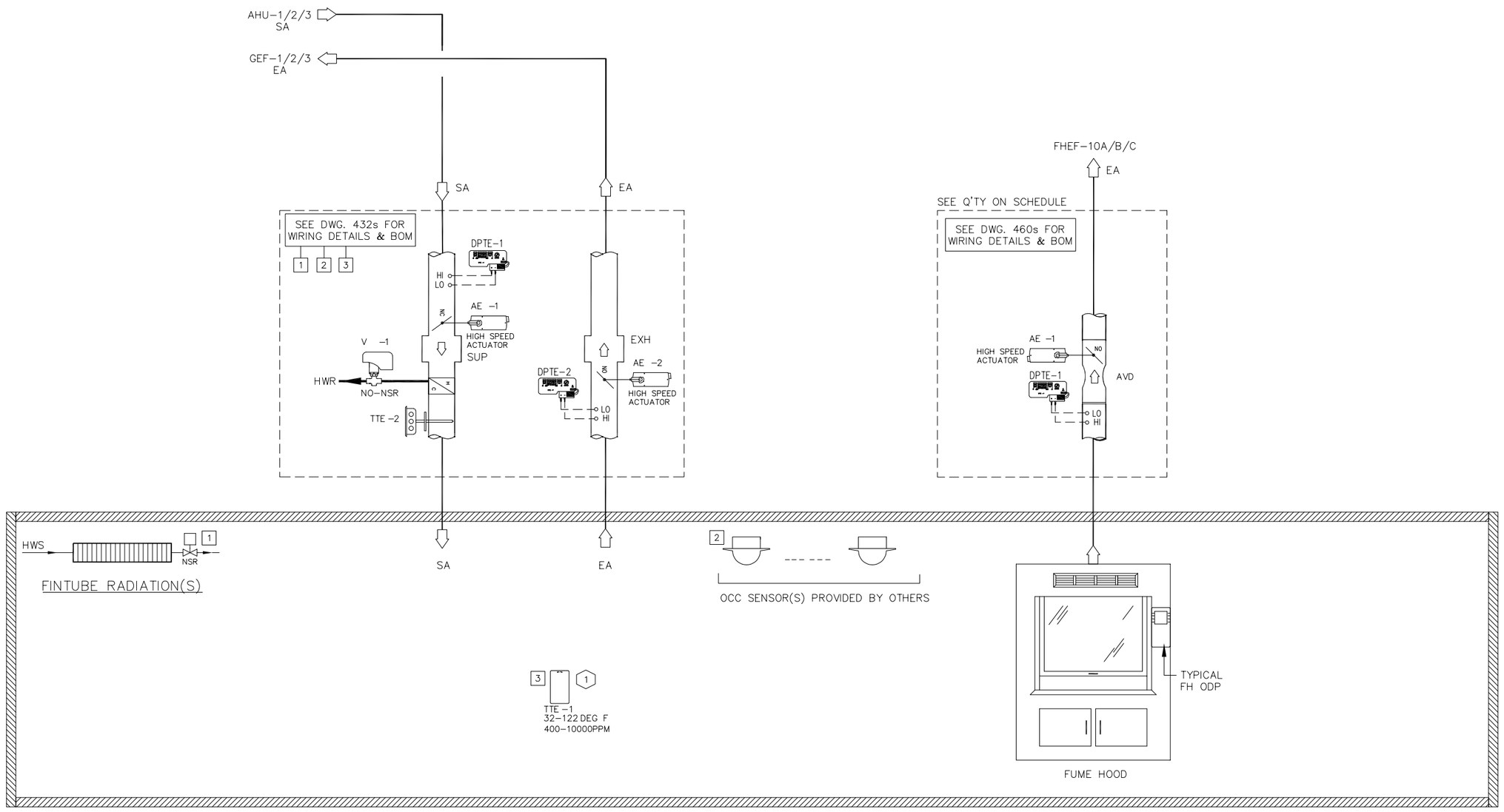

1 / 410 LAB ROOM SCENARIO_4

TYPICAL OF Q'TY : (1)

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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

LAB ROOM SCENARIO_4

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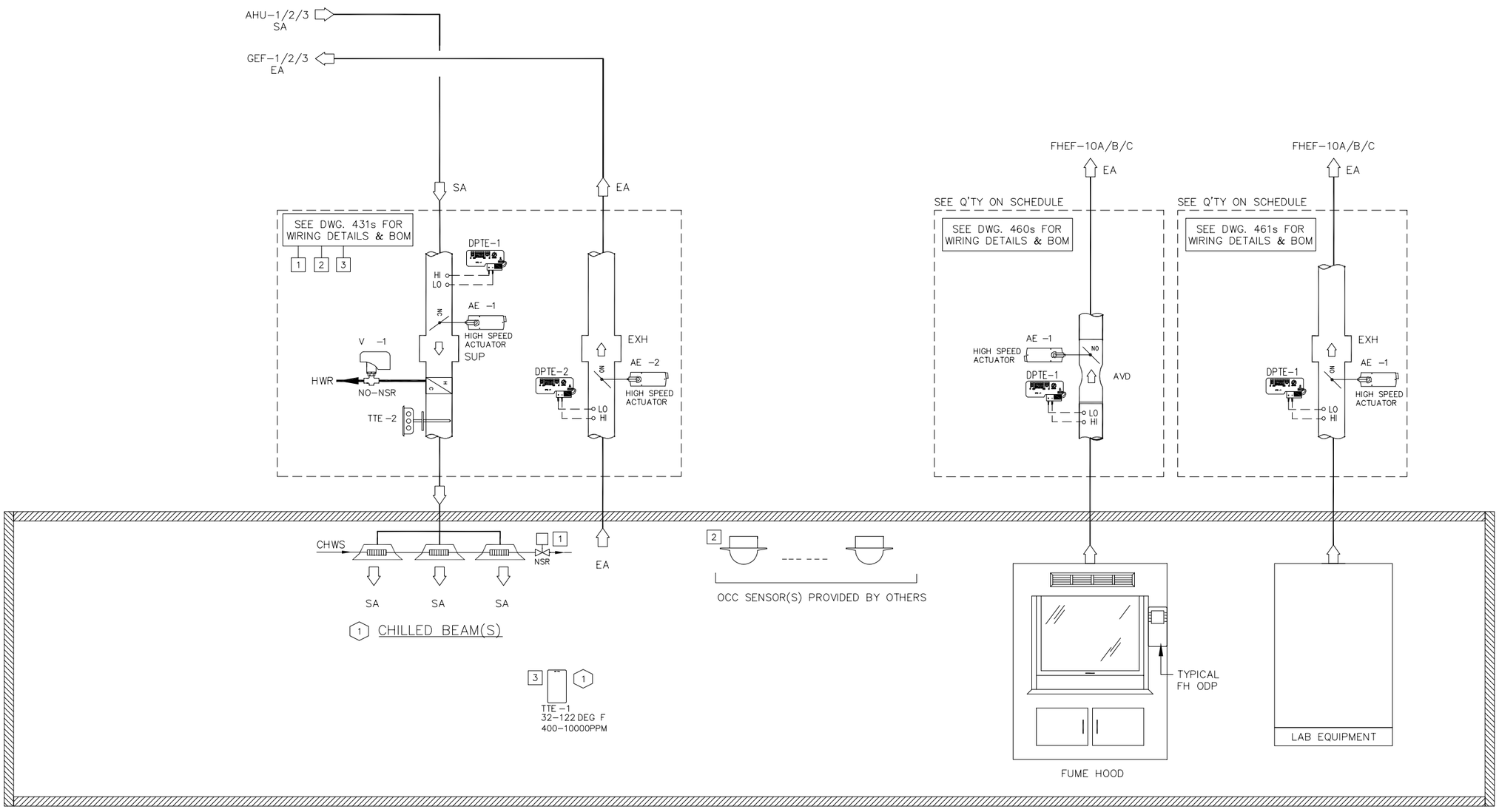

1/410 LAB ROOM SCENARIO_5

TYPICAL OF Q'TY : (1)

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IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

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SMART INFRASTRUCTURE DIVISION

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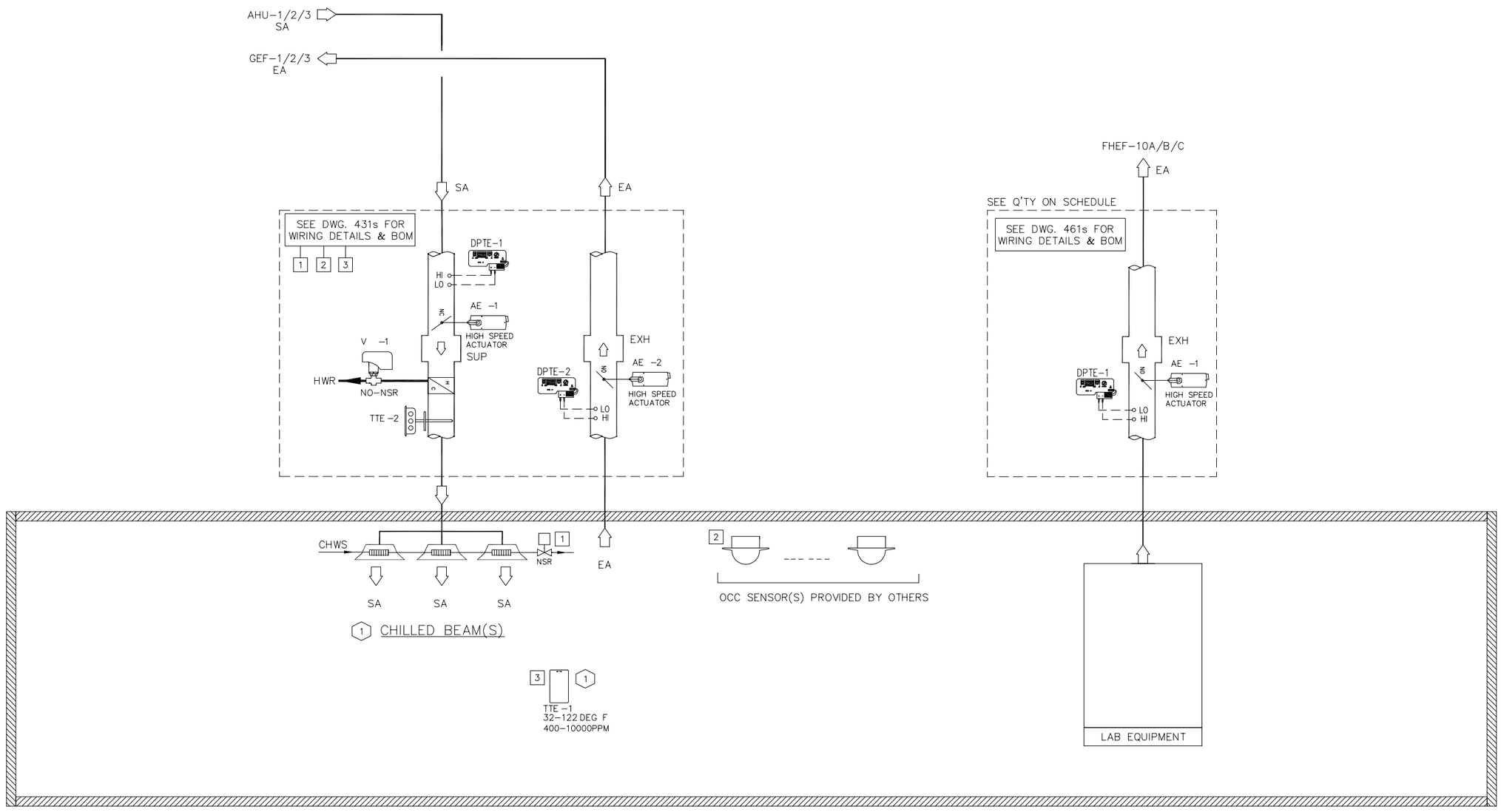

1/410 LAB ROOM SCENARIO_6

TYPICAL OF Q'TY : (4)

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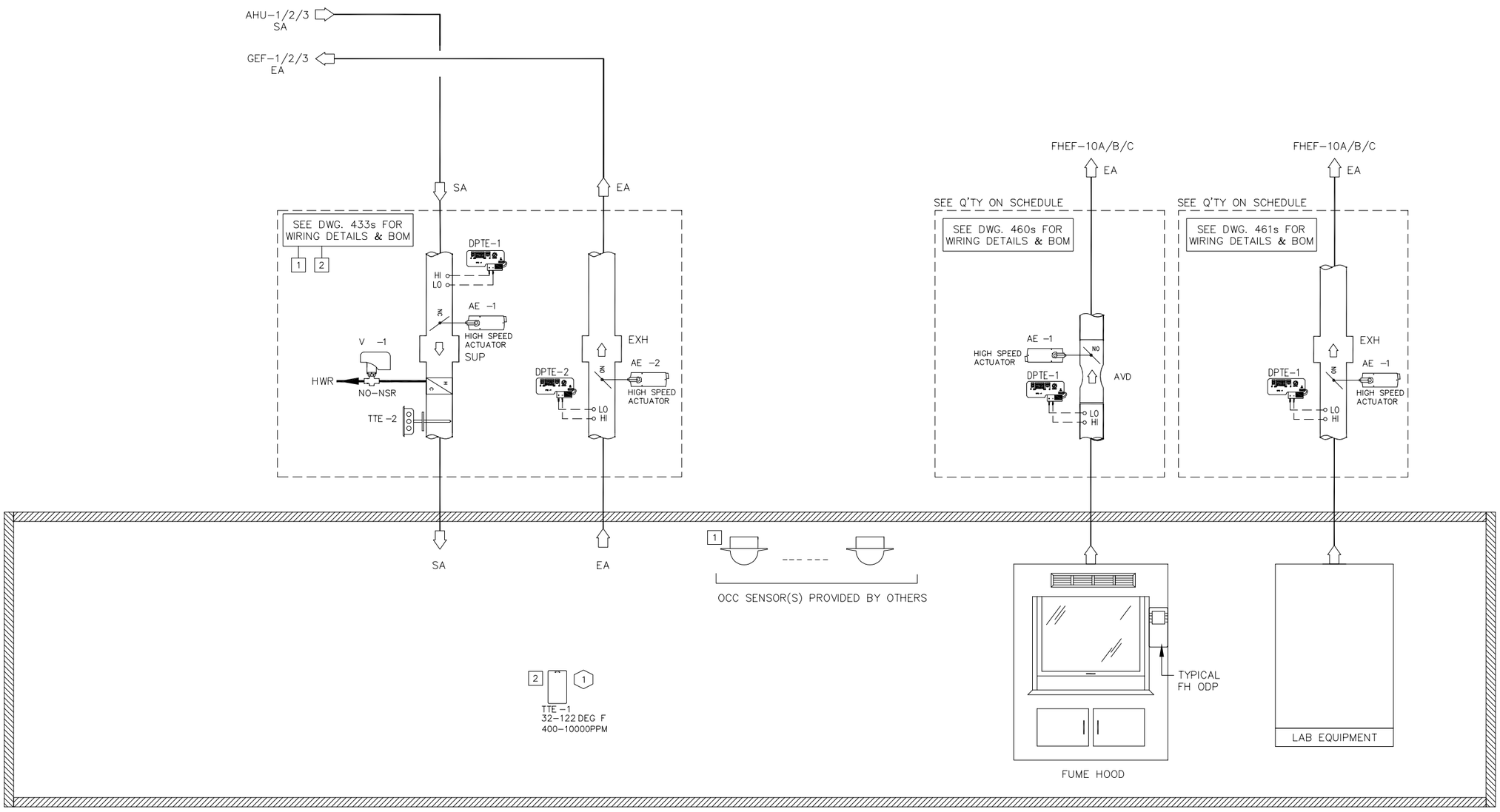

1/410 LAB ROOM SCENARIO_7

TYPICAL OF Q'TY : (9)

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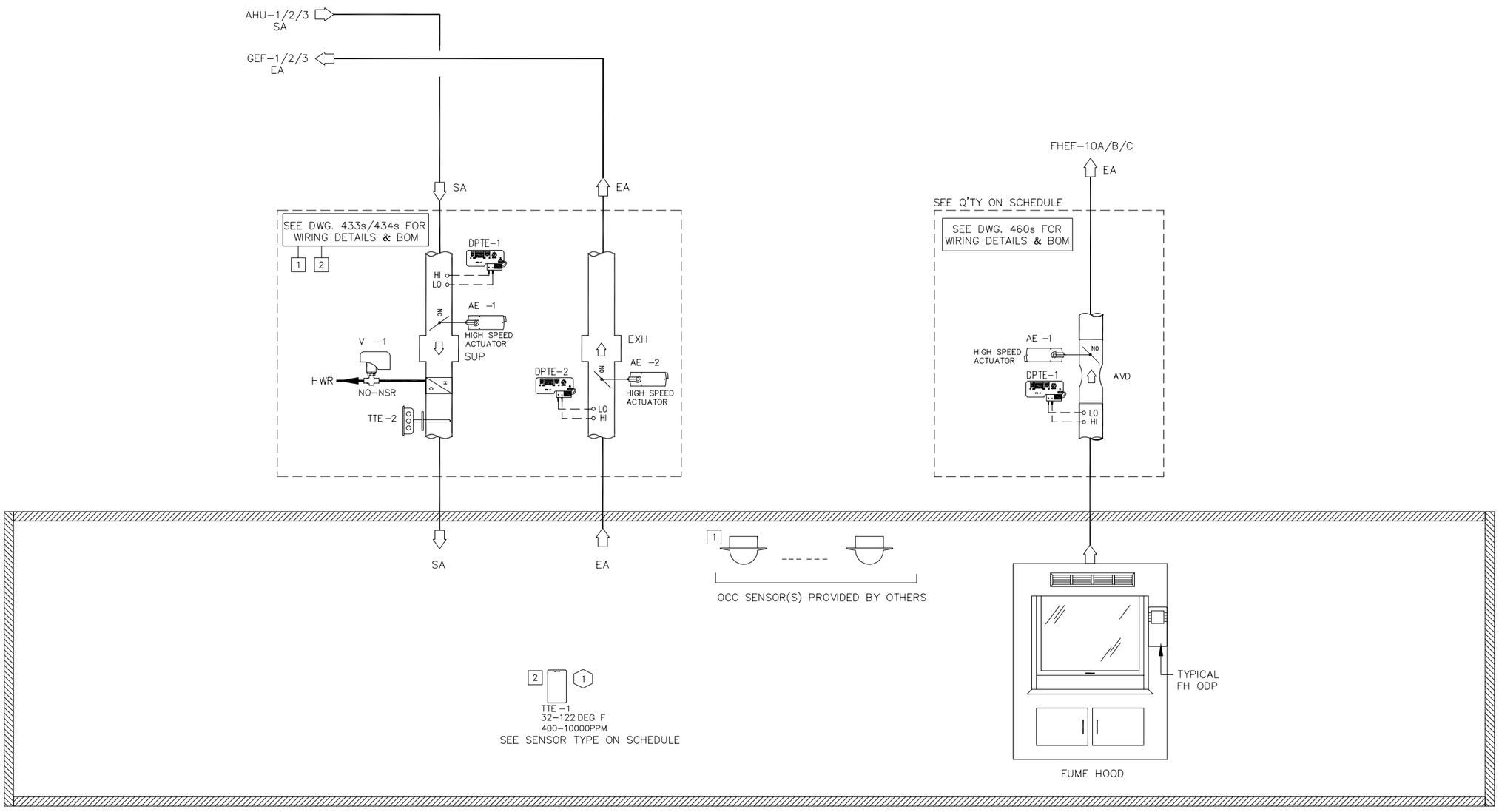

1/410 LAB ROOM SCENARIO_8

TYPICAL OF Q'TY : (14)

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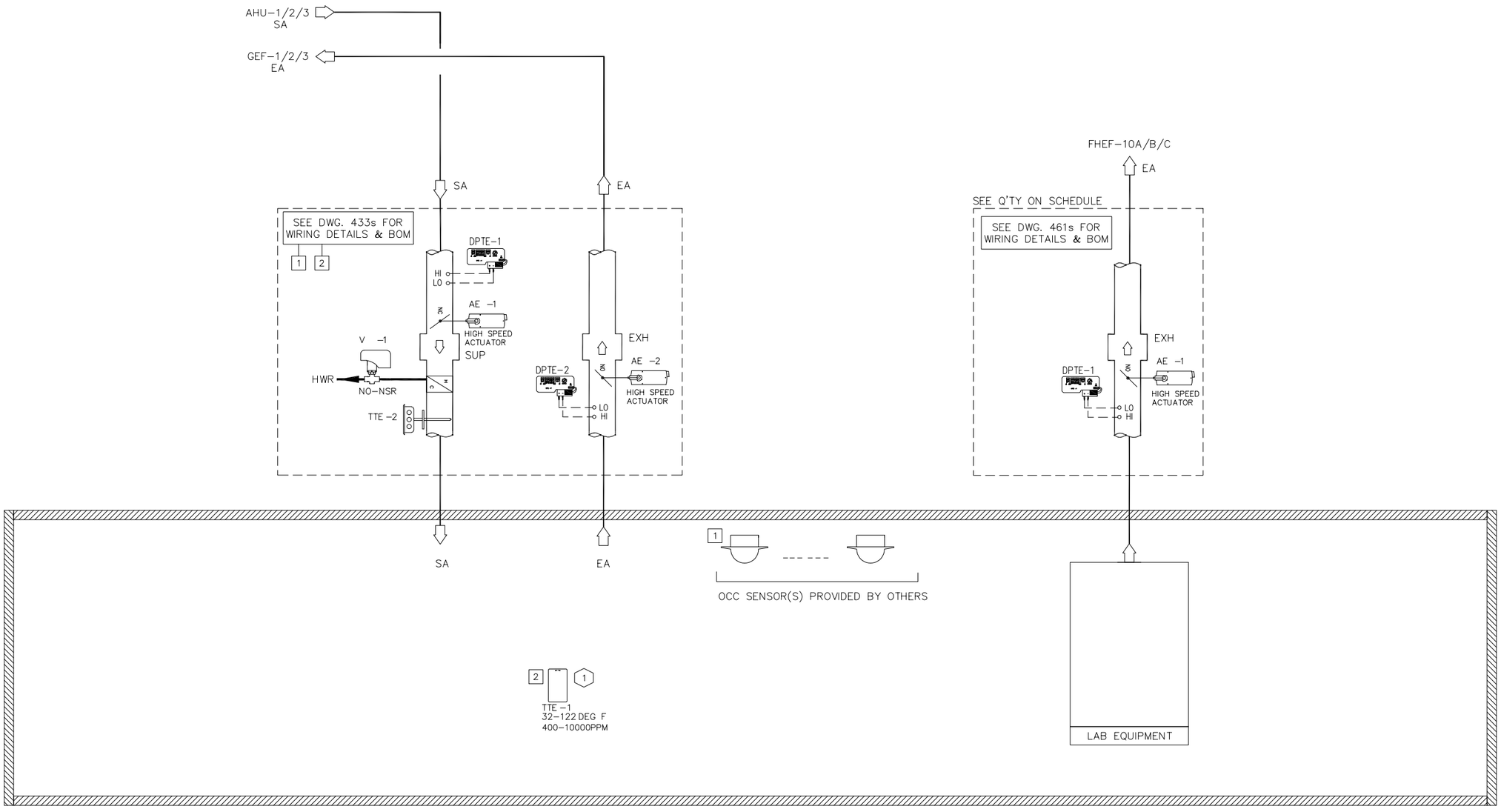

1/408 LAB ROOM SCENARIO_9

TYPICAL OF Q'TY : (8)

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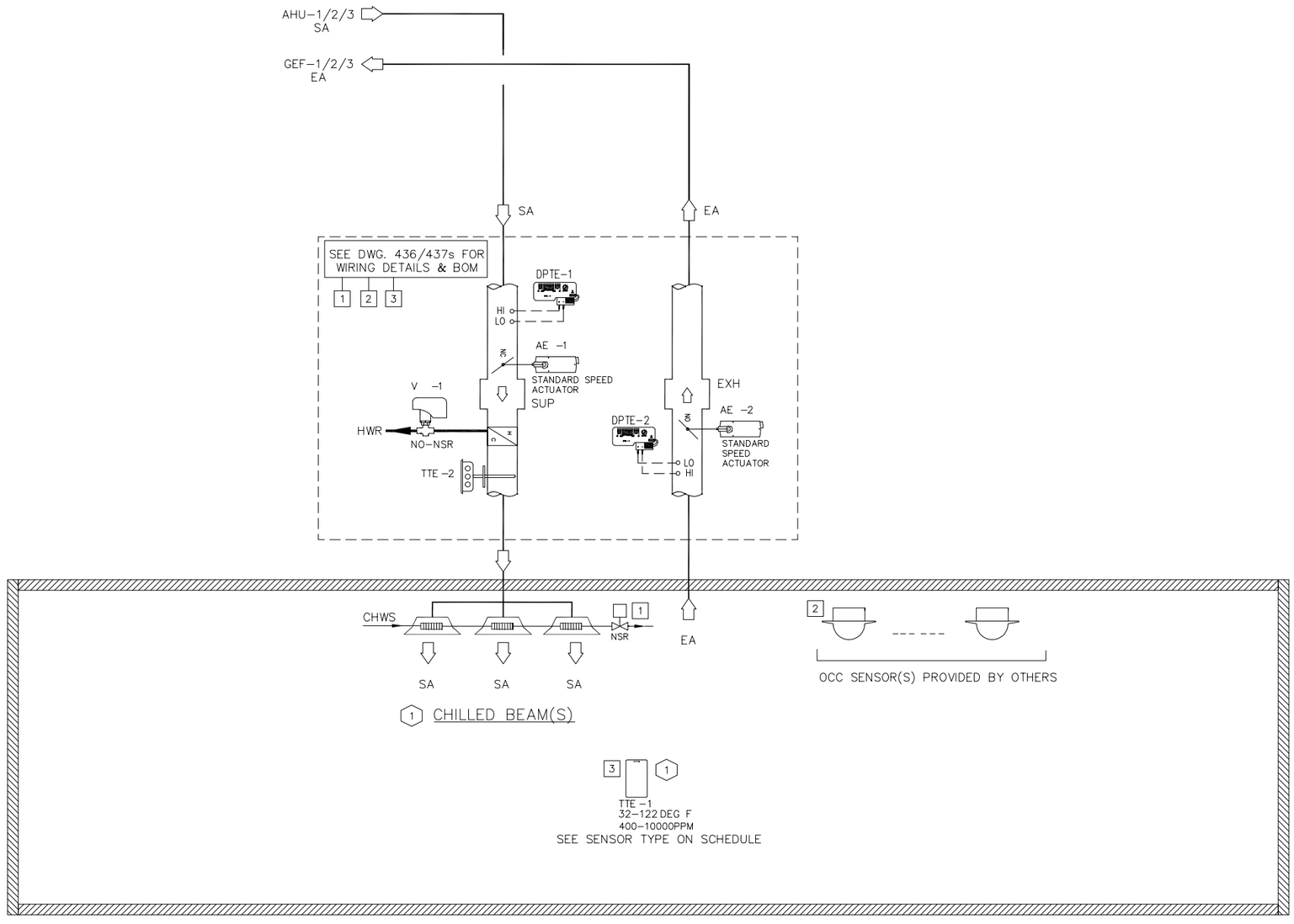

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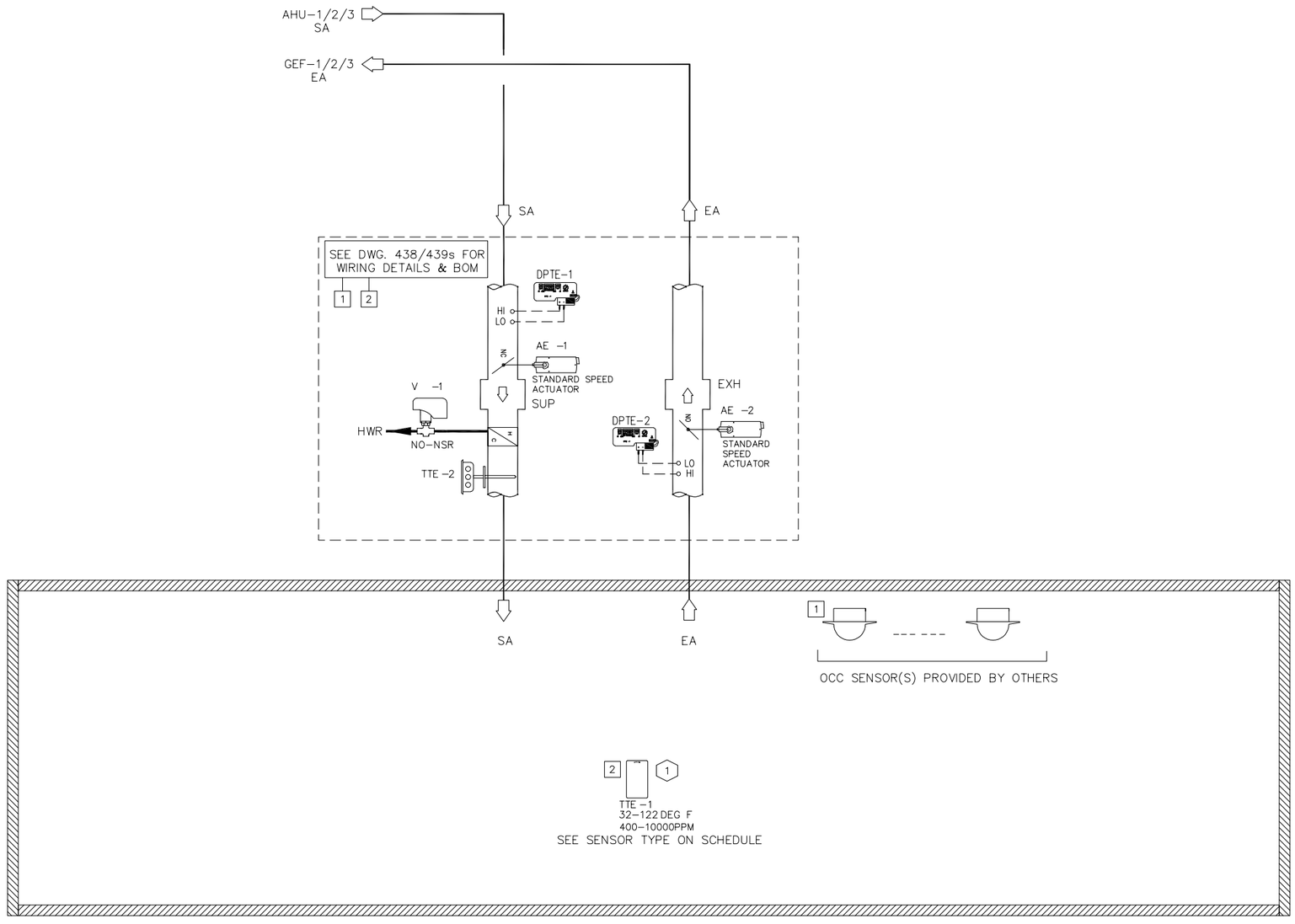

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LAB ROOM SEQUENCE OF OPERATION

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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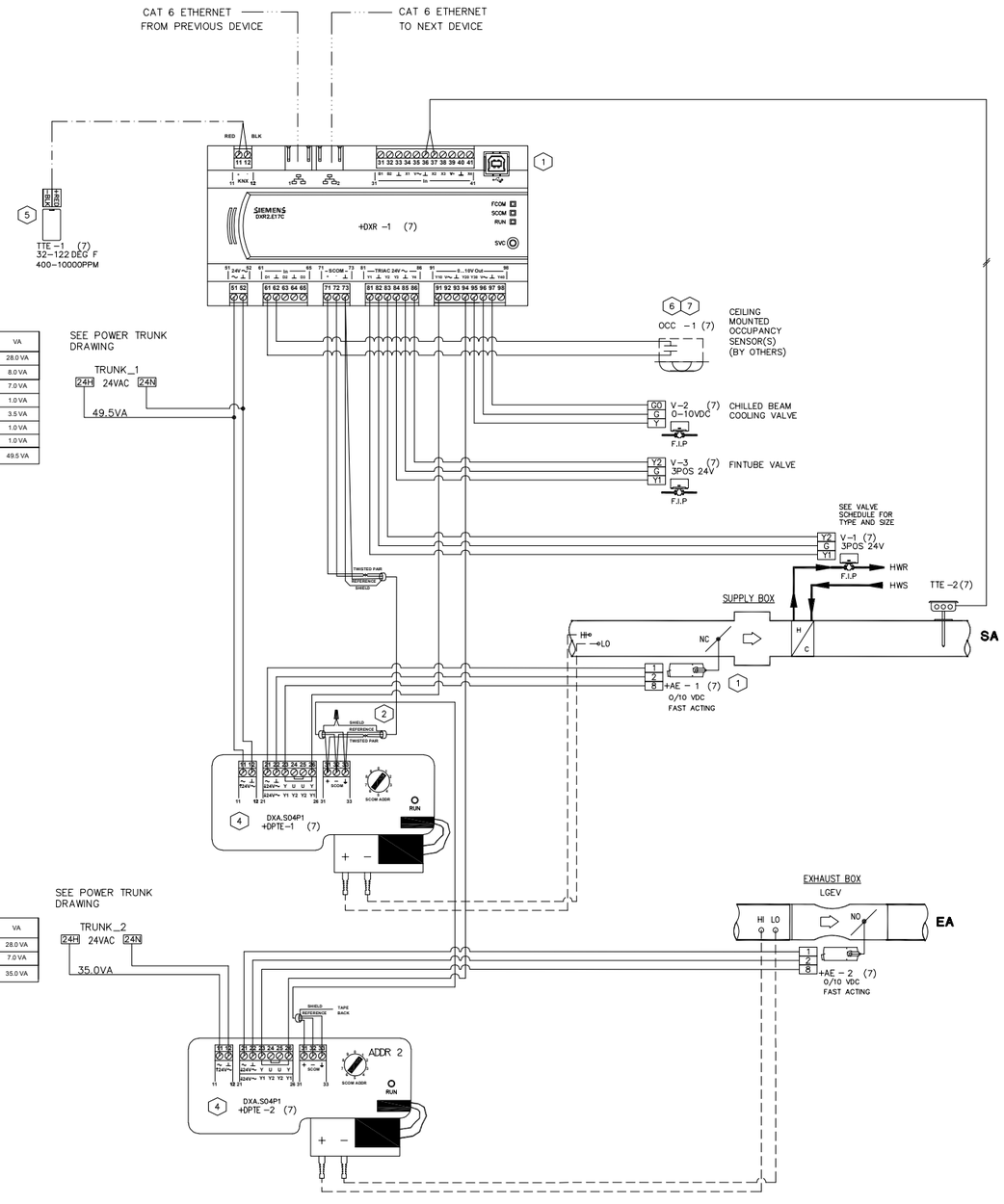


VA POWER DRAW (TYPICAL)

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

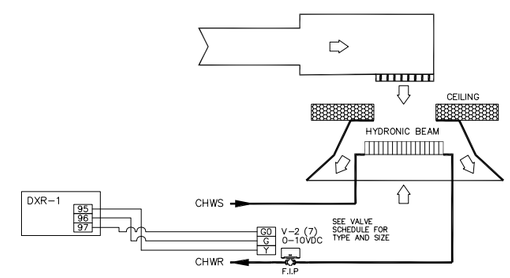
VA POWER DRAW (TYPICAL)

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

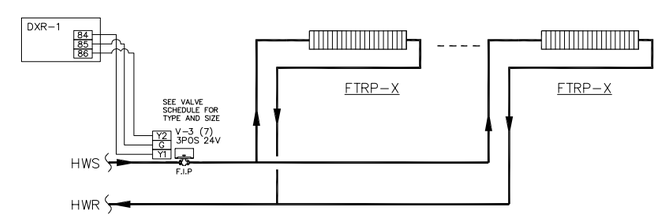
INSTALLATION NOTES:

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
0
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SIEMENS
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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-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

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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-FAST-CB-RAD-P70-OCC BOM

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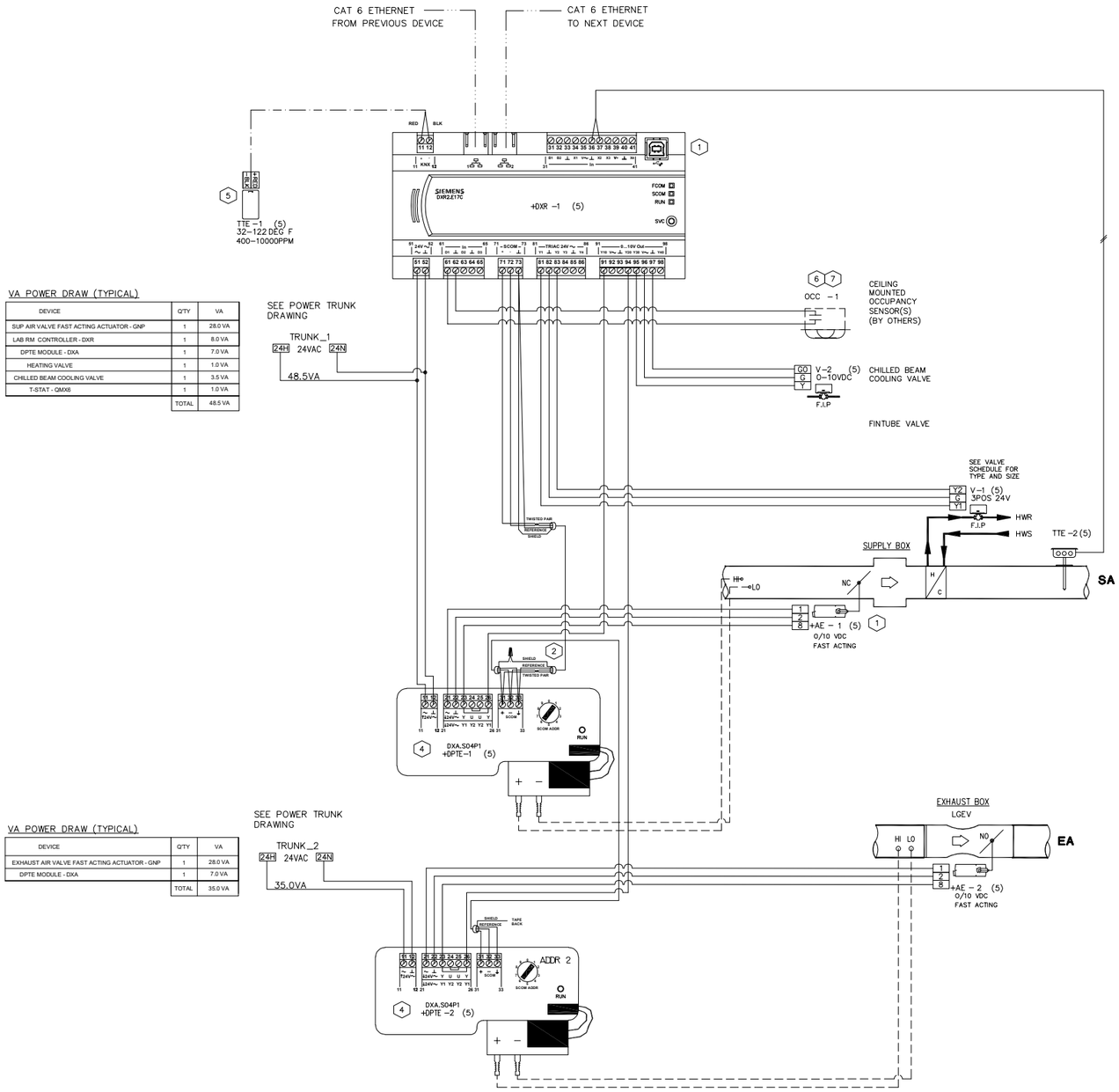
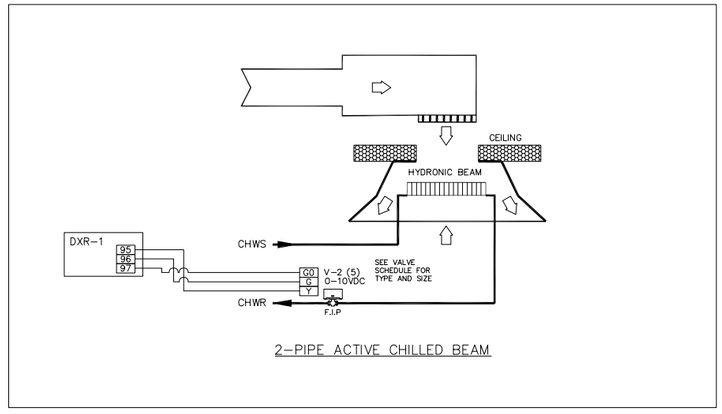
INSTALLATION NOTES:

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.





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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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

C:\USERS\HBOSE\DESKTOP\WORK\LGU - SIEMENS\ACAD\LGEV\440P412785 VAV TYPE\LTB-LGEV-FAST-CB-P70-OCC.DWG

REVISION HISTORY

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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

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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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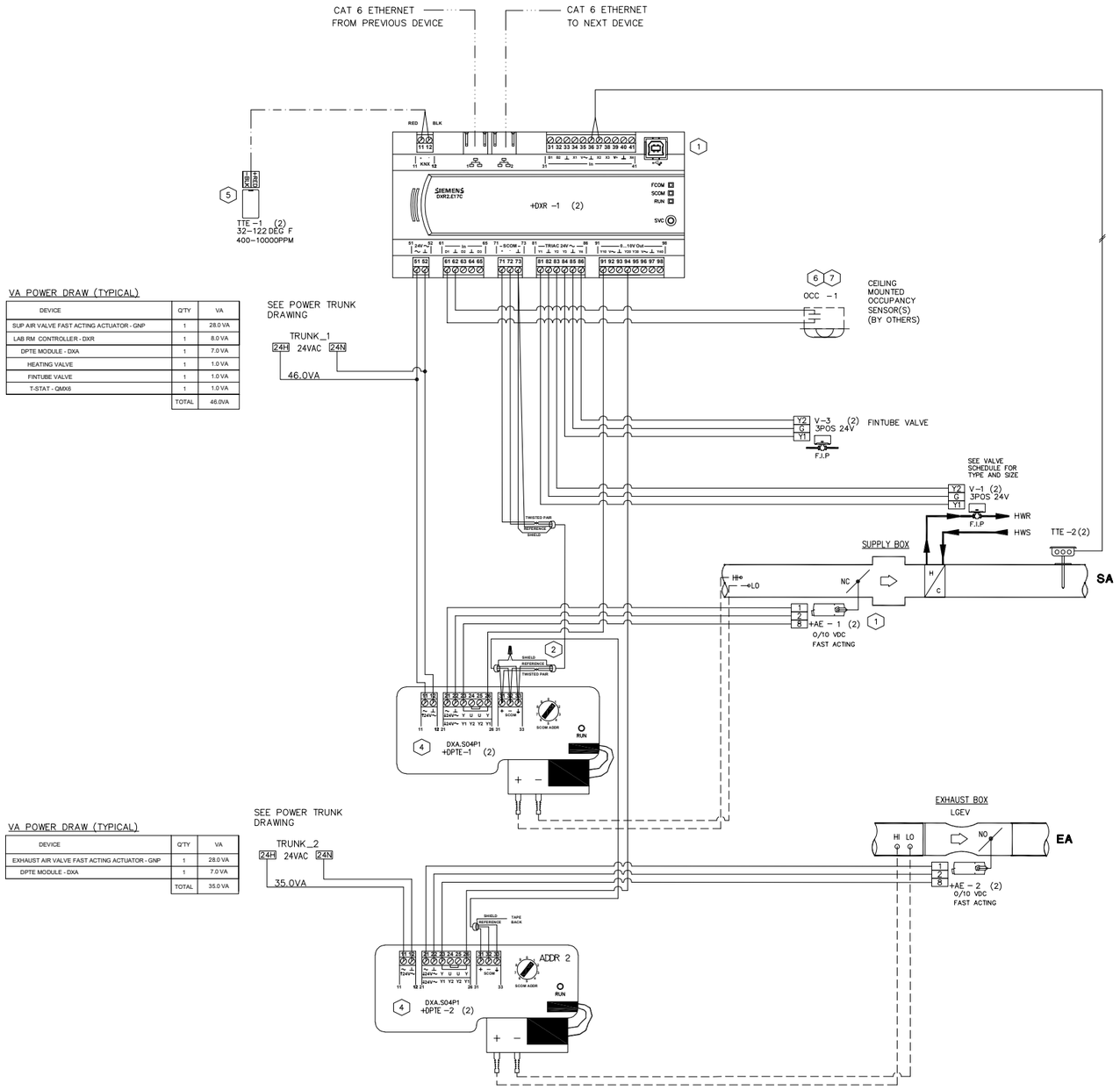
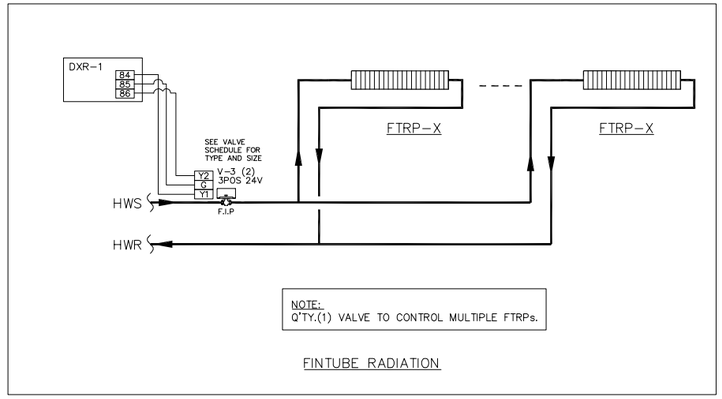


INSTALLATION NOTES:

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

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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

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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

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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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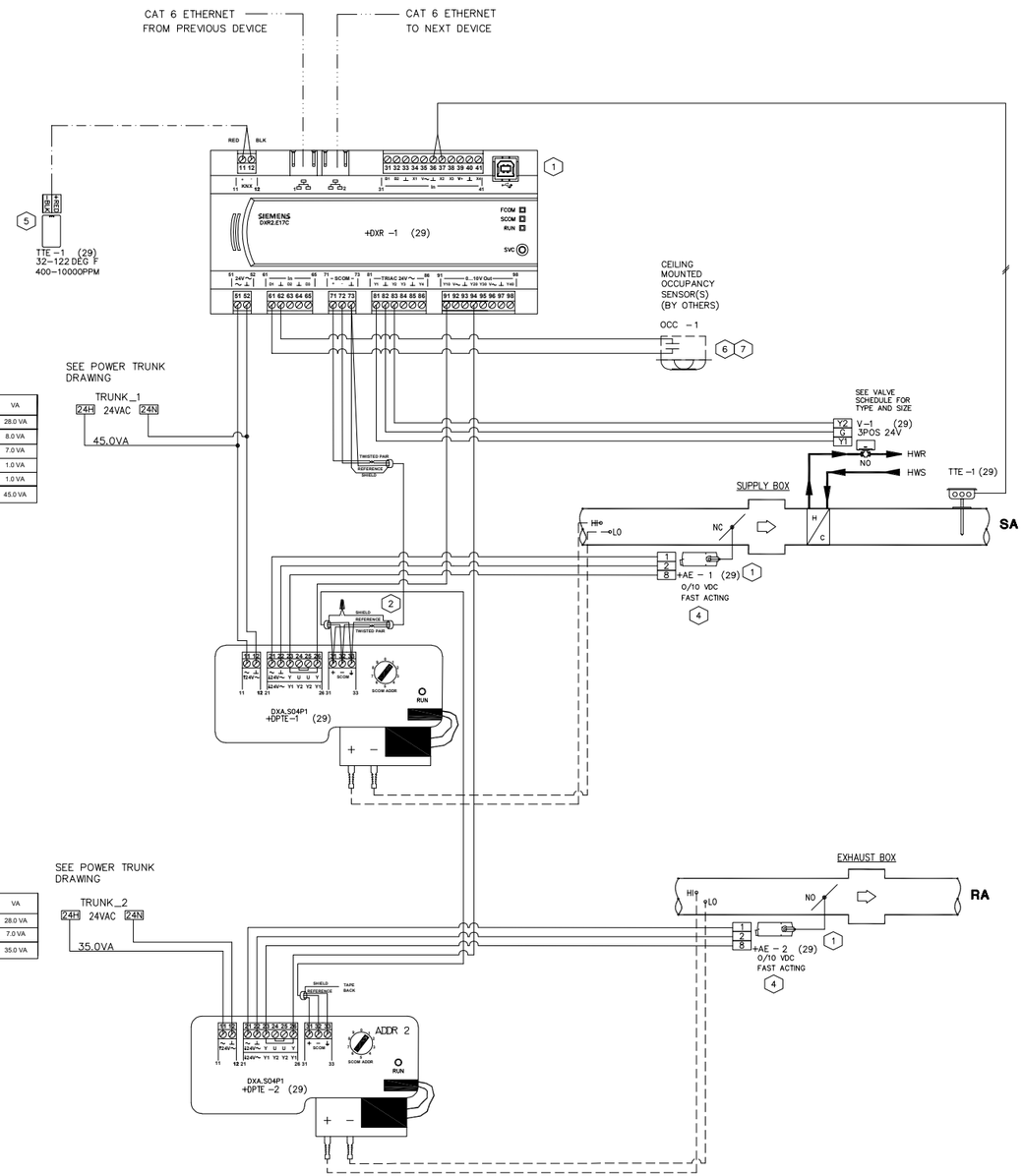

VA POWER DRAW (TYPICAL)

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

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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

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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

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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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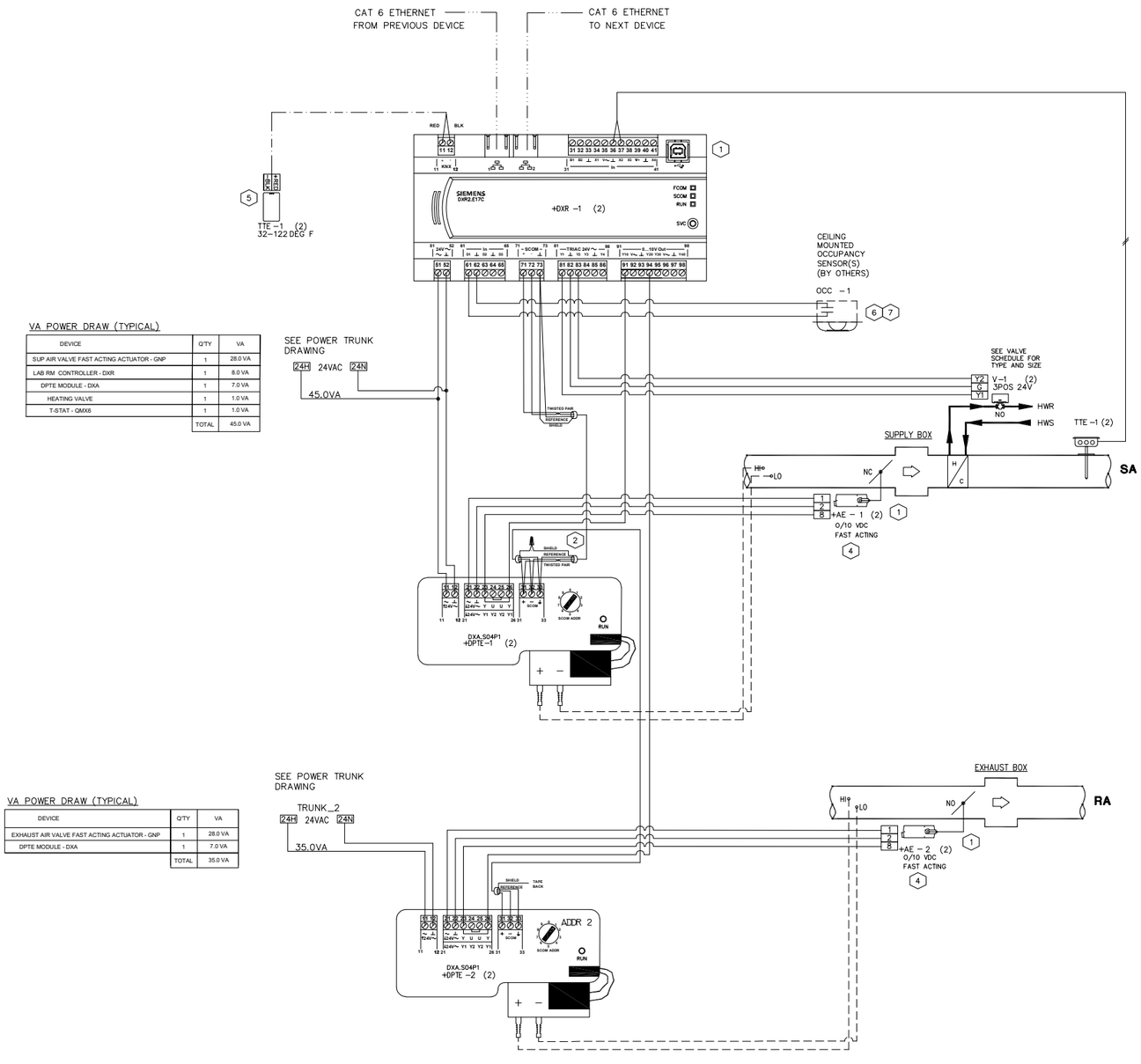

INSTALLATION NOTES:

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

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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

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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-P30-OCC BOM

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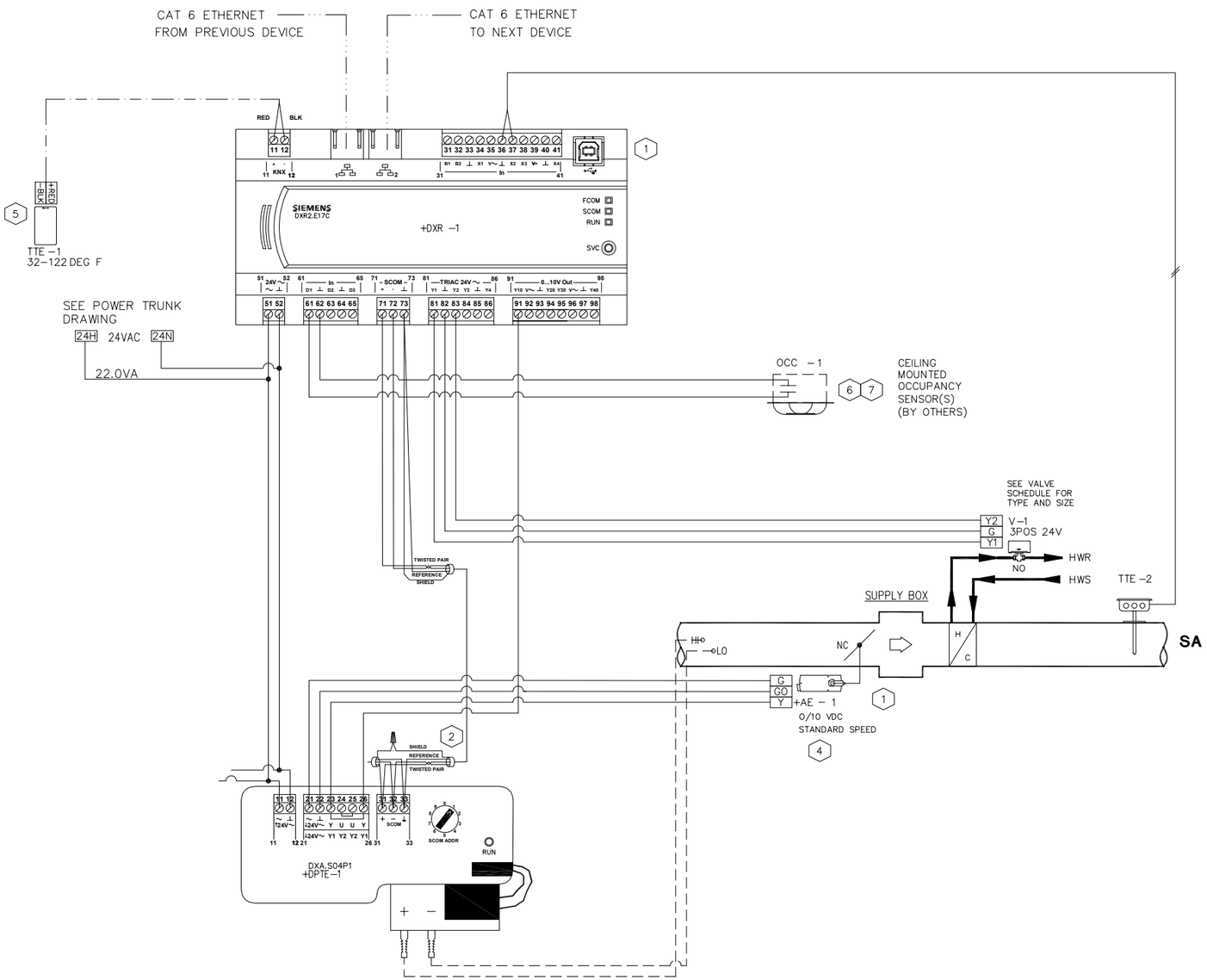

INSTALLATION NOTES:

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

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SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

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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

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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-SLOW-P30-OCC BOM

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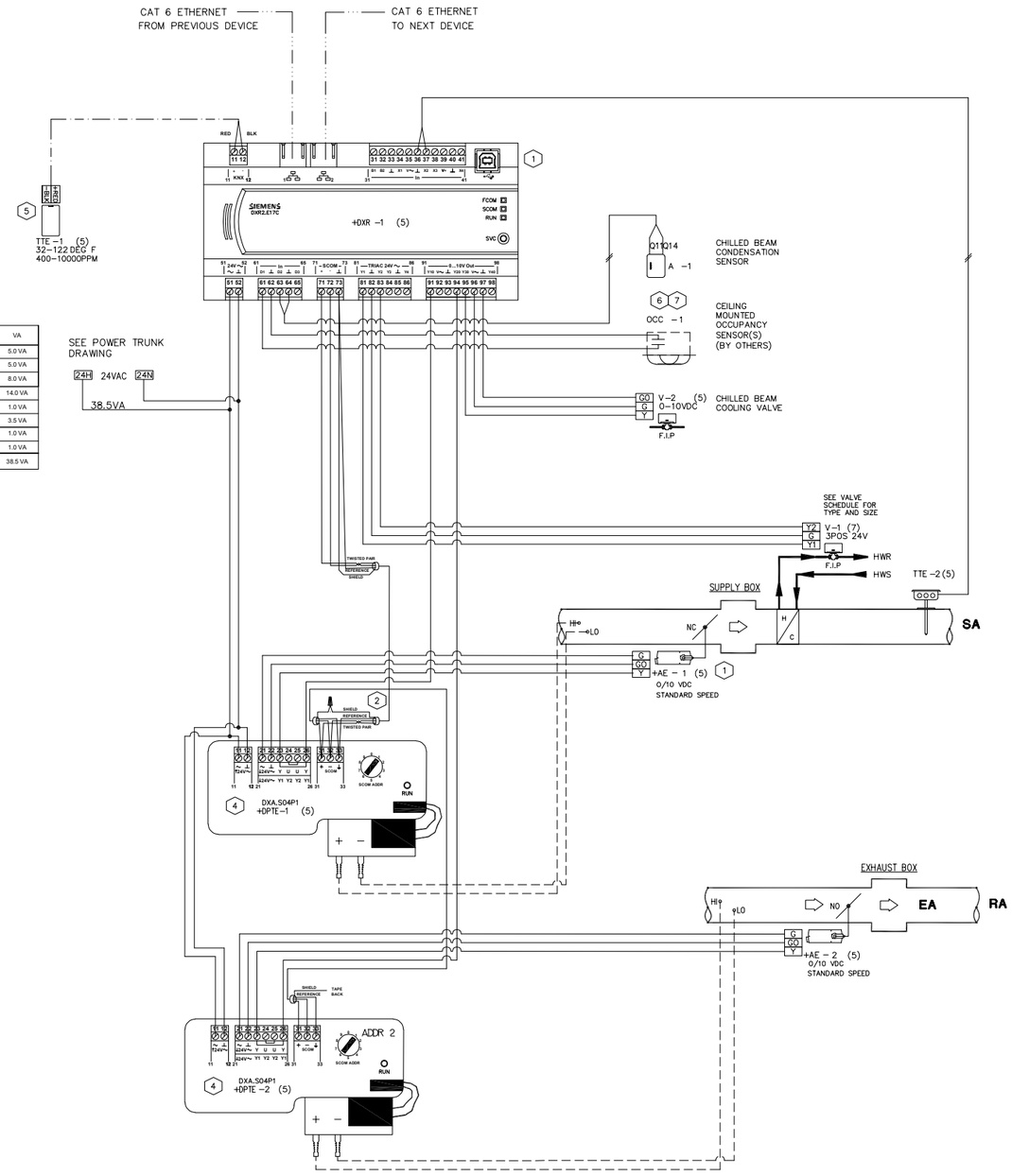


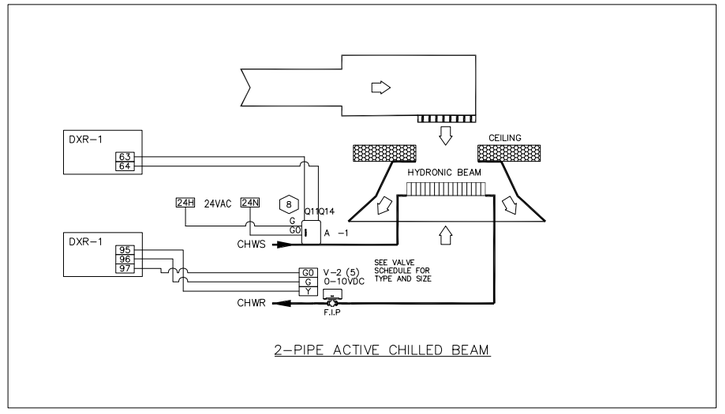
VA POWER DRAW (TYPICAL)

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
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PHONE: 317-293-8880
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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-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

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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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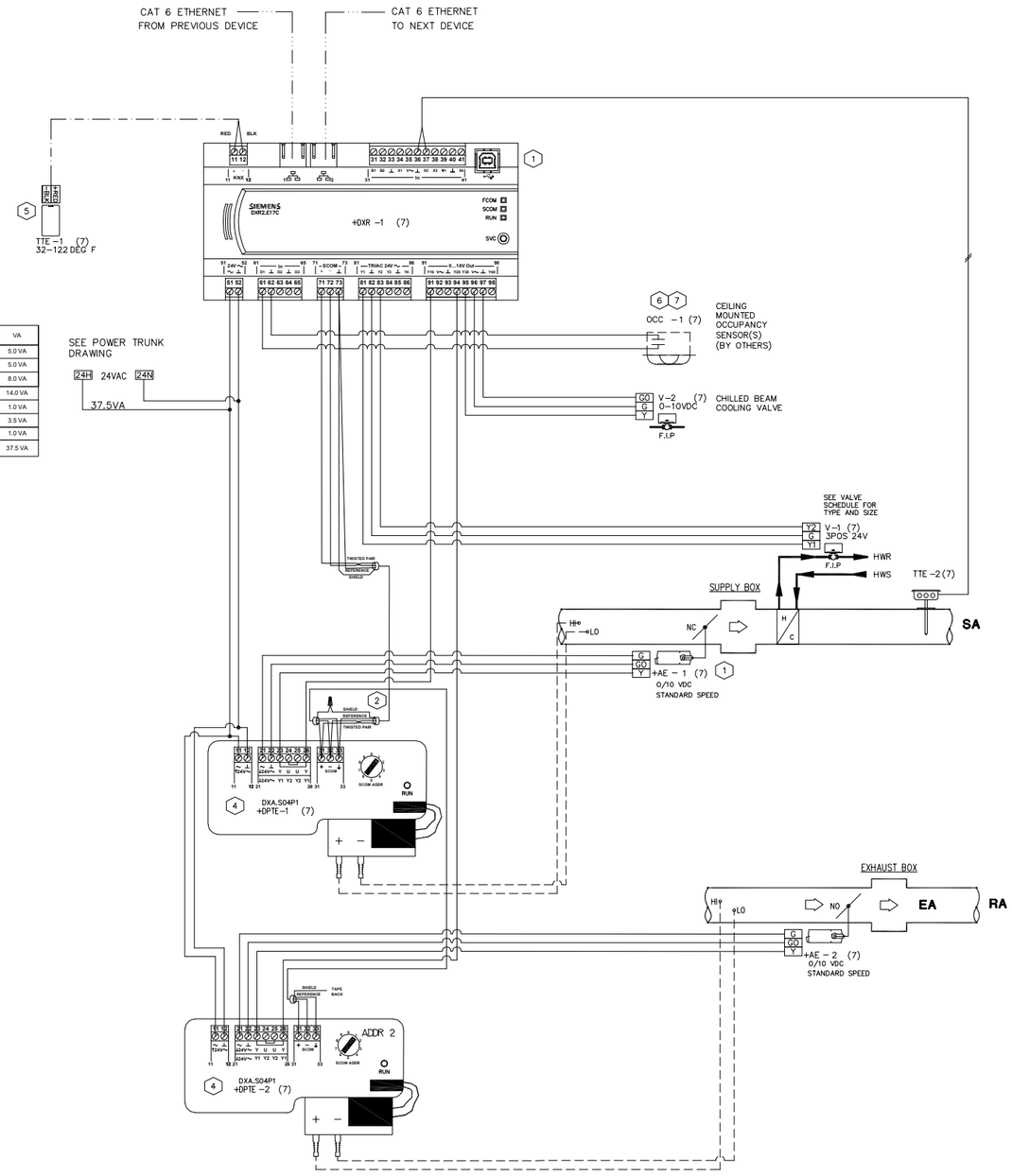


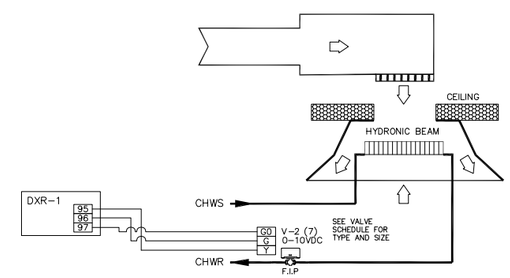
VA POWER DRAW (TYPICAL)

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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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

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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-P30-OCC BOM

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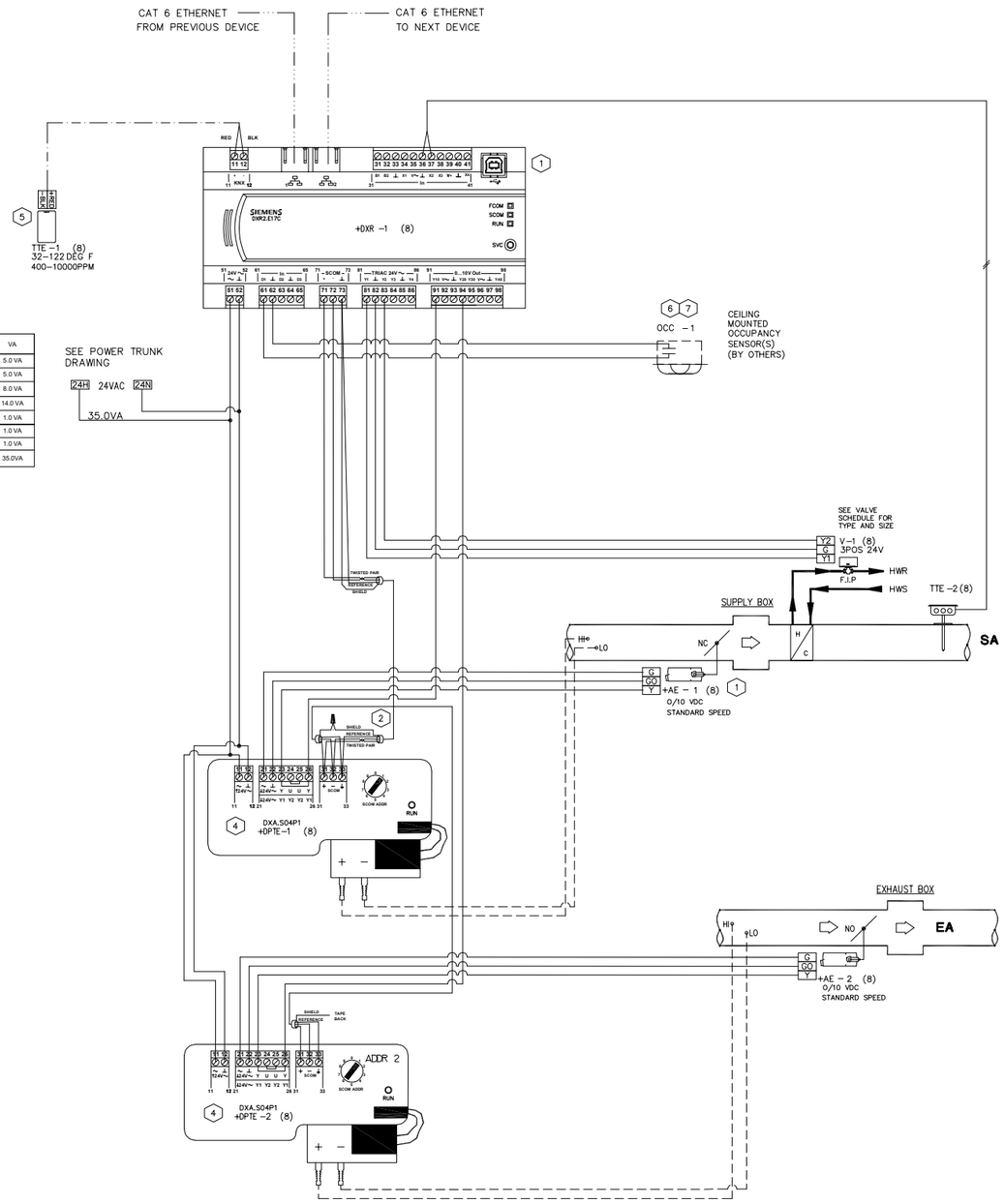

VA POWER DRAW (TYPICAL)

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

440P412785
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438

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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-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
HB	HB	KR	04/02/26	04/02/26

LTB-LGEV-SLOW-P70-OCC BOM

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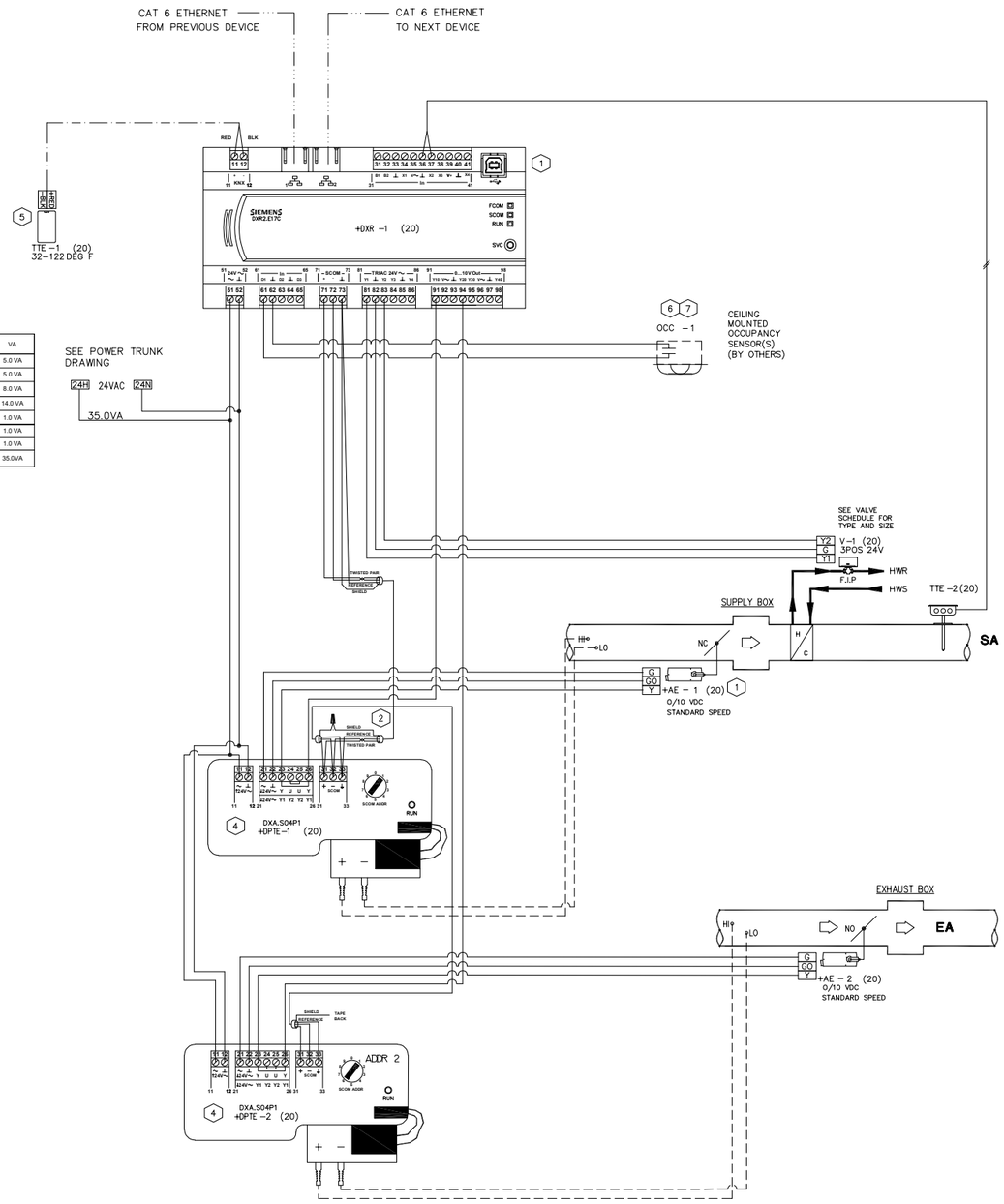

VA POWER DRAW (TYPICAL)

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

440P412785
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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

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	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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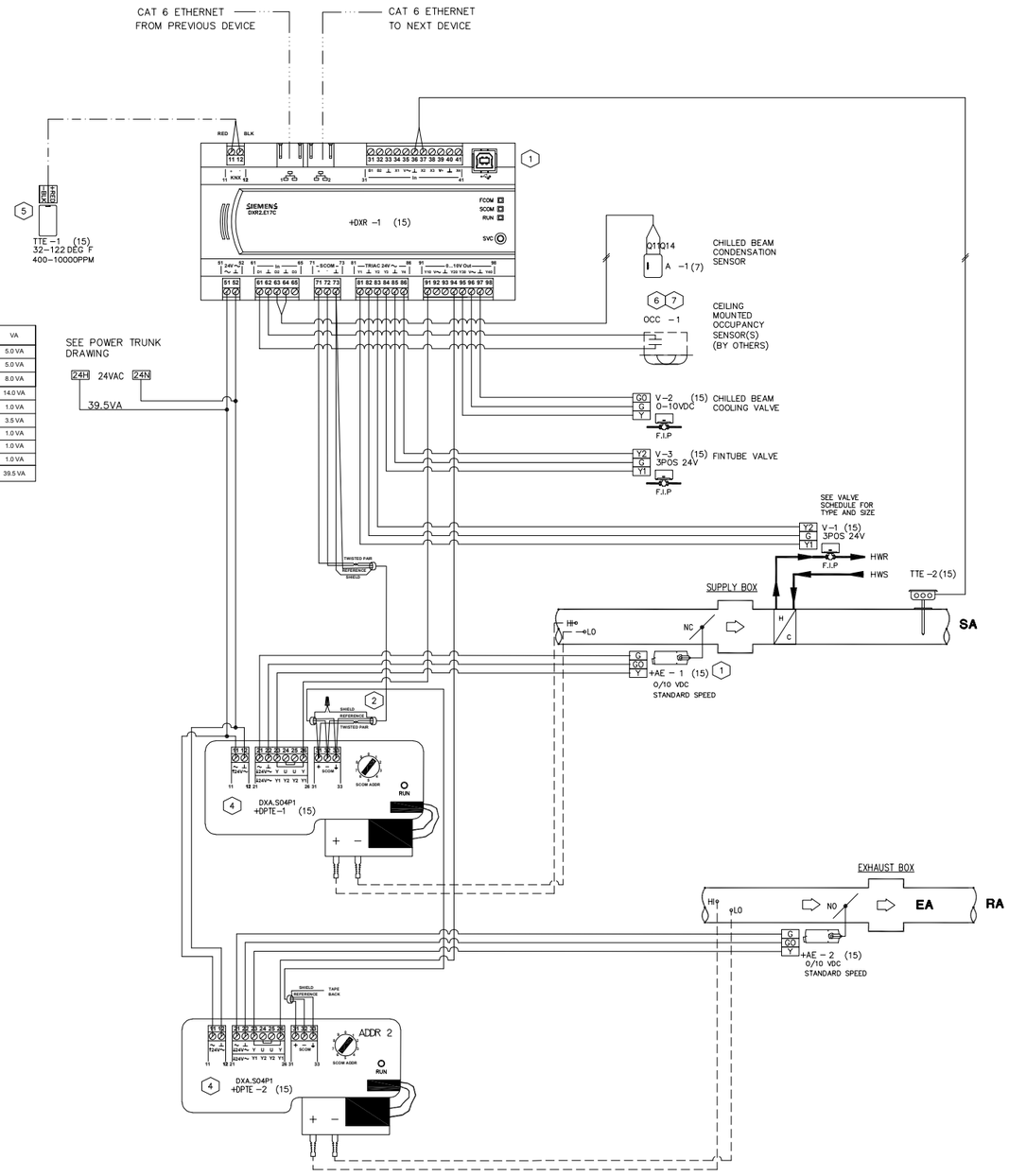


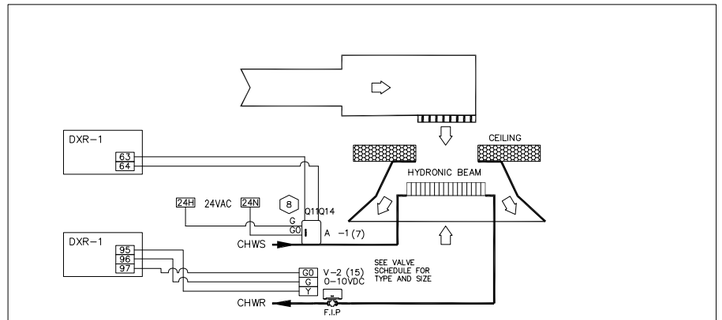
VA POWER DRAW (TYPICAL)

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

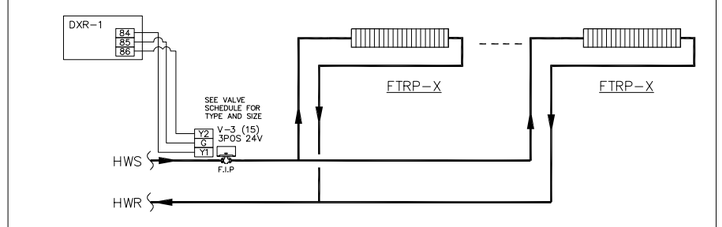
INSTALLATION NOTES:

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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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-RAD-P70-OCC BOM

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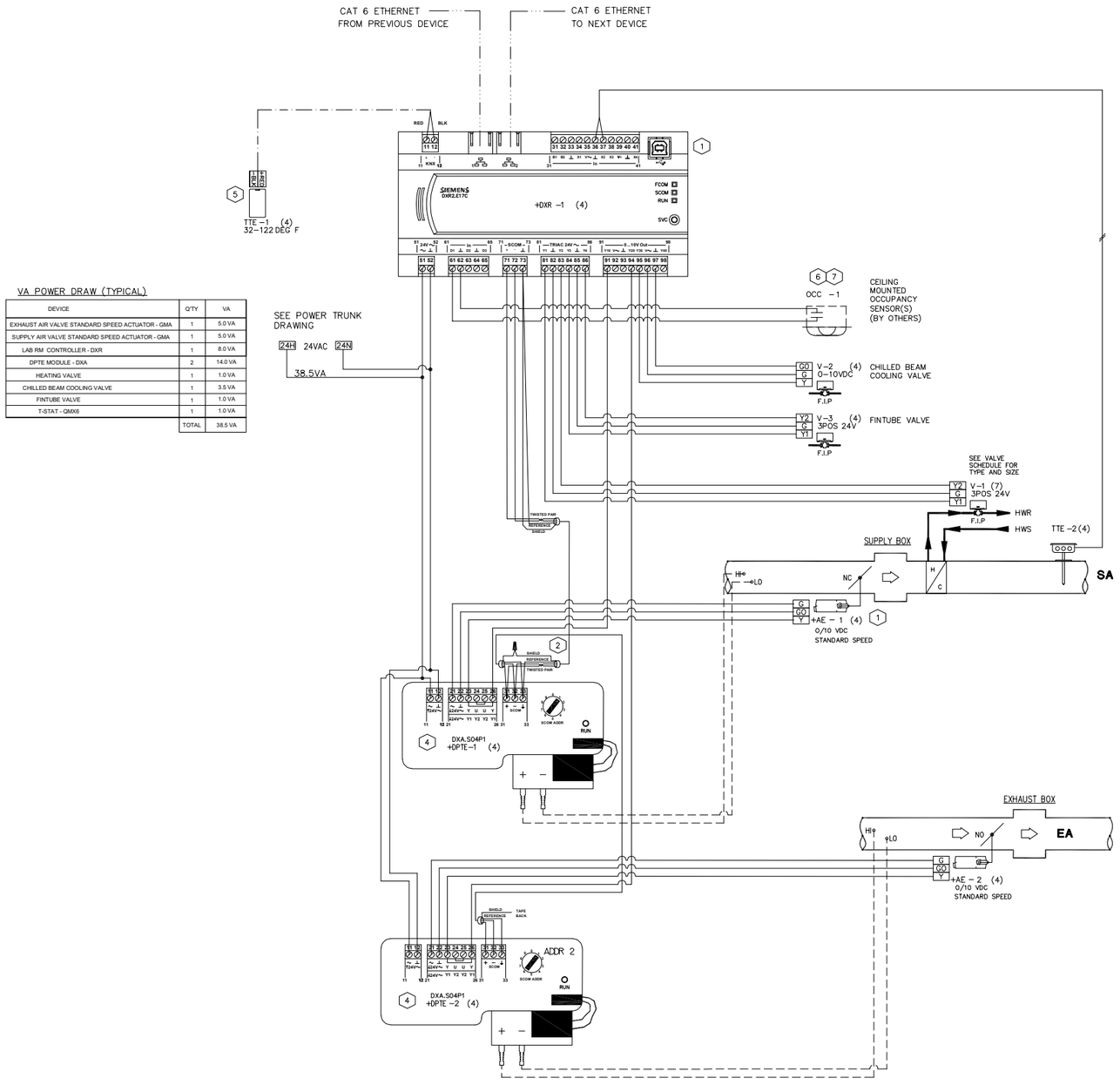


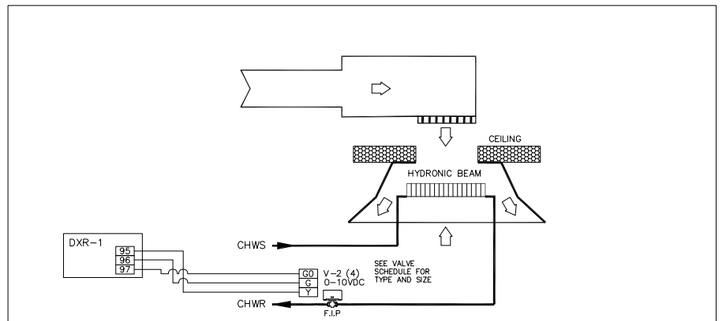
VA POWER DRAW (TYPICAL)

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

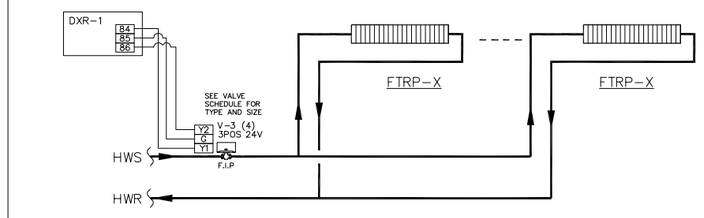
INSTALLATION NOTES:

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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PHONE: 317-208-6980
FAX: 317-208-0374
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

00	4/2/2026	HB	SUBMITTAL SET

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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

TB-EV-SLOW-CB-RAD-P30-OCC BOM

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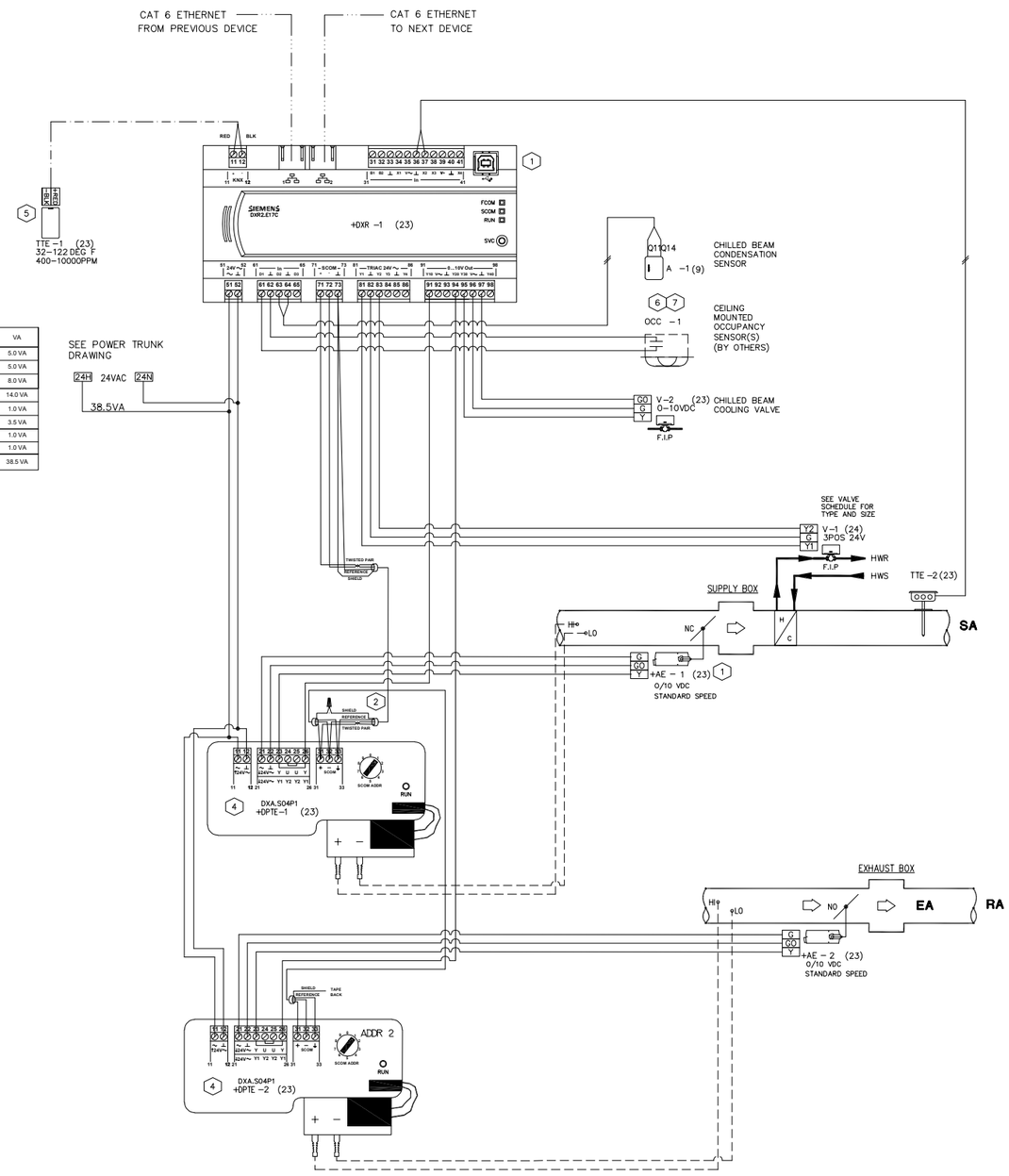


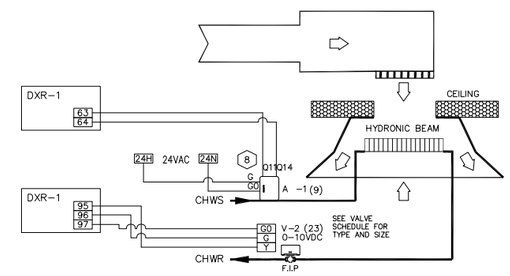
VA POWER DRAW (TYPICAL)

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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SMART INFRASTRUCTURE DIVISION

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

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

TB-EV-SLOW-CB-P70-OCC BOM

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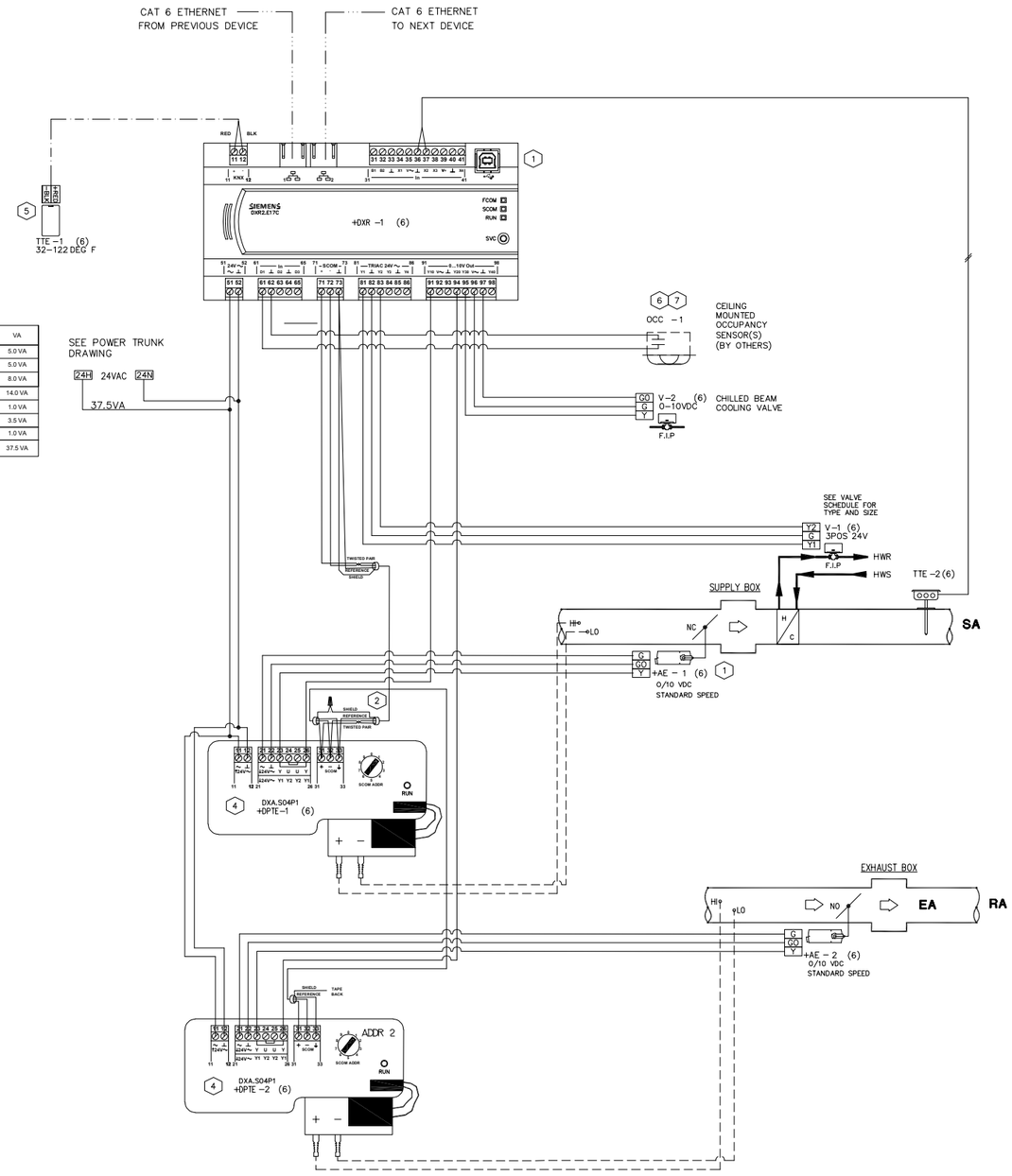


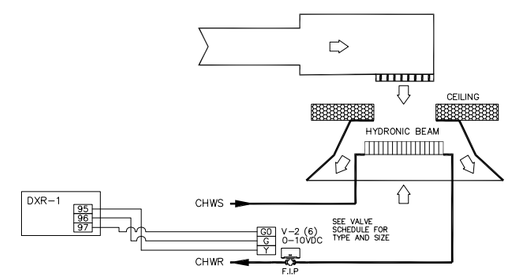
VA POWER DRAW (TYPICAL)

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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443

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BU LAUNCH ACCELERATOR FOR BIO
ID# 20250072, IN

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

TB-EV-SLOW-CB-P30-OCC BOM

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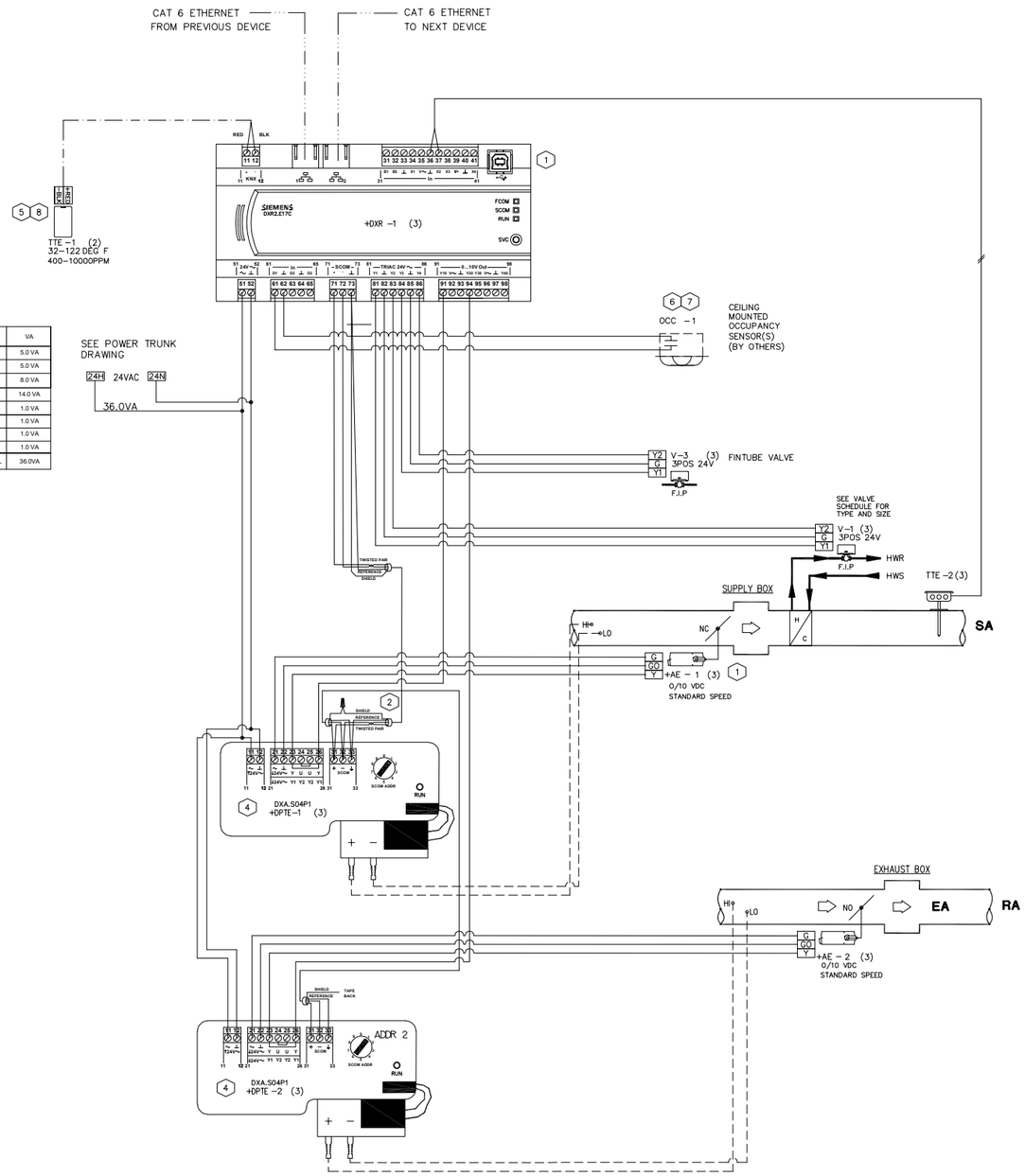


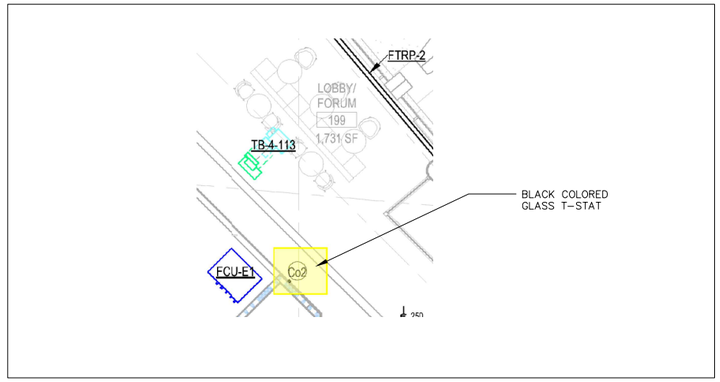
VA POWER DRAW (TYPICAL)

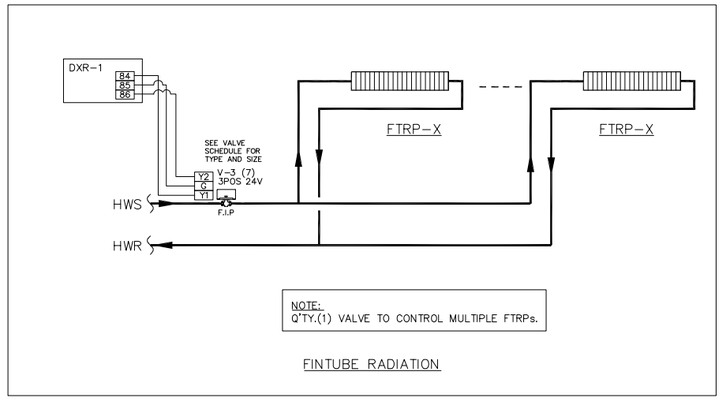
DEVICE	Q'TY	VA
EXHAUST AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
SUPPLY AIR VALVE STANDARD SPEED ACTUATOR - GMA	1	5.0 VA
LAB RM CONTROLLER - DXR	1	8.0 VA
DPTE MODULE - DXA	2	14.0 VA
HEATING VALVE	1	1.0 VA
FINTUBE VALVE	1	1.0 VA
T-STAT - QMX6	1	1.0 VA
CONDENSATION SENSOR	1	1.0 VA
	TOTAL	36.0VA

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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444

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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

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
HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-RAD-P70-OCC BOM

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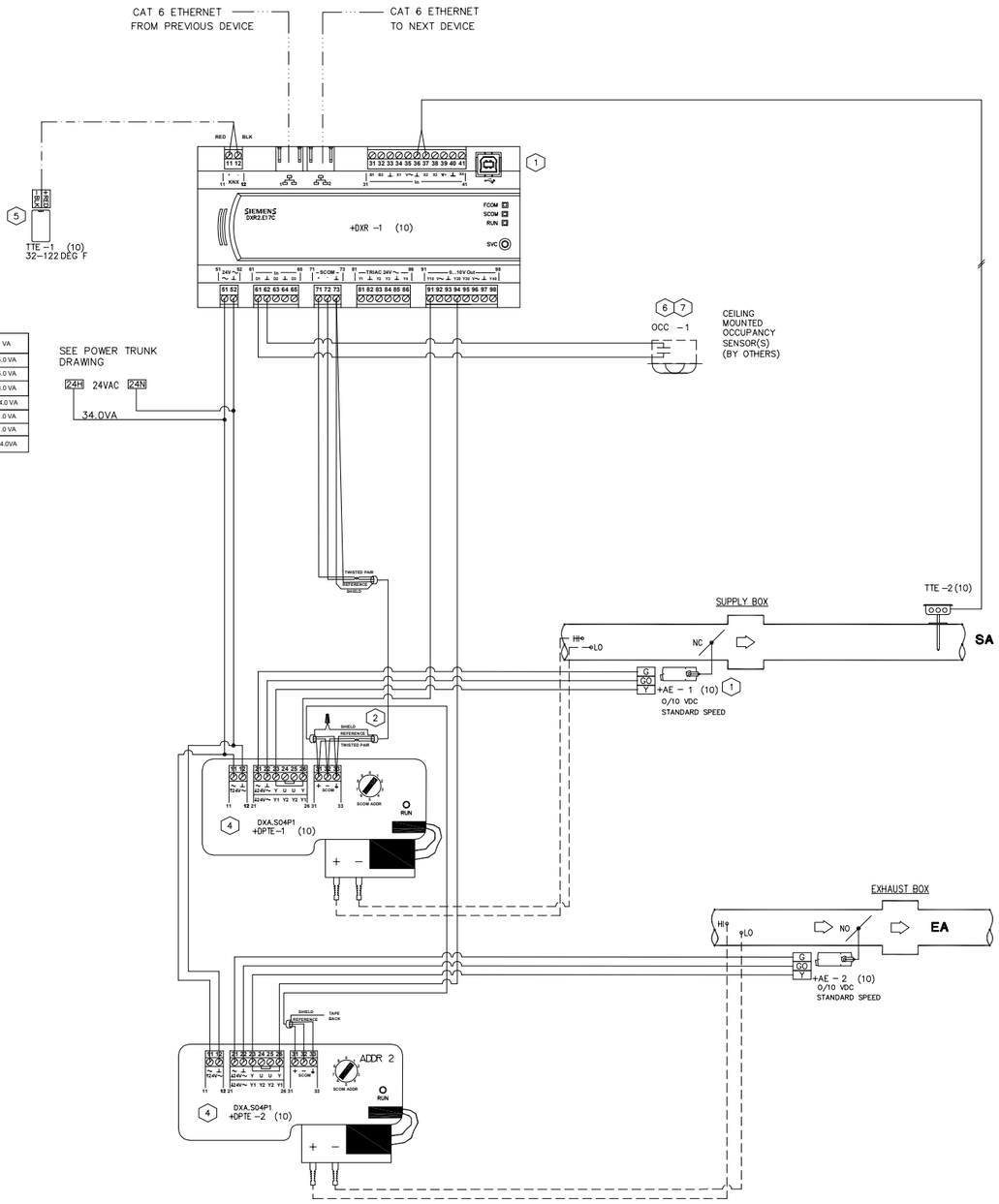

VA POWER DRAW (TYPICAL)

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
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

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	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

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

TB-EV-SLOW-CLG-P30-OCC BOM

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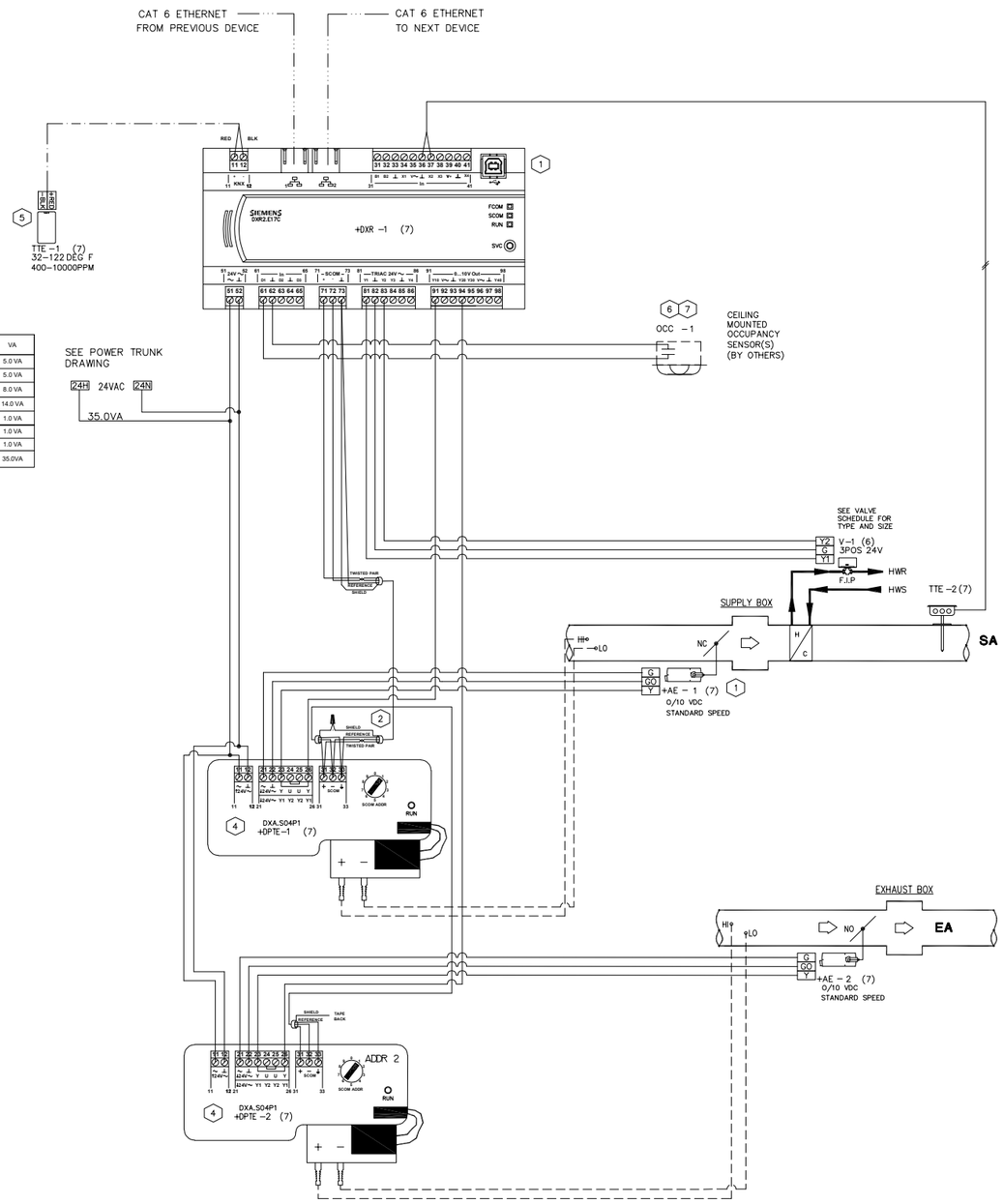

VA POWER DRAW (TYPICAL)

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.

1/446 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

440P412785
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SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

IU LAUNCH ACCELERATOR FOR BIO
IU# 202500072, IN

ENGINEER	DRAWN BY	CHECKED BY	ISSUE RELEASE	LAST EDIT DATE
HB	HB	KS	04/02/26	04/02/26

TB-EV-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	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# 20250072, IN

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HB	HB	KR	04/02/26	04/02/26

TB-EV-SLOW-P70-OCC BOM

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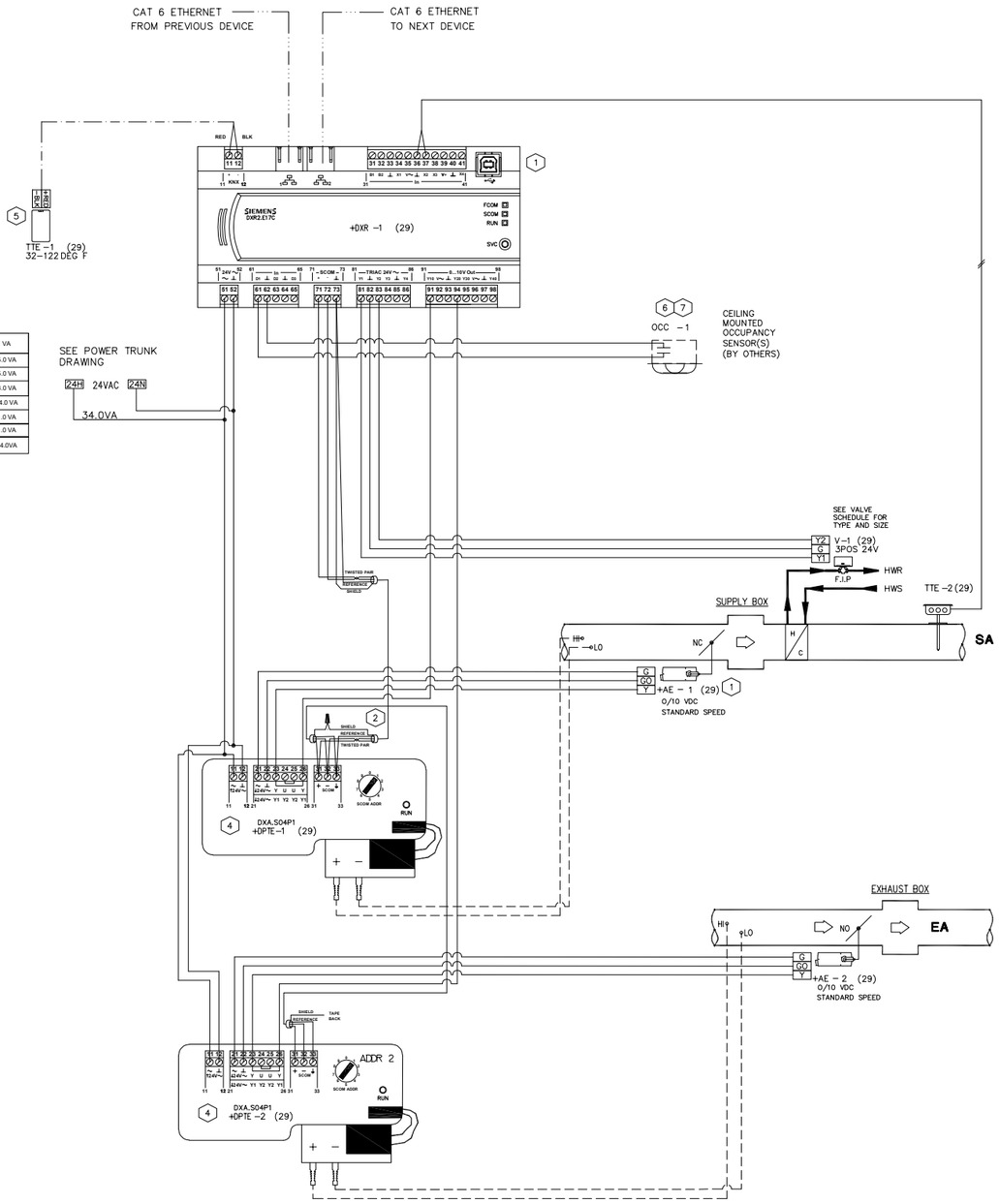

VA POWER DRAW (TYPICAL)

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
	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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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-P30-OCC

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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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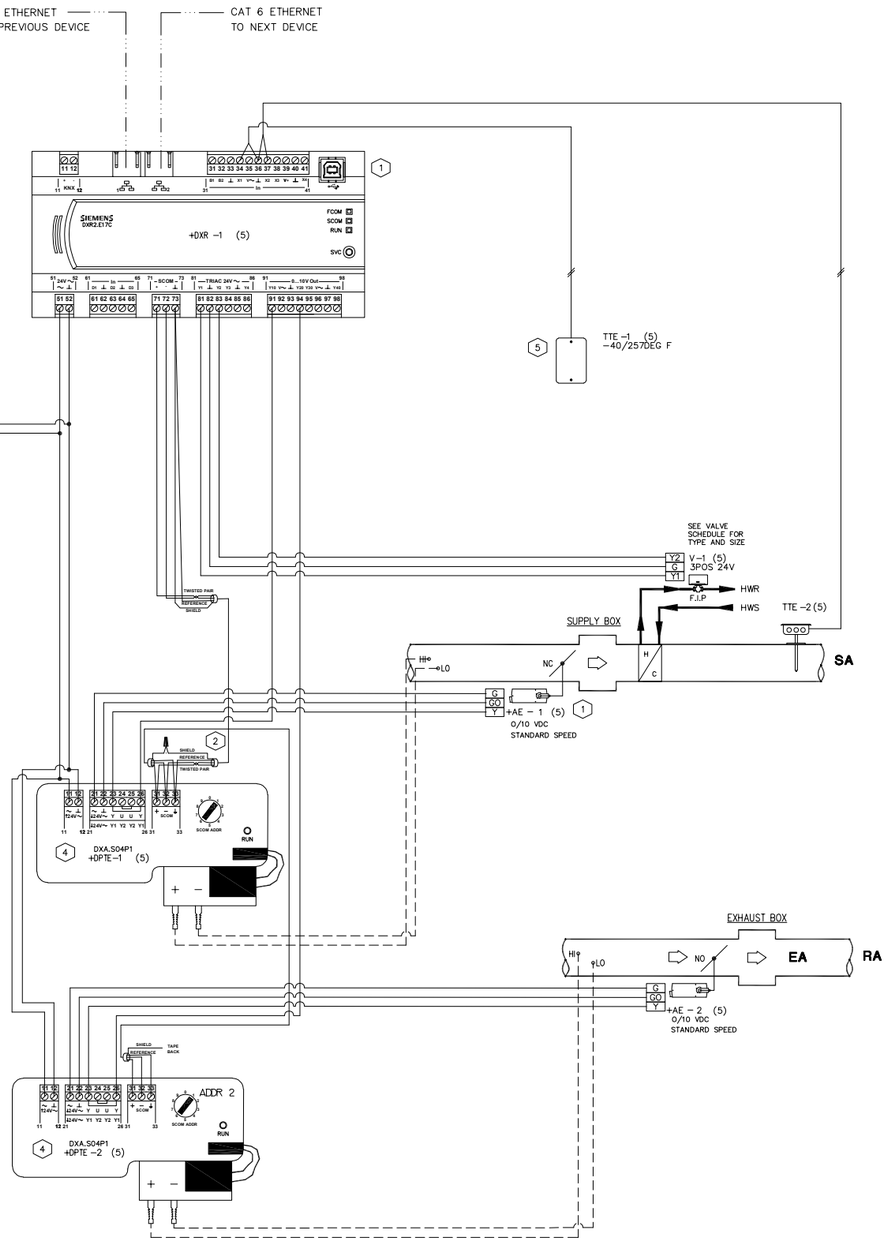

VA POWER DRAW (TYPICAL)

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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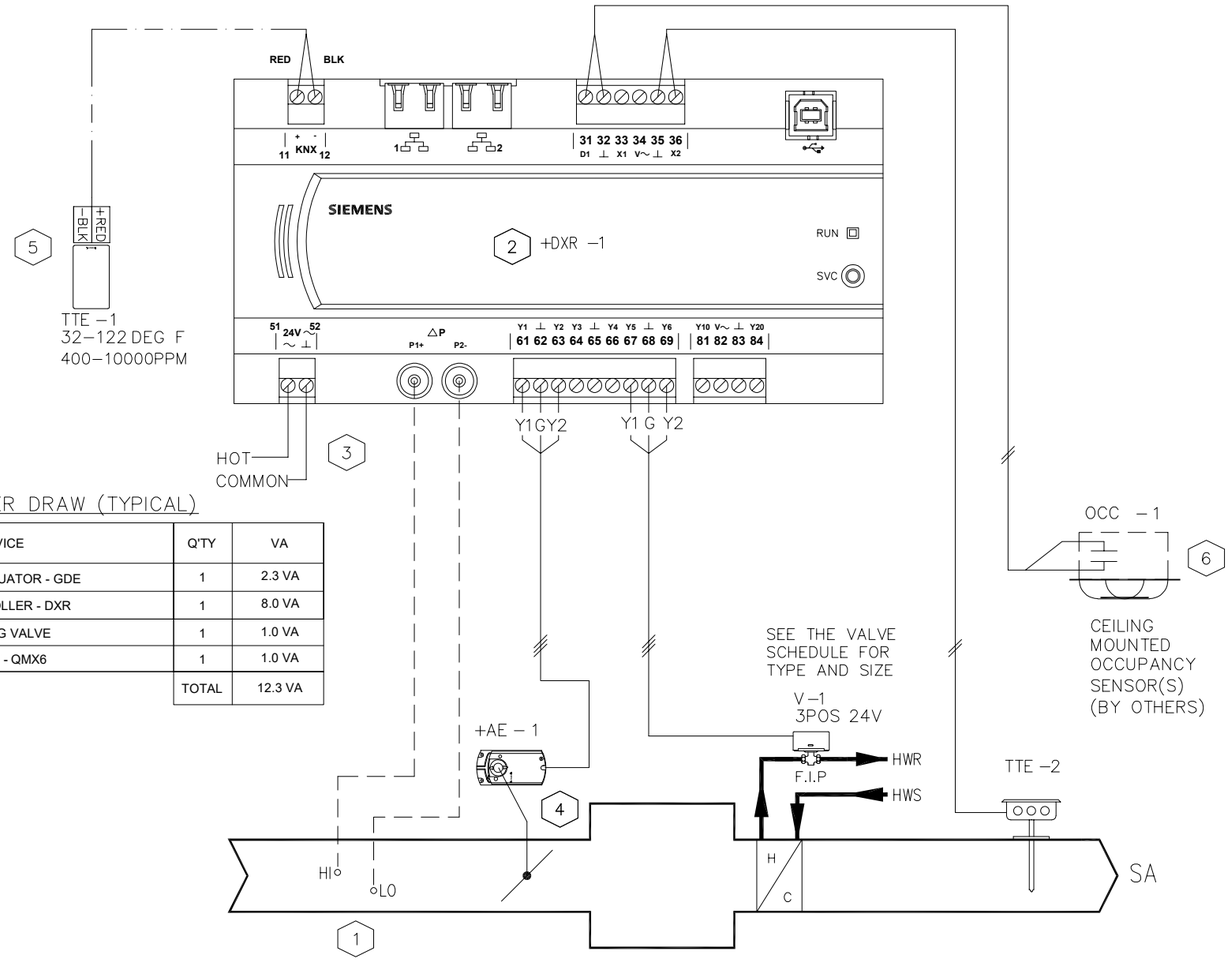

VA POWER DRAW (TYPICAL)

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

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 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
HB	HB	KR		04/15/26

VAV w/HW REHEAT-P70-IP DXR BOM

440P412785

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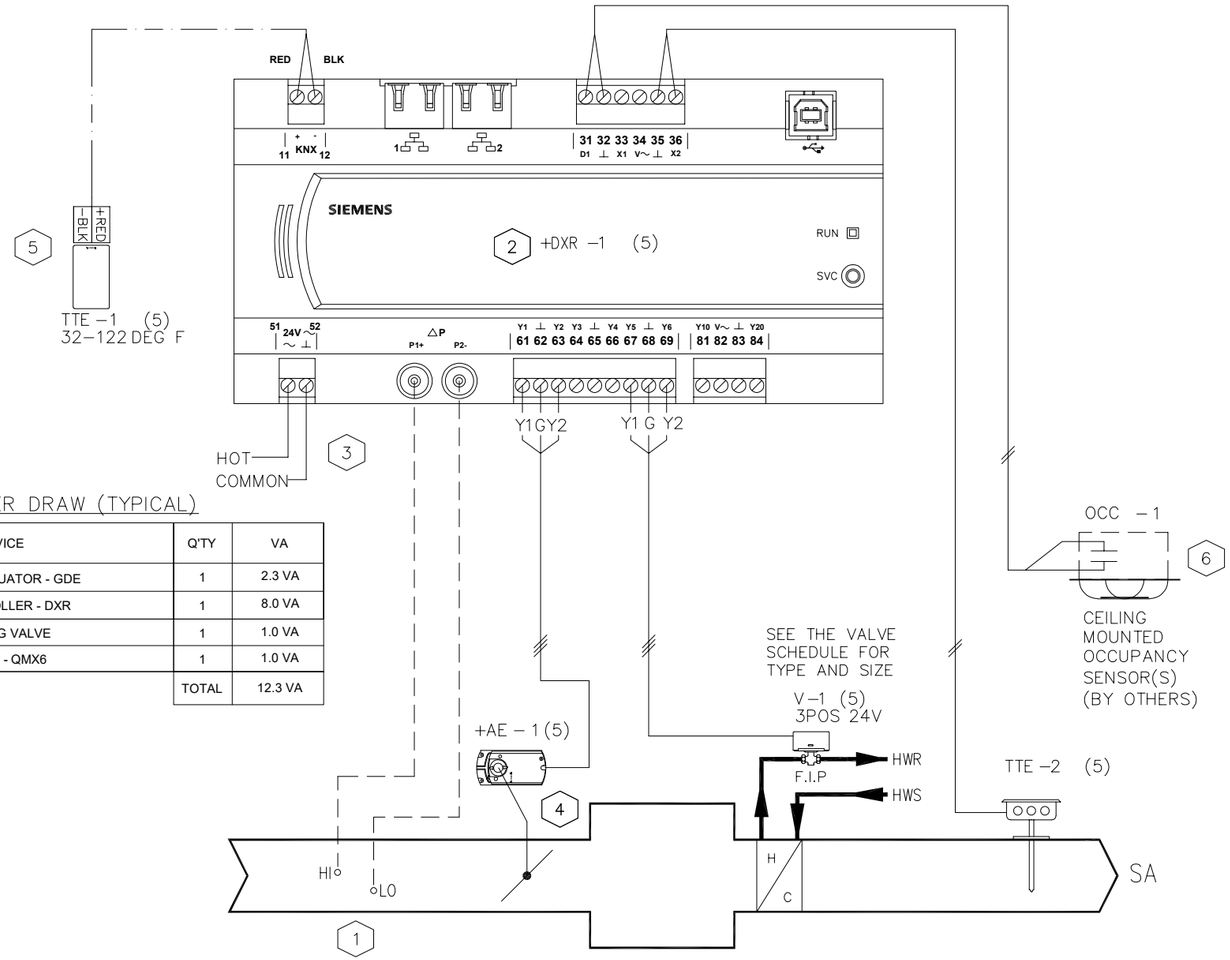

INSTALLATION NOTES:

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
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(+) 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

SIEMENS

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VAV w/HW REHEAT-P30-IP DXR

440P412785
0
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.
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  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)**)
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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).

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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).

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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		04/14/26

VAV w/HW REHEAT-P30-IP DXR BOM

440P412785

451A

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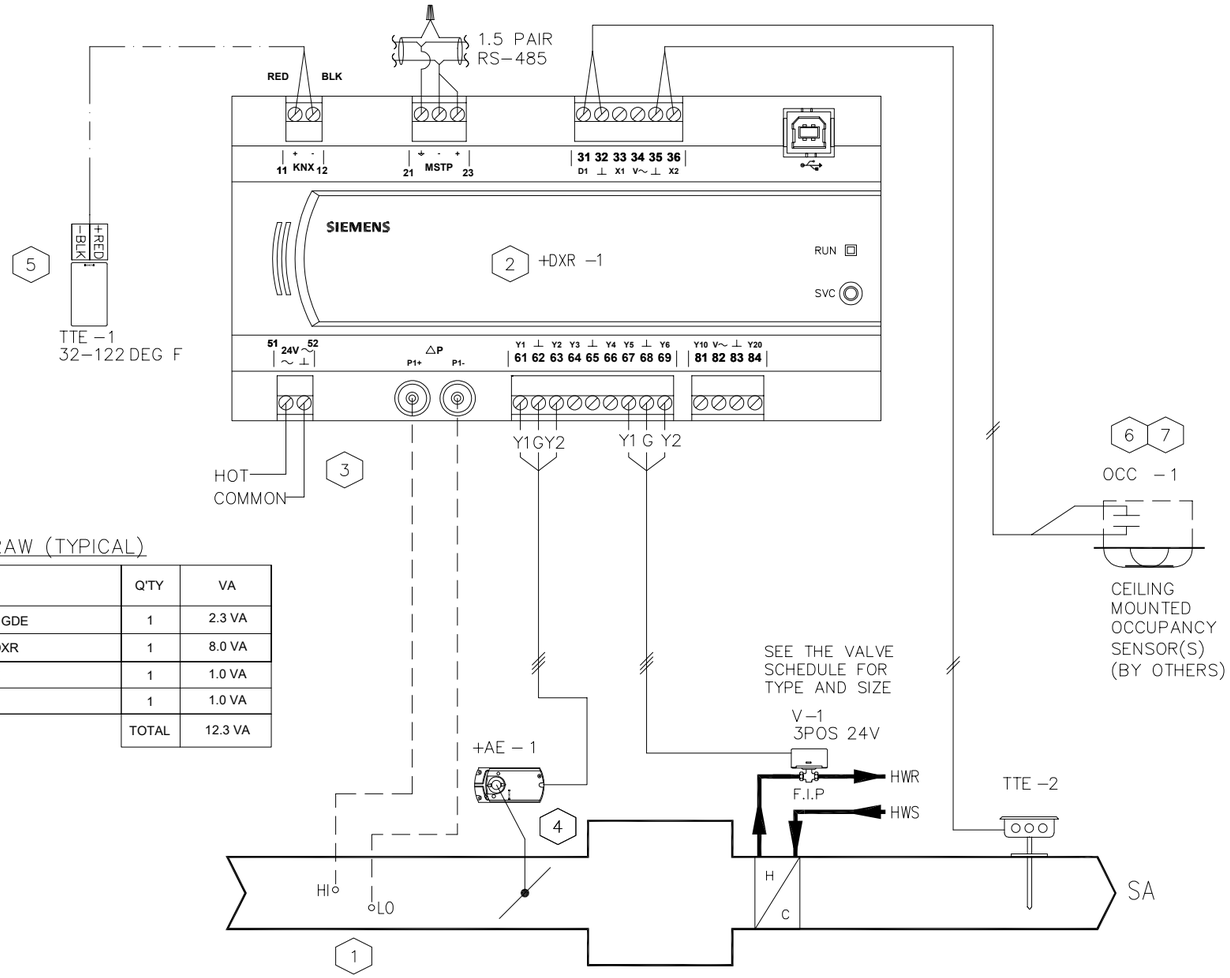

VA POWER DRAW (TYPICAL)

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:

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2. DXR-1 TO BE MOUNTED IN ELECTRICAL BOX PROVIDED BY VAV BOX MANUFACTURER. [FACTORY MOUNTED]
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(+) 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

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	04/22/26

VAV w/HW REHEAT MSTP DXR

440P412785
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452

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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

440P412785

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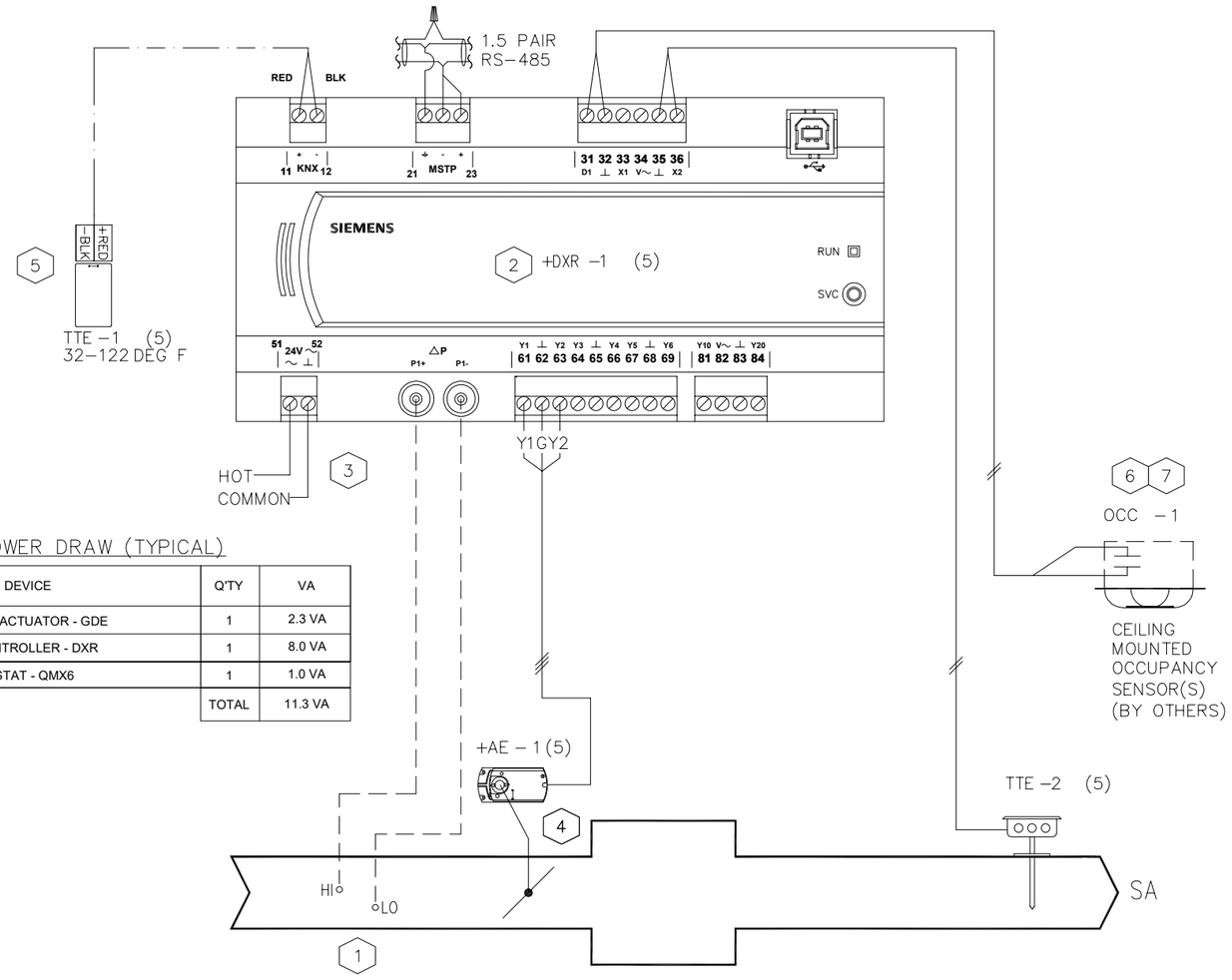

VA POWER DRAW (TYPICAL)

DEVICE	Q'TY	VA
DAMPER ACTUATOR - GDE	1	2.3 VA
CONTROLLER - DXR	1	8.0 VA
T-STAT - QMX6	1	1.0 VA
	TOTAL	11.3 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. 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.

1/453 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

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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	04/22/26

VAV COOLING ONLY

440P412785
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453

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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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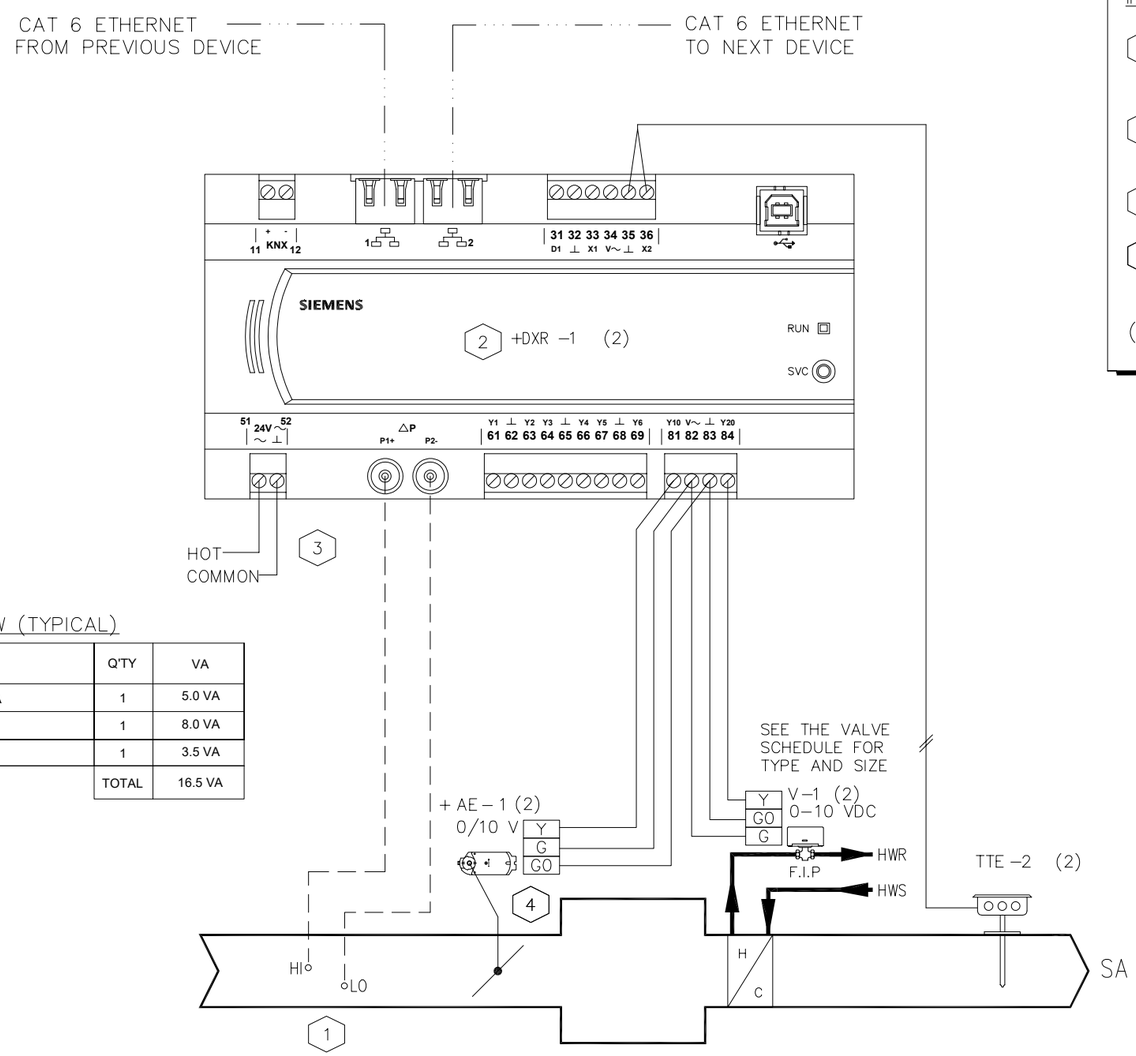

VA POWER DRAW (TYPICAL)

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

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

INJECTION VAV BOX

440P412785
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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

00	4/2/2026	HB	SUBMITTAL SET

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IU# 20250072, IN

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INJECTION VAV BOX BOM

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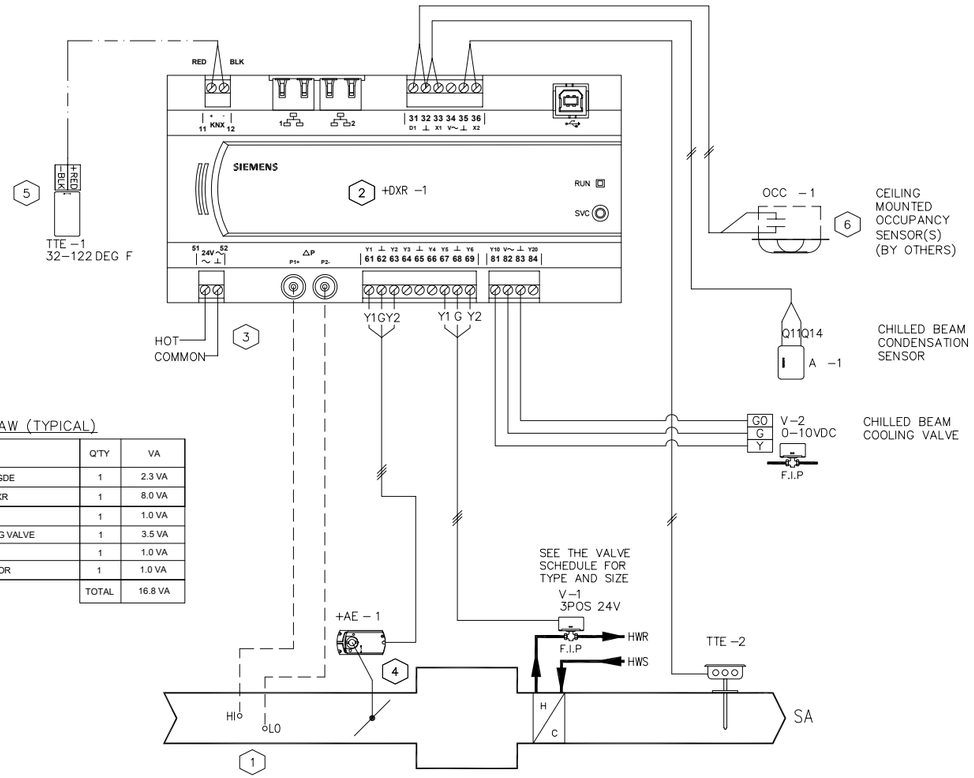


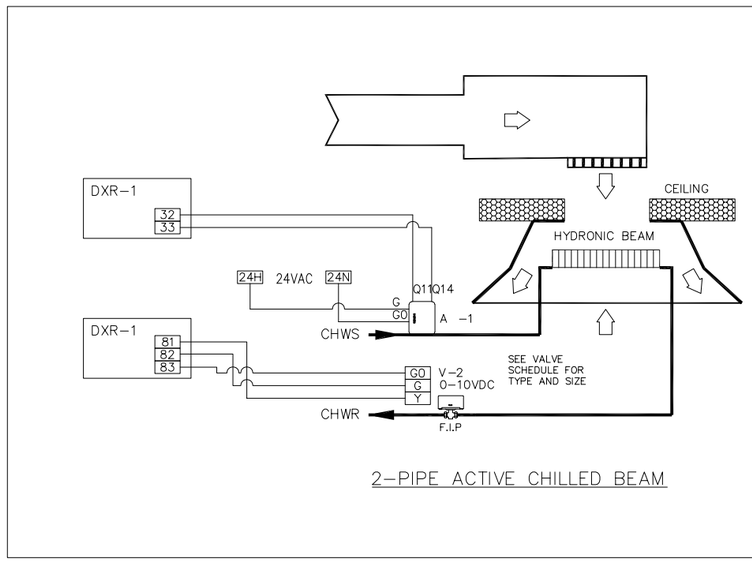
VA POWER DRAW (TYPICAL)

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

440P412785
0
455

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 RH-CB-P30-IP DXR

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SMART INFRASTRUCTURE DIVISION

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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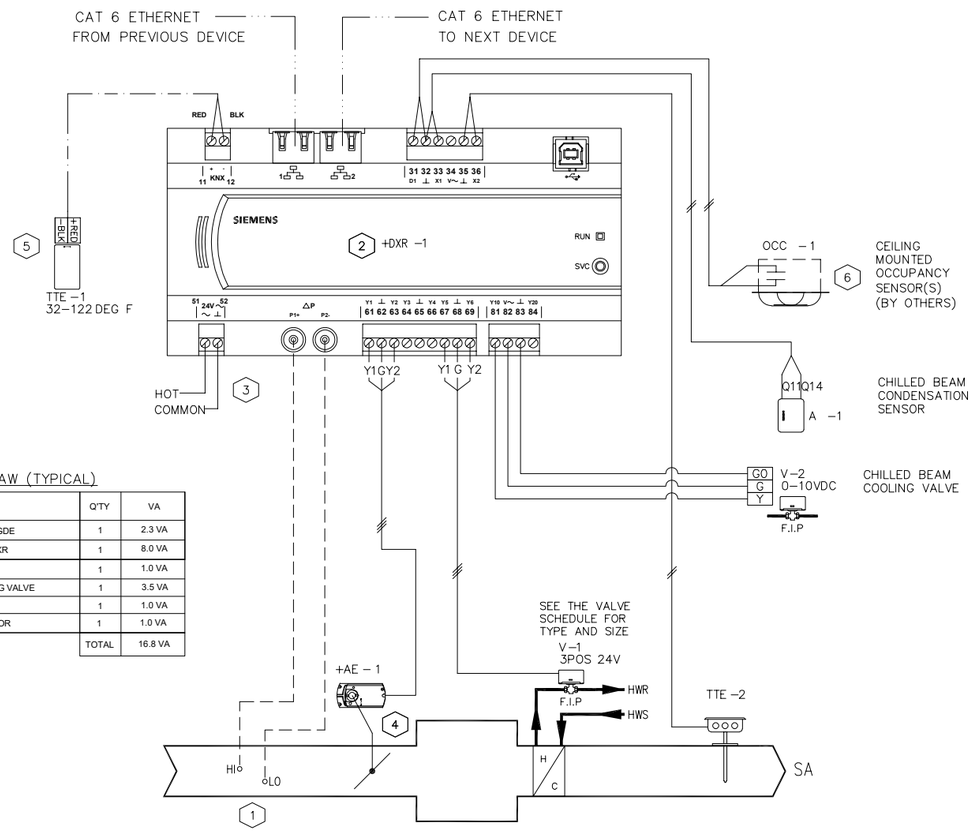


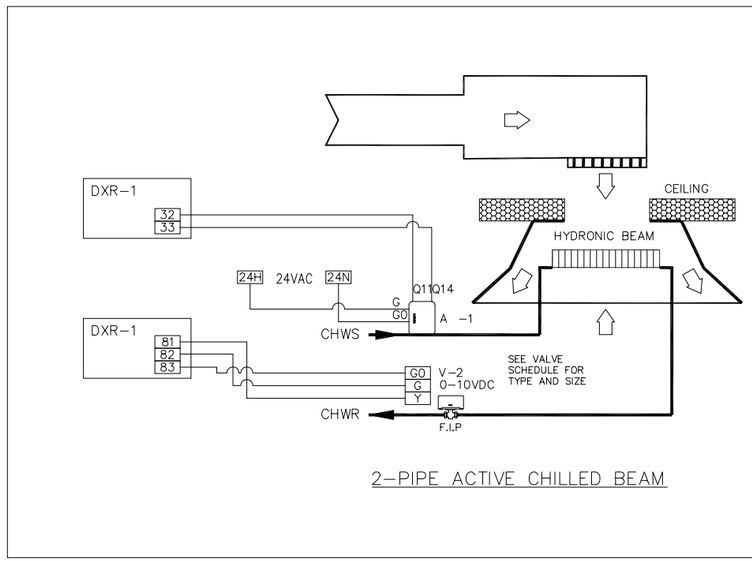
VA POWER DRAW (TYPICAL)

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

440P412785
0
455

IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/15/26

VAV w/HW RH-CB-P30-IP DXR

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

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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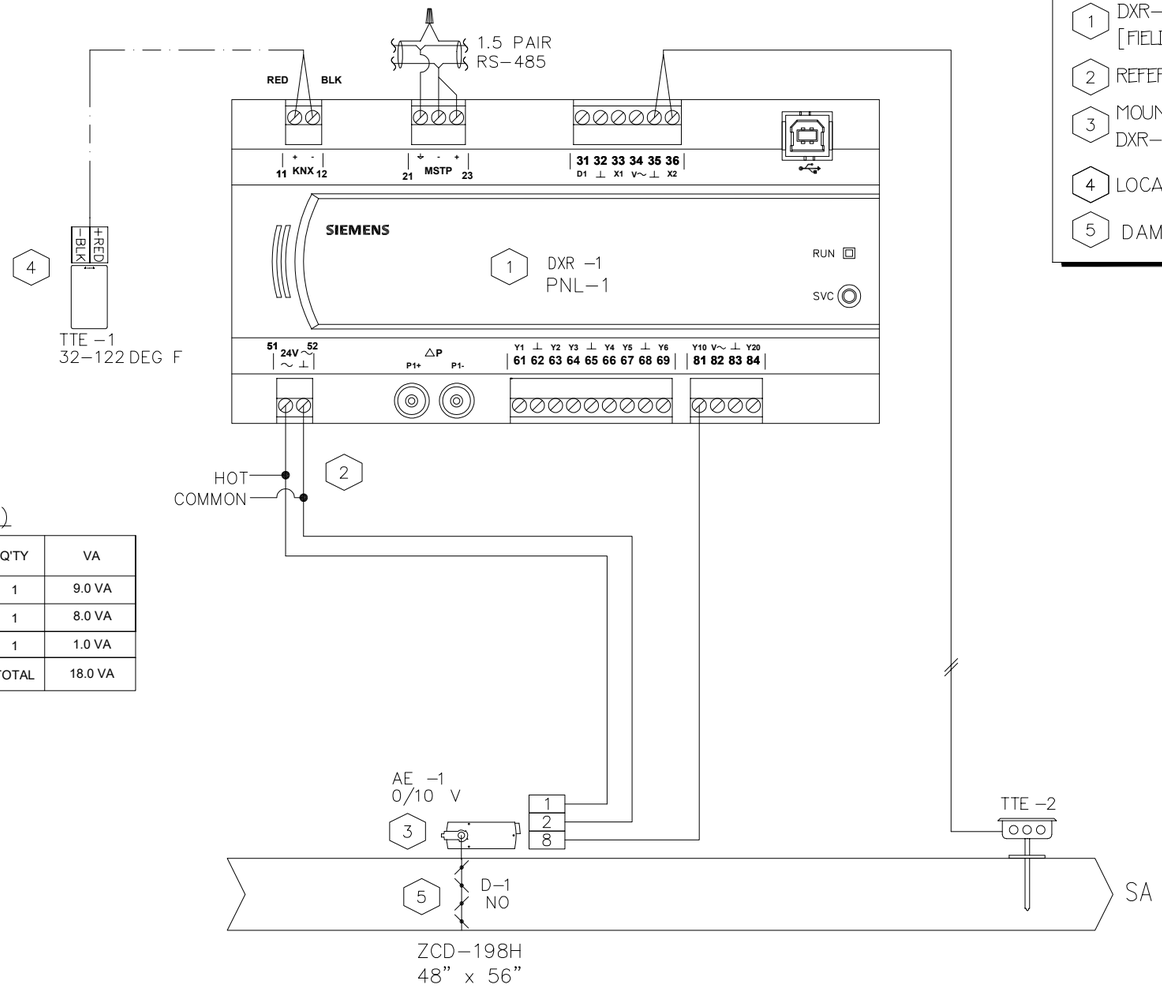

INSTALLATION NOTES:

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

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	04/06/26

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

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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PUMP RM DMP CONTROL

440P412785

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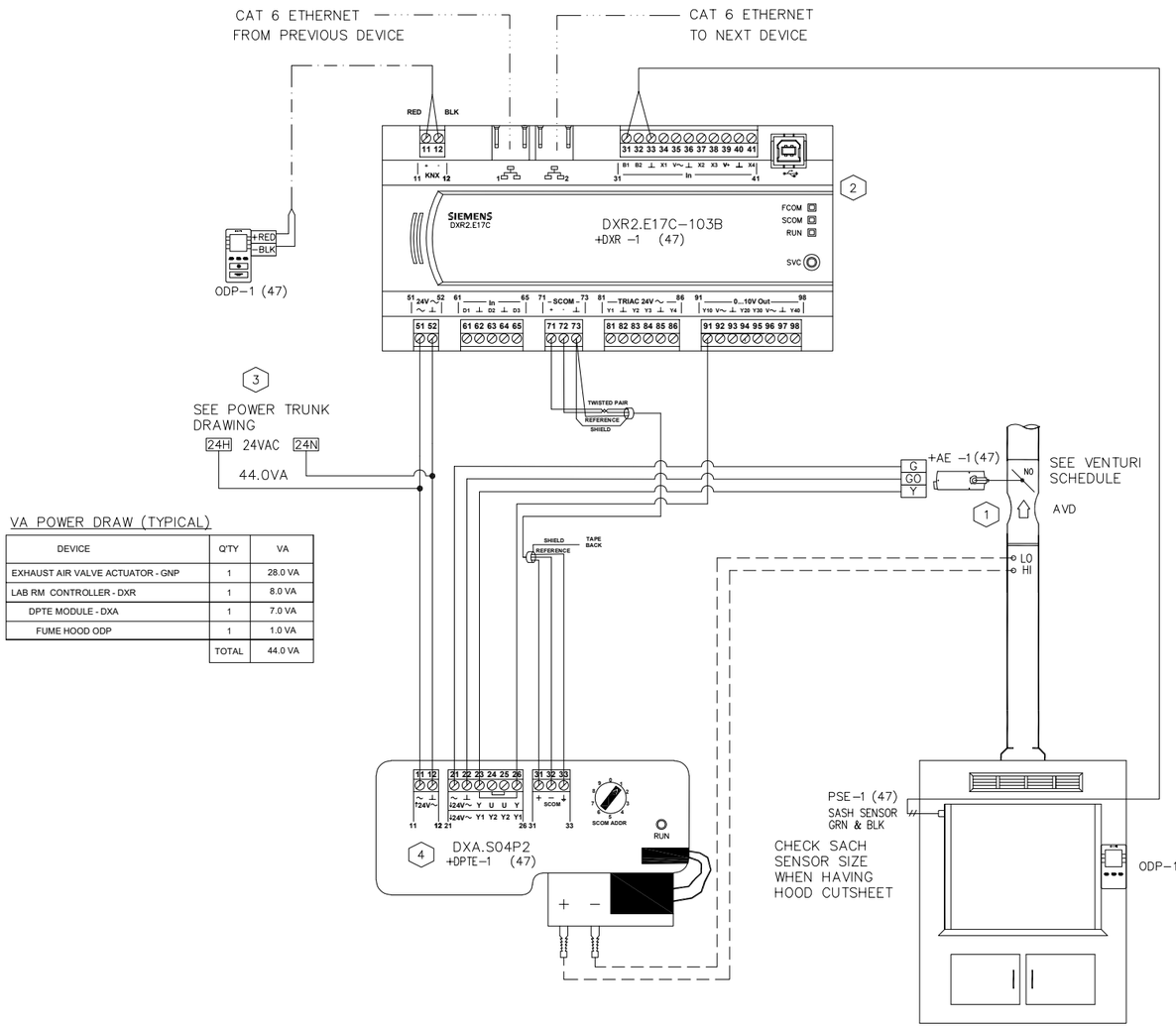
INSTALLATION NOTES:

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

440P412785
0
460

IU LAUNCH ACCELERATOR FOR BIO
IU• 20250072, IN

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
HB	HB	KR	04/02/26	04/14/26

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.S04P2	SIEMENS		AIR FLOW PRES SENSOR 2"
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.S04P2	SIEMENS		AIR FLOW PRES SENSOR 2"
DXR 1	23	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	04/22/26

FUME HOOD CONTROL BOM

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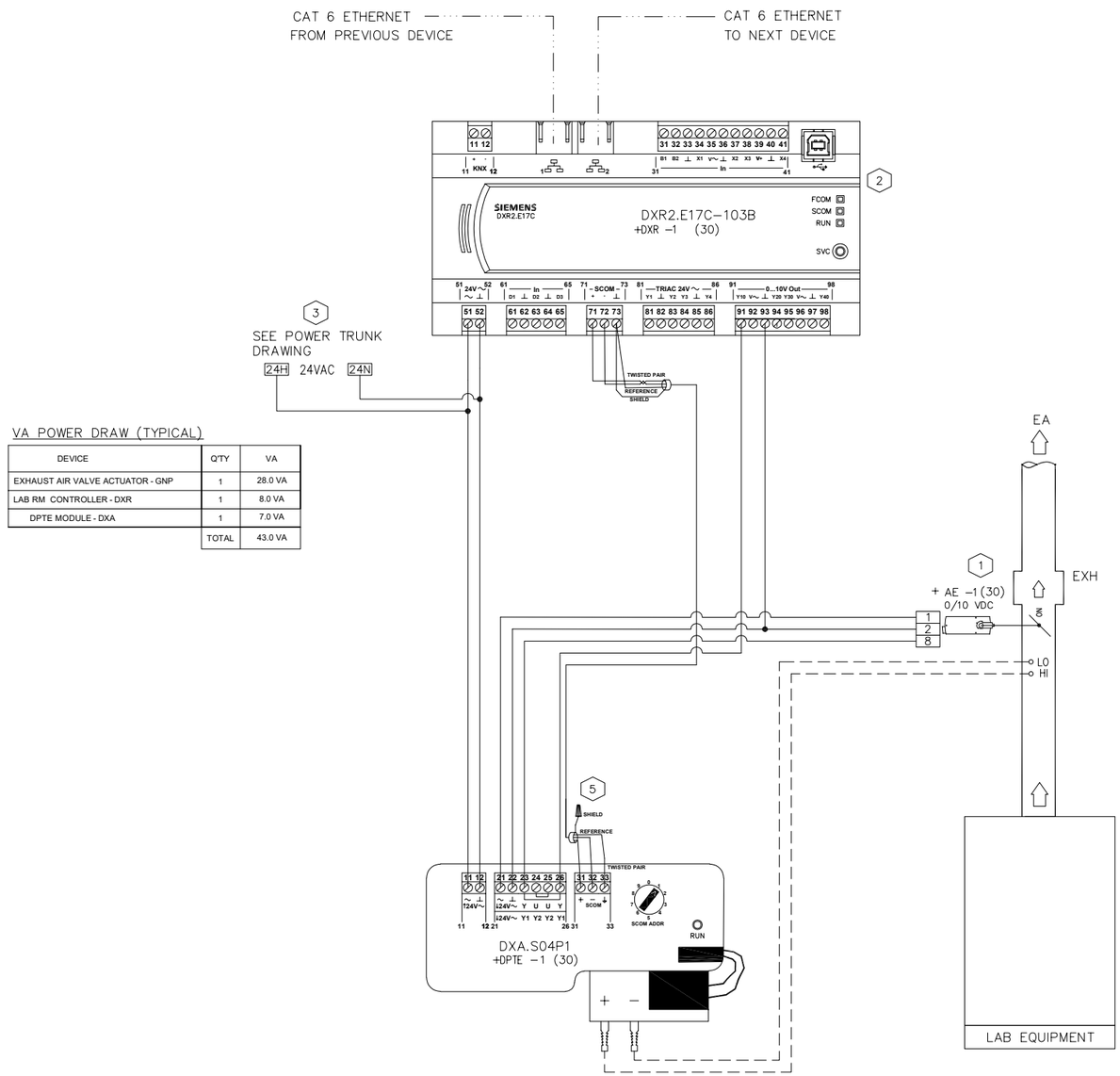

VA POWER DRAW (TYPICAL)

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

440P412785
0
461

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

LAB EQUIPMENT EXHAUST

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REVISION HISTORY

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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

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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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

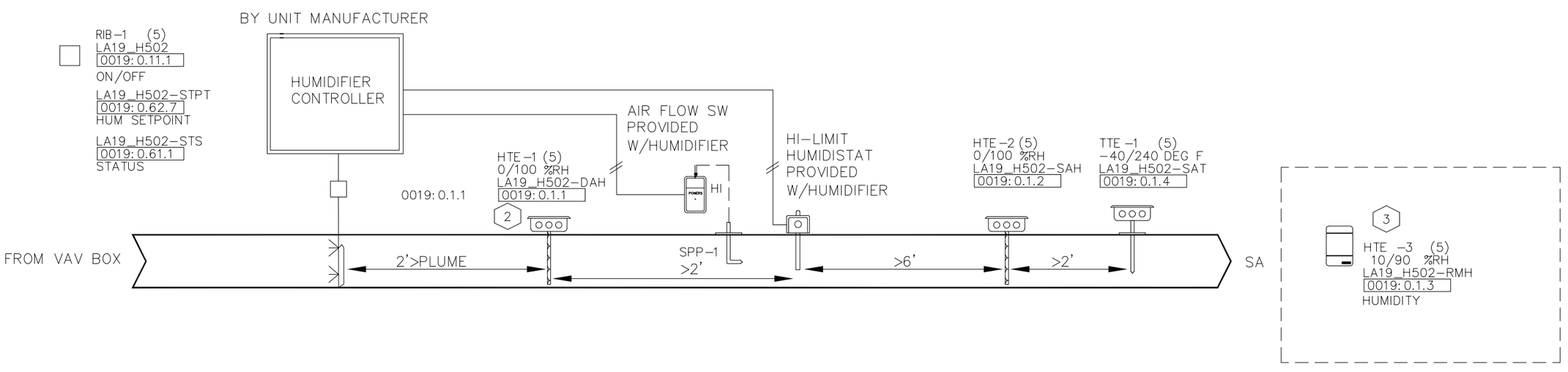
LA19_H2-AHU1-STS
0019: 0.61.4
AHU-1 RUN STATUS
LA19_H2-AHU2-STS
0019: 0.61.5
AHU-2 RUN STATUS
LA19_H2-AHU3-STS
0019: 0.61.6
AHU-3 RUN STATUS

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	

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

DUCT HUMIDIFIER CONTROL

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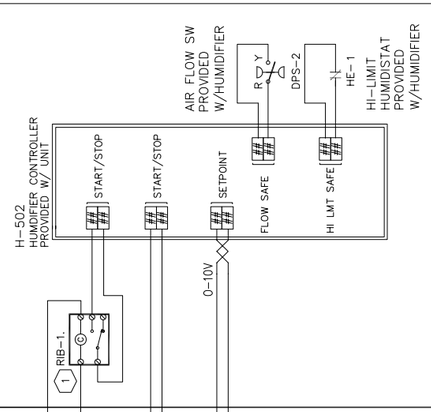
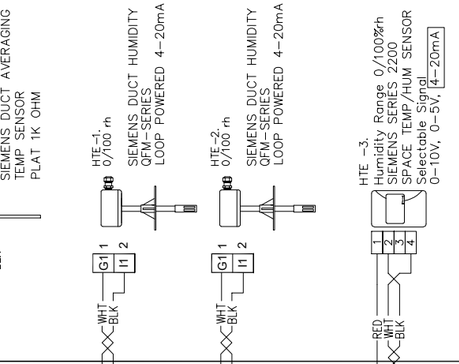
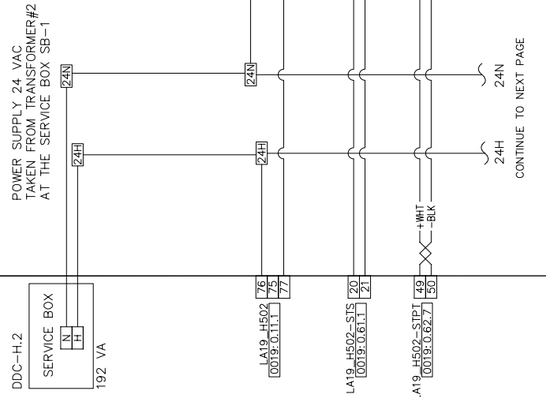
FIELD WIRING

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

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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

H-502 ELEC. WIRING

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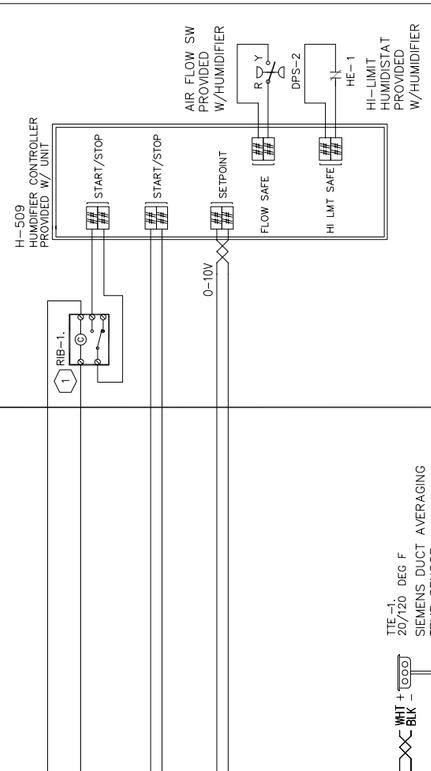

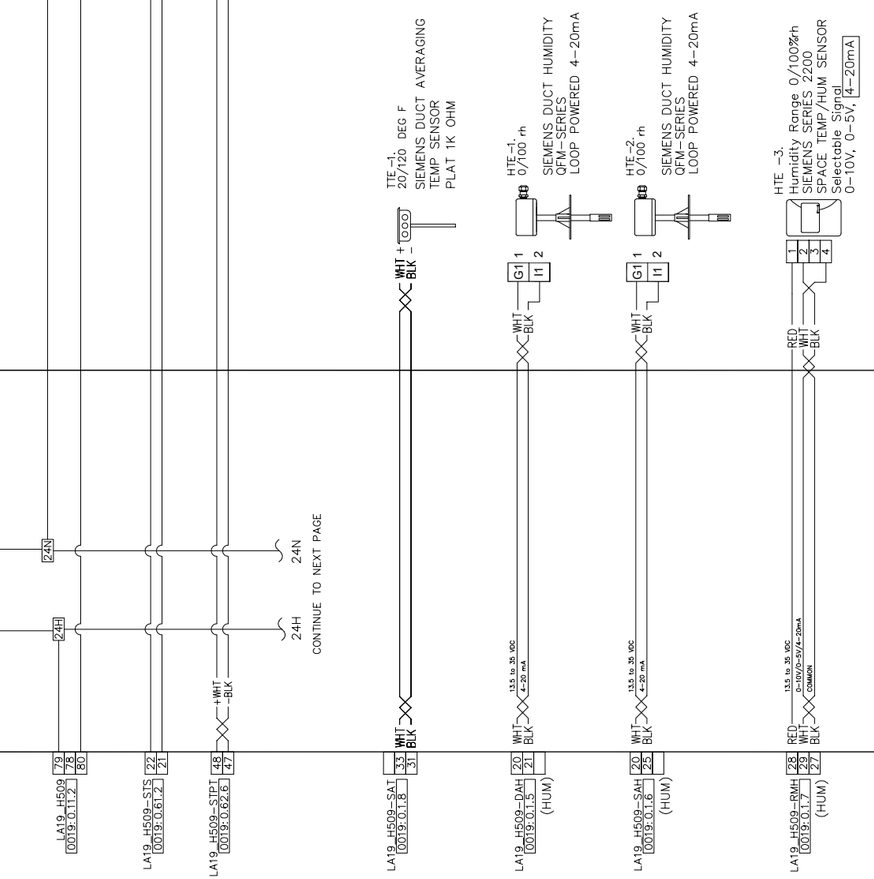

COMPONENT PANEL / POWER

FIELD PANEL

DRAWING NOTES: (#)

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GENERAL NOTES:

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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

H-509 ELEC. WIRING

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FIELD WIRING

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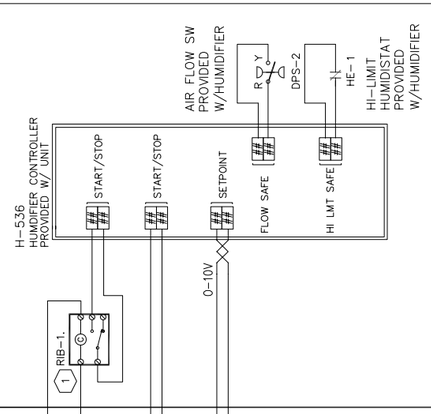
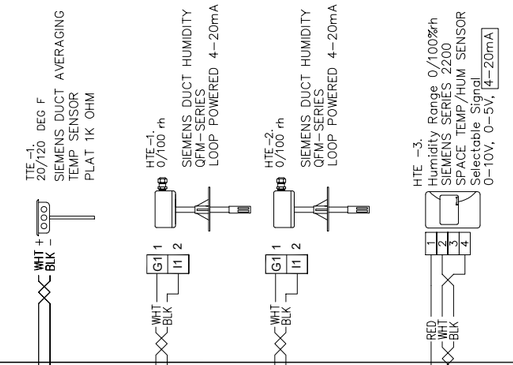
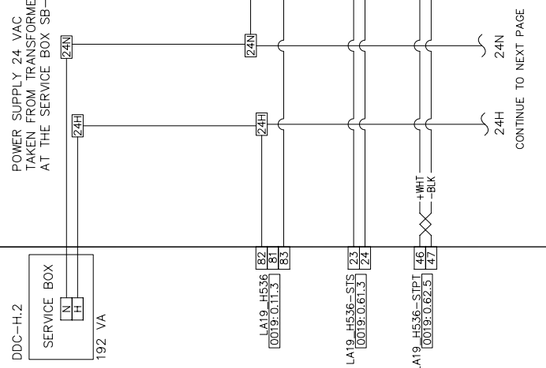
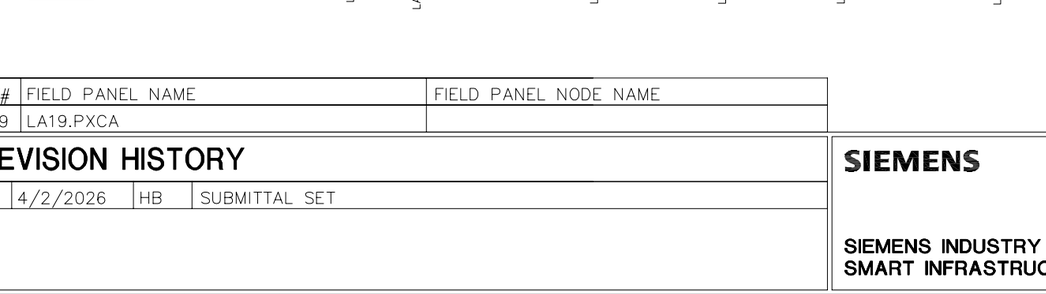




COMPONENT PANEL / POWER



FIELD PANEL



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0019	LA19.PXCA	

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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FIELD WIRING

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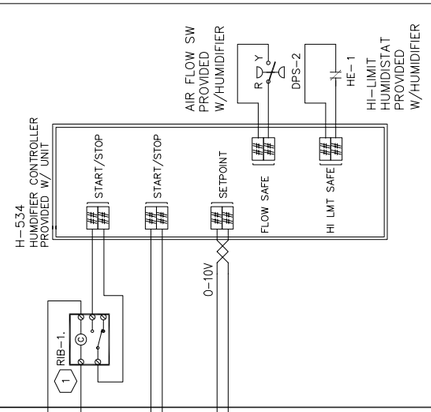

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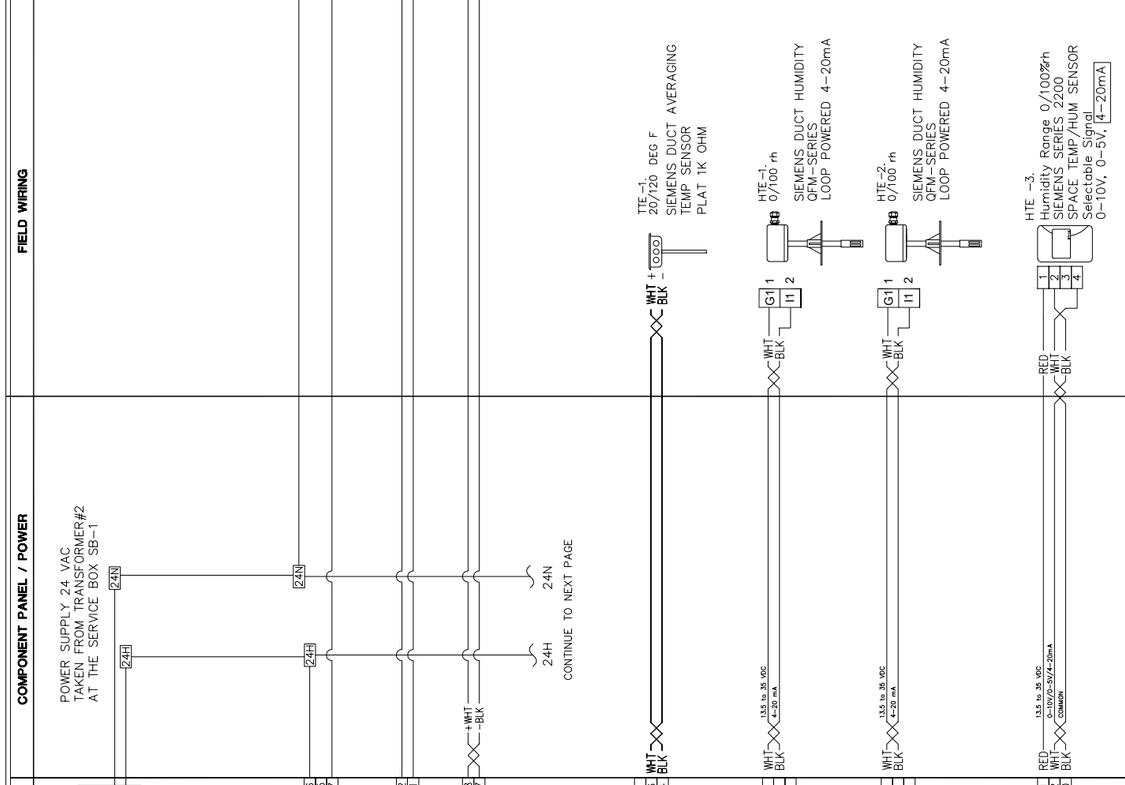
COMPONENT PANEL / POWER



FIELD PANEL

REVISION HISTORY

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SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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H-534 ELEC. WIRING

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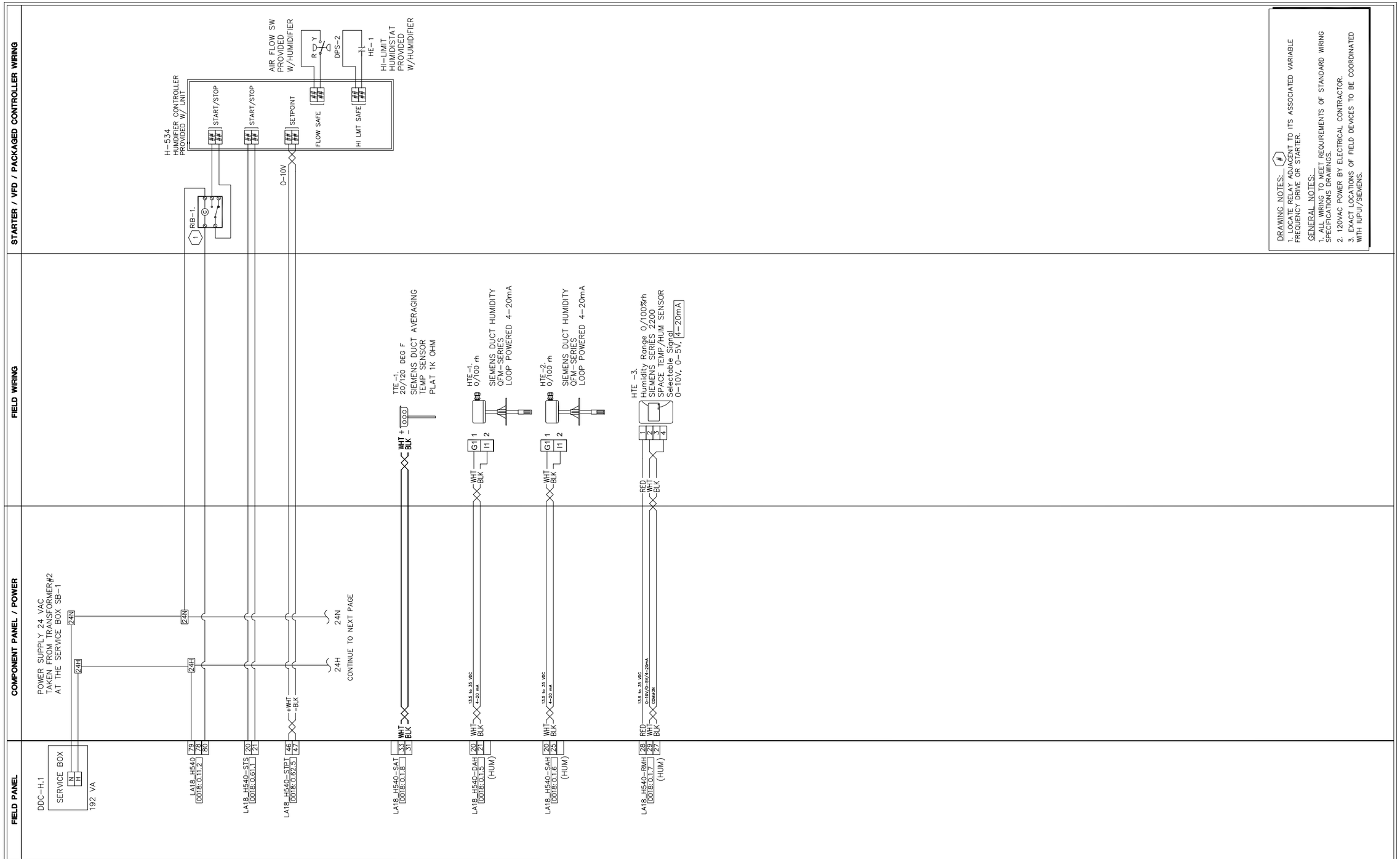

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0018	LA18.PXCA	

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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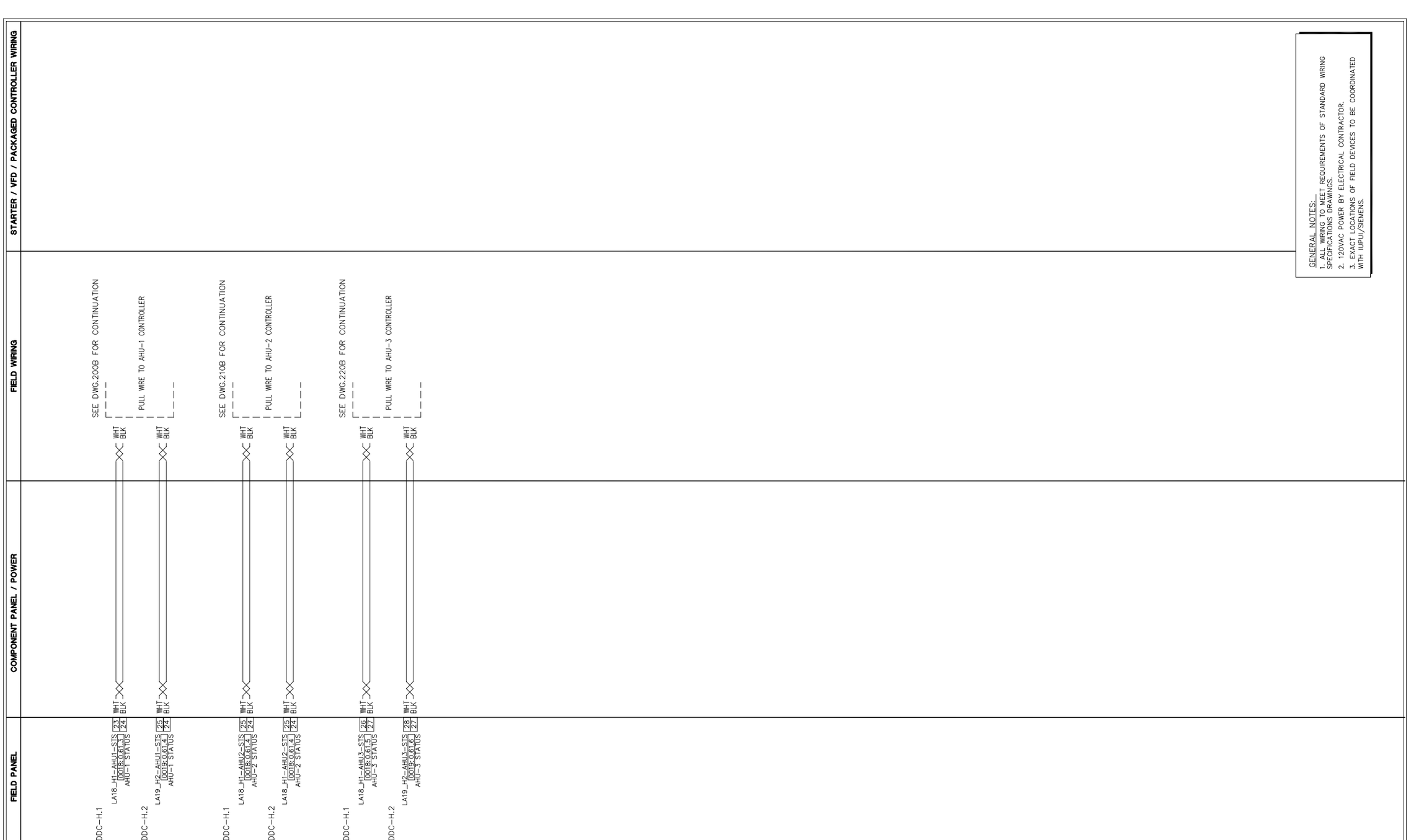

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REVISION HISTORY

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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 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

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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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DUCT HUMIDIFIER BOM & SOO

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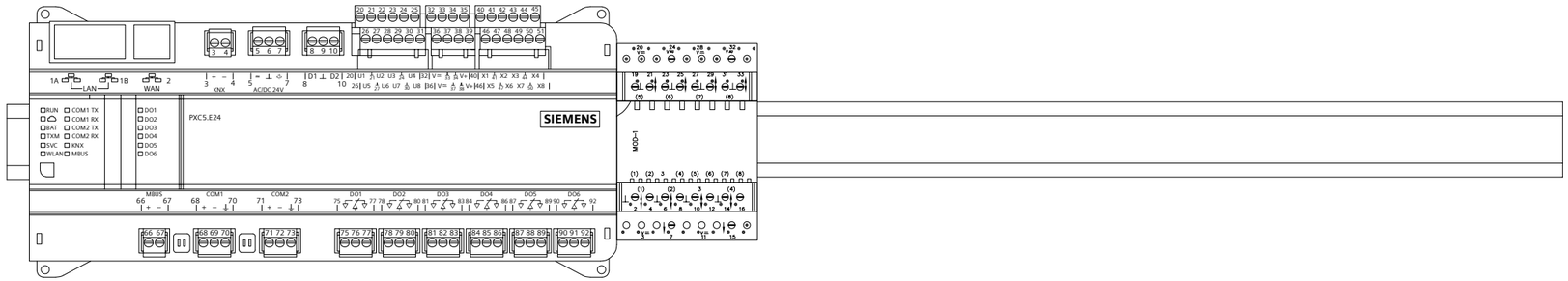
INSTALLATION NOTES:

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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IU# 20250072, IN

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LA18.PXCA INSTALLATION

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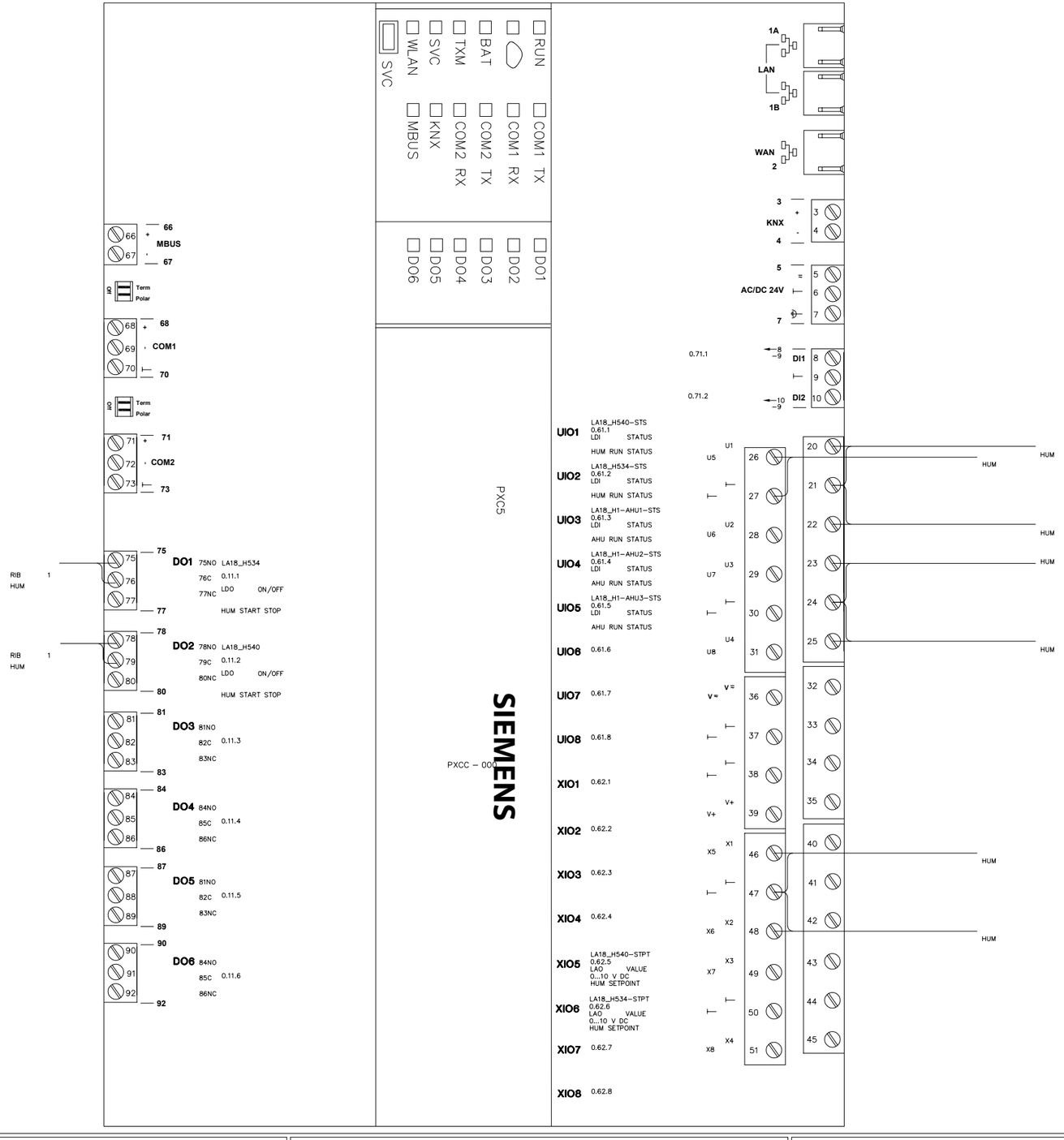

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HUMIDIFIERS 534 & 540

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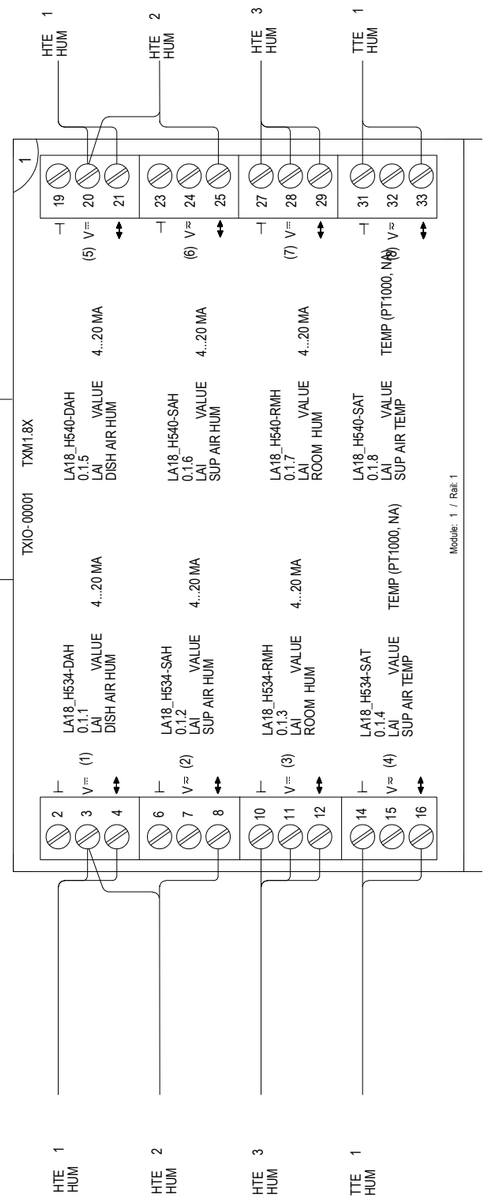

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC5 000	1	PXC5.E24.A	SIEMENS		PXC5.E24.A COMPACT 24PT, BACNET, Desigo
	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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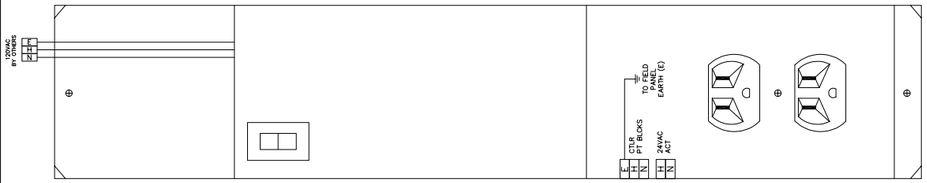

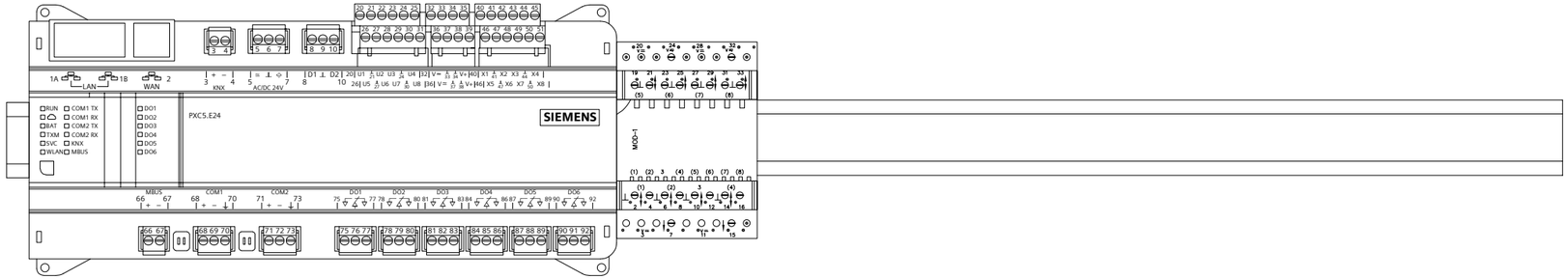

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LA19.PXCA INSTALLATION

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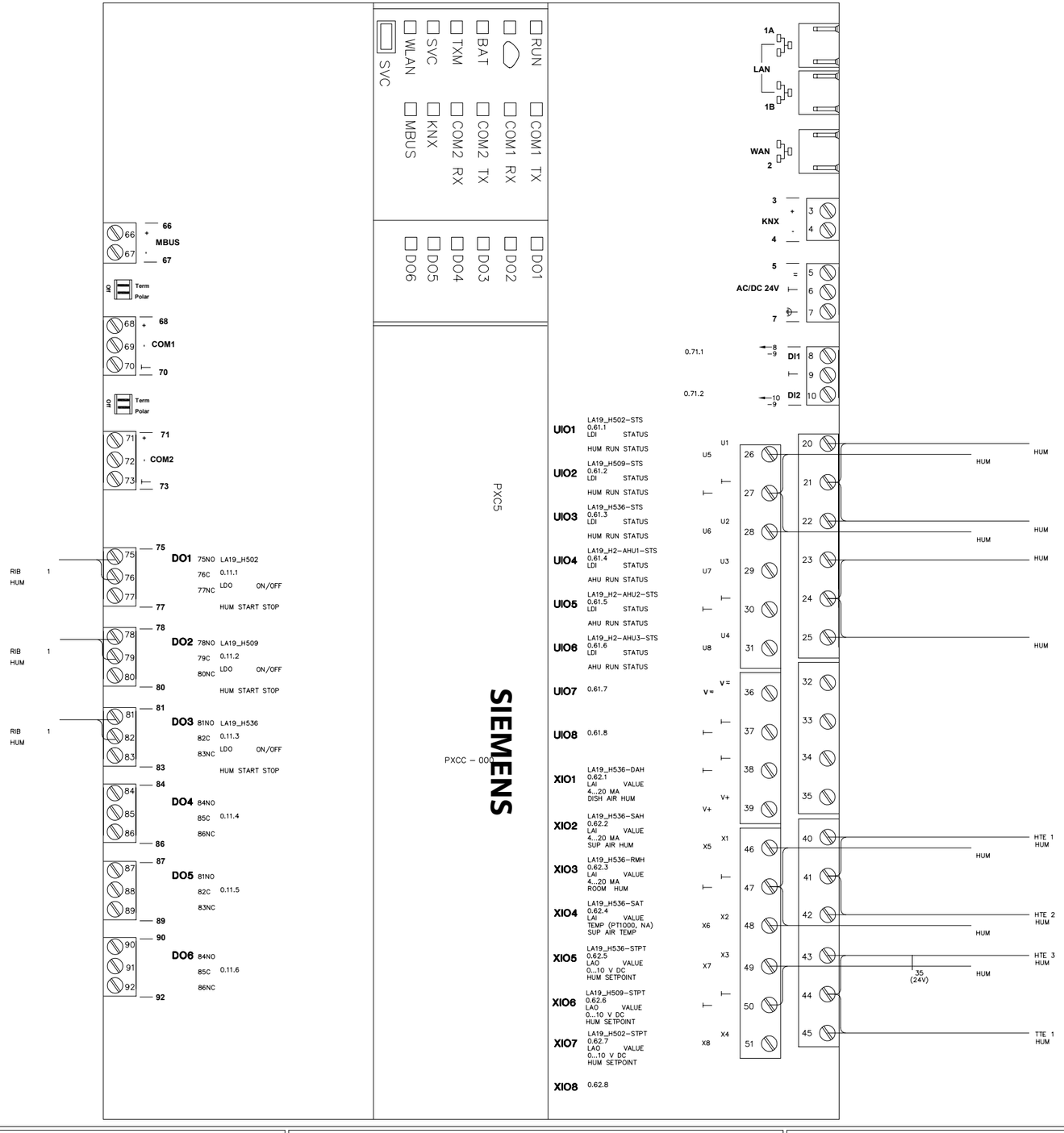

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

SIEMENS

SIEMENS INDUSTRY INC.
SMART INFRASTRUCTURE DIVISION

3502 WOODVIEW TRACE
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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

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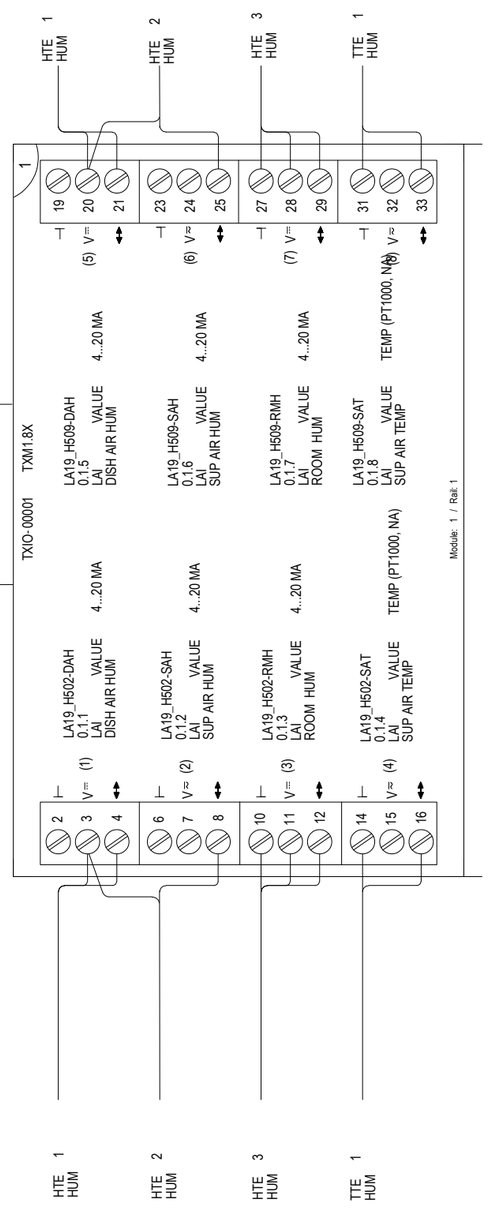

REVISION HISTORY

00	4/2/2026	HB	SUBMITTAL SET

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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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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LA19.PXCA BOM

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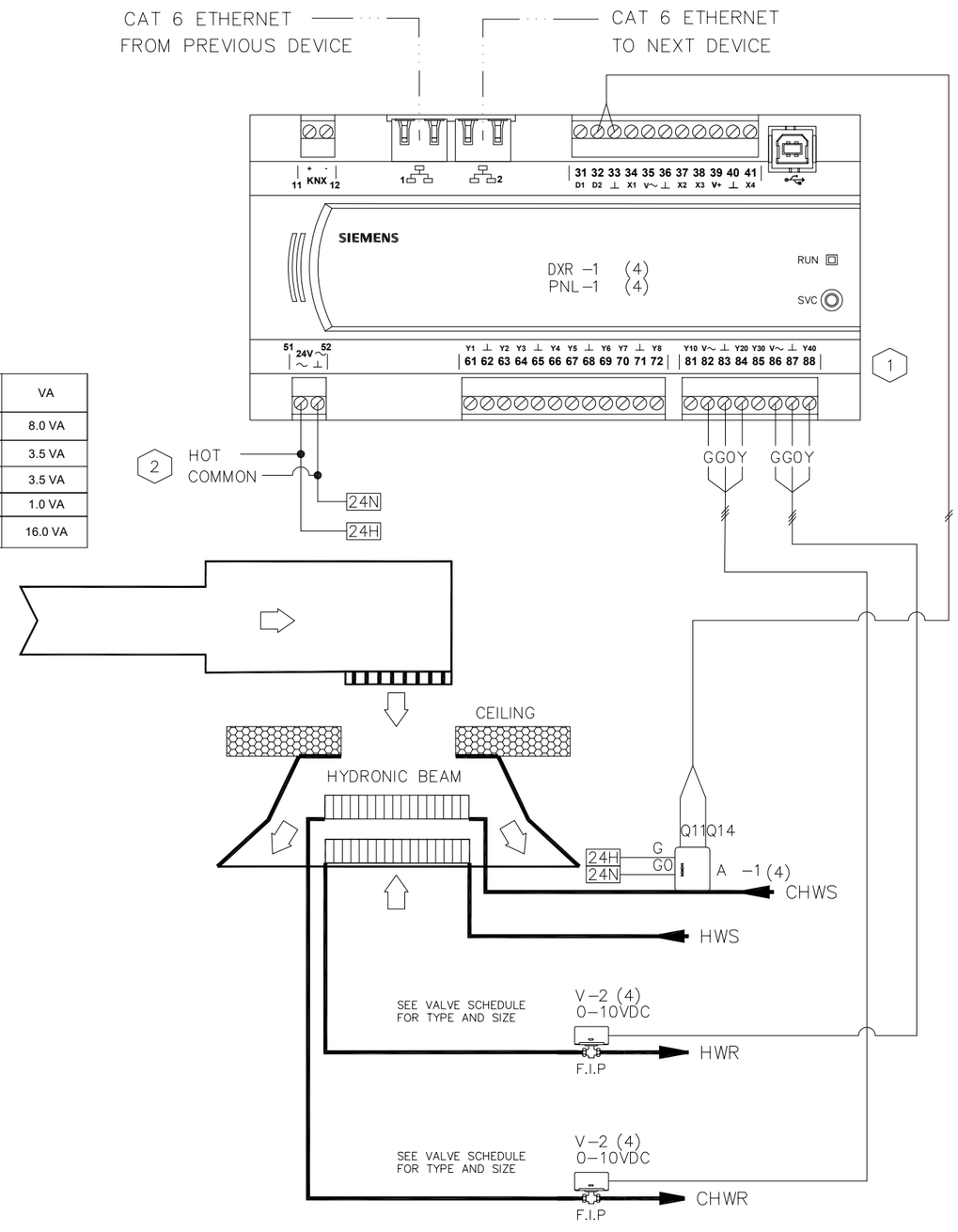

INSTALLATION NOTES:

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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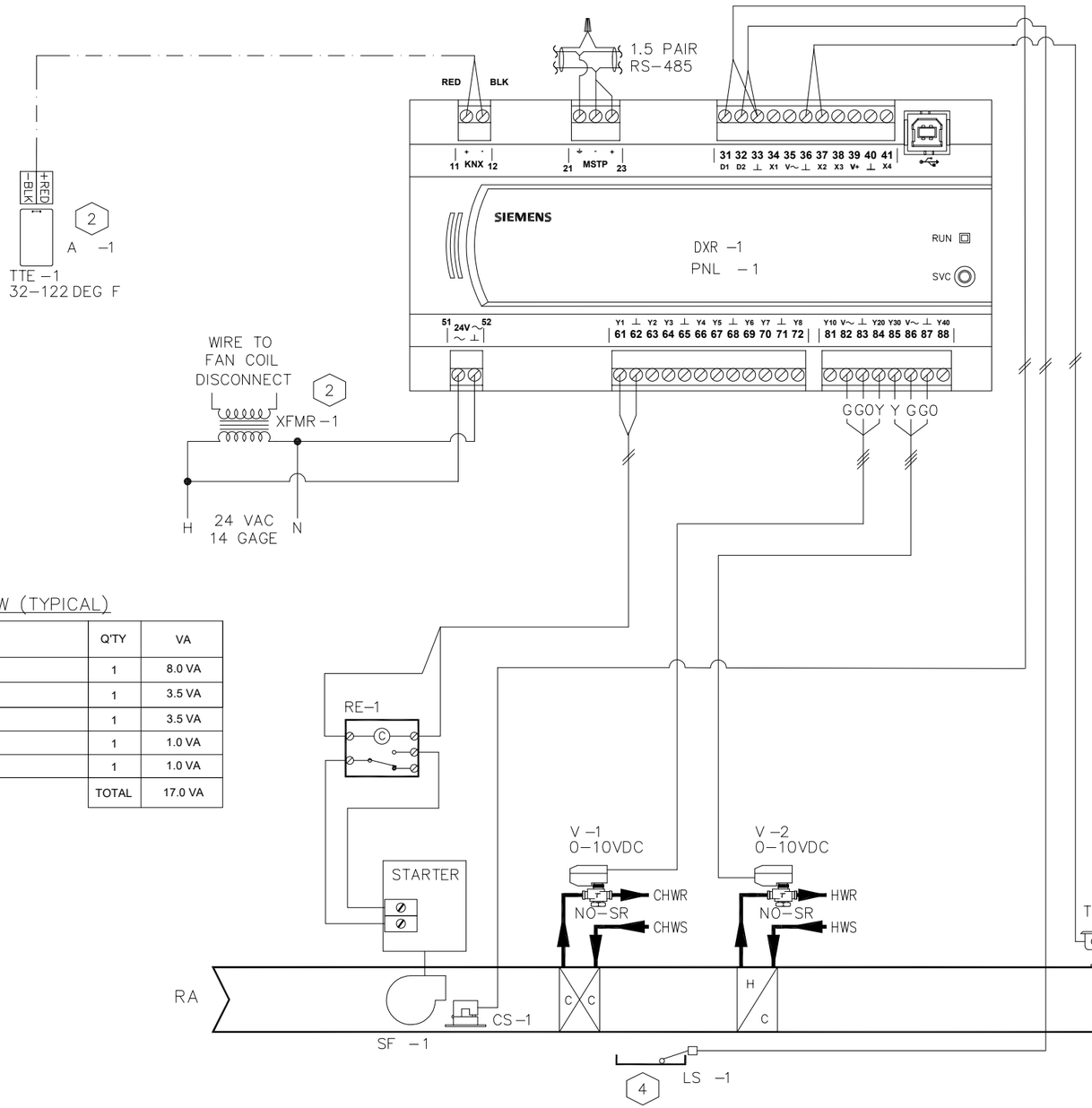

INSTALLATION NOTES:

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

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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4-PIPE FCU CONTROL

440P412785
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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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4-PIPE FCU CTRL BOM & SOO

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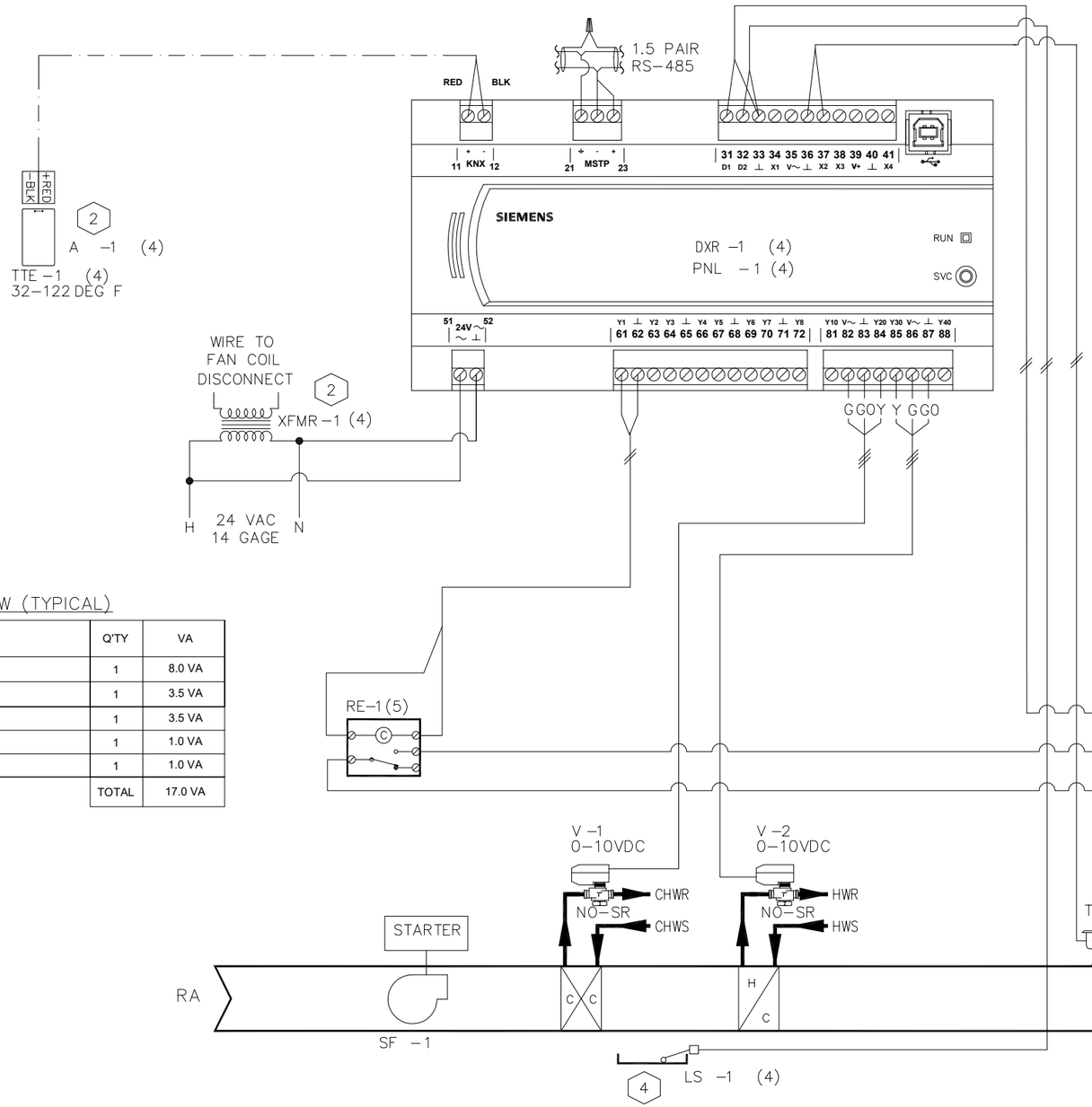
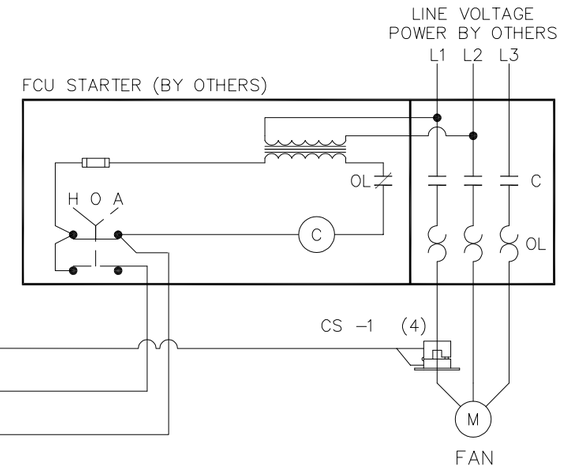
INSTALLATION NOTES:

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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IU# 20250072, IN

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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

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

4-PIPE FCU 3PH FANBOM & SOO

440P412785
0
481A

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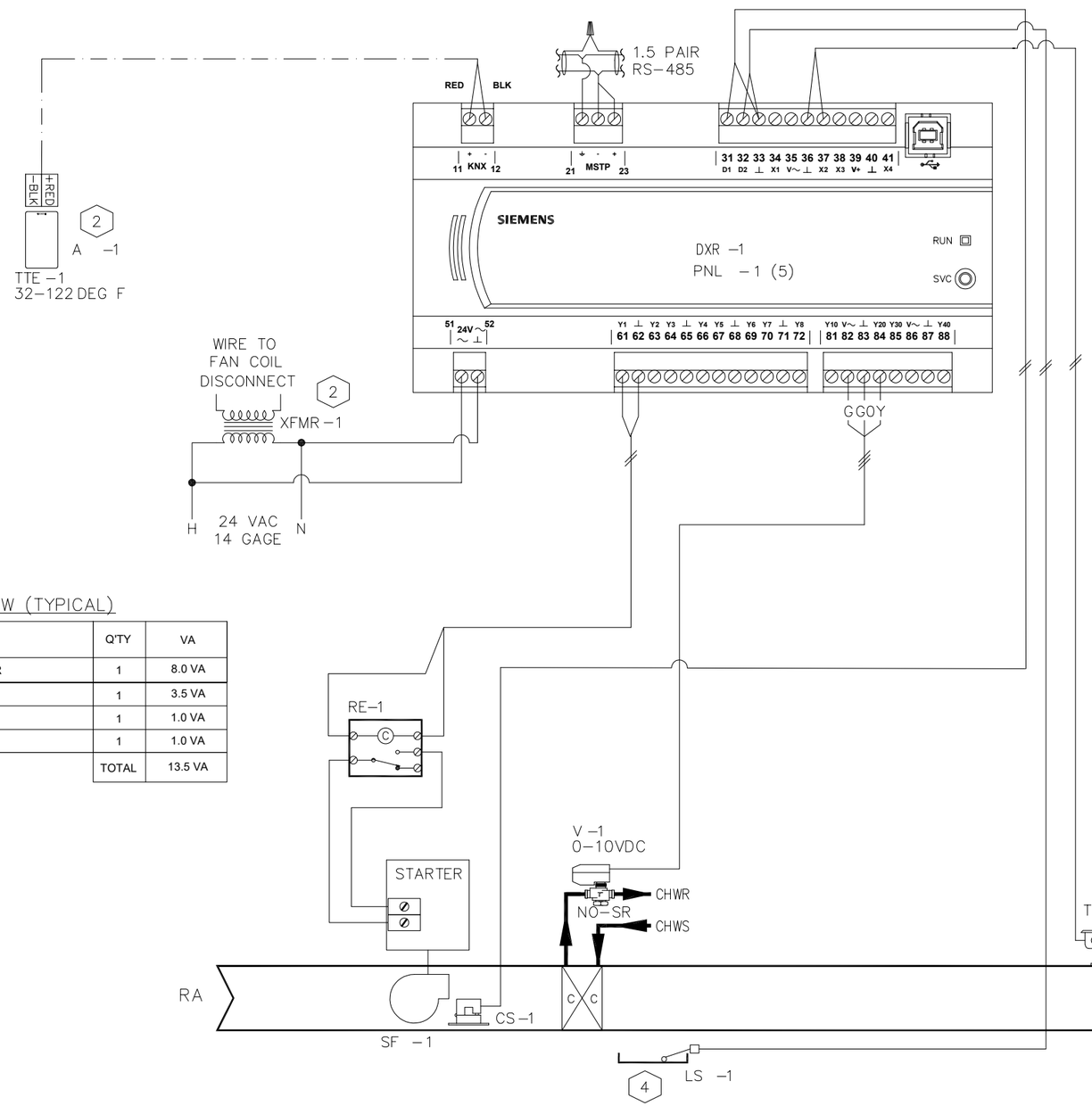

INSTALLATION NOTES:

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
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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 CONTROL

440P412785
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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

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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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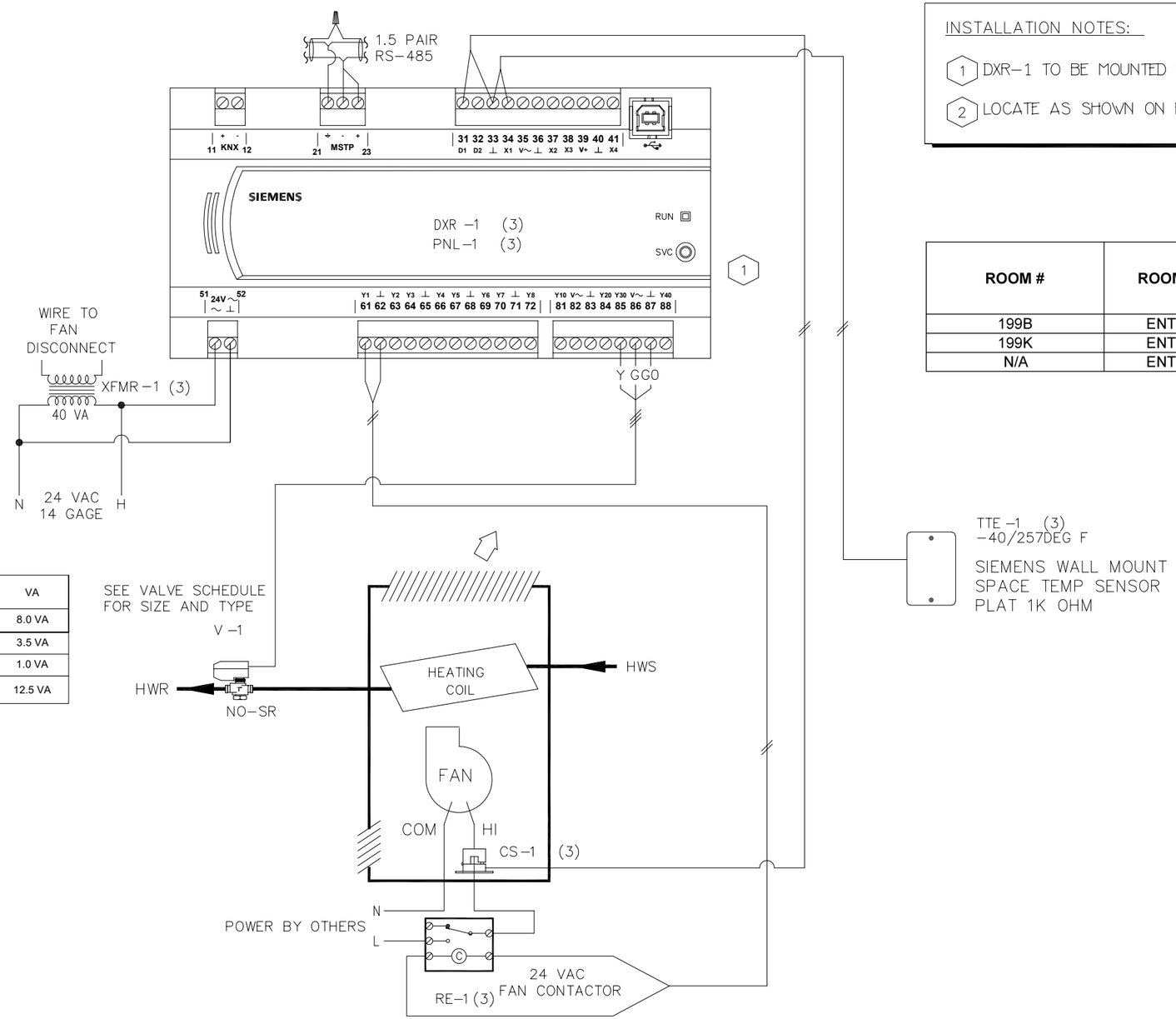
INSTALLATION NOTES:

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

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

CABINET UH CONTROL

440P412785
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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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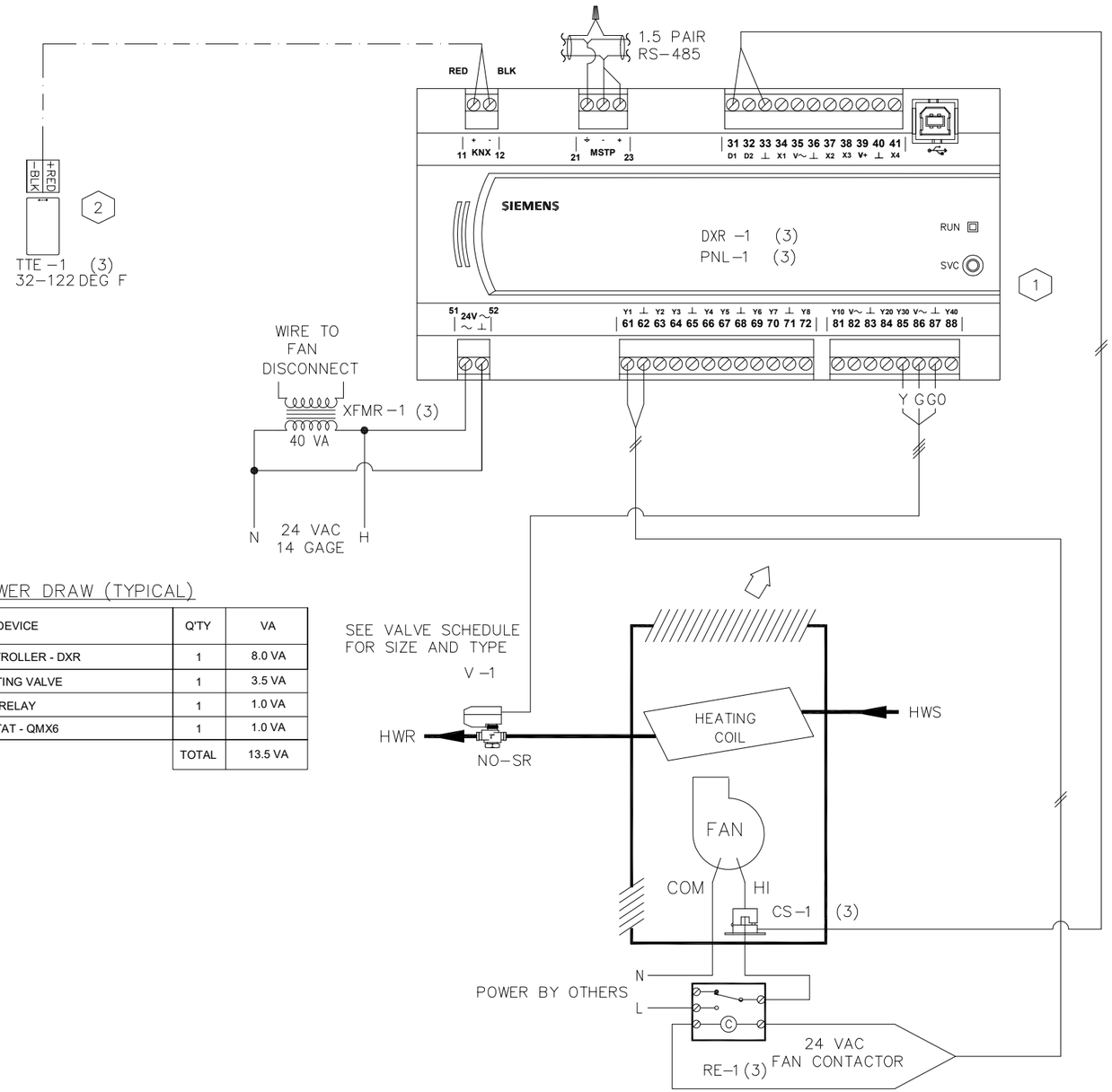

INSTALLATION NOTES:

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
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

UNIT HEATER CONTROL

440P412785
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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

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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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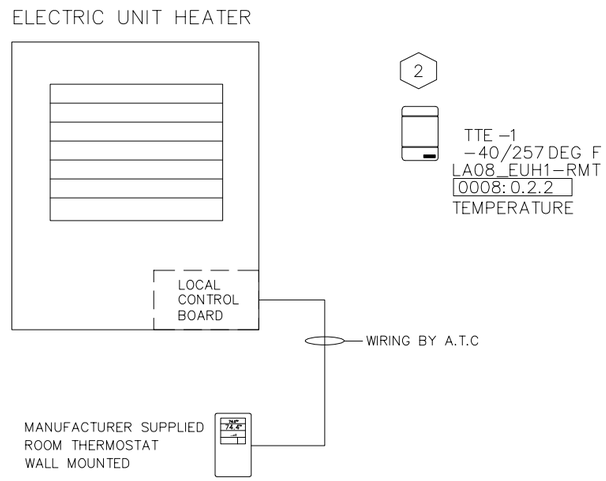
INSTALLATION NOTES:

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
SUITE 240
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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

ELECTRIC UH CONTROL

440P412785
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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

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HB	HB	KR	04/02/26	04/02/26

ELECTRIC UH CTRL WIRING

440P412785
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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

SIEMENS

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IU LAUNCH ACCELERATOR FOR BIO
IU# 20250072, IN

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ELECTRIC UH CTRL BOM & SOO

440P412785
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492B

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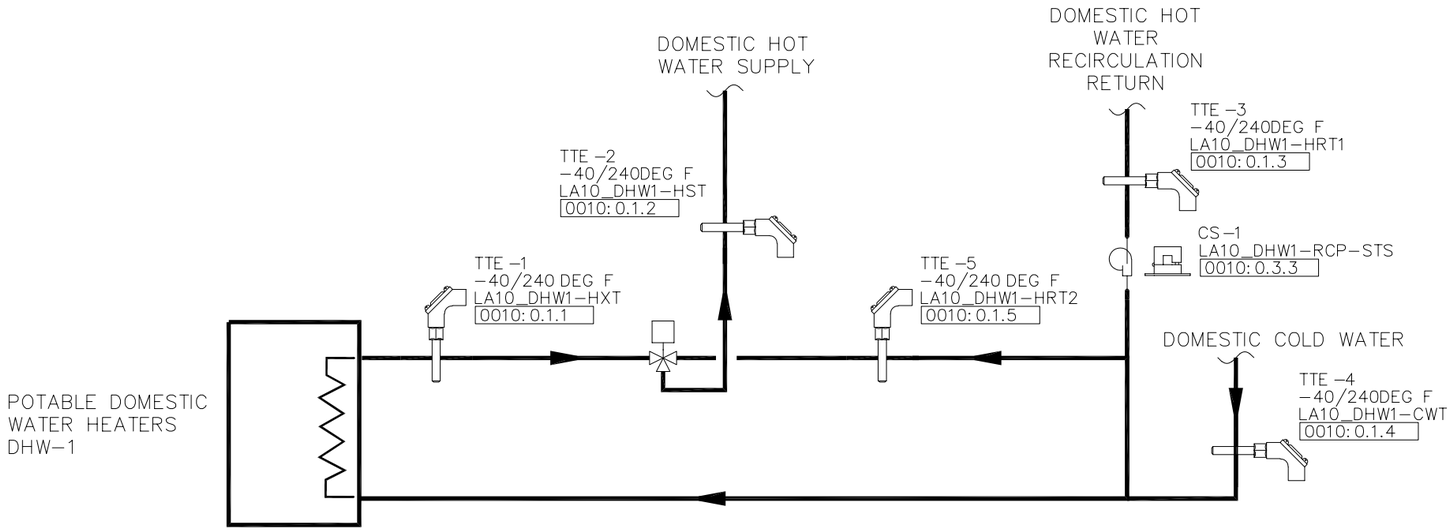
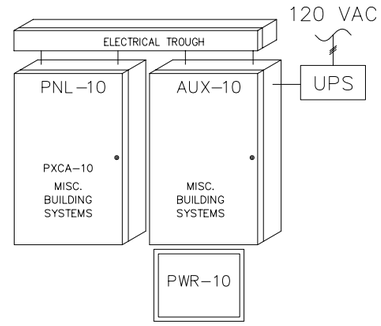
INSTALLATION NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING FOR WIRING TERMINATIONS.



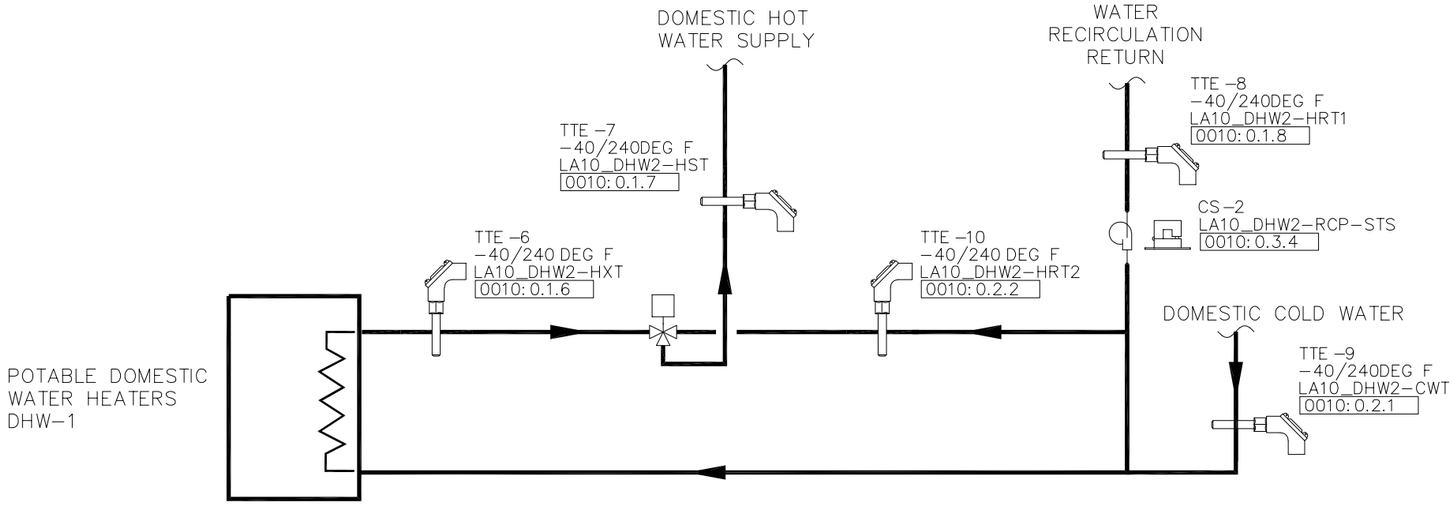
1 / 600 POTABLE DHW–1 MONITOR



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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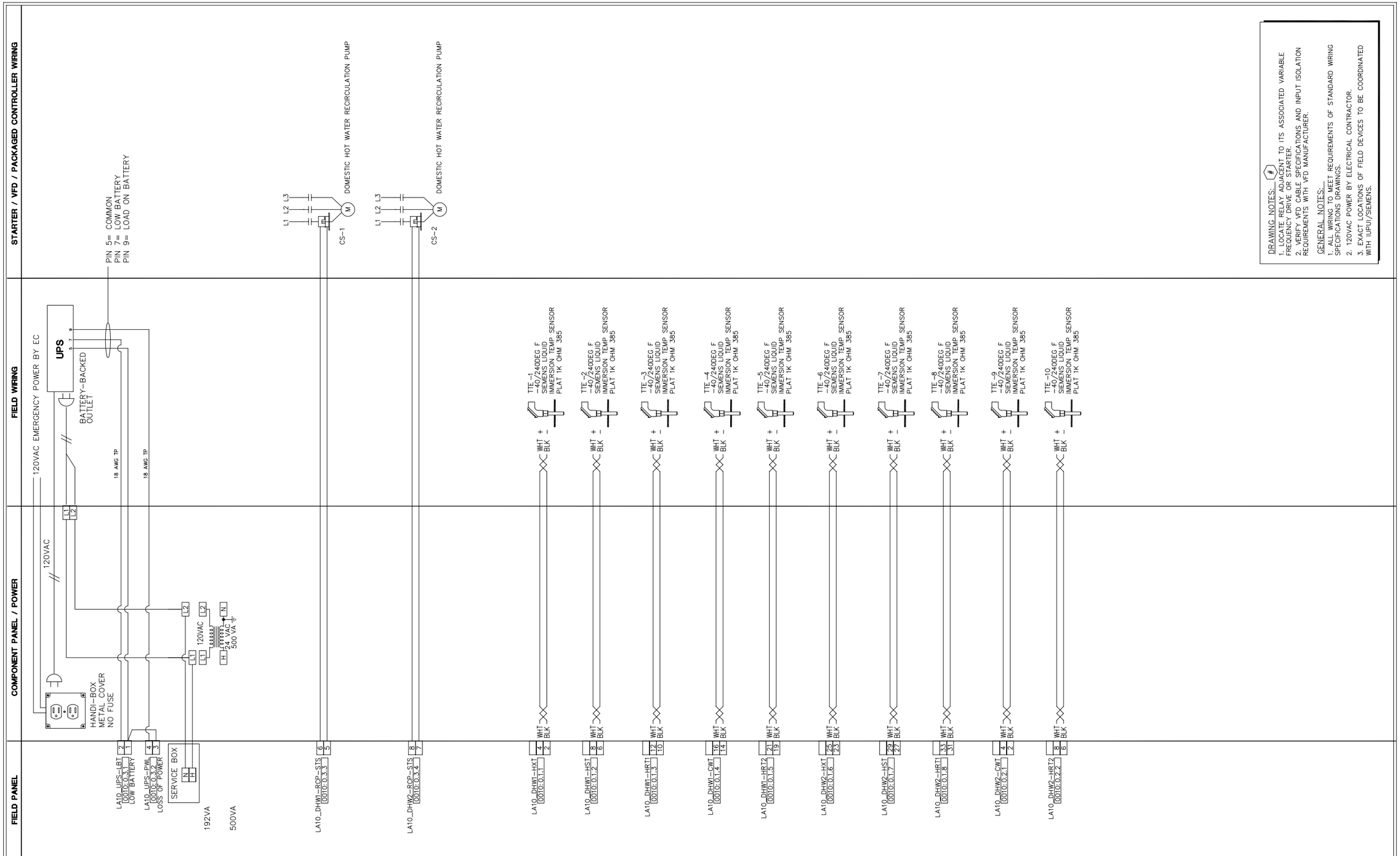

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0010	LA10.PXCA	

REVISION HISTORY

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DHW-1 & 2 ELEC. WIRING

440P412785
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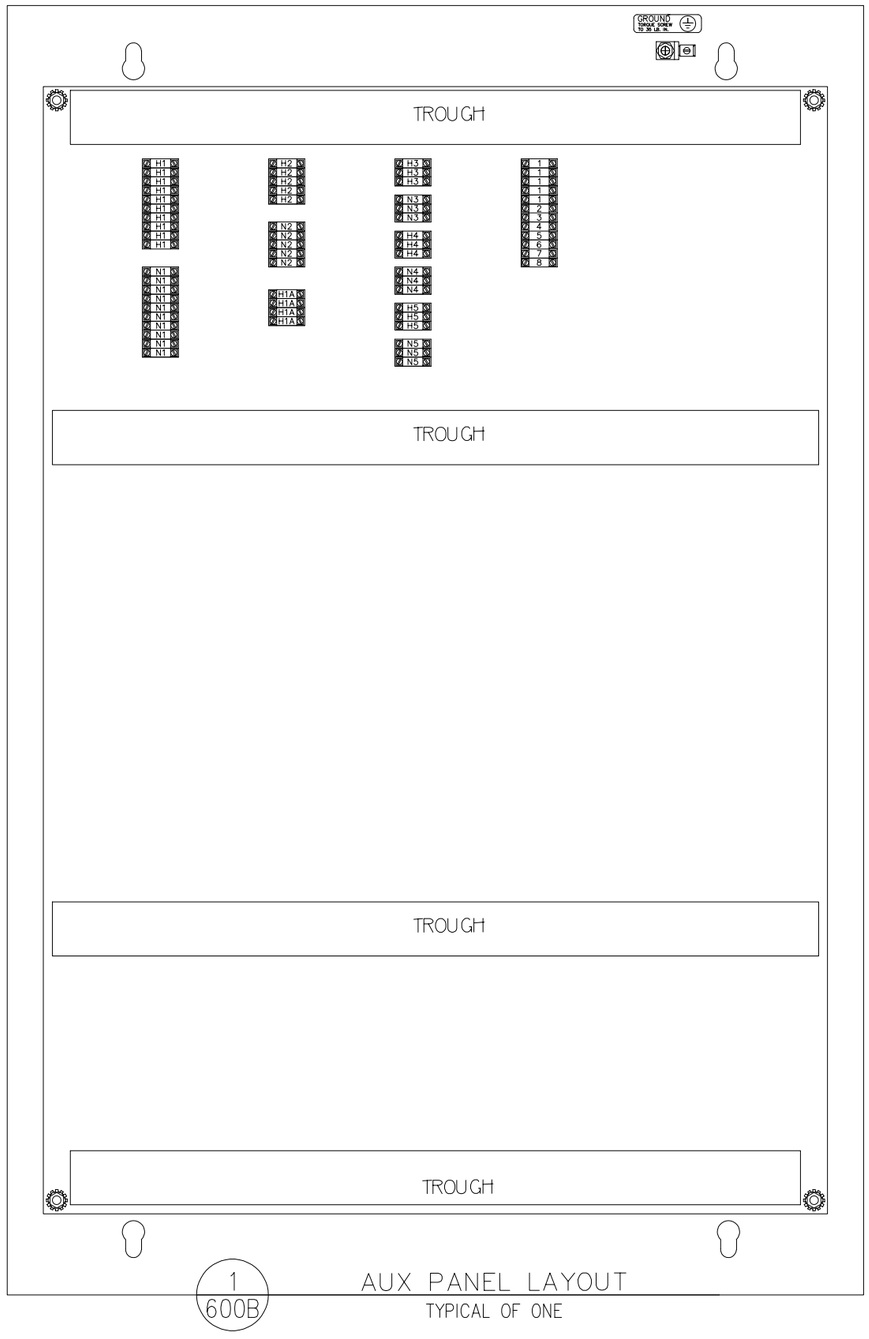
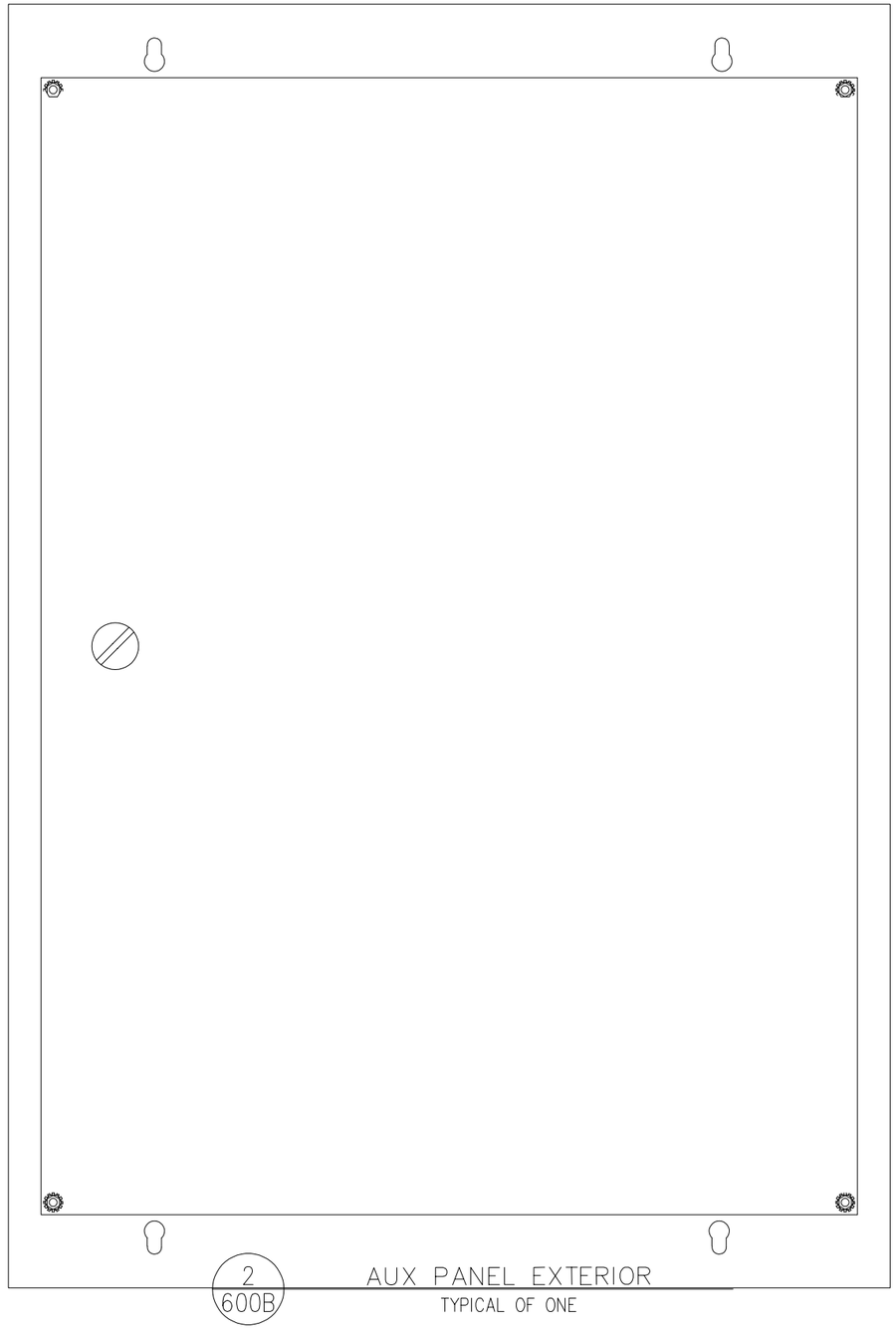


1 600B AUX PANEL LAYOUT
TYPICAL OF ONE



2 600B AUX PANEL EXTERIOR
TYPICAL OF ONE

REVISION HISTORY

01	7/14/2023	HB	SUBMITTAL FOR APPROVAL

SIEMENS

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DWH AUX LAYOUT PANEL

440P412785
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600B

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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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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

DW HEATERS BOM & SOO

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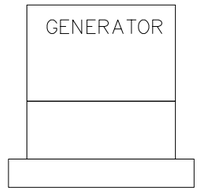
INSTALLATION NOTES:

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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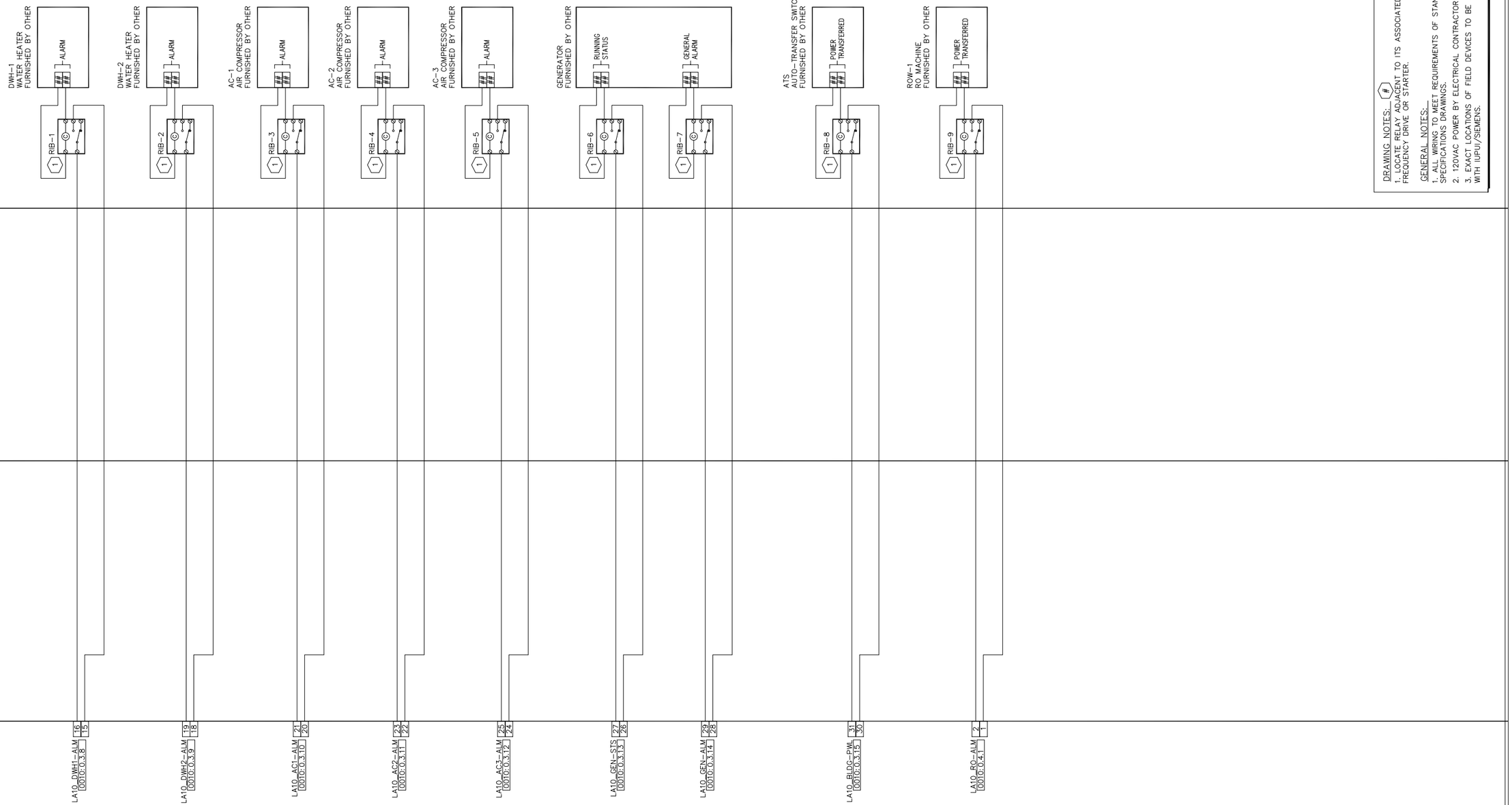
FIELD WIRING

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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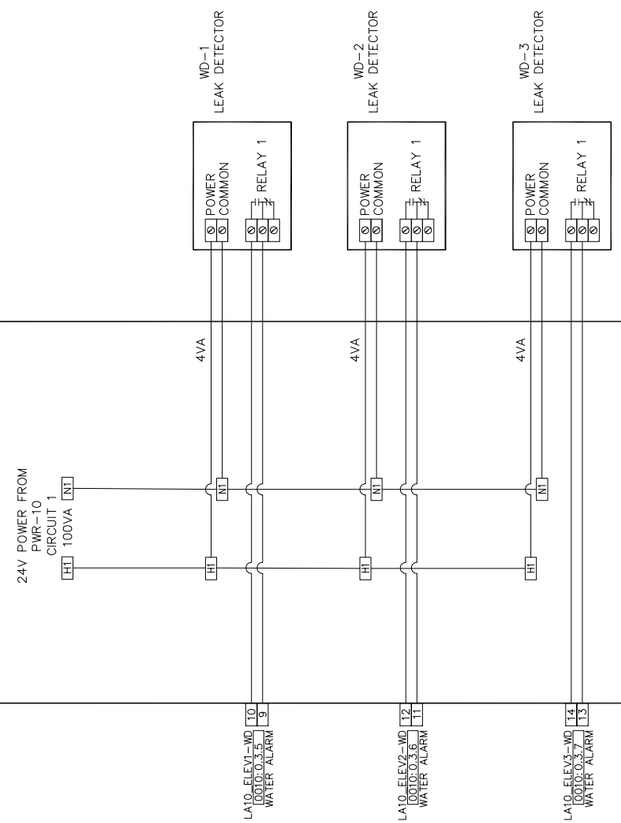
FIELD WIRING

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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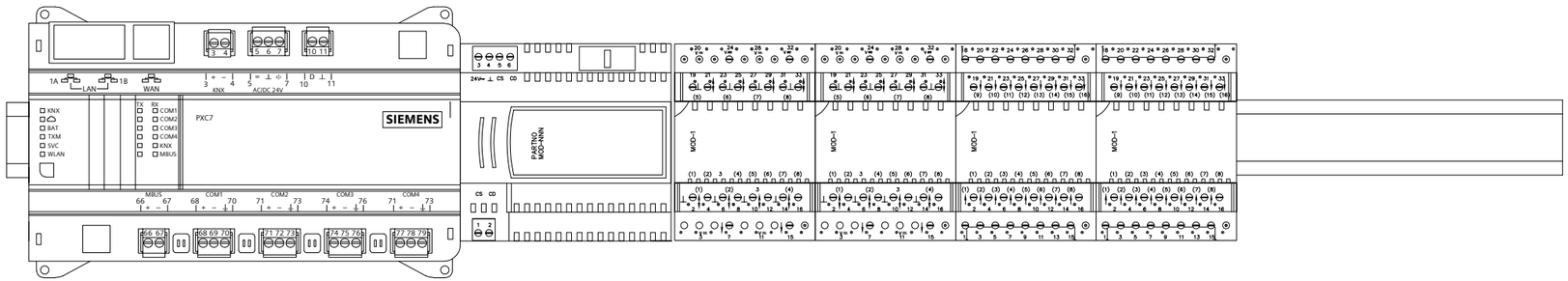
INSTALLATION NOTES:

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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LA10.PXCA INSTALLATION

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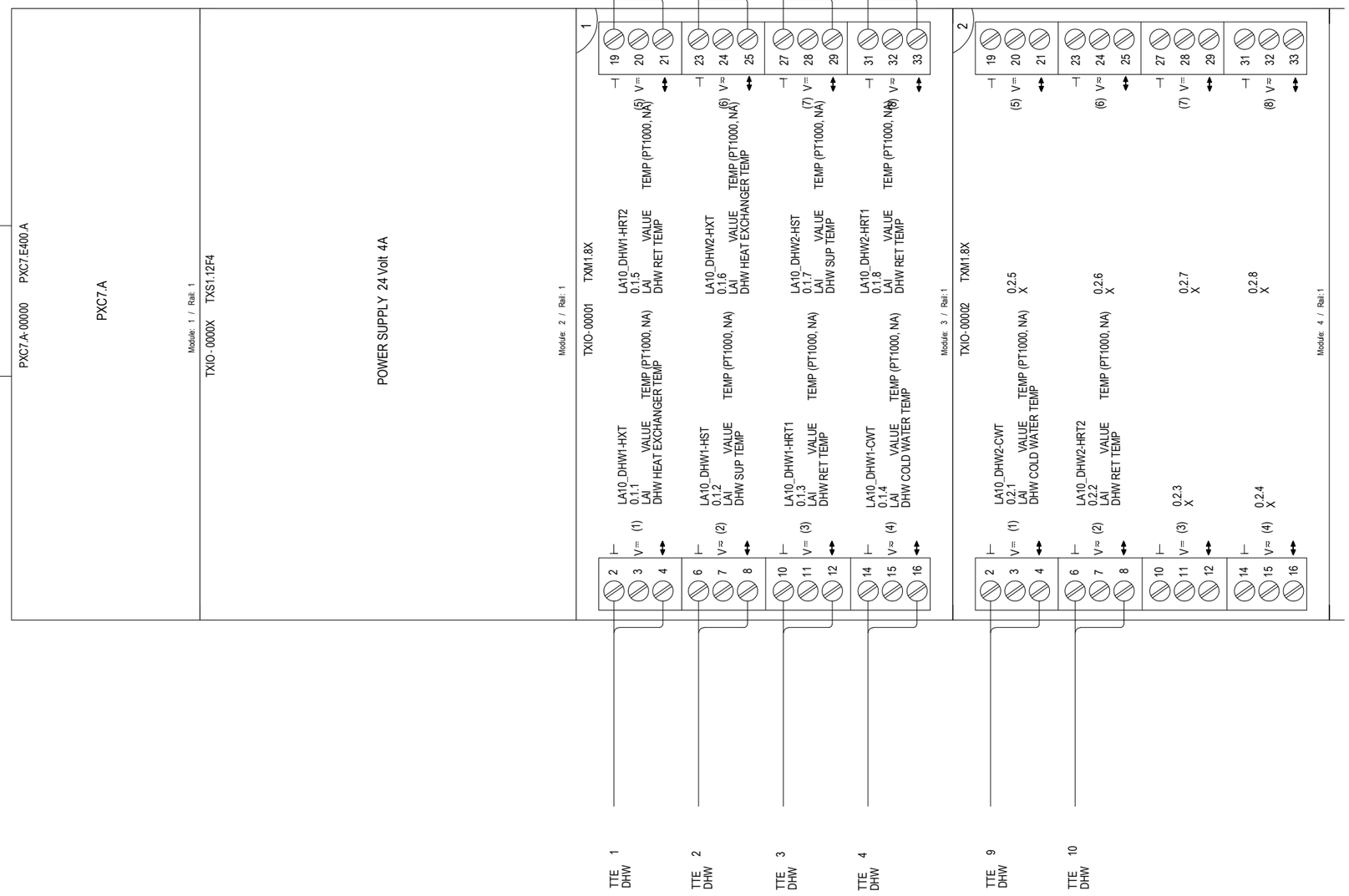
PXC7.A-00000 PXC7.E400.A

PXC7.A

Module: 1 / Rail: 1

TXIO - 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A



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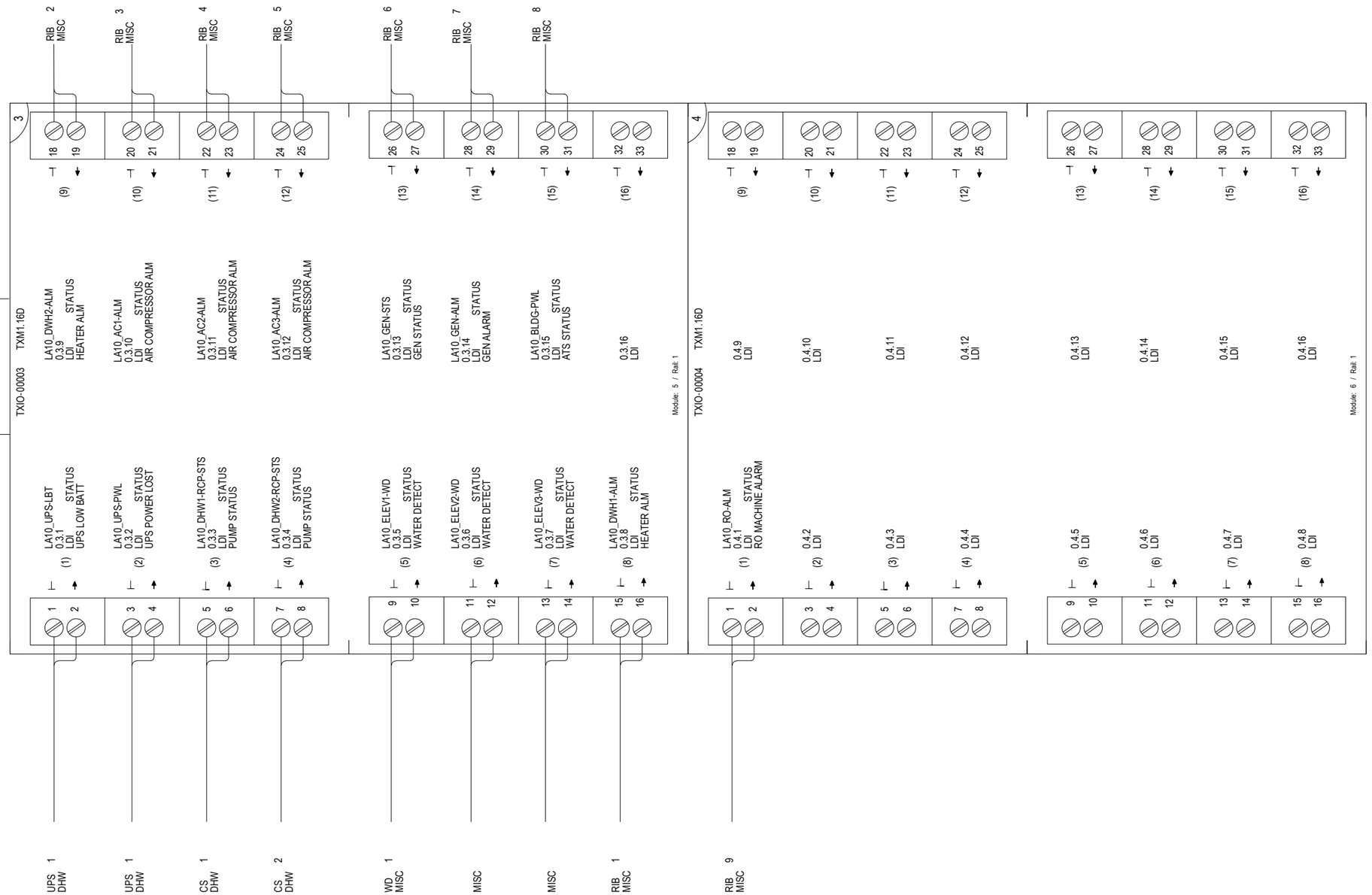

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
Panel Mounted Devices					
PXC7 000	1	PXC7.E400.A	SIEMENS		PXC7.E400.A MODULAR, BACNET, Desigo
	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
	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 6423
SCROLL WATER CHILLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air-cooled scroll water chillers.

1.02 REFERENCE STANDARDS

A. AHRI 550/590 (I-P) - Standard for Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle.

B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems.

C. ASHRAE Std 135 - BACnet - A Data Communication Protocol for Building Automation and Control Networks.

D. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels.

E. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

F. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

G. UL 1995 - Heating and Cooling Equipment.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate physical size, weight and location of major pieces of equipment to be installed. Notify Architect of any major deviations from the equipment originally specified prior to ordering equipment.

1.04 SUBMITTALS

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

B. Product Data: Provide rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.
   1. Performance at ARI standard conditions and at conditions indicated.
   2. Performance at ARI standard unloading conditions.
   3. Minimum evaporator flow rate.
   4. Refrigerant capacity of chiller and refrigerant type.
   5. Oil capacity of chiller.
   6. Fluid capacity of evaporator.
   7. Characteristics of safety relief valves.
   8. Minimum entering condenser-air temperature.
   9. Maximum entering condenser-air temperature.
   10. Performance at varying capacities with constant-design entering condenser-air temperature. Repeat performance at varying capacities for different entering condenser-air temperatures from design to minimum in 10 deg. F (6 deg. C) increments.
   11. Flow switch requirements.
   12. Insulation thickness, application areas and weatherized finish information.
   13. Characteristics of controller and safeties.
   14. Short circuit withstand rating in amperes.
   15. Wiring diagrams indicating factory and field wiring for power and control wiring.
   16. Starter type with maximum in-rush current.

17. Acoustic performance and characteristics of sound attenuation measures.
18. Accessory characteristics (hail guards, vibration isolation) as scheduled or specified.
19. Minimum required system volume for stable operation without short cycling.

C. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, piping and connections, valves, strainers, and thermostatic valves required for complete system.

D. Wiring diagrams: For power, signal, and control wiring.

E. Manufacturer's Certificate: Certify that components furnished but not produced by manufacturer meet or exceed manufacturer's requirements.

F. Manufacturer's Performance Data: Indicate energy input versus cooling load output from 0 to 100 percent of full load at specified and minimum outdoor air temperature for air-cooled chillers.

G. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.

H. Operation and Maintenance Data: Include start-up instructions, maintenance data, parts lists, controls, and accessories; include trouble-shooting guide.

I. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements for additional provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written installation instructions for rigging, unloading, and transporting units.

B. Deliver units to the job site completely assembled and charged with refrigerant and oil by manufacturer.

1.06 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 Corporation.

B. Trane Technologies, PLC.

C. York, a brand of Johnson Controls International, PLC.

2.02 SCROLL-WATER CHILLER PERFORMANCE REQUIREMENTS

A. Factory-assembled and run-tested chiller complete with base and frame, condenser casing, compressors, compressor motors and motor controllers, evaporator, condenser coils, condenser fans and motors, electrical power, controls, and accessories.

B. Packaged Air-Cooled Chiller:
1. Refrigerant: use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) no greater than that allowed by federal code.

2.03 AIR-COOLED, SCROLL WATER CHILLER

A. Factory assembled and tested chiller consisting of compressor(s), compressor motor(s), evaporator, condenser, enclosure, refrigeration circuits(s) and specialties, interconnecting piping, starters, and microprocessor-based controls.
   1. Rating: AHRI 550/590 (I-P).
   2. Safety: UL 1995 and ASHRAE Std 15.
   3. Construction and Testing: ASME BPVC-VIII-1 as applicable for construction type.
   4. Enclosures:
      a. Frame: Heavy-gauge steel with hot-dipped galvanized or air-dried paint finish.
      b. Steel Cabinets: Factory apply baked on enamel or baked on powder paint finish.
      c. Perform 500-hour minimum salt spray test in accordance with ASTM B117.
   5. Vibration isolation: 2" deflection restrained spring isolators. See 230548.

B. Hermetic Scroll Compressor:
   1. Unit: Fully hermetic type with multiple, direct drive compressors with discharge and suction service valves.
   2. Vibration Control: Factory installed internal isolators and field installed external isolators.
   3. Oil Lubrication System: Initial oil charge, oil sump, heater, oil level, and sight glass.
   4. Motor: 3600 or 3500 rpm, suction gas-cooled, with thermal or current overload protection.

C. Evaporator:
   1. Brazed plate type.
      a. Plate Material: 316 stainless steel.
      b. Working Pressure Rating, Refrigerant Side: 430 psi minimum.
      c. Working Pressure Rating. Water Side: 150 psi minimum.
      d. End Connections: Provide with flanged or grooved connections.
      e. Cold Surface Insulation.
         1) Insulation is factory or field installed on evaporator, connections, and suction piping.
         2) 0.75 inches minimum thick, closed cell, expanded polyvinyl chloride, polyurethane, or Armaflex II insulation with a maximum K factor of 0.28.
      f. Provide factory installed vents and water drain connections on evaporator or piping.
      g. Provide factory installed fittings for temperature control sensors on evaporator or piping.
      h. Freeze Protection for Outdoor Locations: Provide thermostatically controlled electric heater to protect from freezing at ambient temperatures down to minus 20 degrees F.

D. Air-Cooled Condenser, Finned-Tube Type:
   1. Finned-Tube Type:
      a. Mechanically bond aluminum fins to copper tubing ~~**and protect with corrosion resistant materials or coatings.**~~
      b. Clean, dehydrate and test.
      c. Leak Test: 650 psi minimum.
   2. Coil Guards: Provide corrosion proof, louvered panels, heavy gauge wire panels, or grilles, factory installed. Protect condenser coil by enclosing with heavy plastic to prevent damage during shipping or rigging.
   3. Fans and Motors:
      a. Fans: Dynamically balance propeller, shrouded-axial, or airfoil type fans of reinforced polymer or glass fiber reinforced composite corrosion resistant construction equipped with sealed, permanently lubricated ball bearings.
      b. Discharge Fan Guards: Corrosion resistant, heavy gauge, steel wire.

c. Discharge Direction: Vertical.
d. Motors: Direct drive, totally enclosed for outdoor use with current overload protection.

E. Refrigerant Circuits:
1. Provide multiple independent refrigeration circuits with one or multiple compressor(s) per circuit.
2. Provide liquid line shut-off valve, filter-drier, expansion valve, and refrigerant relief device for each independent circuit.

F. Controls Package:
1. Unit Controls: Factory-supplied DDC:
a. Control-panel mounted with required input-output expansions, power supply, fused disconnect, hand switches, knobs, and accessories required to control chiller unit to manufacturer required sequences to meet intended use with listed performance.
b. Factory configured to interface prewired sensors, switches, and safeties with allowance to add up to four chiller valves and flow sensors.
c. Graphic-based touchscreen to include unit operation controls and user filter based interface for faults, alarms, performance, unit diagnostics, and data recording up to 12 months.
d. BAS, SCADA, or other Integrated Automation Link: ASHRAE Std 135 BACnet MS/TP.
e. External Point Mapping: Provide mapping table for each parameter included in the local visual interface with software-toggle flag to allow reduced mapping of available points.
2. Provide controls, monitoring, programmable setpoints, alarms, and BAS interface as defined below:
a. Automatic Adjustable Operating Controls:
1) Temperature of chilled water leaving chiller.
2) Chiller system capacity control based on setpoints and system load.
3) Compressor short-cycling prevention.
4) Lead/lag for multiple compressors.
5) Automatic reset on power source failure.
6) Load limiting.
b. Normal Operation Monitoring and Open Coverless Displays:
1) Hours of operation.
2) Suction and discharge refrigerant pressures.
3) Automatic diagnostics.
4) Number of starts.
5) On/off compressor status.
6) Entering and leaving chilled water temperatures.
7) Status of operation.
8) Condenser water entering and leaving temperatures.
9) Weekly purge cycle totalization if applicable.
10) Oil pressure.
c. Setpoints:
1) Leaving chilled water temperature.
d. Automatic Chiller Shut-Down Safety Controls and Alarm:
1) Automatic Reset:
(a) Chilled water flow interlock.
(b) Voltage protection; over and under.

(c) Phase reversal protection.

2) Manual Reset:
(a) Evaporator low pressure.
(b) High motor winding temperature.
(c) Low chilled water temperature.
(d) Low chilled water flow.
(e) High condenser refrigerant discharge pressure.
(f) Motor current overload and phase loss.
(g) Low oil flow.

3) Remote Alarm: Activate remote, audible bell upon safety shutdown of chiller.

e. Points for Remote Monitoring and Control:
1) Minimum Data Transmission to BAS:
(a) All system operating conditions.
(b) Capacity control information.
(c) Safety shutdown conditions.
2) Minimum Operating Commands from BAS:
(a) Remote unit start/stop.
(b) Remote chilled water reset.

G. Electrical:
1. Prewire, assemble, factory mount, and test operating and safety control system consisting of a digital display or gauges, on-auto-off switch, motor starters, disconnect switches, power and control wiring.
2. Provide a single point power connection **from a factory mounted NEMA KS-1, heavy-duty, non-fused disconnect switch.**
3. **House electrical components within a NEMA 250, Type 3R enclosure with hinged access door. Interlock disconnect with door operation.**
4. **Provide a minimum short circuit withstand rating as required by the electrical power distribution system, but not less than 65,000 Amps at operating voltage. Rating shall be in accordance with UL 508.**
5. Compliance: NEMA EN 10250 or UL 1995 as applicable.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Align chiller package on steel or concrete foundations.

C. Install units on vibration isolators.

D. Connect to electrical service.

E. Connect to chilled water piping.

F. Arrange piping for easy dismantling to permit tube cleaning and removal.

G. Coordinate BAS, BMS, or Integrated Automation linking between unit controller(s) and remote front-end interface; see Section 25 1500.

3.02 MANUFACTURER'S FIELD SERVICES

A. Perform factory startup of the chiller by factory trained and authorized servicing technicians confirming equipment has been correctly installed prior to equipment becoming operational and covered under the manufacturer's warranty.

B. Provide On-site technical labor to assist the ECC Contractor with the data integration and to verify the specified data points, including data values, change of state values and units and are communicated properly and completely to the BAS system. On-site technical assistance shall not be less than a minimum of 4 hours total time on the job site for each piece of equipment installed with this time split over two separate site visits. Allow a minimum of 2 hours to assist the ECC Electrician and coordinate wiring terminations and a minimum of 2 hours to assist the ECC Programmer to confirm data connectivity. On-site technical assistance shall continue beyond these minimum times stated at no cost to the Owner nor revisions to the Contract amount nor schedule until such time as the Engineer of Record determines that the equipment operation, startup and graphics are satisfactory.

C. Supply initial charge of refrigerant and oil if not completely factory charged.

D. Demonstrate system operations and verify specified performance.

3.03 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals for closeout submittals.

B. See Section 01 7900.00 - Demonstration and Training - DO NOT USE for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

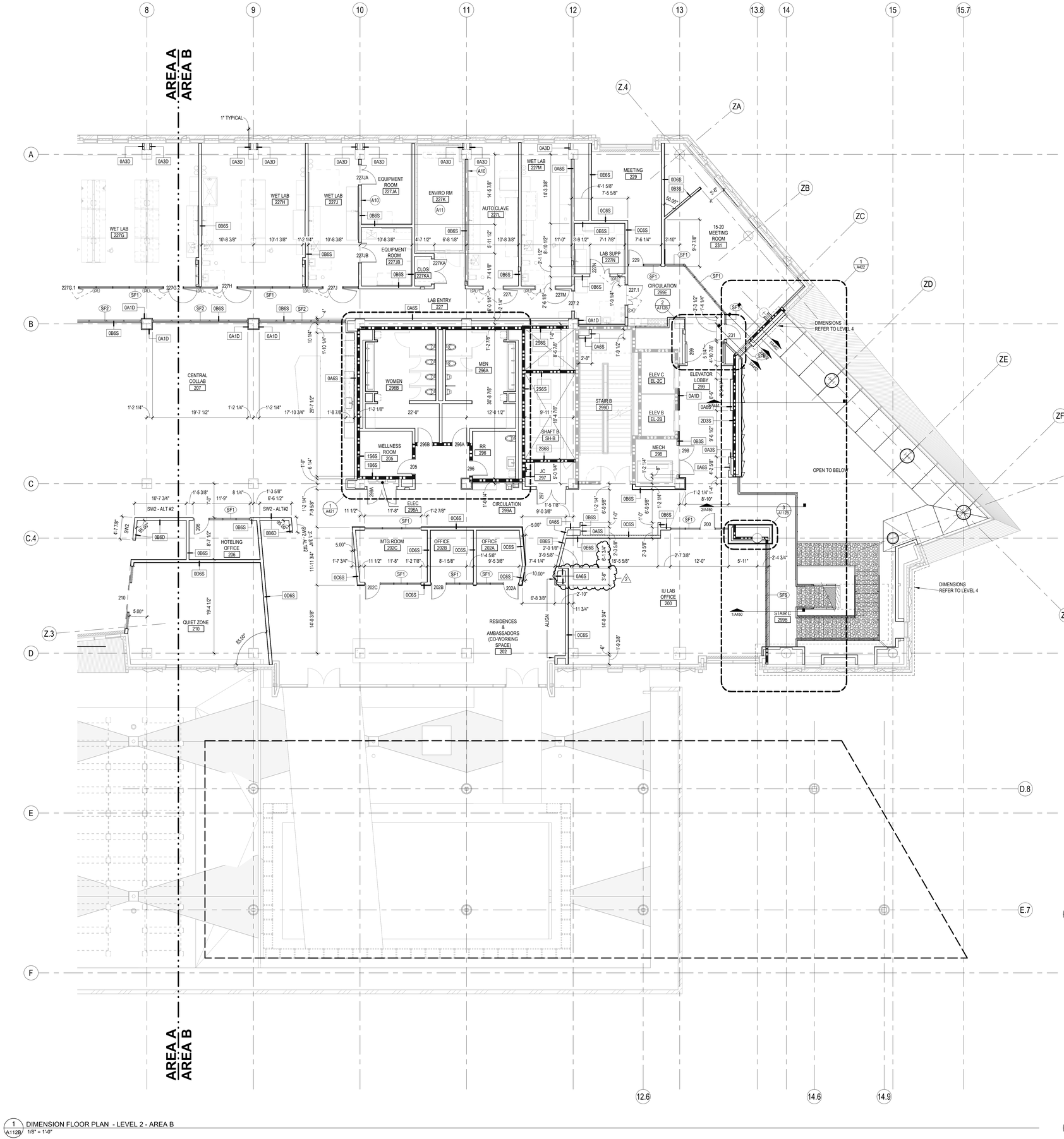
D. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.

E. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.

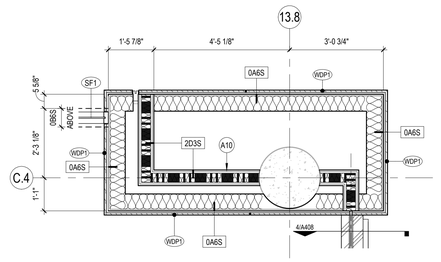
3.04 MAINTENANCE

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

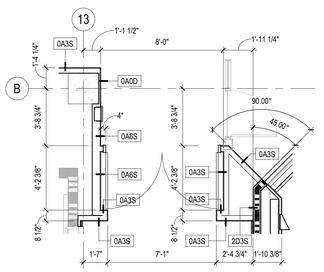
END OF SECTION 23 6423



1 A112B DIMENSION FLOOR PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"



3 A112B PLAN DETAIL - TYPICAL
1/2" = 1'-0"



2 A112B ENLARGED PLAN - TYPICAL ELEVATOR LOBBY DOOR
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.
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

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175 S. Rangeline Rd, Suite 200
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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

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MARK	DATE	DESCRIPTION
2	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN JOHNSON
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

DIMENSION PLAN - LEVEL 2 - AREA B

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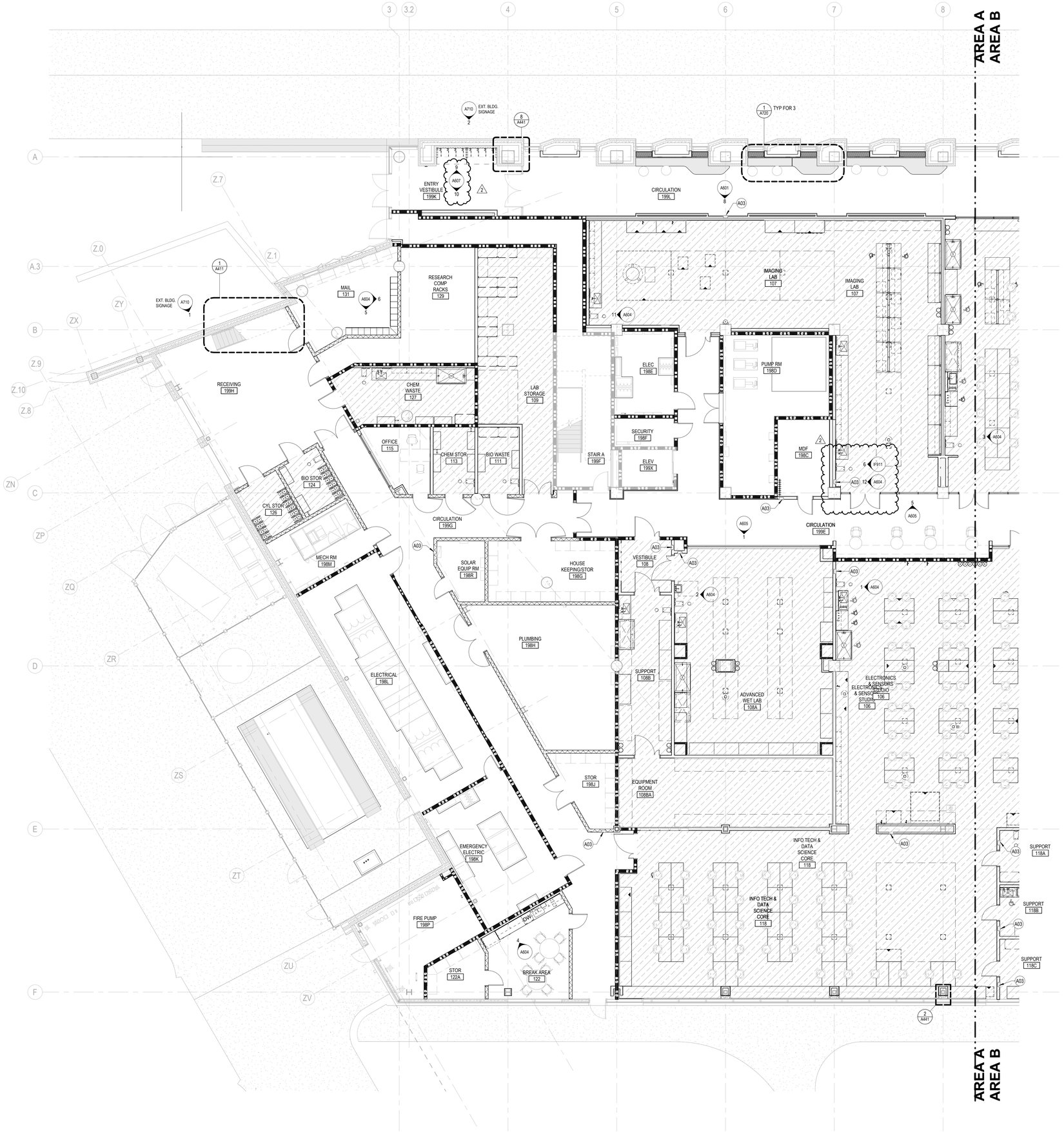

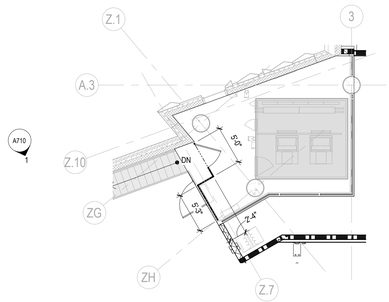

1 A121A ARCHITECTURAL FLOOR PLAN - MEZZANINE
1/8" = 1'-0"

2 A121A ARCHITECTURAL FLOOR PLAN - LEVEL 1 - AREA A
1/8" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

1. DIMENSIONS ARE TO FACE OF PARTITION, UNLESS NOTED OTHERWISE.
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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
- 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.

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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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MARK	DATE	DESCRIPTION
2	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN JOHNSON — REGISTERED — No. AR10400213 STATE OF INDIANA — ARCHITECT

ARCHITECTURAL PLAN - LEVEL 1 - AREA A

DATE	REF: SHEET INDEX
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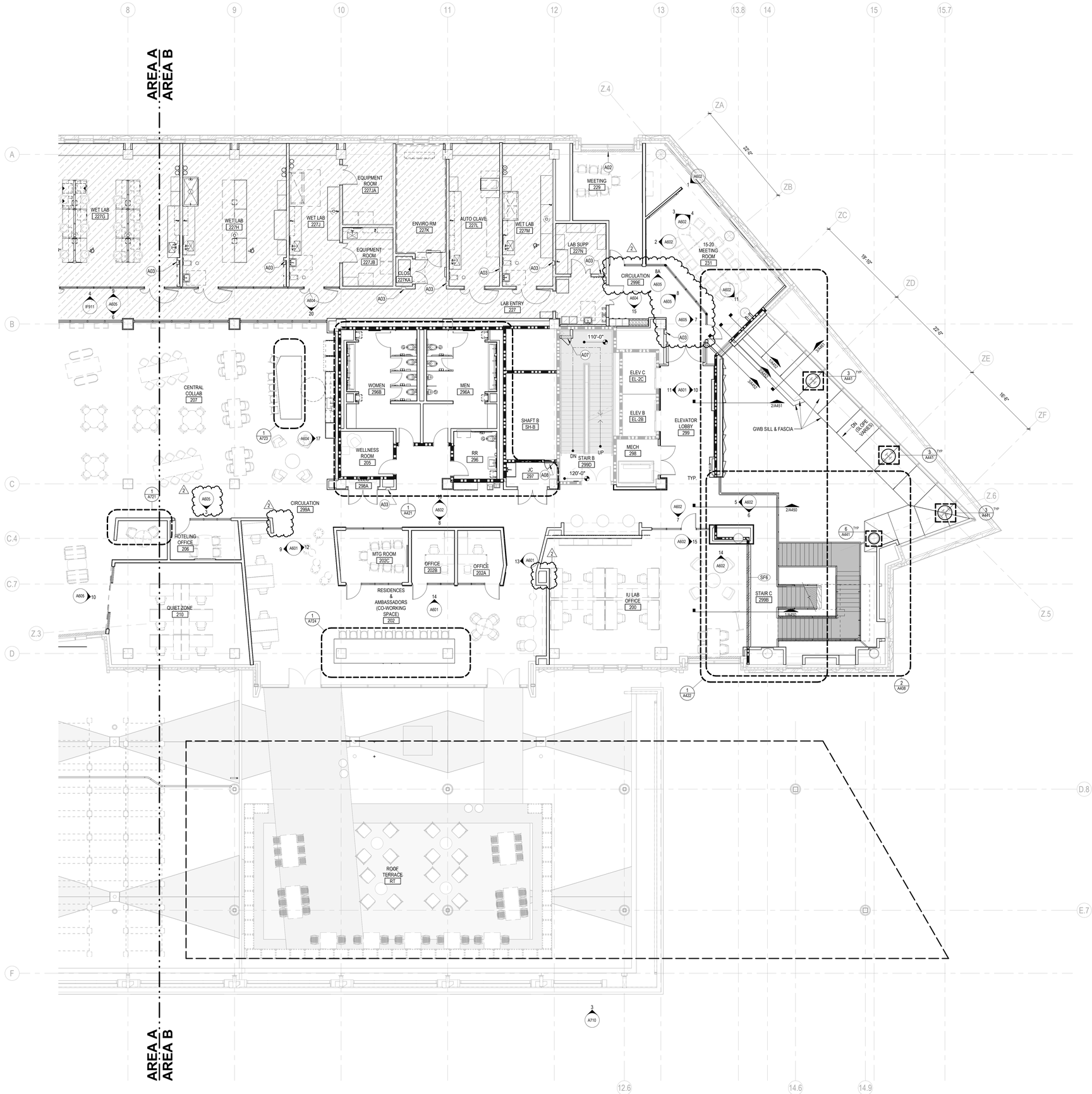

1 A122B ARCHITECTURAL FLOOR PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

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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
- 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
A02	PEDESTAL MOUNTED FIN TUBE ENCLOSURE, REFER TO MECHANICAL.
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04
A08	24"x36" RATED PANEL. SEE 08 3100.A04

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INDIANAPOLIS, INDIANA

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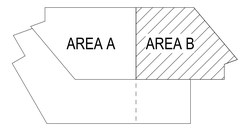

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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2	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN KNOX REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

ARCHITECTURAL PLAN - LEVEL 2 - AREA B

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1 A123A ARCHITECTURAL FLOOR PLAN - LEVEL 3 - AREA A
1/8" = 1'-0"

ARCHITECTURAL PLAN LEGEND

ARCHITECTURAL PLAN NOTES

1. DIMENSIONS ARE TO FACE OF PARTITION, UNLESS NOTED OTHERWISE.
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WALL RATING LEGEND

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SHEET NOTE SCHEDULE

NUMBER	TEXT
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

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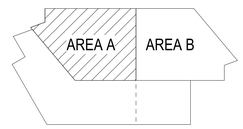

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MARK	DATE	DESCRIPTION
2	04/27/2026	BP4-CD: ADDENDUM 02
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ANDREW JOHN TOMICH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

ARCHITECTURAL PLAN - LEVEL 3 - AREA A

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1 A124A ARCHITECTURAL 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.
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SHEET NOTE SCHEDULE

NUMBER	TEXT
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A07	24"x24" ACCESS PANEL. SEE 08 3100.A04

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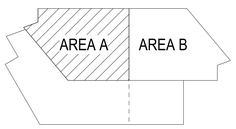
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



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2	04/27/2026	BP4-CD: ADDENDUM 02
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ANDREW JOHN HOLDEN REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

ARCHITECTURAL PLAN - LEVEL 4 - AREA A

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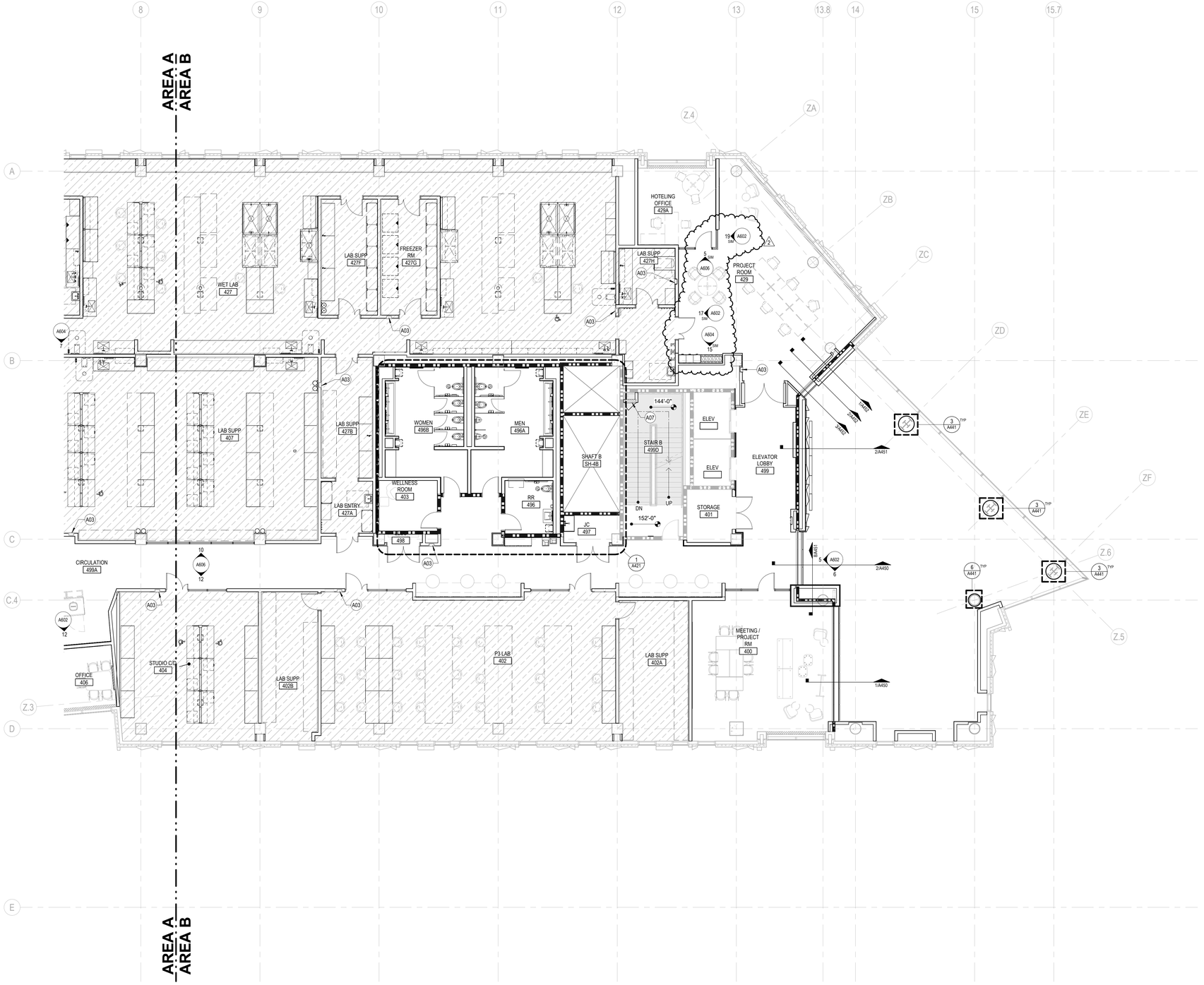

1 A124B ARCHITECTURAL FLOOR PLAN - LEVEL 4 - AREA B
1/8" = 1'-0"

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

SHEET NOTE SCHEDULE

NUMBER	TEXT
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04

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175 S. Rangeline Rd, Suite 200
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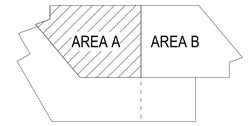
LAUNCH ACCELERATOR FOR BIOSCIENCES

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	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



ARCHITECTURAL PLAN - LEVEL 4 - AREA B

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

A124B

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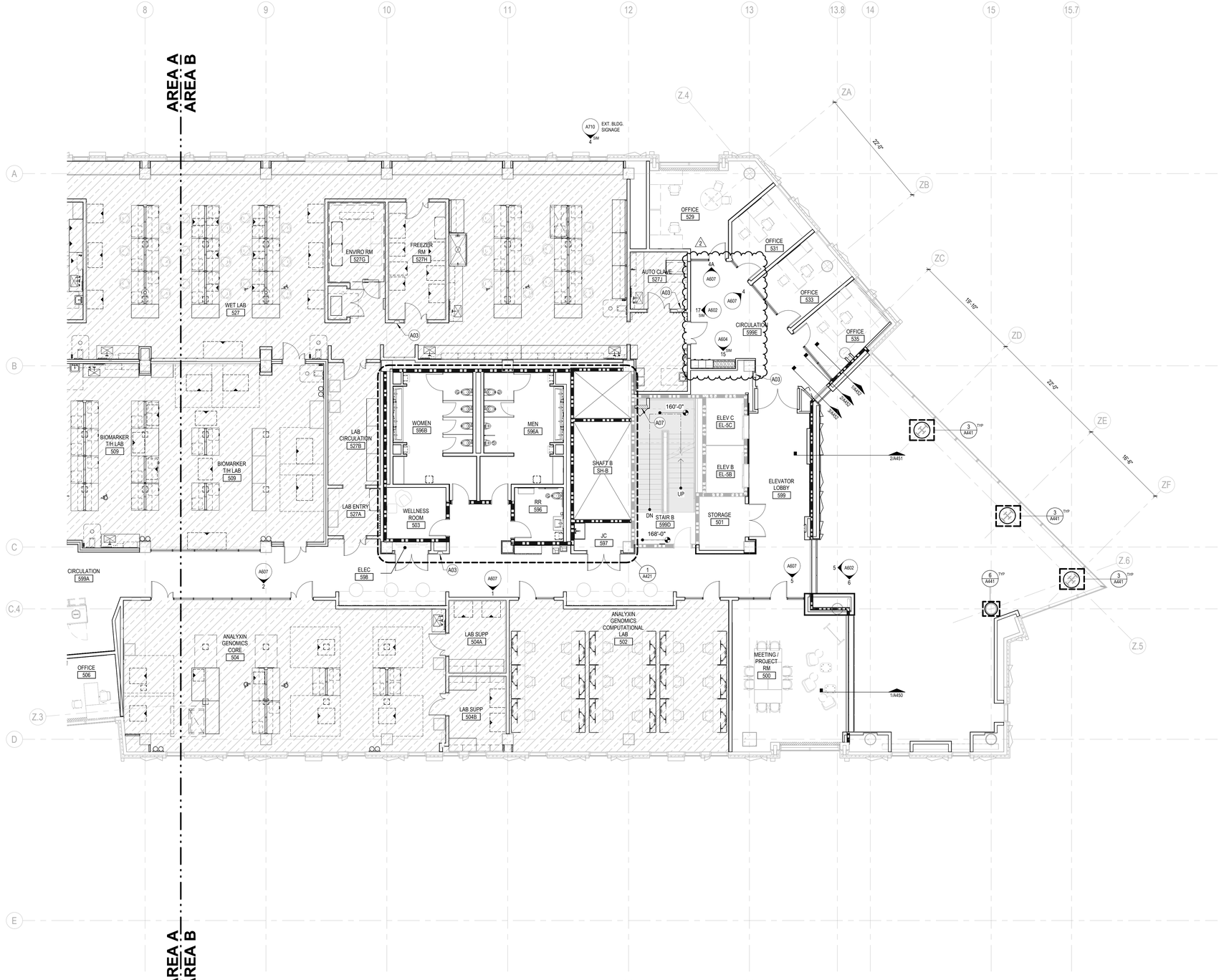
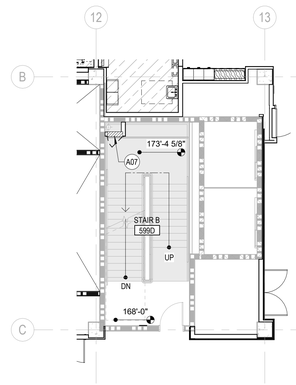


1 A125B ARCHITECTURAL FLOOR PLAN - LEVEL 5 - AREA B
1/8" = 1'-0"



2 A125B PARTIAL FLOOR PLAN - LEVEL 5 - AREA B - CUT ABOVE LANDING
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

SHEET NOTE SCHEDULE

NUMBER	TEXT
A03	RECESSED FIRE EXTINGUISHER CABINET - SPEC 10 4400.
A07	24"x24" ACCESS PANEL. SEE 08 3100.A04

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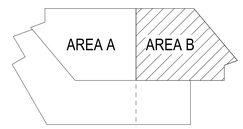
LAUNCH ACCELERATOR FOR BIOSCIENCES

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	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN TAYLOR REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

ARCHITECTURAL PLAN - LEVEL 5 - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A125B

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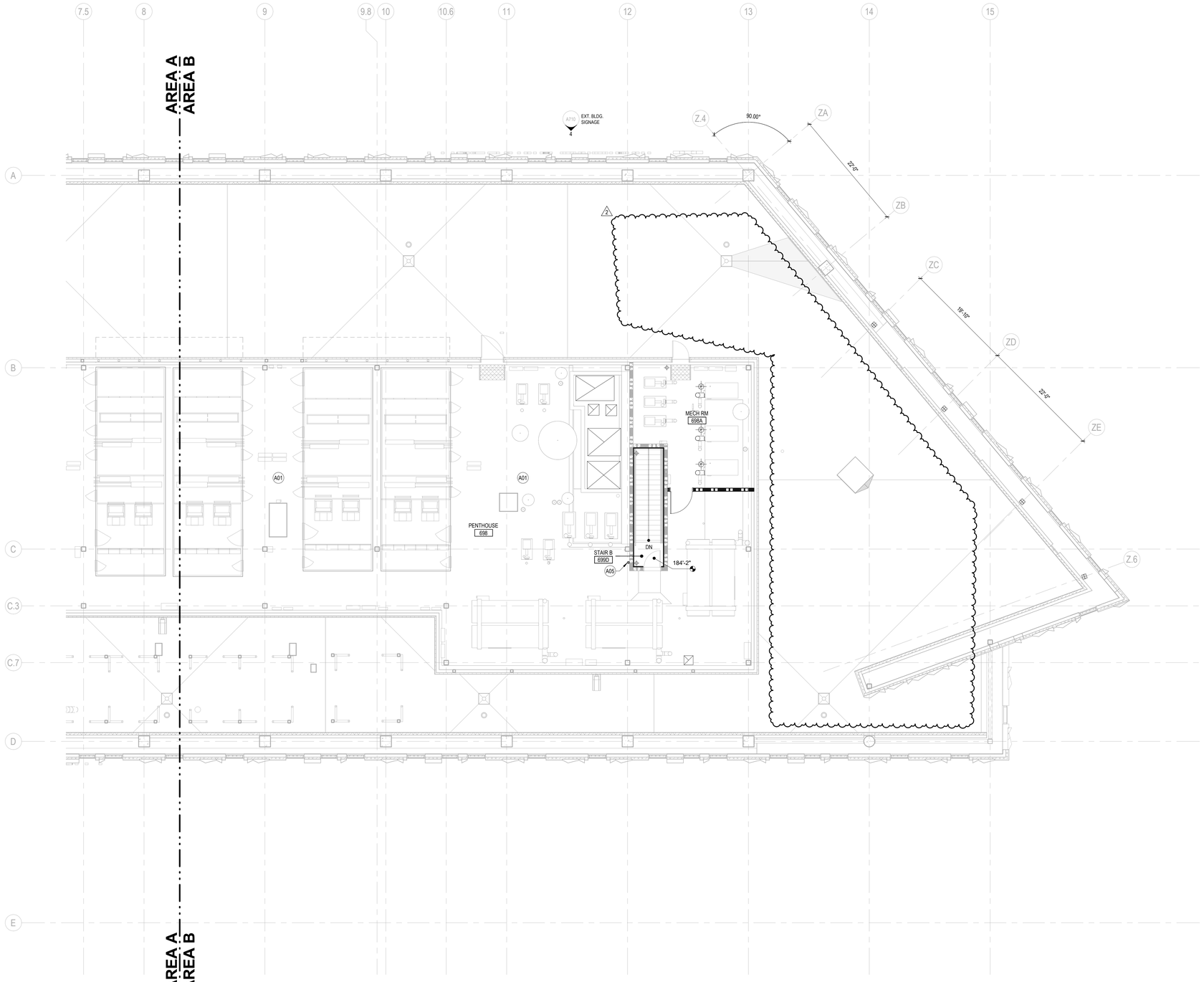

1 A126B ARCHITECTURAL FLOOR PLAN - PENTHOUSE - AREA B
1/8" = 1'-0"

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.
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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

SHEET NOTE SCHEDULE

NUMBER	TEXT
A01	REFER TO ENGINEERING DRAWINGS FOR LAYOUT OF PENTHOUSE.
A05	FIRE EXTINGUISHER WITH BRACKET - SPEC 10 4400.

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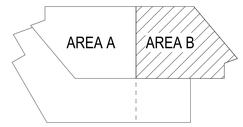
LAUNCH ACCELERATOR FOR BIOSCIENCES

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	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

ARCHITECTURAL PLAN - PENTHOUSE - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A126B

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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	

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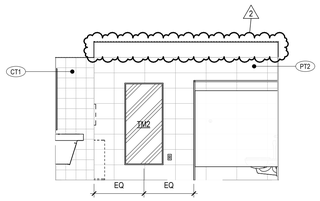
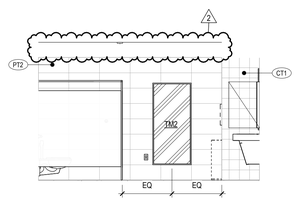
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

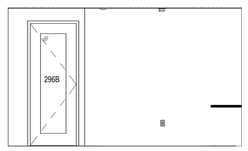
CLIENT PROJECT NO. - 20250072



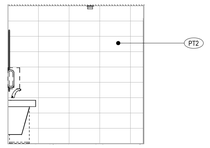
11 A421 ELEVATION - RESTROOM
1/4" = 1'-0"



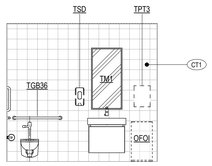
10 A421 ELEVATION
1/4" = 1'-0"



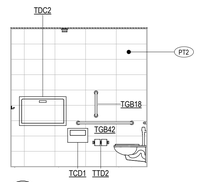
9 A421 ELEVATION UL RESTROOM ENTRY
1/4" = 1'-0"



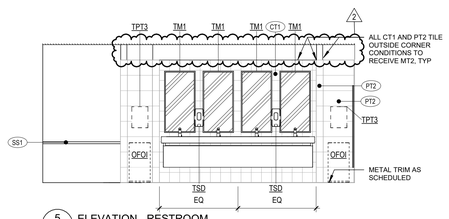
8 A421 ELEVATION
1/4" = 1'-0"



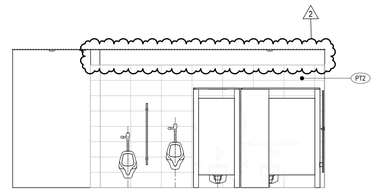
7 A421 ELEVATION
1/4" = 1'-0"



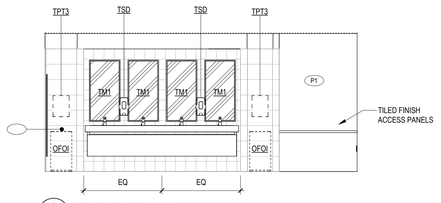
6 A421 ELEVATION
1/4" = 1'-0"



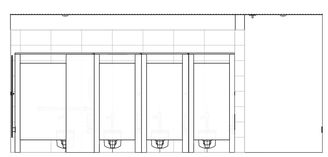
5 A421 ELEVATION - RESTROOM
1/4" = 1'-0"



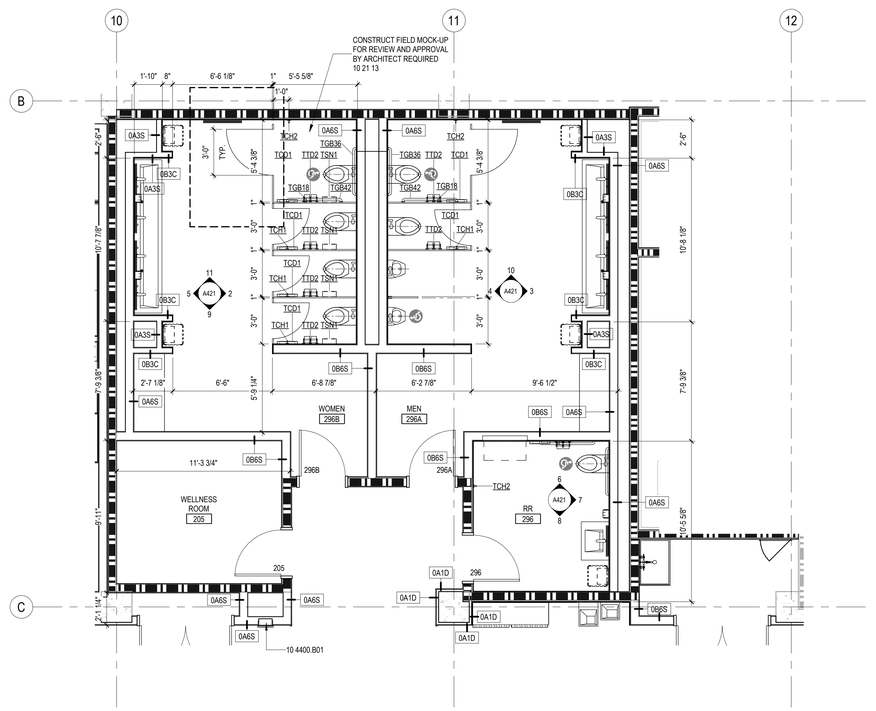
4 A421 ELEVATION - RESTROOM
1/4" = 1'-0"



3 A421 ELEVATION - RESTROOM
1/4" = 1'-0"



2 A421 ELEVATION - RESTROOM
1/4" = 1'-0"



1 A421 PLAN - LEVEL 2 TO 5 RESTROOMS
1/4" = 1'-0"

ISSUED / REVISIONS SCHEDULE		
MARK	DATE	DESCRIPTION
2	04/27/2026	BP4-CD: ADDENDUM 02
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN JOHNSON
REGISTERED
No. AR10400213
STATE OF
INDIANA
ARCHITECT

ENLARGED FLOOR PLANS AND ELEVATIONS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

A421

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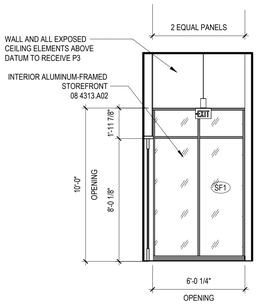
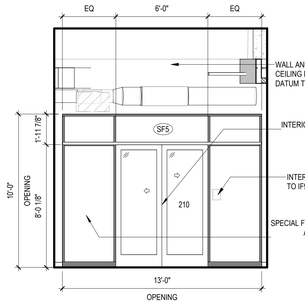
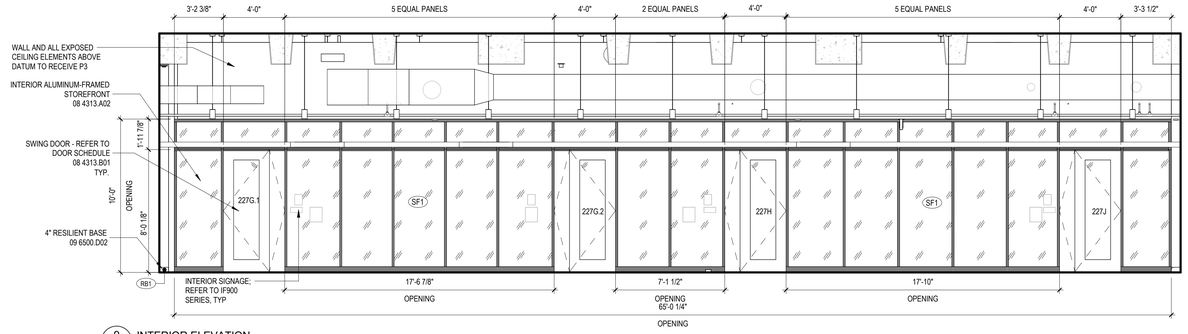


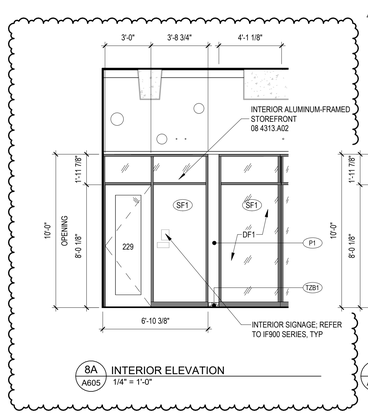
11 A605 INTERIOR ELEVATION
1/4" = 1'-0"



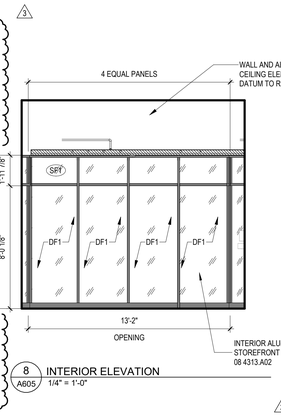
10 A605 INTERIOR ELEVATION
1/4" = 1'-0"



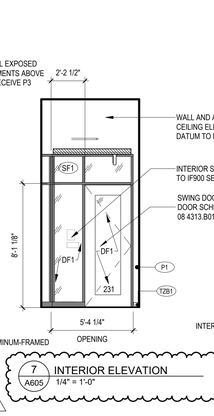
9 A605 INTERIOR ELEVATION
1/4" = 1'-0"



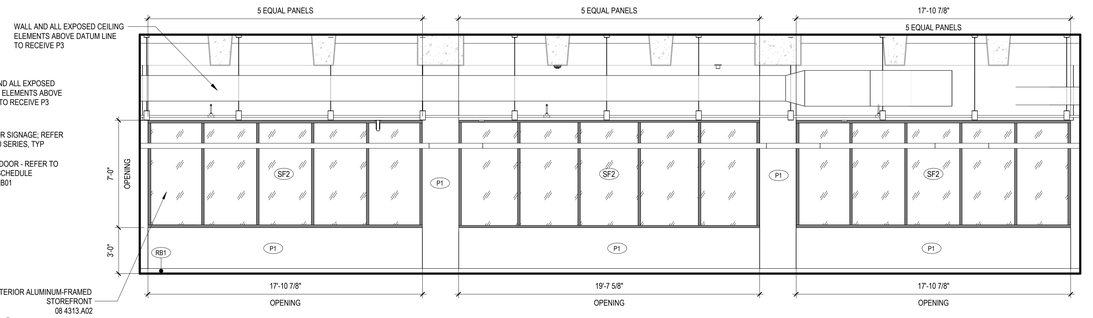
8A A605 INTERIOR ELEVATION
1/4" = 1'-0"



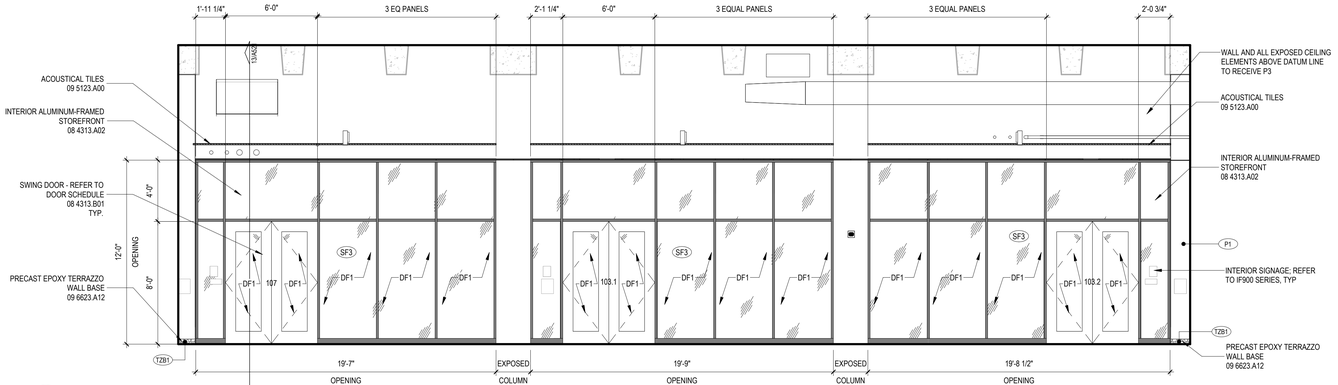
8 A605 INTERIOR ELEVATION
1/4" = 1'-0"



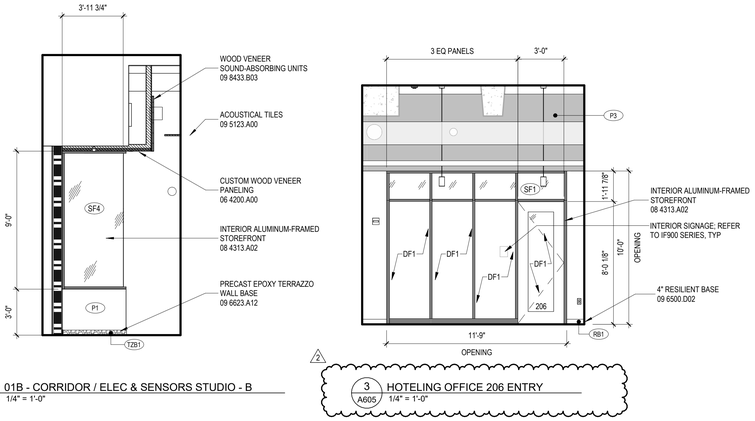
7 A605 INTERIOR ELEVATION
1/4" = 1'-0"



6 A605 INTERIOR ELEVATION
1/4" = 1'-0"

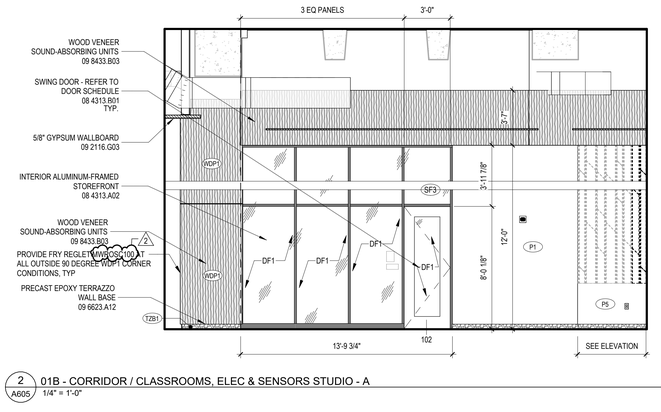


5 A605 01B - CIRCULATION TO IMAGING LAB/ INSTRUCTIONAL LAB
1/4" = 1'-0"

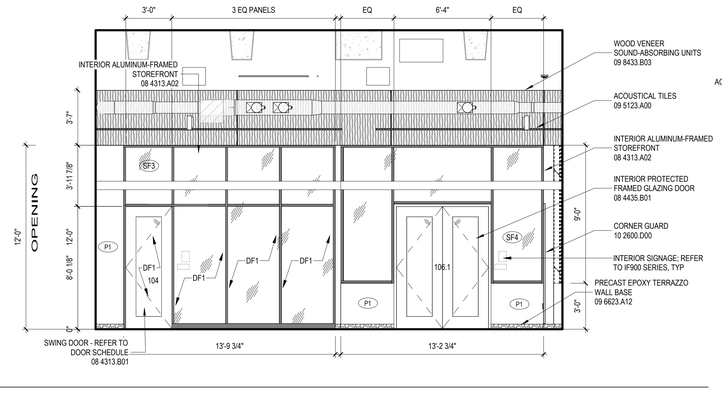


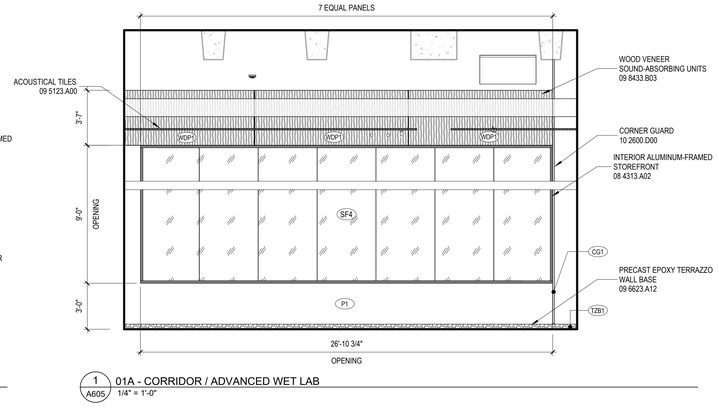
4 A605 01B - CORRIDOR / ELEC & SENSORS STUDIO - B
1/4" = 1'-0"

3 HOTELING OFFICE 206 ENTRY
A605 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"

INTERIOR ELEVATION LEGEND

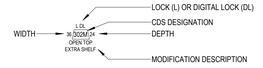
INTERIOR ELEVATION NOTES

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
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

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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
3	04/27/2026	BP4-CD: ADDENDUM 02
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

A605

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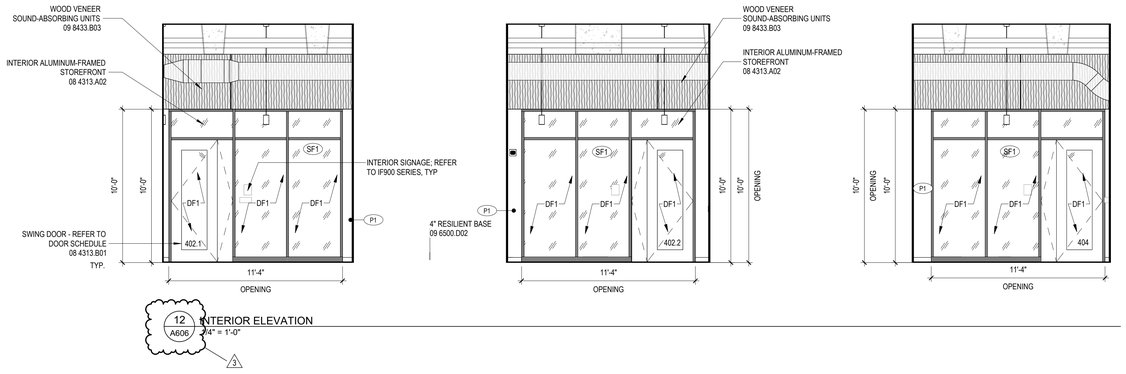
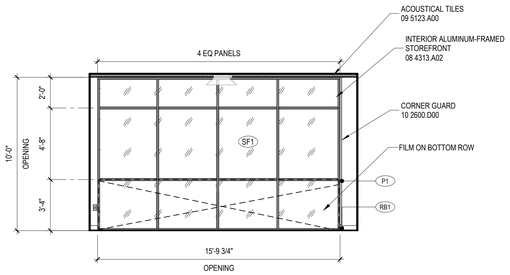
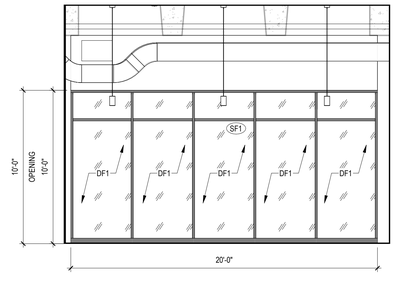


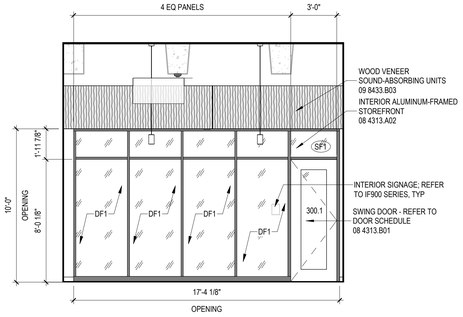
12 A606 INTERIOR ELEVATION 1/4" = 1'-0"



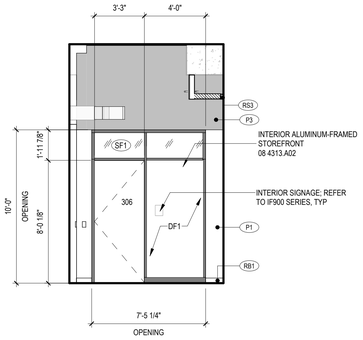
11 A606 04A- OPEN OFFICE WORKSPACE (TO WET LAB) 1/4" = 1'-0"



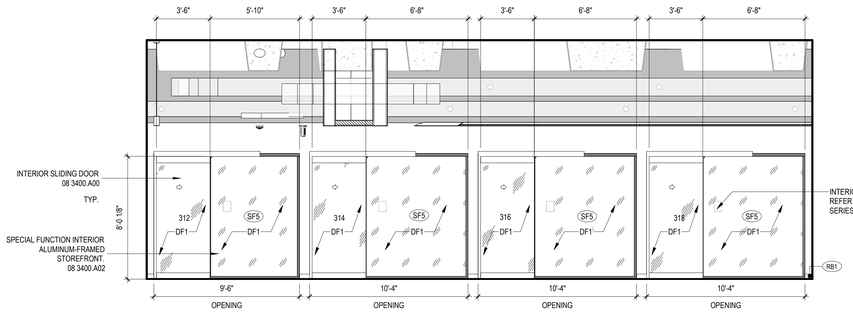
10 A606 INTERIOR ELEVATION 1/4" = 1'-0"



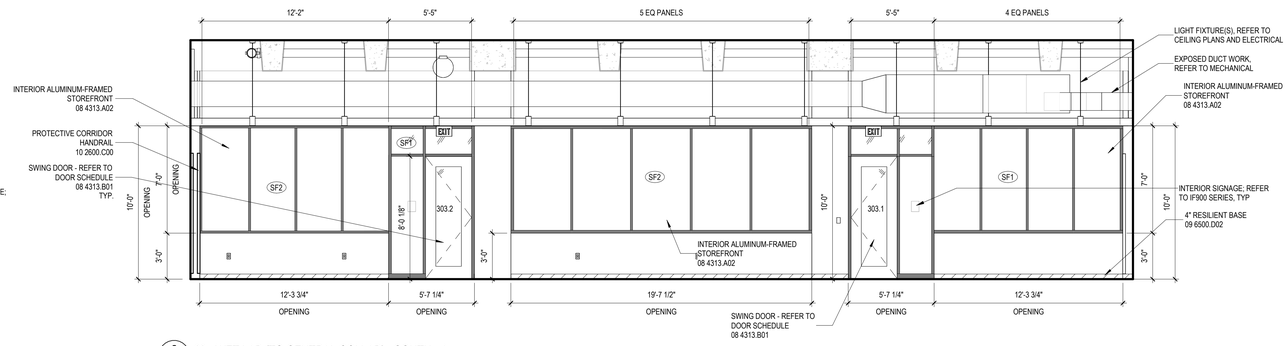
9 A606 INTERIOR ELEVATION 1/4" = 1'-0"



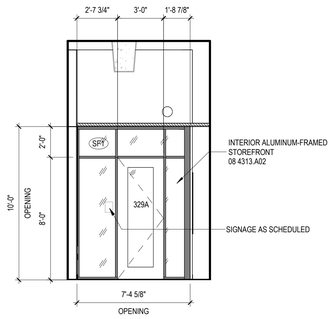
8 A606 INTERIOR ELEVATION 1/4" = 1'-0"



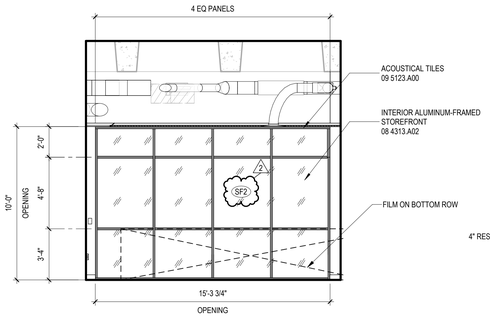
7 A606 INTERIOR ELEVATION 1/4" = 1'-0"



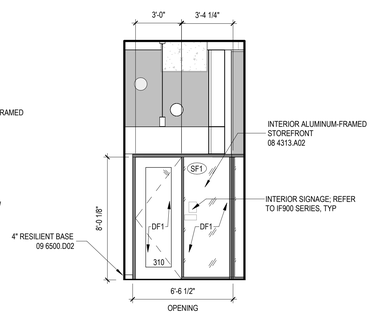
6 A606 03 - WET LAB (TO CENTRAL COLLAB) - SOUTH - A 1/4" = 1'-0"



5 A606 INTERIOR ELEVATION 1/4" = 1'-0"

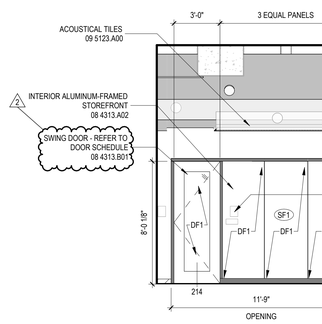


4 A606 03A- SHARED OFFICE SPACE (TO WET LAB) 1/4" = 1'-0"



3 A606 INTERIOR ELEVATION - 310 MTG ROOM 1/4" = 1'-0"

2



1 A606 ELEVATION - MTG RM 214 ENTRY 1/4" = 1'-0"

INTERIOR ELEVATION LEGEND

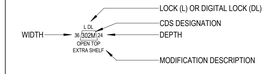
INTERIOR ELEVATION NOTES

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.

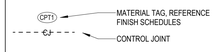
CASEWORK NOTES

A. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION OF CABINETS.
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
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

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
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 ELEVATIONS

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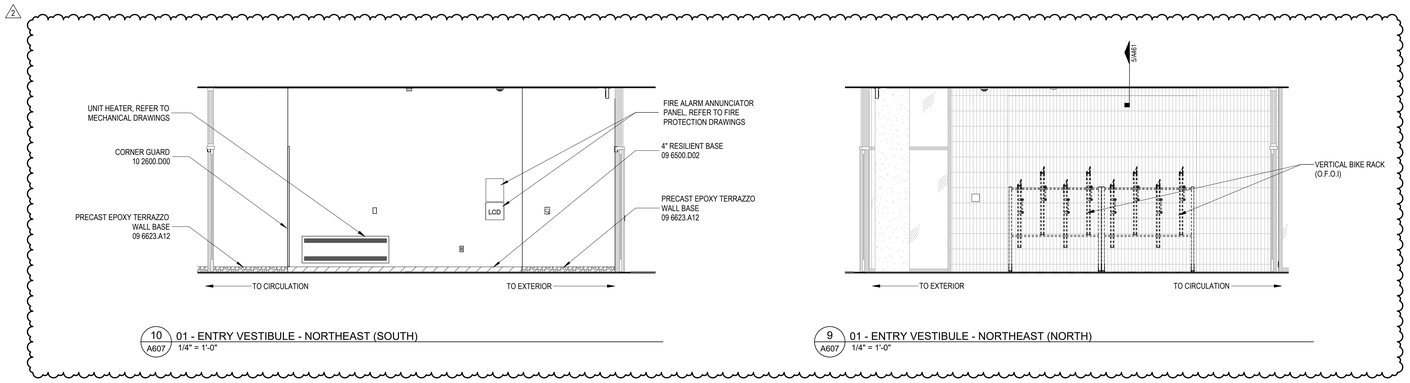
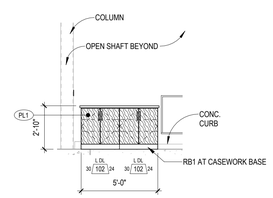
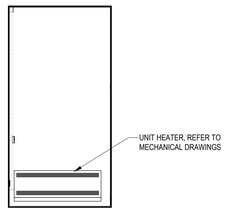


10 / A607 01 - ENTRY VESTIBULE - NORTHEAST (SOUTH)
1/4" = 1'-0"

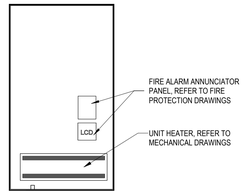
9 / A607 01 - ENTRY VESTIBULE - NORTHEAST (NORTH)
1/4" = 1'-0"



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

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

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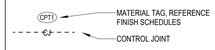
B. CASEWORK TO BE PLASTIC LAMINATE, UNLESS NOTED OTHERWISE
C. GYPSUM WALLBOARD SOFFITS ABOVE UPPER CABINETS TO BE 1 " DEEPER AND WIDER THAN CABINETS BELOW, UNLESS NOTED OTHERWISE.
D. COORDINATE WALL DEVICE LOCATIONS TO AVOID CONFLICT WITH CASEWORK AND COUNTERTOPS.
E. COORDINATE COUNTERTOP SUPPORT BRACKET 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
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

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LAUNCH ACCELERATOR FOR BIOSCIENCES

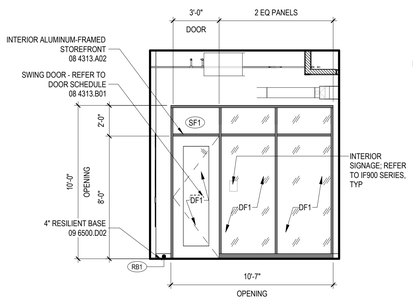
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

5 / A607 INTERIOR ELEVATION
1/4" = 1'-0"

4A / A607 INTERIOR ELEVATION
1/4" = 1'-0"

4 / A607 INTERIOR ELEVATION
1/4" = 1'-0"



3 / A607 05A - OFFICE ENTRY - ELEVATION A
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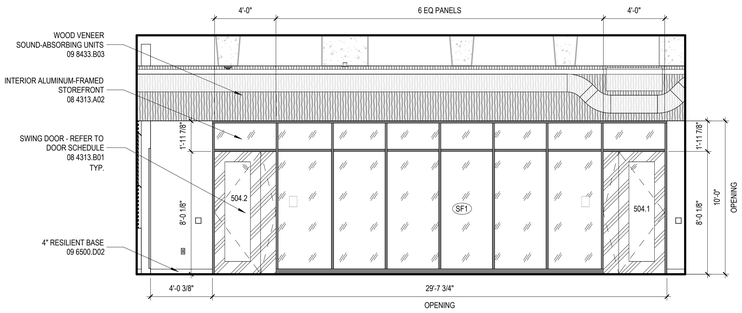
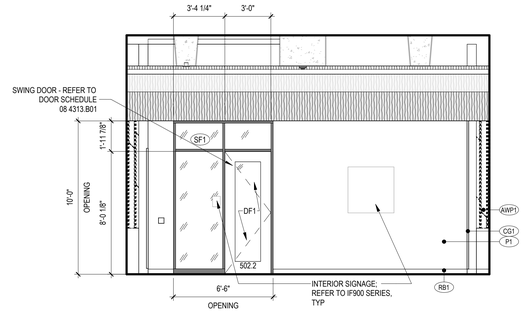


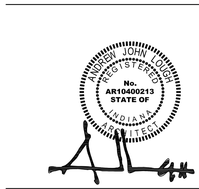
2 / A607 05 - CIRCULATION (TO ANALYXIN GENOMICS CORE) - SOUTH - A
1/4" = 1'-0"



1 / A607 05B - CIRCULATION (TO ANALYXIN GENOMICS COMP LAB) - SOUTH - B
1/4" = 1'-0"

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE



INTERIOR ELEVATIONS

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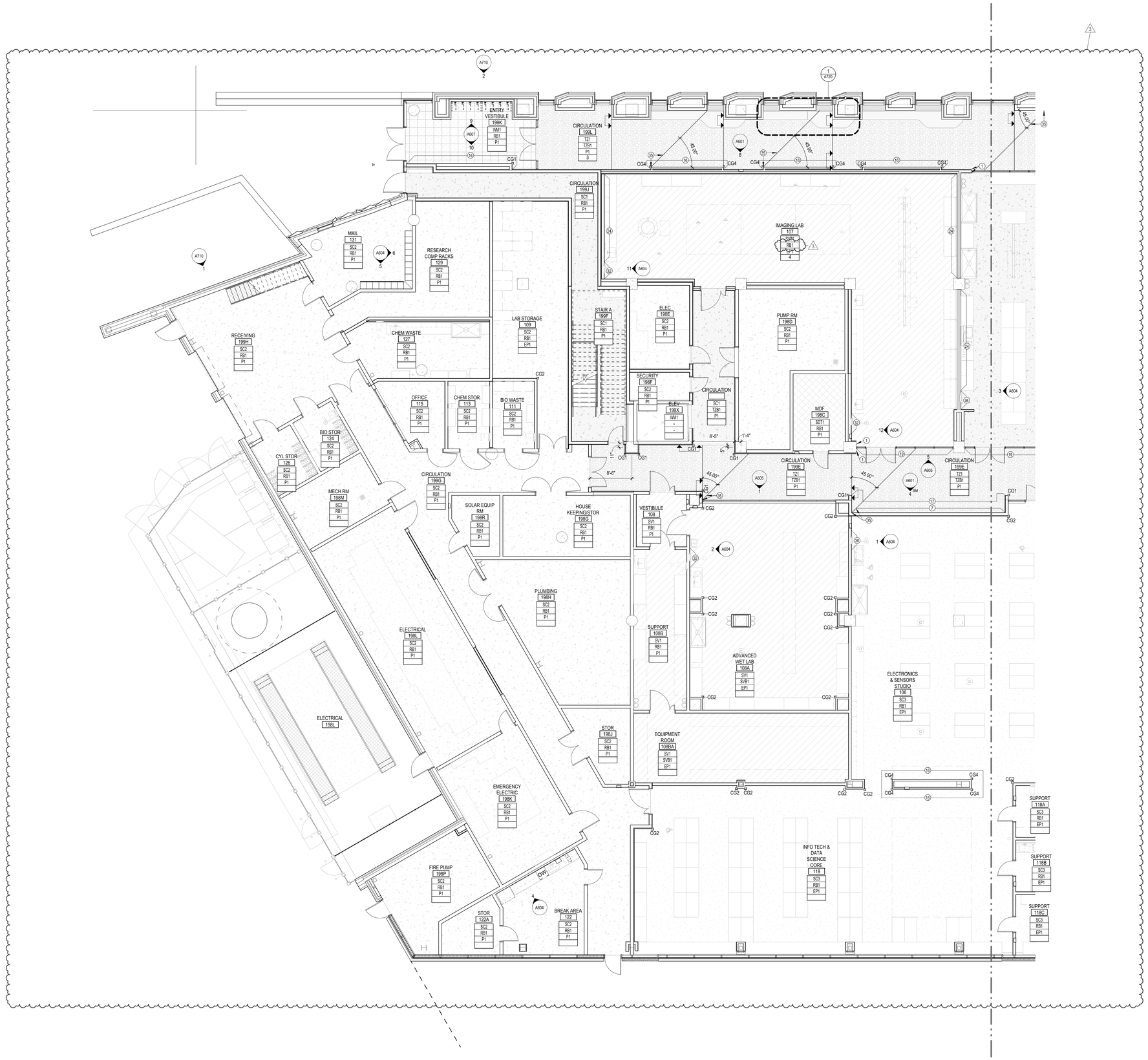

1 IF111A INTERIOR FINISH PLAN - LEVEL 1 - AREA A
1/8" = 1'-0"

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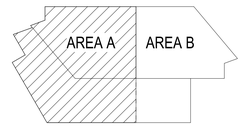
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
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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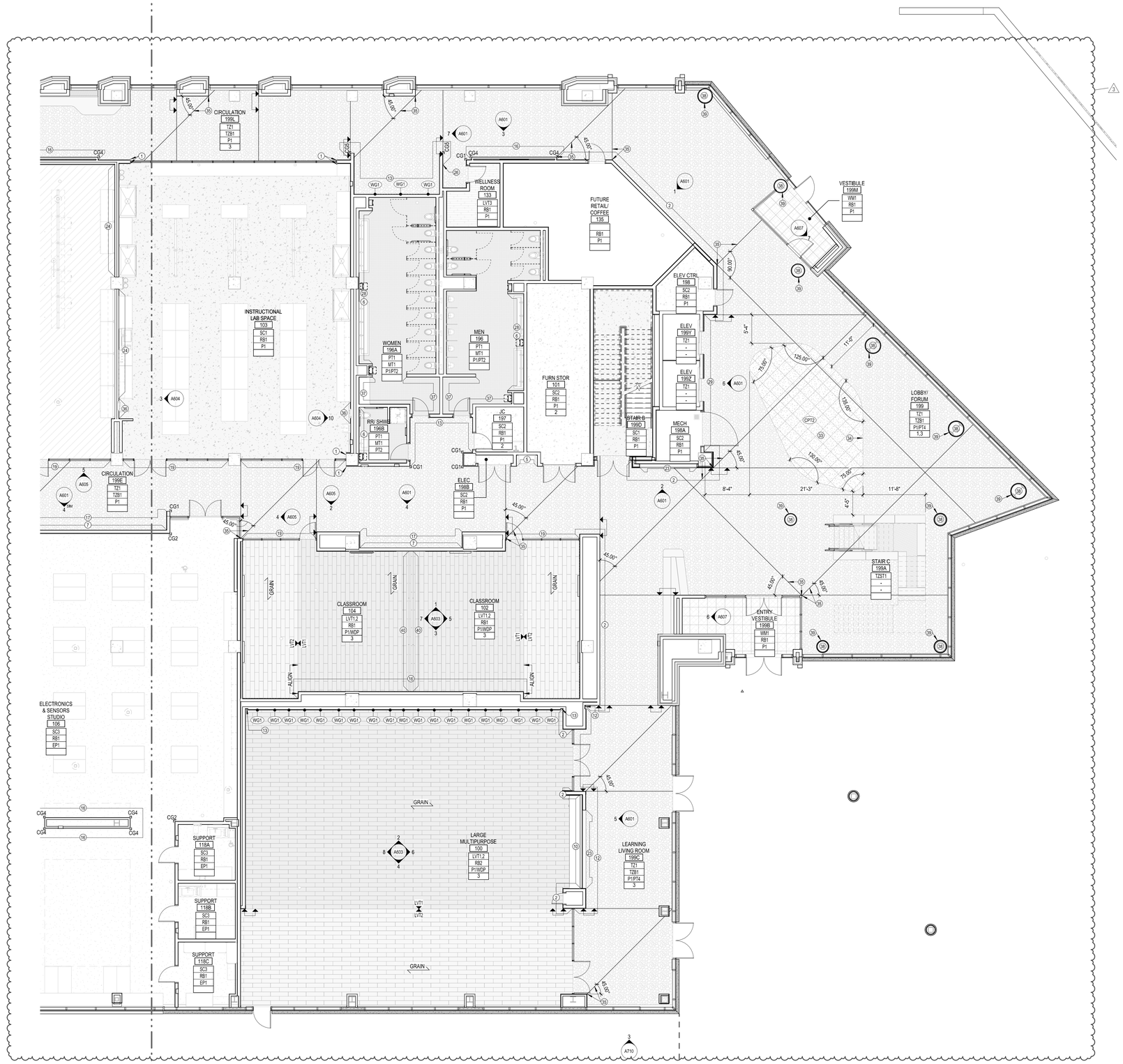

1 INTERIOR FINISH PLAN - LEVEL 1 - AREA B
IF111B 1/8" = 1'-0"

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Carmel, IN 46032
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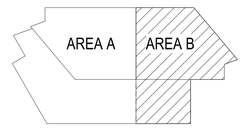
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN MASON
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

INTERIOR FINISH PLAN - LEVEL 1 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

IF111B

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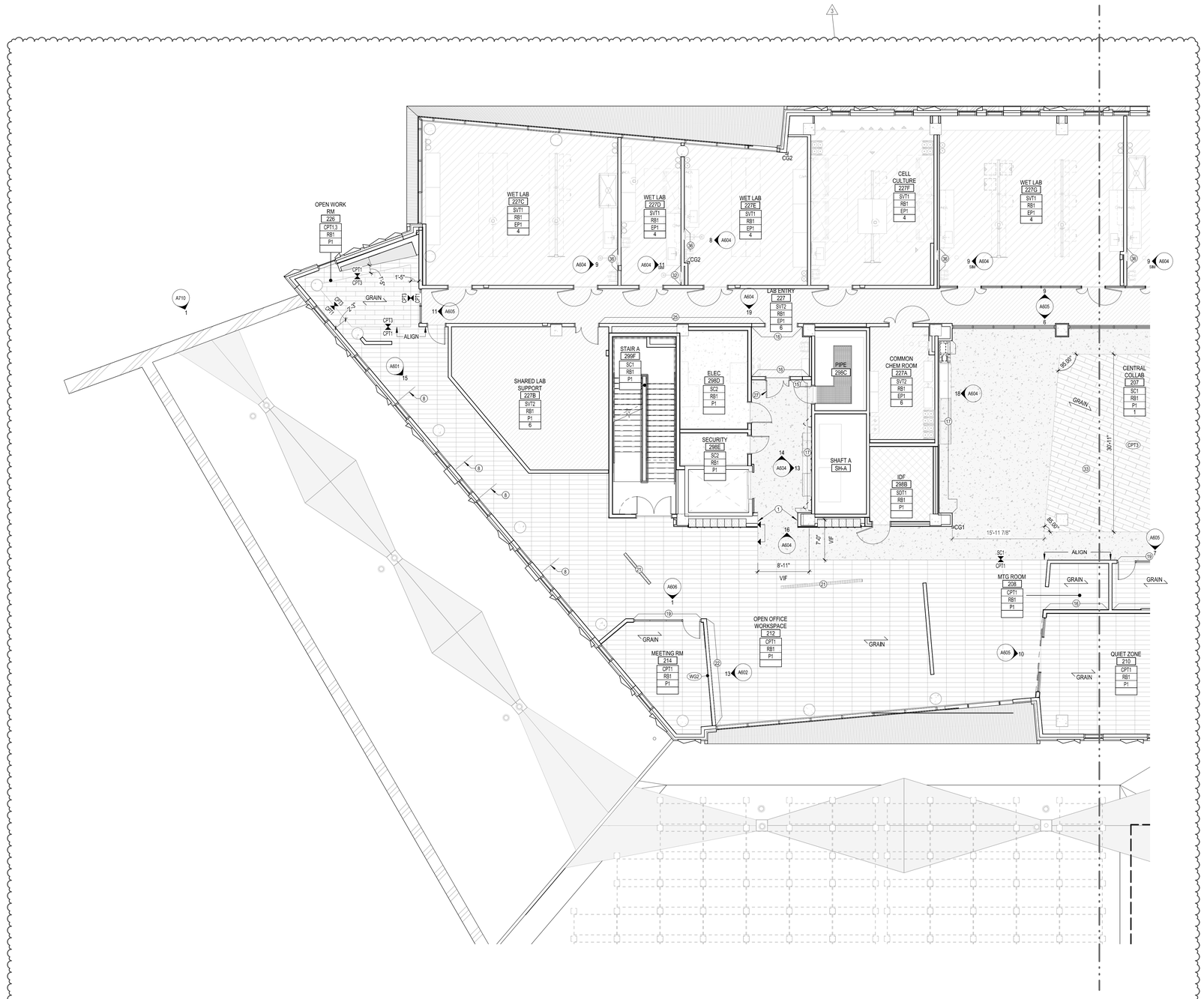

1 IF112A INTERIOR FINISH PLAN - LEVEL 2 - AREA A
1/8" = 1'-0"

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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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313.983.3600
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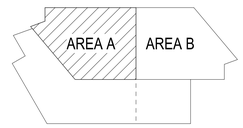
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN HUDSON REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

INTERIOR FINISH PLAN - LEVEL 2 - AREA A

DATE REF: SHEET INDEX
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IF112A

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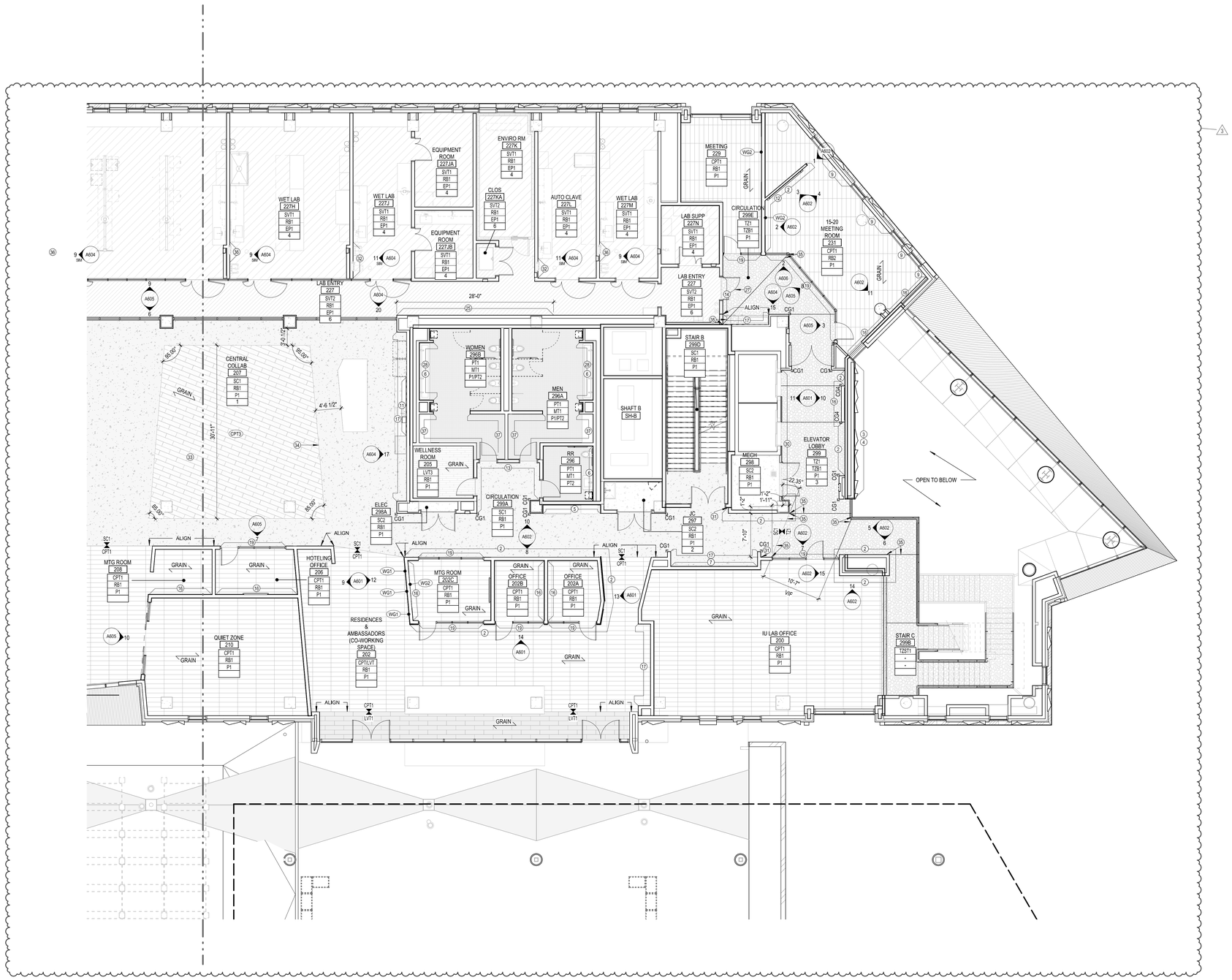

1 IF112B INTERIOR FINISH PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
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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

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
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 FINISH PLAN - LEVEL 2 - AREA B

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

IF112B

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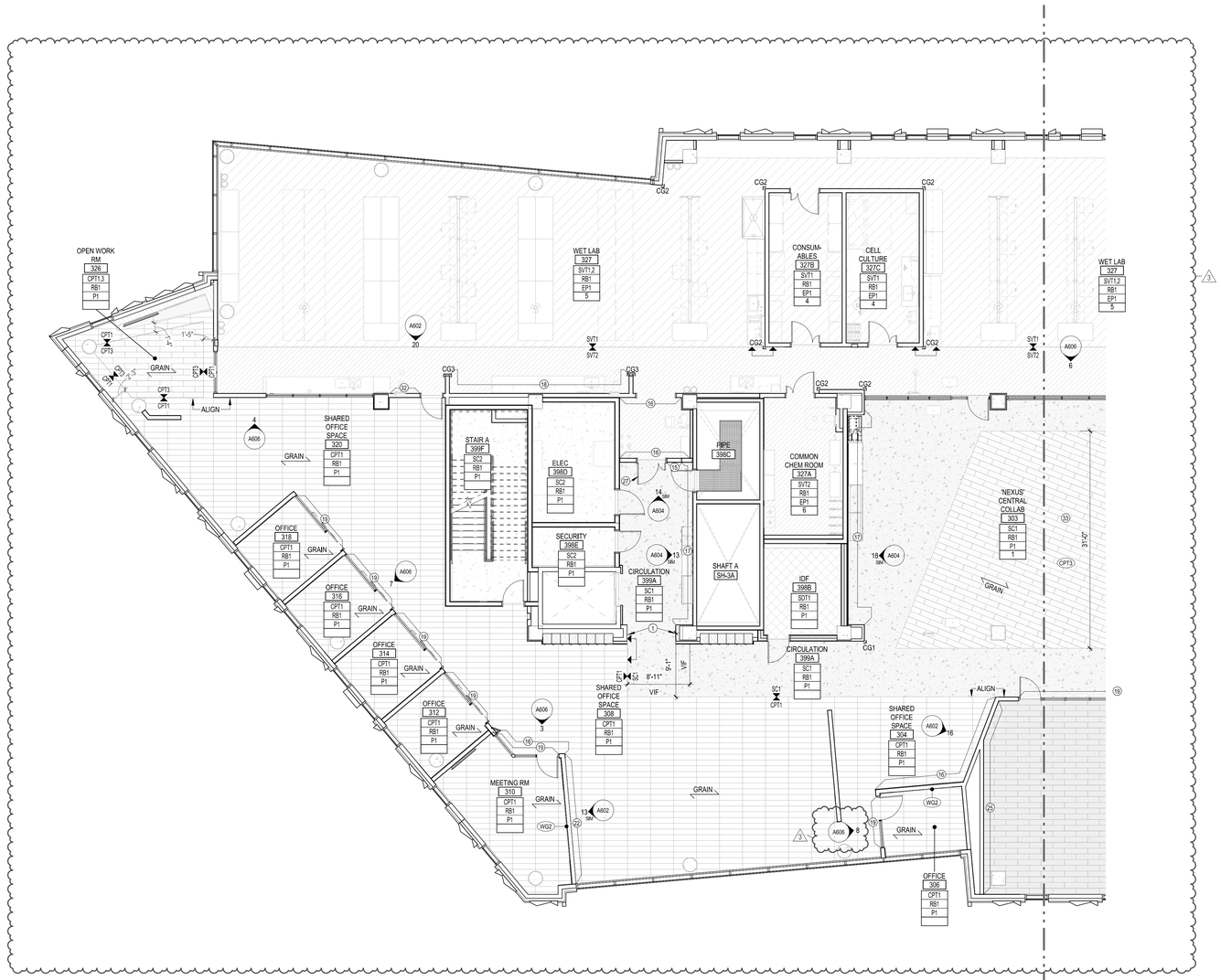

1 IF113A INTERIOR FINISH PLAN - LEVEL 3 - AREA A
1/8" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
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CLIENT PROJECT NO. - 20250072

AREA A | AREA B

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 JOHN REGISTERED No. AR10400213 STATE OF INDIANA ARCHITECT

INTERIOR FINISH PLAN - LEVEL 3 - AREA A

DATE REF: SHEET INDEX
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IF113A

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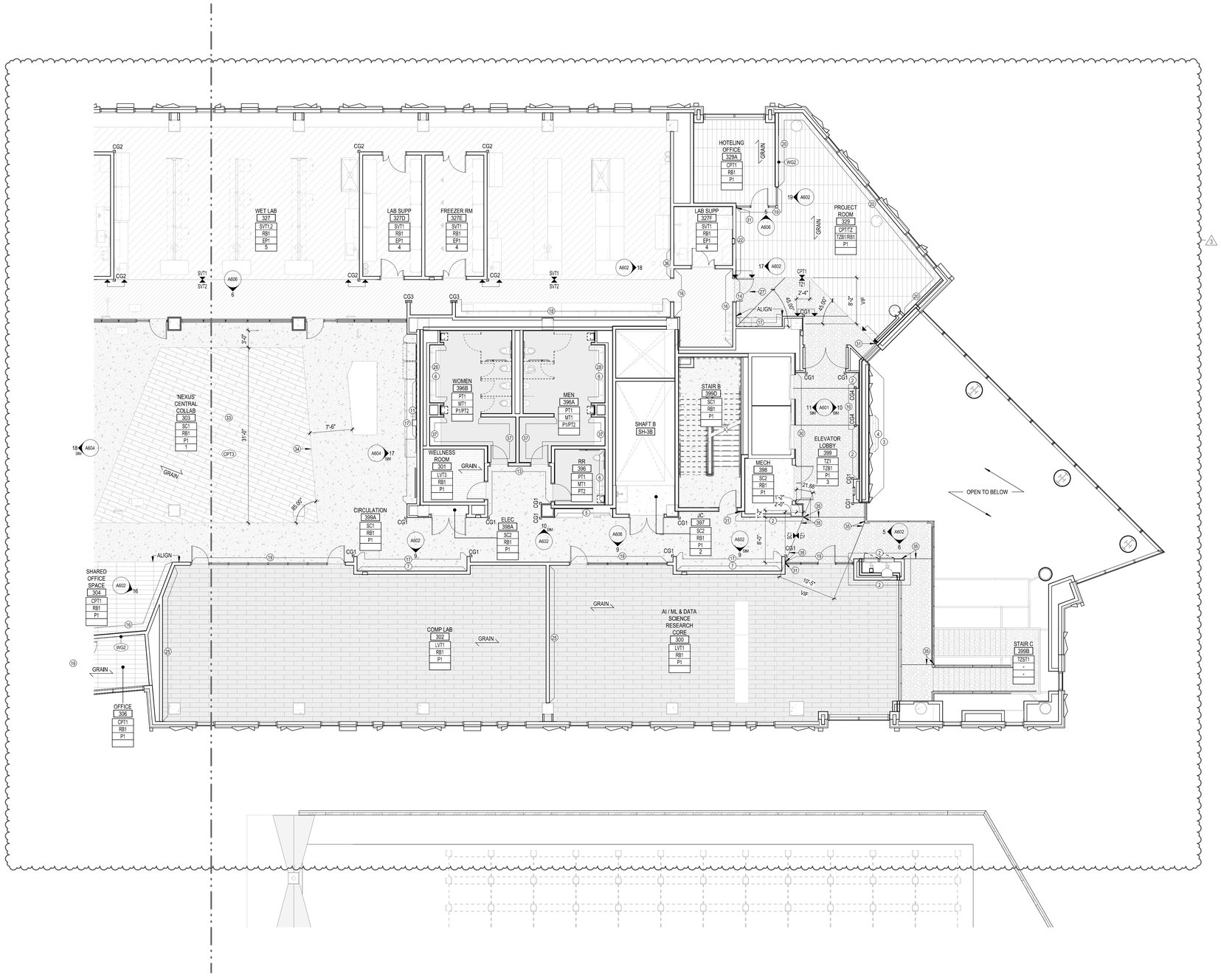
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LAB SUPP 327D SVT1 RB1 EP1 4
FREEZER RM 327E SVT1 RB1 EP1 4
LAB SUPP 327F SVT1 RB1 EP1 4
HOTELING OFFICE 329A CPT1 RB1 P1
PROJECT ROOM 329 CPT/TZ TZB1/RB1 P1
'NEXUS' CENTRAL COLLAB 303 SC1 RB1 P1 1
WOMEN 396B PT1 MT1 P1/PT2
MEN 396A PT1 MT1 P1/PT2
WELLNESS ROOM 301 LVT3 RB1 P1
RR 396 PT1 MT1 PT2
SHAFT B SH-3B
STAIR B 399D SC1 RB1 P1
ELEVATOR LOBBY 399 TZ1 TZB1 P1 3
MECH 398 SC2 RB1 P1
CIRCULATION 399A SC1 RB1 P1
ELEC 398A SC2 RB1 P1
JC 397 SC2 RB1 P1 2
SHARED OFFICE SPACE 304 CPT1 RB1 P1
COMP LAB 302 LVT1 RB1 P1
AI / ML & DATA SCIENCE RESEARCH CORE 300 LVT1 RB1 P1
OFFICE 306 CPT1 RB1 P1
STAIR C 399B TZST1
ALIGN
GRAIN
OPEN TO BELOW
CG1
CG2
CG3
CG4
CPT1
CPT3
SVT1
SVT2
WG2
A602
A604
A606
A607
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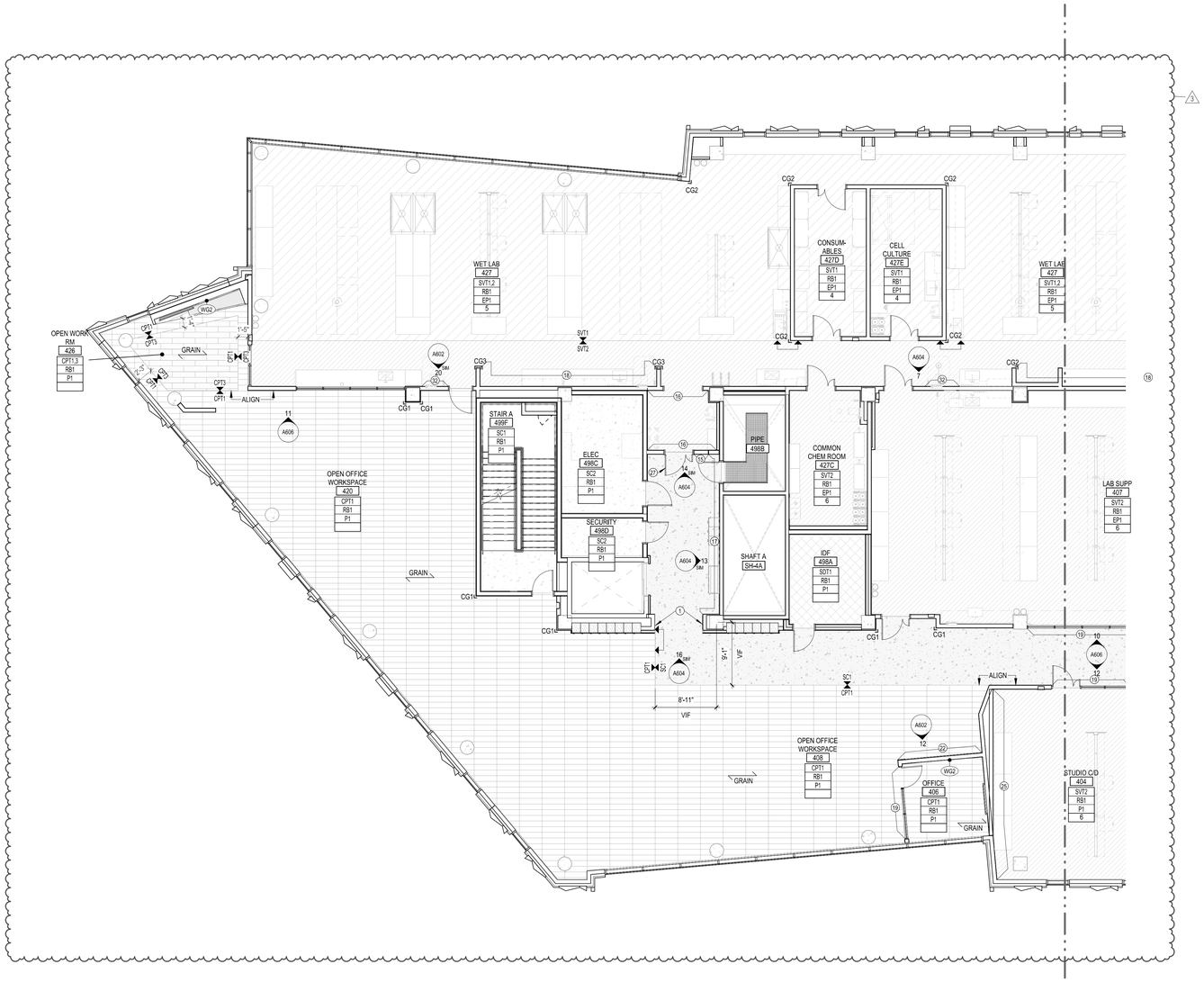

1 INTERIOR FINISH PLAN - LEVEL 4 - AREA A
IF114A 1/8" = 1'-0"

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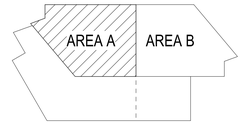
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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3	04/27/2026	BP4-CD: ADDENDUM 02
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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

INTERIOR FINISH PLAN - LEVEL 4 - AREA A

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF114A

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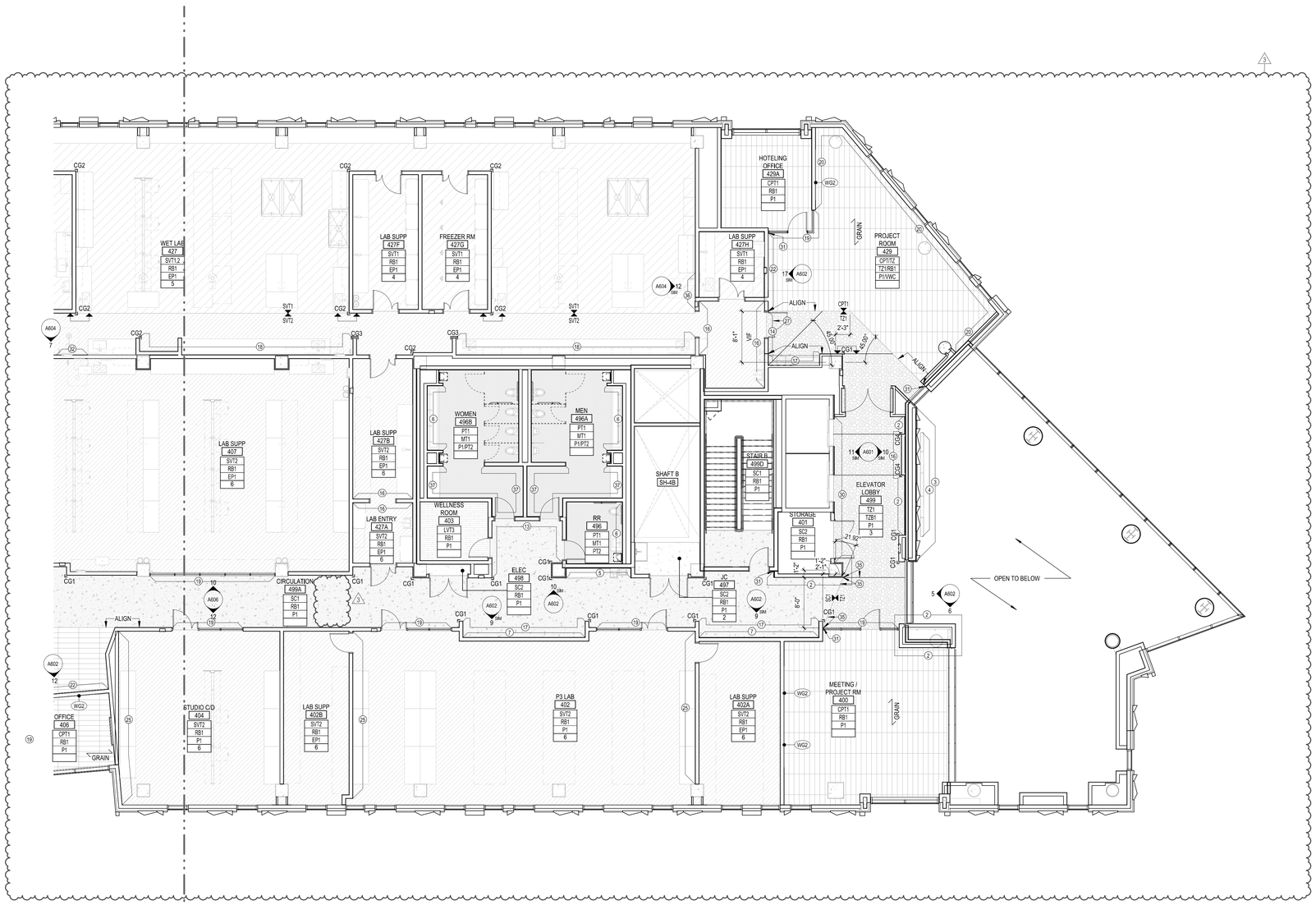

1 IF114B INTERIOR FINISH PLAN - LEVEL 4 - AREA B
1/8" = 1'-0"

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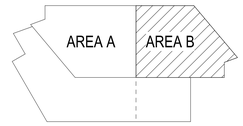
INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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TRUE NORTH

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MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
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ANDREW JOHN WILSON
REGISTERED ARCHITECT
No. AR10400213
STATE OF INDIANA

INTERIOR FINISH PLAN - LEVEL 4 - AREA B

DATE
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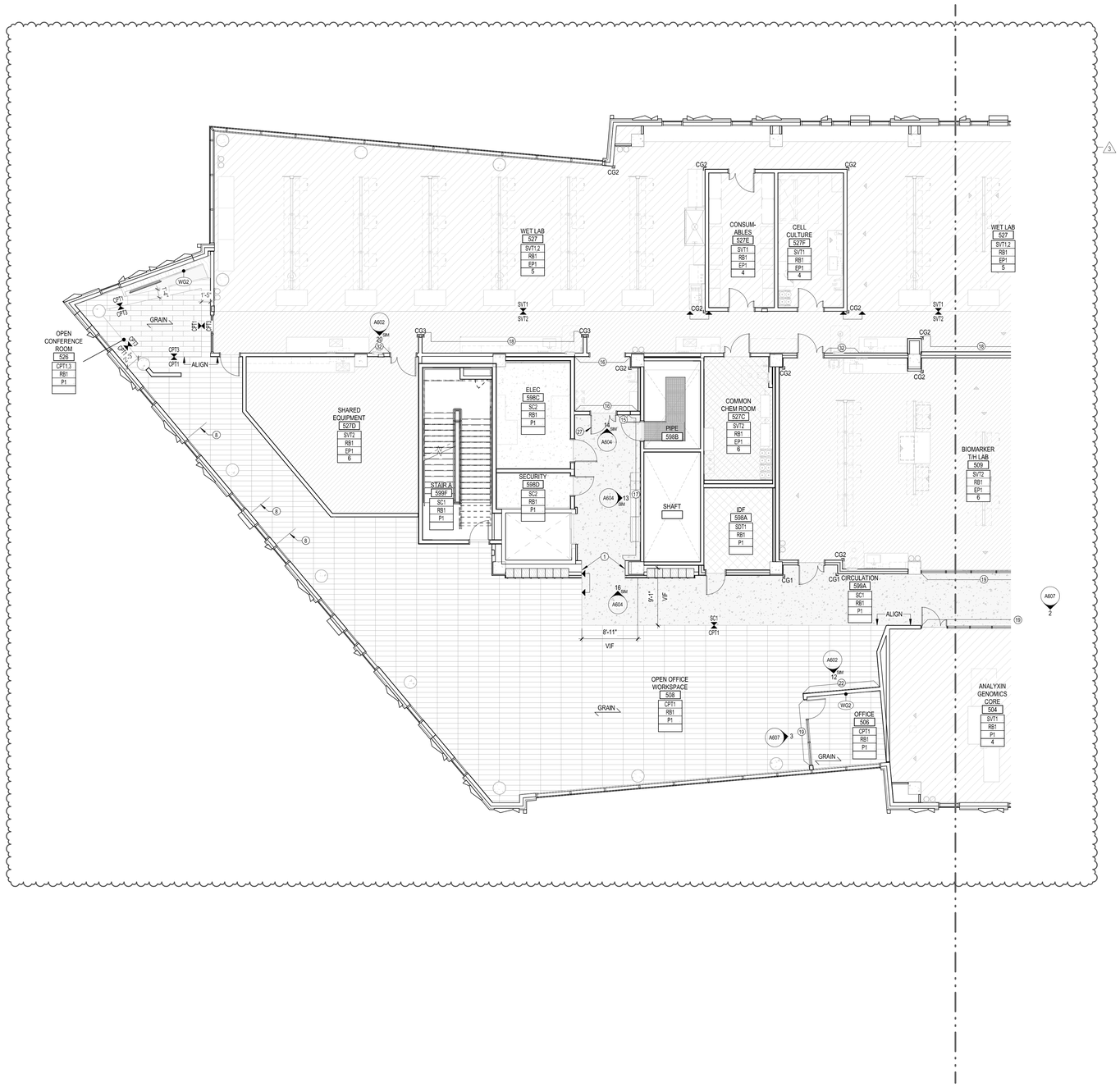

1 IF115A INTERIOR FINISH PLAN - LEVEL 5 - AREA A
1/8" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
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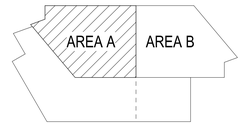
CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

ANDREW JOHN LAUX REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

INTERIOR FINISH PLAN - LEVEL 5 - AREA A

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

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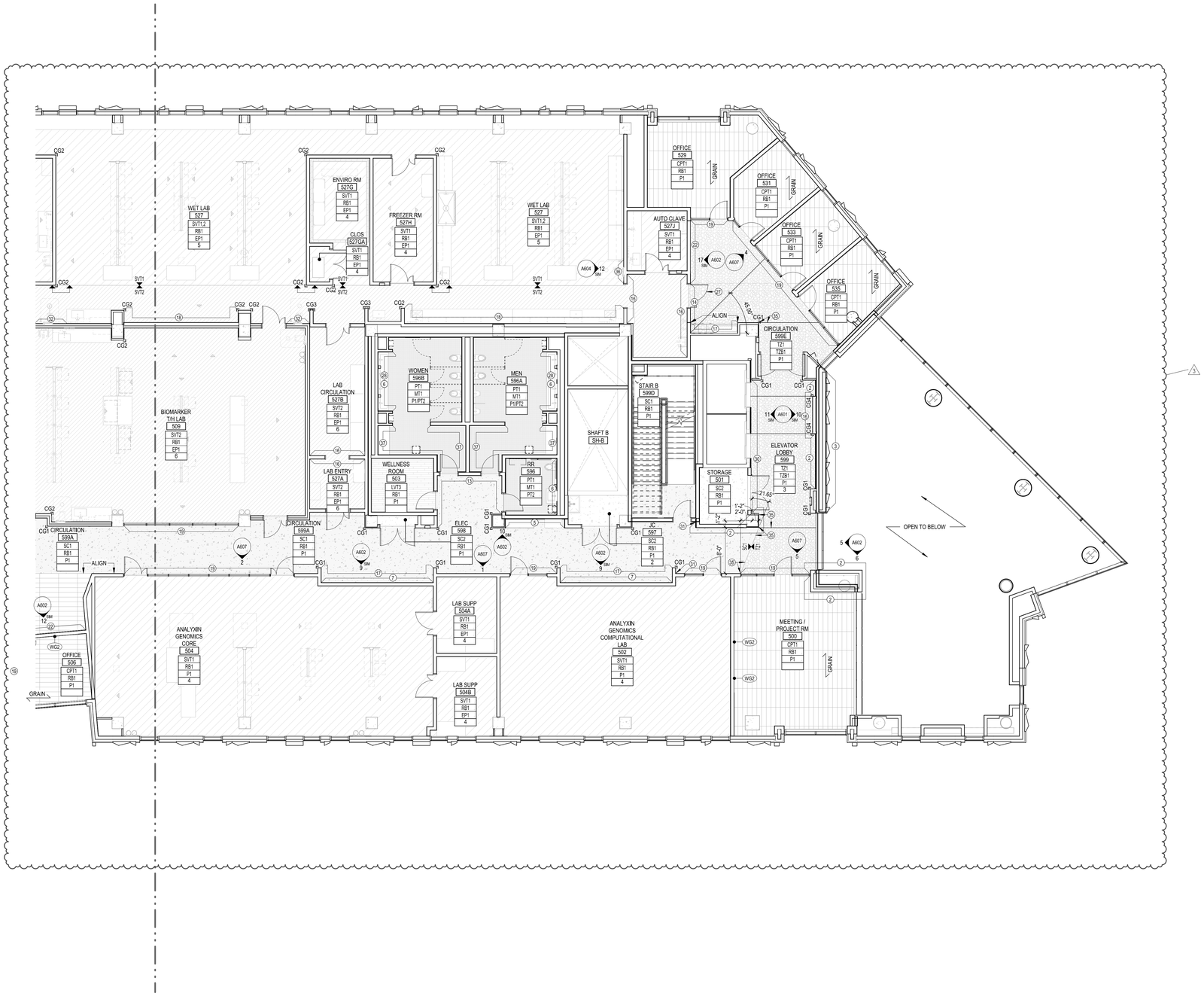

1 IF115B INTERIOR FINISH PLAN - LEVEL 5 - AREA B
1/8" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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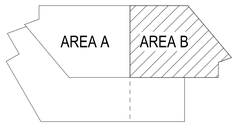
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072



KEYPLAN
PROJECT NORTH
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ANDREW JOHN LOUGH
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

INTERIOR FINISH PLAN - LEVEL 5 - AREA B

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF115B

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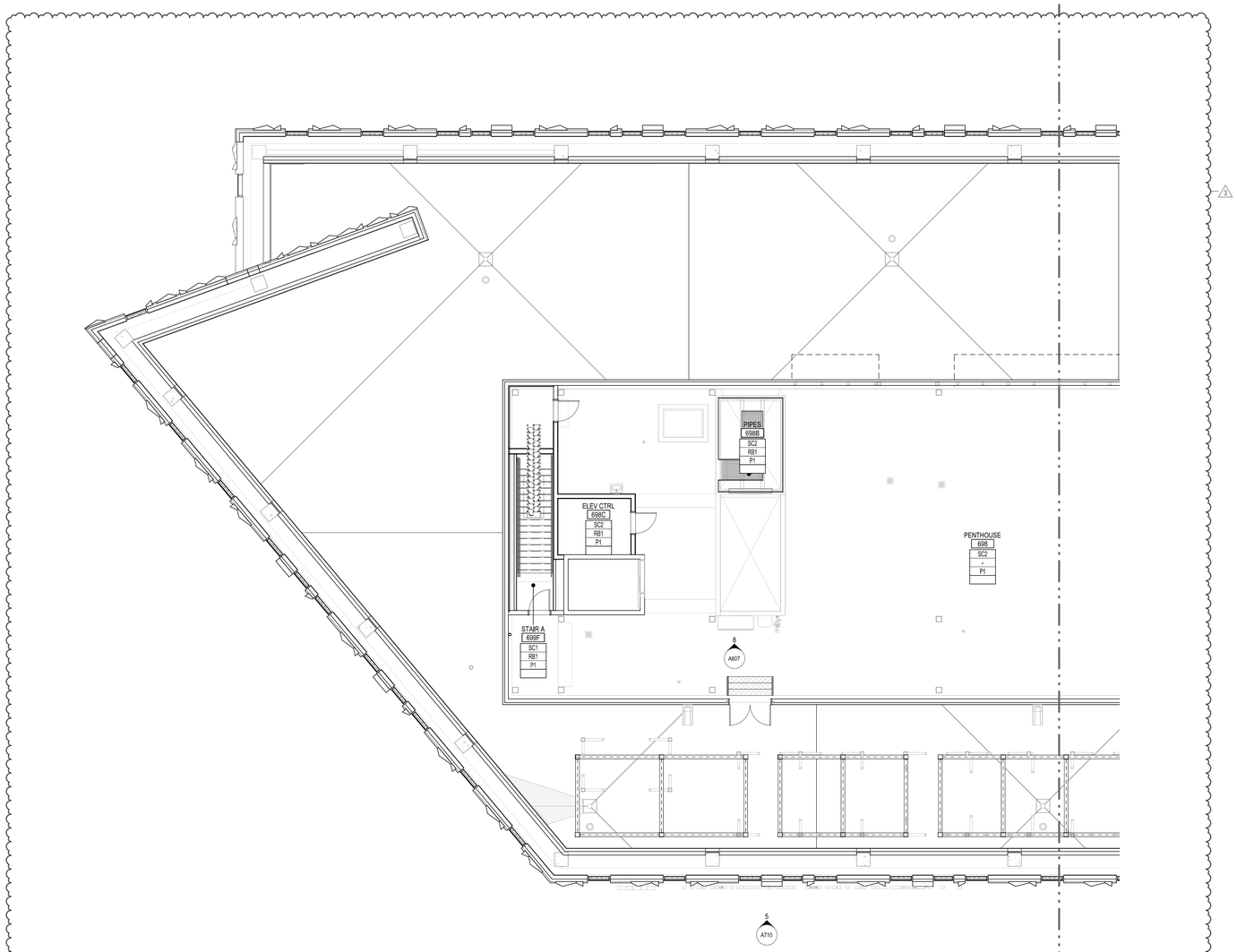

1 IF116A INTERIOR FINISH PLAN - LEVEL 6 - AREA A
1/8" = 1'-0"

BSA LifeStructures
175 S. Rangeline Rd, Suite 200
Carmel, IN 46032
ph 317.819.7878 fx 317.819.7288

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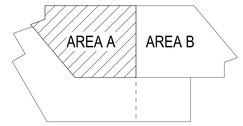
INDIANAPOLIS, INDIANA

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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ANDREW JOHN JOHNSON
REGISTERED
No. AR10400213
STATE OF INDIANA
ARCHITECT

INTERIOR FINISH PLAN - LEVEL 6 - AREA A

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

IF116A

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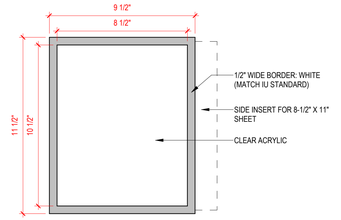
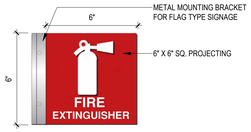
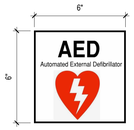


5 IF911 SIGN TYPE O LAB SAFETY
3" = 1'-0"



7 IF911 SIGN TYPE P - FIRE EXTINGUISHER
3" = 1'-0"



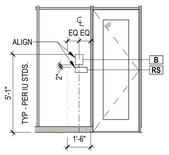
8 IF911 SIGN TYPE U - AEC DEBRILLATOR
3" = 1'-0"



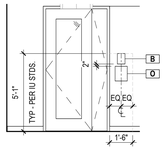
9 IF911 SIGN TYPE V - NON-POTABLE WATER
3" = 1'-0"



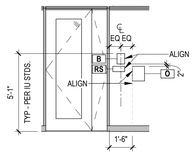
10 IF911 SIGN TYPE W - WELLFIELD SIGNAGE
3" = 1'-0"



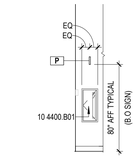
2 IF911 ROOM ID + ROOM SCHEDULER TYPICAL
1/4" = 1'-0"



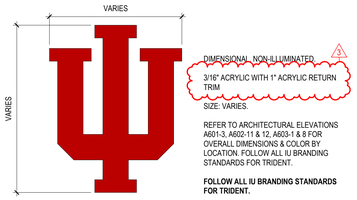
3 IF911 ROOM ID + LAB SAFETY TYPICAL
1/4" = 1'-0"



4 IF911 ROOM ID, ROOM SCHEDULER + LAB SAFETY TYPICAL
1/4" = 1'-0"



6 IF911 SIGN TYPE P TYPICAL
1/4" = 1'-0"



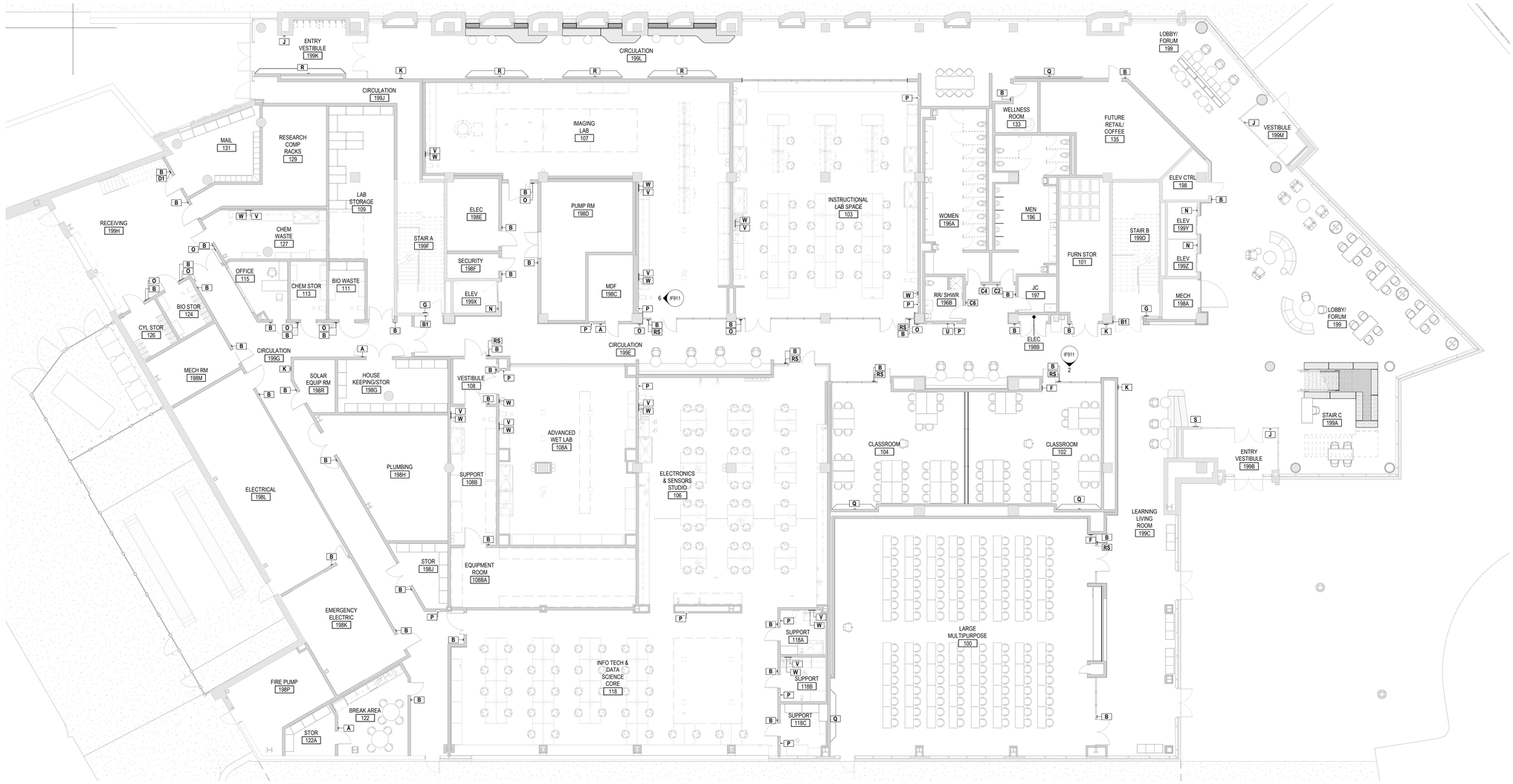
11 IF911 SIGN TYPE Q - IU TRIDENT
3" = 1'-0"

SIGNAGE GENERAL NOTES

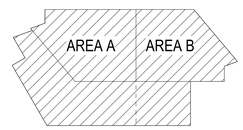
1. BRING ANY DISCREPANCIES TO THE ATTENTION OF THE DESIGNER FOR CLARIFICATION.
2. SIGNAGE TYPES AND FONTS TO ALIGN WITH INDIANA UNIVERSITY SIGNAGE STANDARDS.
3. VENDOR TO PROVIDE DIGITAL SCHEDULE AND DRAWING OF EACH SIGN TYPE FOR REVIEW AND APPROVAL AS PART OF SUBMITTAL PROCESS.
4. REFER TO IU SIGNAGE STANDARDS FOR SIGNAGE TYPES A THROUGH N.
5. FOR SIGN TYPES O AND Q, REFER TO INTERIOR ELEVATIONS FOR MORE INFORMATION.
6. SIGN TYPES R, S, AND T ARE O.F.O.I. AND SHOWN FOR REFERENCE ONLY.
7. FOR SIGN TYPE RS, REFER TO LOW VOLTAGE/ICT/AV DRAWINGS FOR ADDITIONAL INFORMATION.
8. SIGNAGE LOCATED ON GLASS IS TO RECEIVE COORDINATING BACK PLATE.
9. REFER TO LAB REFERENCE ELEVATIONS FOR SIGNAGE LOCATIONS IN LABS, INCLUDING BUT NOT LIMITED TO WELLFIELD AND NON-POTABLE WATER. EMERGENCY SHOWER AND EYE WASH SIGNAGE MAY BE NOTED AND WILL BE PROVIDED AS PART OF THE SHOWER PACKAGE. COORDINATE FINAL LOCATIONS AND ALL TYPES WITH THE OWNER.
10. PROVIDE FLAG STYLE SIGNAGE AT ALL FIRE EXTINGUISHER LOCATIONS. SIGN TO BE CENTERED ABOVE CABINET WITH BOTTOM OF SIGN AT 80" ABOVE FINISHED FLOOR.
11. PROVIDE SIGNAGE AT ALL DEFIBRILLATOR LOCATIONS. SIGNAGE TO BE CENTERED ABOVE CABINET WITH BOTTOM OF SIGN 4" ABOVE TOP OF CABINET.
12. COORDINATE WELLFIELD SIGNAGE CONTENT WITH OWNER AND APPROPRIATE GOVERNING AGENCIES. SIGNAGE PLANS INDICATE LOCATION ONLY.
13. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL SIGNAGE WITHIN LABS.
14. COORDINATE ALL SIGNAGE LOCATED AT BUILDING ENTRIES / VESTIBULES WITH OWNER FOR CORRECT TYPE AND PLACEMENT. SIGNAGE NOTED ON PLANS IN THESE LOCATIONS IS FOR REFERENCE ONLY.

INTERIOR SIGNAGE TYPE KEY

SIGN TYPE	DESCRIPTION
A	ROOM ID
B	ROOM ID
B1	STAIR
C2	ACCESSIBLE RESTROOM - MEN
C4	ACCESSIBLE RESTROOM - WOMEN
C6	ACCESSIBLE RESTROOM - NON-GENDER
D1	INFORMATIONAL
F	MAX OCCUPANCY
G	STAIRWELL
G1	STAIR EXIT
J	NO SMOKING
K	DIRECTIONAL
N	ELEVATOR CAB
O	LAB SAFETY
P	FIRE EXTINGUISHER
Q	BRANDING / IU TRIDENT
R	ENVIRONMENTAL GRAPHICS (SHOWN FOR REFERENCE ONLY)
RS	ROOM SCHEDULER (SHOWN FOR REFERENCE ONLY)
S	LEED BUILDING PLAQUE (SHOWN FOR REFERENCE ONLY)
T	ARTWORK (SHOWN FOR REFERENCE ONLY)
U	DEFIBRILLATOR
V	NON POTABLE WATER
W	WELLFIELD



1 IF911 INTERIOR SIGNAGE PLAN - LEVEL 1 - COMPOSITE
3/32" = 1'-0"



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
3	04/27/2026	BP4-CD: ADDENDUM 02
2	04/20/2026	BP4-CD: ADDENDUM 01
1	03/30/2026	BP4-CD: BUILD-OUT PACKAGE

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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

ANDREW JOHN LEVITT REGISTERED ARCHITECT No. AR10400213 STATE OF INDIANA

INTERIOR SIGNAGE PLAN - LEVEL 1

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

IF911

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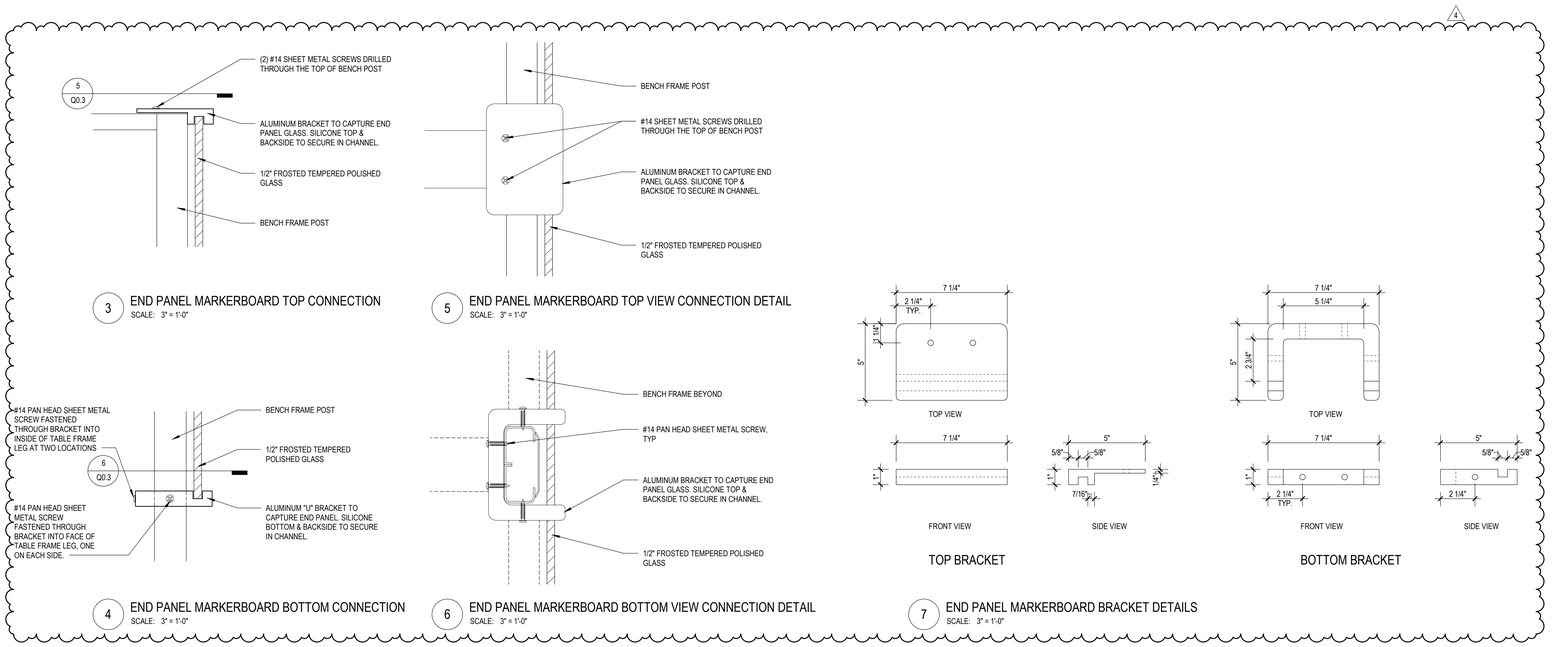


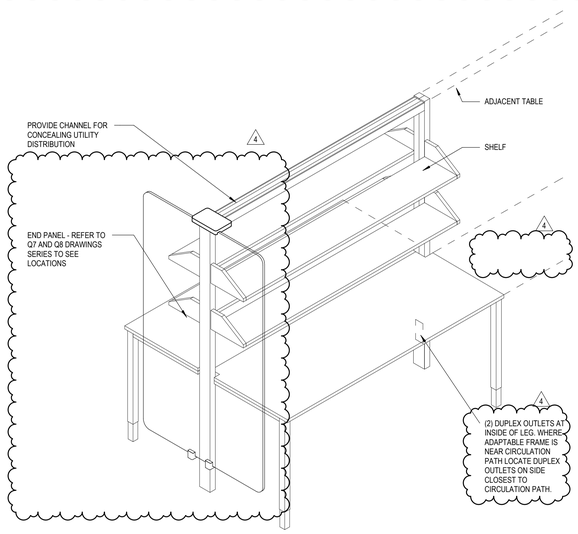
3 END PANEL MARKERBOARD TOP CONNECTION
SCALE: 3" = 1'-0"

5 END PANEL MARKERBOARD TOP VIEW CONNECTION DETAIL
SCALE: 3" = 1'-0"

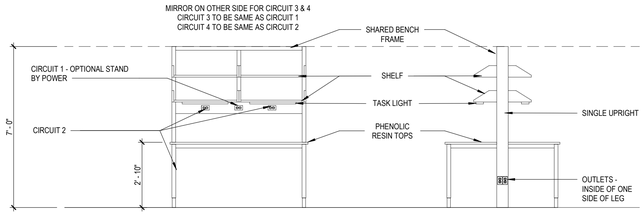
4 END PANEL MARKERBOARD BOTTOM CONNECTION
SCALE: 3" = 1'-0"

6 END PANEL MARKERBOARD BOTTOM VIEW CONNECTION DETAIL
SCALE: 3" = 1'-0"

7 END PANEL MARKERBOARD BRACKET DETAILS
SCALE: 3" = 1'-0"



2 DETAIL - ADAPTABLE LABORATORY CASEWORK SYSTEM
SCALE: 3/4" = 1'-0"

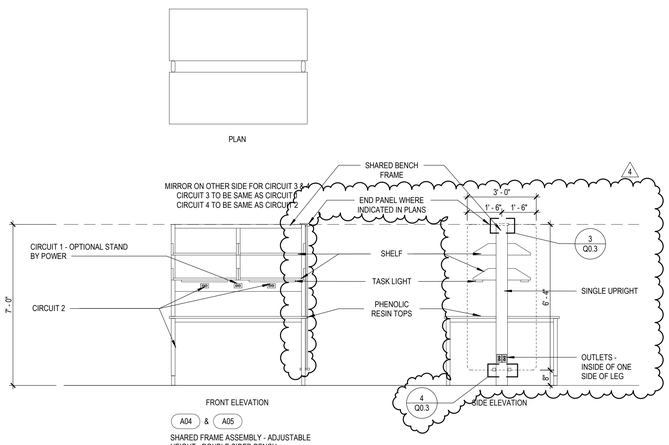


PLAN

FRONT ELEVATION | SIDE ELEVATION

A06 & A07

SHARED FRAME ASSEMBLY - ADJUSTABLE HEIGHT - DOUBLE SIDED BENCH

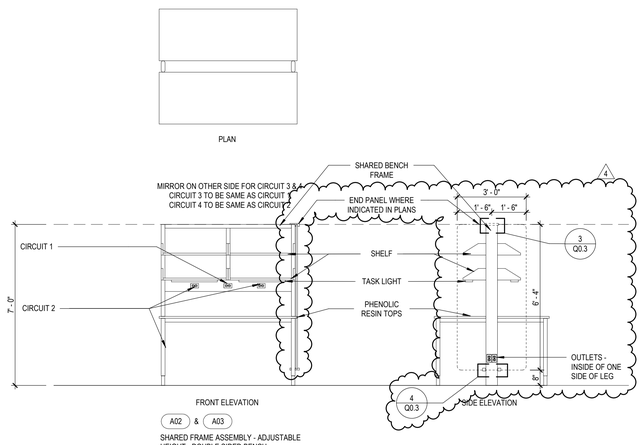


PLAN

FRONT ELEVATION | SIDE ELEVATION

A04 & A05

SHARED FRAME ASSEMBLY - ADJUSTABLE HEIGHT - DOUBLE SIDED BENCH

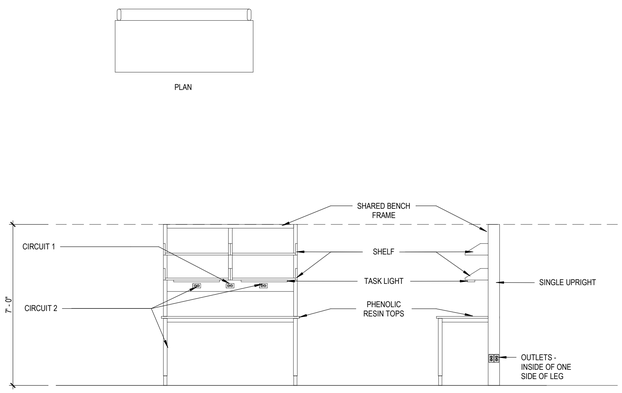


PLAN

FRONT ELEVATION | SIDE ELEVATION

A02 & A03

SHARED FRAME ASSEMBLY - ADJUSTABLE HEIGHT - DOUBLE SIDED BENCH



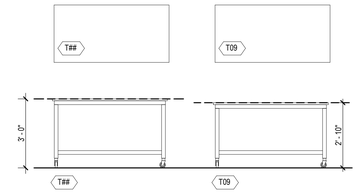
FRONT ELEVATION | SIDE ELEVATION

A01

SHARED FRAME ASSEMBLY - ADJUSTABLE HEIGHT - SINGLE SIDED BENCH

TABLE SCHEDULE

T## TAG	W	D	H	TOP MATERIAL	FRAME MATERIAL	DESCRIPTION
T01	6' - 0"	2' - 6"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T02	5' - 0"	2' - 6"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T03	4' - 0"	2' - 6"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T04	6' - 0"	2' - 3"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T05	4' - 0"	2' - 3"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T06	5' - 0"	2' - 3"	3' - 0"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T07	5' - 0"	2' - 6"	3' - 0"	BUTCHER BLOCK	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T08	6' - 0"	2' - 6"	3' - 0"	BUTCHER BLOCK	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE
T09	5' - 0"	2' - 6"	2' - 10"	PHENOLIC RESIN	POWDER COATED STEEL	ADJUSTABLE HEIGHT TABLE



NOTE:
ALL TABLES TO HAVE SIDE & BACK STRETCHERS

ASSEMBLY SCHEDULE

TAG	W	D	HEIGHT TO THE TOP OF WORKSURFACE	DESCRIPTION
A01	6' - 0"	2' - 6"	3' - 0"	SINGLE SIDED BENCH
A02	5' - 0"	2' - 6"	3' - 0"	DOUBLE SIDED BENCH
A03	6' - 0"	2' - 6"	3' - 0"	DOUBLE SIDED BENCH
A04	6' - 0"	2' - 6"	3' - 0"	DOUBLE SIDED BENCH
A05	5' - 0"	2' - 6"	3' - 0"	DOUBLE SIDED BENCH
A06	6' - 0"	2' - 6"	2' - 10"	DOUBLE SIDED BENCH
A07	5' - 0"	2' - 6"	2' - 10"	DOUBLE SIDED BENCH

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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	04/27/2026	BP4-CD: ADDENDUM 02
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 SCHEDULES

DATE

BSA PROJECT NO. 00360481

Q0.3

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Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/LAB-20250073-ADL&D_R24.rvt

FUME HOOD SCHEDULE (FH-#-#) - CFCI

TAG	ROOM NAME	ROOM NUMBER	DESCRIPTION	WIDTH	DEPTH	MOUNTING	LA	LV	CW	MAX SASH HEIGHT	NO. OF VERTICAL PANELS	NO. OF HORIZONTAL PANELS	HORIZONTAL PANEL WIDTH (INCHES)	NO. OF HORIZONTAL TRACKS	DESIGN SASH OPENING	FACE VELOCITY (FPM)	NO. OF HOOD COLLAR CONNECTIONS	HOOD COLLAR	EXHAUST TRANSITION DUCT SIZE	ENCLOSURE PANEL	COMMENTS
FH-1-6																					
FH-1-6	INSTRUCTIONAL LAB SPACE	103	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	INSTRUCTIONAL LAB SPACE	103	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	INSTRUCTIONAL LAB SPACE	103	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	CHEM WASTE	127	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	227C	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	227H	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	327	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	527	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6	WET LAB	527	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6A																					
FH-1-6A	INSTRUCTIONAL LAB SPACE	103	6LF Fumehood - Accessible	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6A	ELECTRONICS AND SENSORS STUDIO	106	6LF Fumehood - Accessible	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6A	WET LAB	327	6LF Fumehood - Accessible	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e																					
FH-1-6e	ADVANCED WET LAB	108A	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	327	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FH-1-6e	WET LAB	427	Benchtop Chemical	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	Yes	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6																					
FUTURE FH-1-6	INSTRUCTIONAL LAB SPACE	103	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	ADVANCED WET LAB	108A	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	SUPPORT	108B	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	SUPPORT	118A	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	227G	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	227M	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	327	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	327	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	327	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	427	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	527	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	527	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH
FUTURE FH-1-6	WET LAB	527	Benchtop Chemical - Future	6' - 0"	3' - 3"	Bench	Yes	Yes	Yes	2' - 4 1/2"	1	4	15.75	2	18"	80	1	3" X 36"	0' - 10"	---	BOD: MOTT RFV2 BENCH - COMBINATION SASH

FUME HOOD TYPE SYMBOL

FH - 1 - 4 Ae

- FUME HOOD IDENTIFICATION
- TYPE DESIGNATION
  1 = BENCHTOP CHEMICAL
  2 = TEACHING / OBSERVATION
  3 = DEMONSTRATION / DOUBLE-SIDED
  4 = FLOOR-MOUNTED
  5 = DISTILLATION
  6 = SPECIALTY / RADIOISOTOPE
  7 = SPECIALTY / PERCHLORIC ACID
  8 = SPECIALTY / POLYPROPYLENE
  9 = SPECIALTY / HYDROCHLORIC-HYDROFLUORIC ACID
- ENCLOSURE PANEL (WHEN NOTED)
- ACCESSIBLE TAG (WHEN NOTED)
- WIDTH DESIGNATION (EXAMPLE: 4 = 4 FEET)

EXAMPLE: **FH-1-4A**
FUME HOOD
BENCHTOP CHEMICAL
4'-0" IN WIDTH
ACCESSIBLE

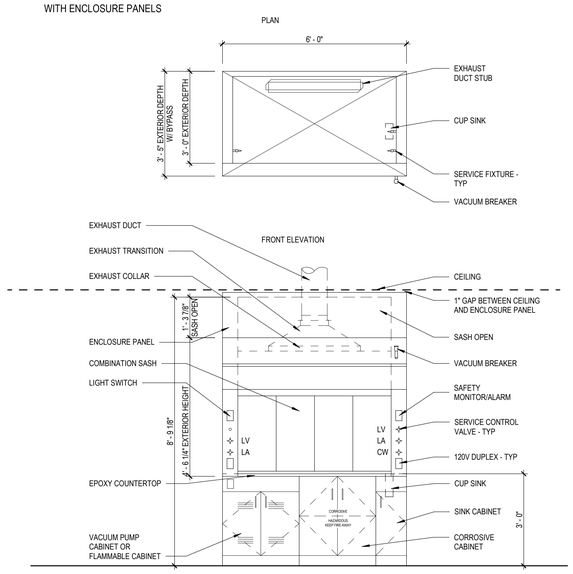
FUME HOOD EXHAUST

EXHAUST SYSTEM CAPACITY FOR FUME HOODS IS DESIGNED FOR A MAXIMUM OF (43) 6' FUME HOODS @ 720CFM PER FUME HOOD. FUTURE FUME HOODS INDICATED IN SCHEDULE AND PLANS ARE LOCATED BASED ON CLIENT FEEDBACK. FINAL SIZES, LOCATIONS, AND NUMBER OF FUTURE FUME HOODS TBD BY REMAINING EXHAUST SYSTEM CAPACITY AFTER DAY ONE FUME HOODS HAVE BEEN ACCOUNTED FOR. SIZE AND NUMBER OF FUTURE FUME HOODS SHALL NOT EXCEED EXHAUST SYSTEM CAPABILITIES.

FUME HOOD LEGEND

NOTE: REFER TO Q0.2 CASEWORK LEGEND, Q2 SERIES ENLARGED PLANS, AND Q8 SERIES ELEVATIONS FOR BASE CABINET TYPES AND LABELS

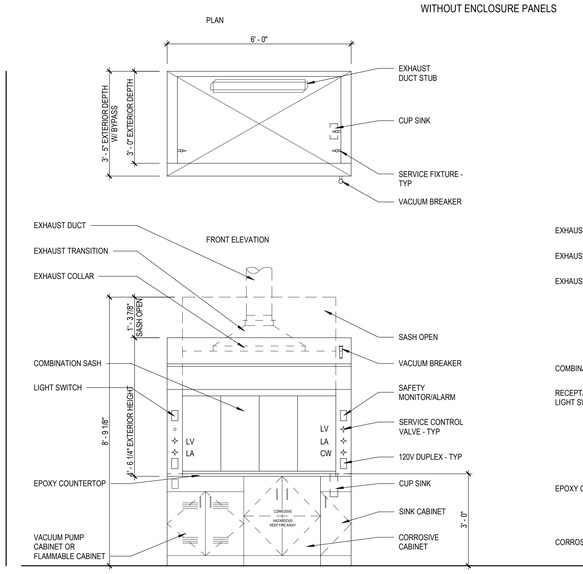
WITH ENCLOSURE PANELS



FH-1-6p
6FT STANDARD BENCH MOUNTED FUME HOOD, COMBINATION SASH, WITH BASE CABINETS

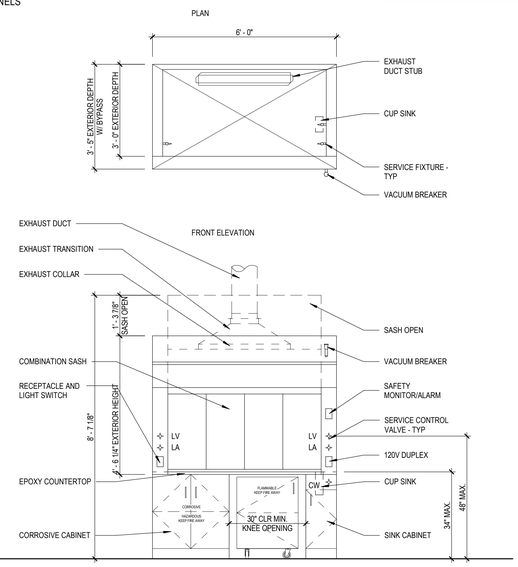
FLAMMABLE CABINET LOCATED ADJACENT TO FUME HOOD

WITHOUT ENCLOSURE PANELS



FH-1-6
6FT STANDARD BENCH MOUNTED FUME HOOD, COMBINATION SASH, WITH BASE CABINETS, NO ENCLOSURE PANELS

FLAMMABLE CABINET LOCATED ADJACENT TO FUME HOOD



FH-1-6A
6FT STANDARD BENCH MOUNTED FUME HOOD - ACCESSIBLE, COMBINATION SASH, WITH BASE CABINETS, NO ENCLOSURE PANELS

VACUUM PUMP CABINET LOCATED ADJACENT TO FUME HOOD

CONTROLLED ENVIRONEMNTAL ROOM SCHEDULE - (CER-##)

TAG	ROOM NAME	ROOM NUMBER	EXTERIOR WIDTH	EXTERIOR DEPTH	EXTERIOR HEIGHT	TEMP. & TOLERANCE (°C)	DOOR OPEN PER 24-RH (DOOR X)	NO. PEOPLE WORKING	EQUIP WATT/SF	LIGHTS WATT/SF	BMS CONNECTION	COMPRESSOR / CONDENSER				CONTROL PANEL					STAND BY POWER	COMMENTS
												VOLTAGE	PHASE	AMERAGE	kVA	VOLTAGE	PHASE	AMPERAGE	kVA	DATA		
CER-1	ENVIRO RM	527G	10' - 0"	14' - 4"	10' - 0"	4° C, ±2° C		0				208	3			120/208	3				Yes	BOD MANUFACTURER: ENVIRONMENTAL GROWTH CHAMBERS. CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE.
CER-2	ENVIRO RM	227K	10' - 0"	22' - 4"	10' - 0"	-4° C, ±2° C		0				208	3			120/208	3				Yes	BOD MANUFACTURER: ENVIRONMENTAL GROWTH CHAMBERS. CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE.

4

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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
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NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

EQUIPMENT SCHEDULES

DATE

BSA PROJECT NO. 00360481

Q1.1

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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. CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE. 5

LAB EQUIPMENT SCHEDULE - MQ-CFCI

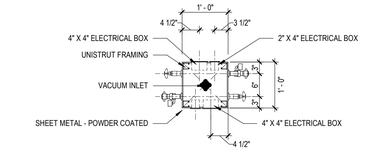
EQ NUMBER	DESCRIPTION	BOD MANUFACTURER	BOD MODEL	WIDTH	DEPTH	HEIGHT	UNIT WEIGHT	MOUNTING	VOLTAGE (VAC)	WATTS / AMPS	POWER PHASE	DEDICATED CIRCUIT	NEMA	STAND-BY POWER	UPS	DATA	ELECTRICAL NOTES	LAB AIR (LA)	LAB VAC (LV)	SPECIALTY GASES	SPECIALTY GAS NOTES	CW	HW	DI/RO WATER	DRAIN	PLUMBING NOTES	EXHAUST (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	--	CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE. 5
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	--	CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE.
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	--	CONTRACTOR TO PROVIDE BREAKOUT PRICE TO PROVIDE AND INSTALL THIS EQUIPMENT WITHIN THE BASE BID SCOPE.

OVERHEAD SERVICE COLUMNS

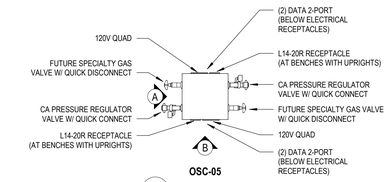
(OSC) OVERHEAD SERVICE COLUMN SCHEDULE

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

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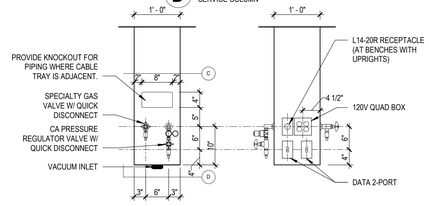
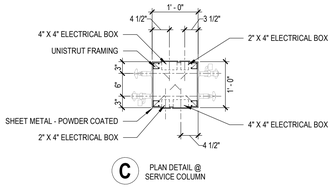


ELEVATION A ELEVATION B



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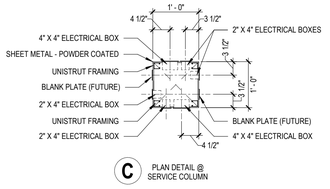

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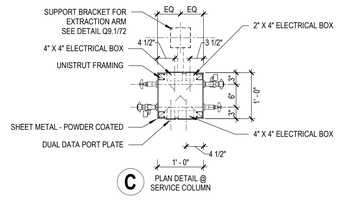

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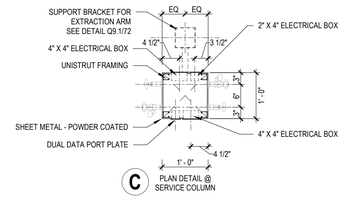

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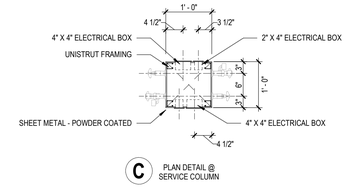

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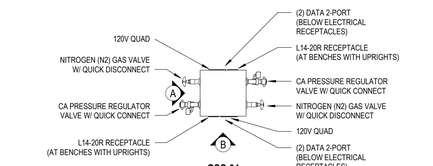

OSC-04

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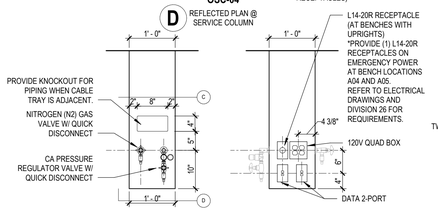

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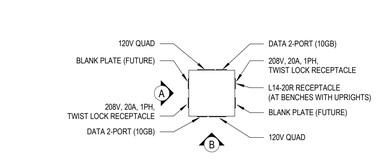

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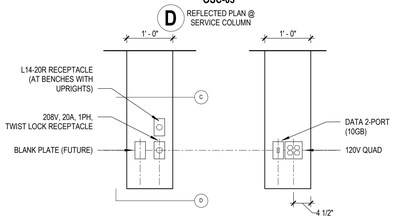

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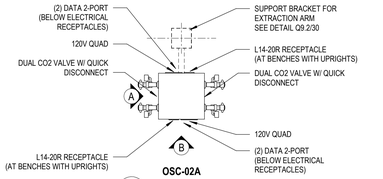

OSC-02A

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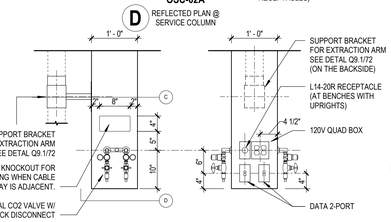

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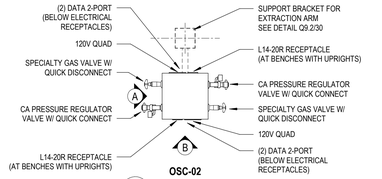

OSC-02

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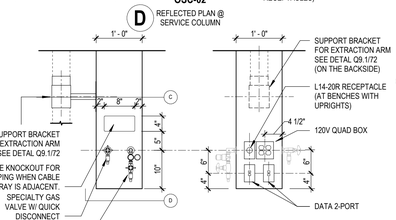

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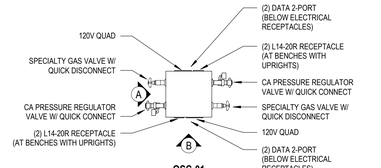

OSC-01

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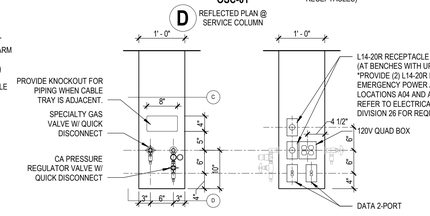

ELEVATION A ELEVATION B

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

EQUIPMENT SCHEDULES

DATE

BSA PROJECT NO. 00360481

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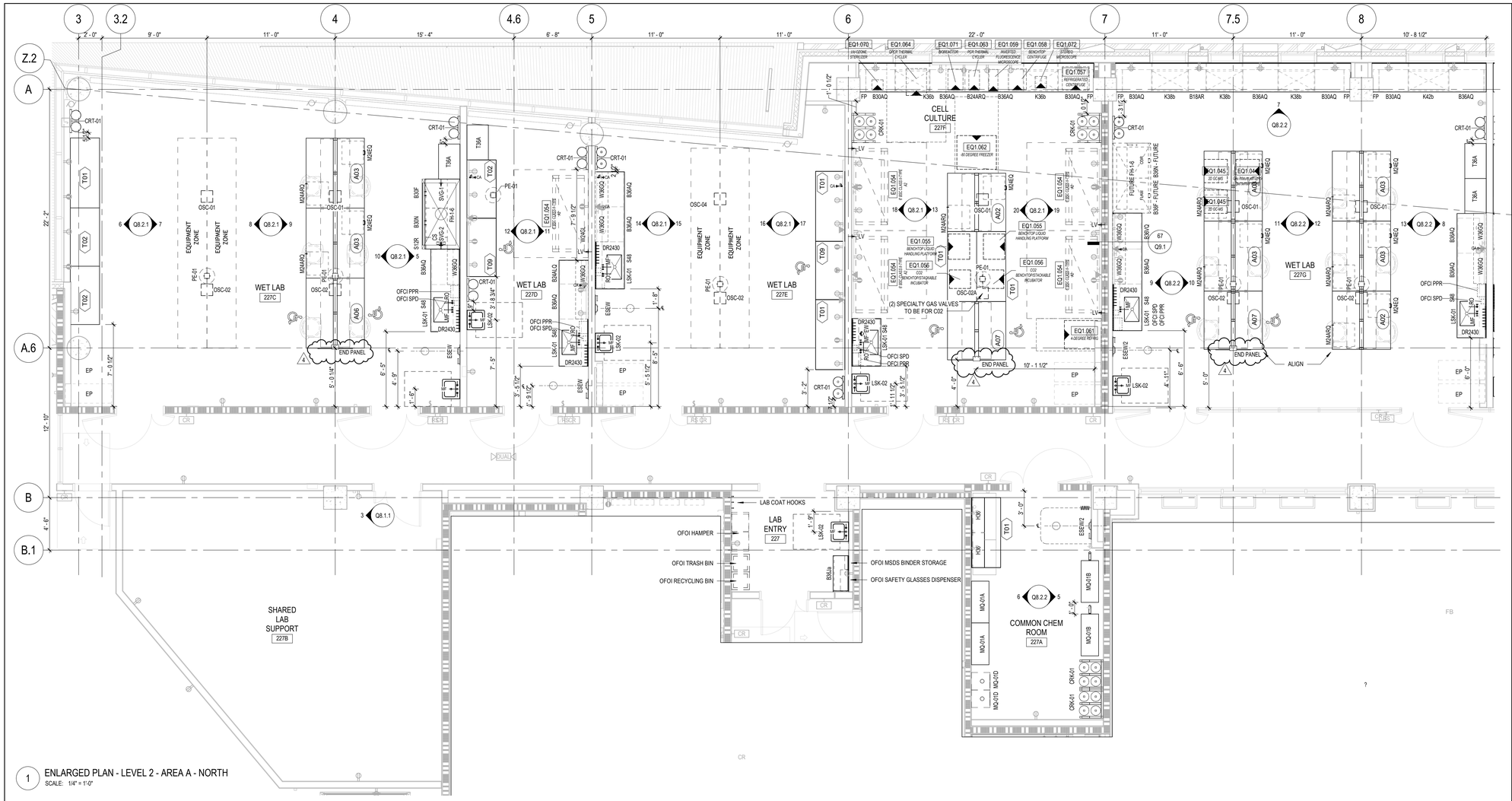
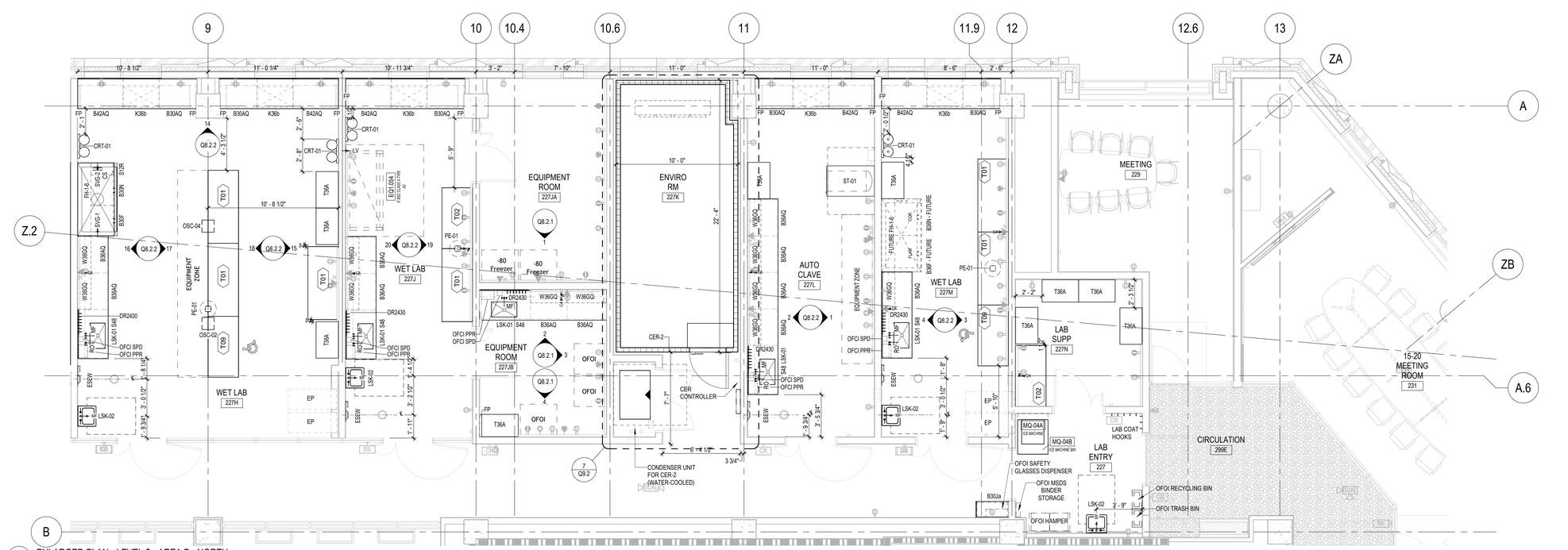


1 ENLARGED PLAN - LEVEL 2 - AREA A - NORTH
SCALE: 1/4" = 1'-0"



2 ENLARGED PLAN - LEVEL 2 - AREA B - NORTH
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.

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.

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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

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NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

LEVEL 2 - ENLARGED PLAN

DATE

BSA PROJECT NO. 00360481

Q7.2.1

GRAPHIC SCALE: 1/4" = 1'-0"

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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.

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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.

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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AREA A | AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
5	04/27/2026	BP4-CD: ADDENDUM 02
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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LEVEL 3 - ENLARGED PLAN

DATE

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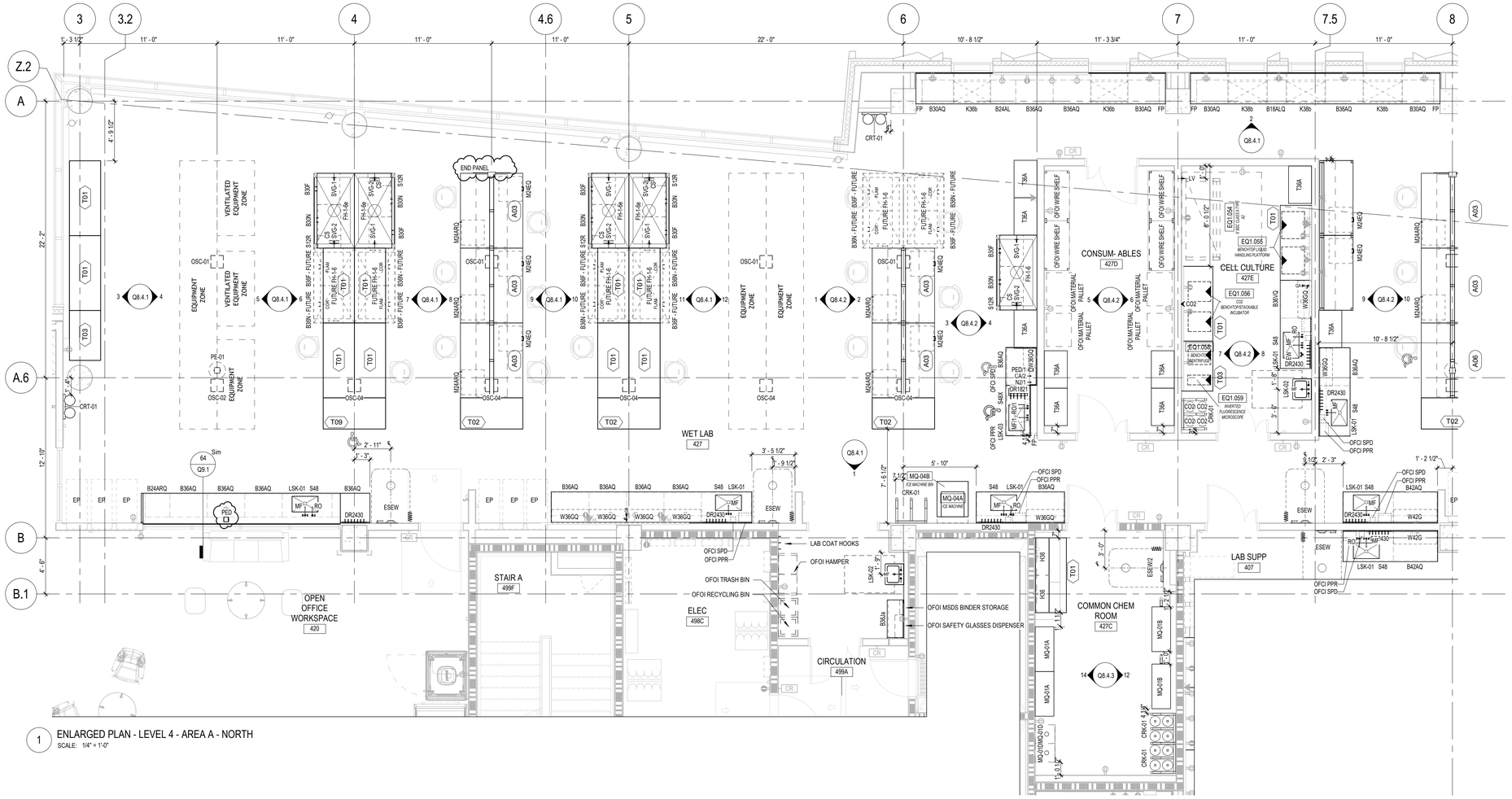
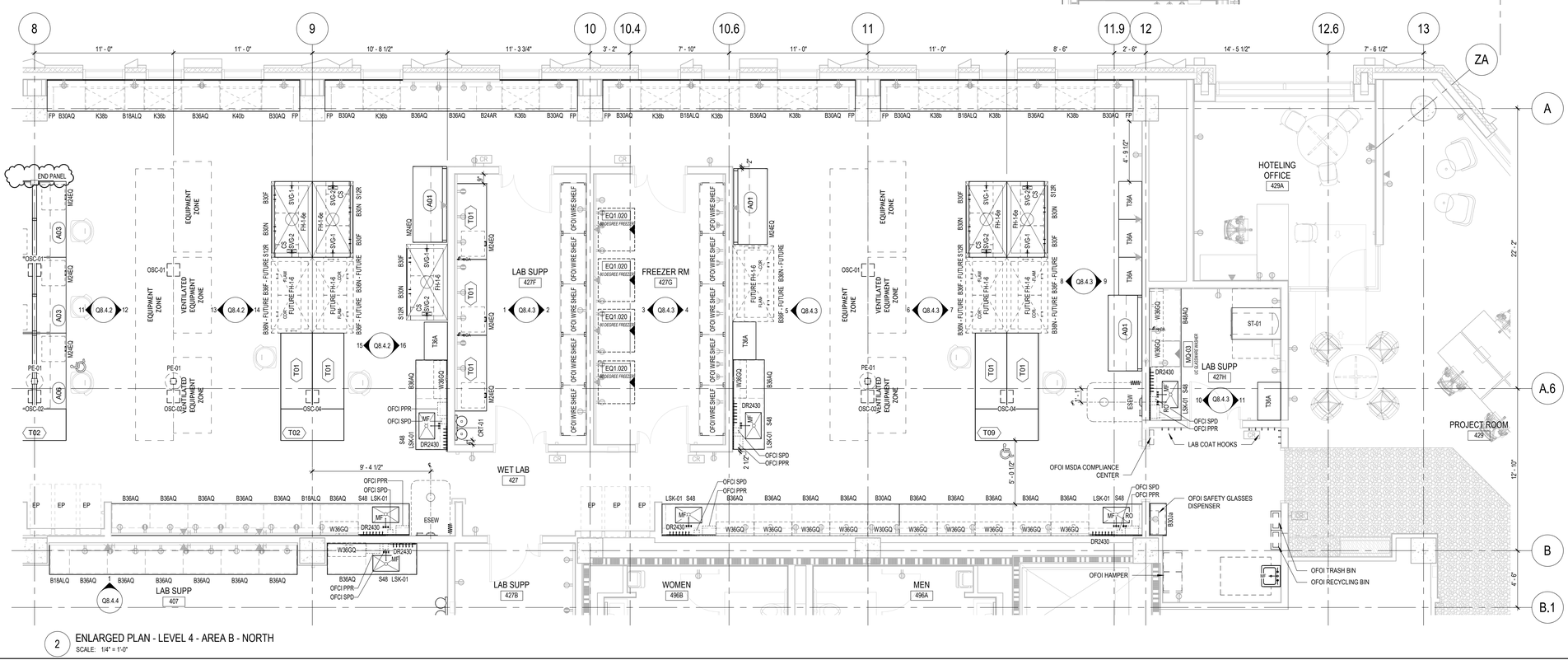


1 ENLARGED PLAN - LEVEL 4 - AREA A - NORTH
SCALE: 1/4" = 1'-0"



2 ENLARGED PLAN - LEVEL 4 - AREA B - NORTH
SCALE: 1/4" = 1'-0"

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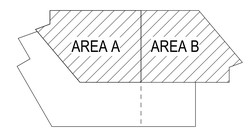

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REGISTERED
No. AR12500214
STATE OF
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ARCHITECT
Nicole Taylor

LEVEL 4 - ENLARGED PLAN

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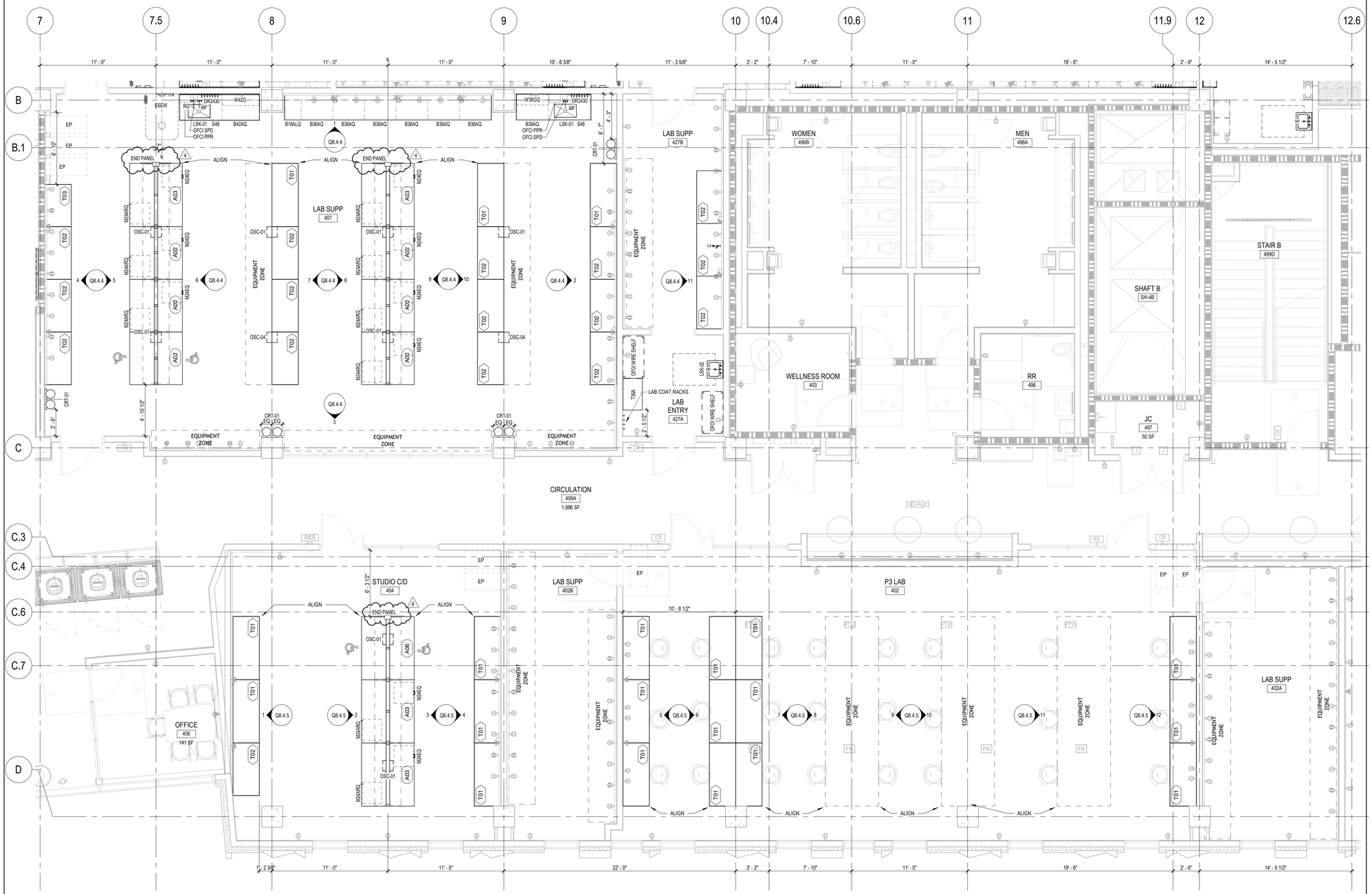

1 ENLARGED PLAN - LEVEL 4 - AREA B - SOUTH
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GRAPHIC SCALE: 1/4" = 1'-0"

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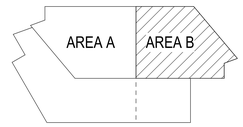

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ARCHITECT

LEVEL 4 - ENLARGED PLAN

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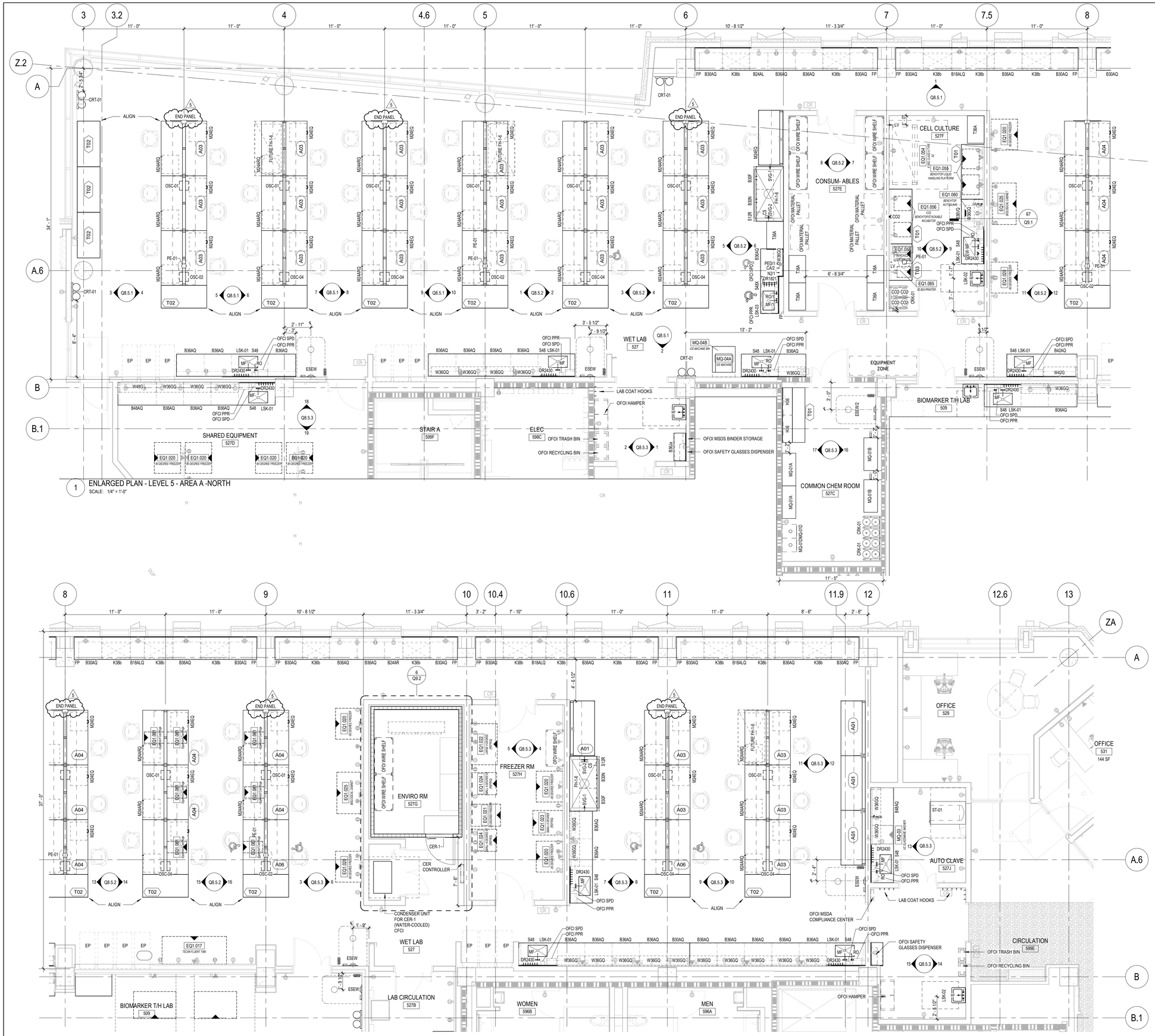

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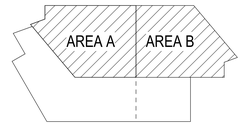

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NICOLLE TAYLOR REGISTERED No. AR12500214 STATE OF INDIANA ARCHITECT

LEVEL 5 - ENLARGED PLAN

DATE

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Q7.5.1

4' 2' 0' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

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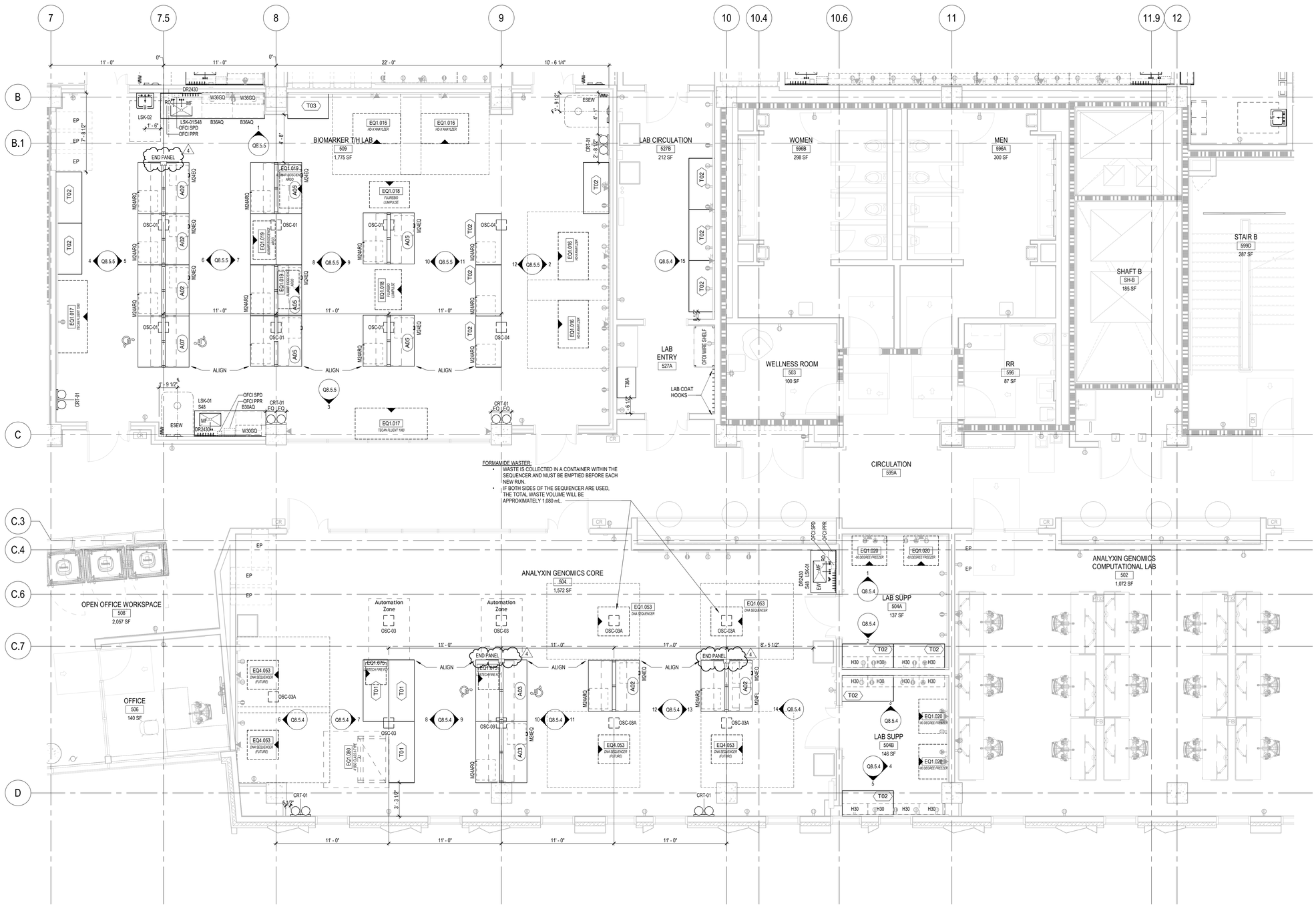

1 ENLARGED PLAN - LEVEL 5 - AREA B - SOUTH
SCALE: 1/4" = 1'-0"

GRAPHIC SCALE: 1/4" = 1'-0"

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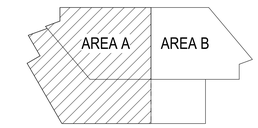

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LEVEL 5 - ENLARGED PLAN

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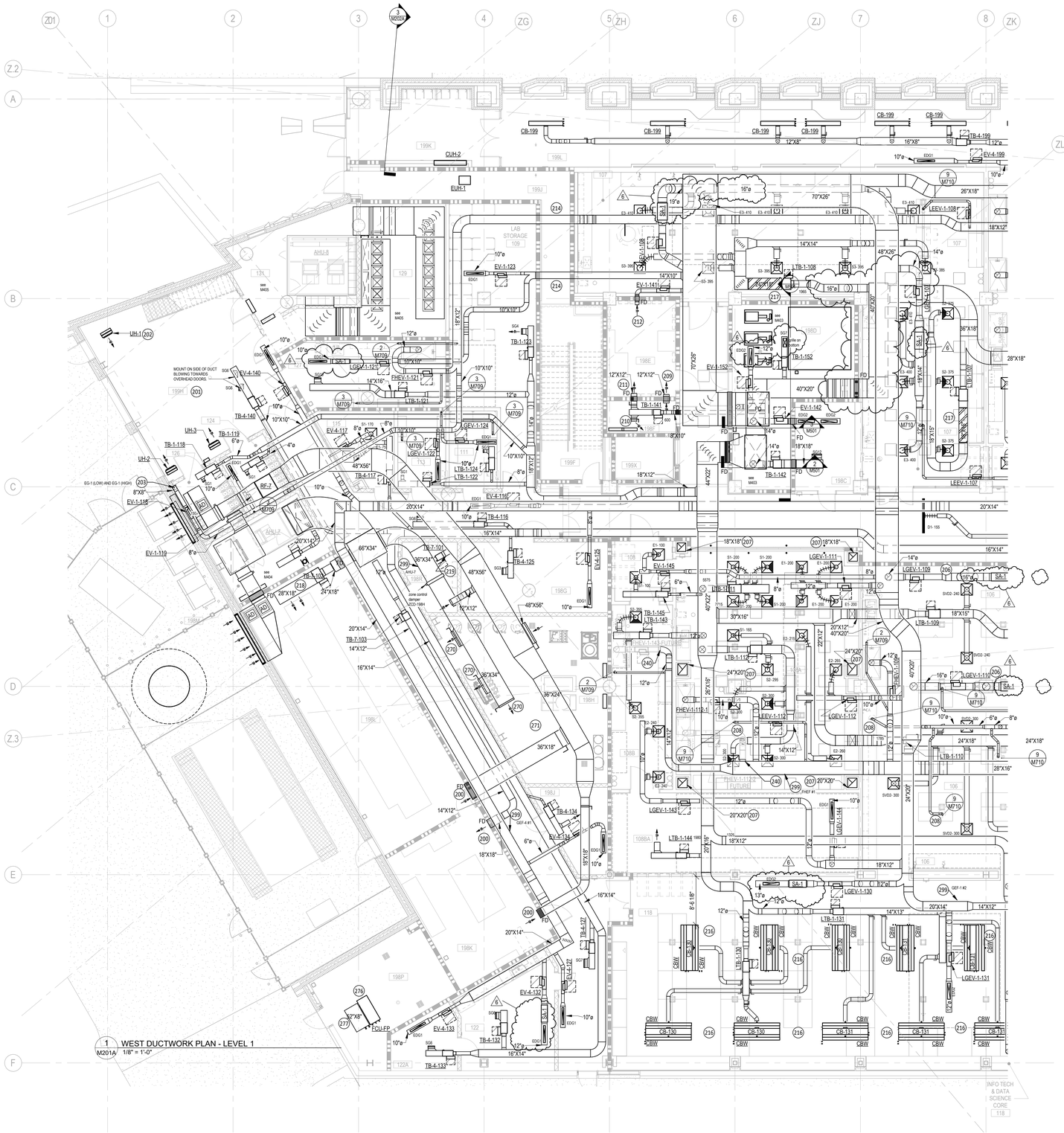

X00	PLAN NOTES
200	TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER IS VISIBLE FROM INSIDE THE ELECTRICAL ROOM. PROVIDE ACCESS DOOR IN DUCT ON THE HALLWAY SIDE OF THE WALL EVEN IF THE LINKS ARE LOCATED ON THE ELECTRICAL ROOM SIDE.
201	PROVIDE CLEAR ACCESS SPACE PER THE 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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CUMULATIVE DOCUMENTS

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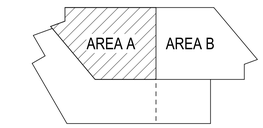

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



DUCTWORK PLAN - LEVEL 1 - AREA A

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

M201A

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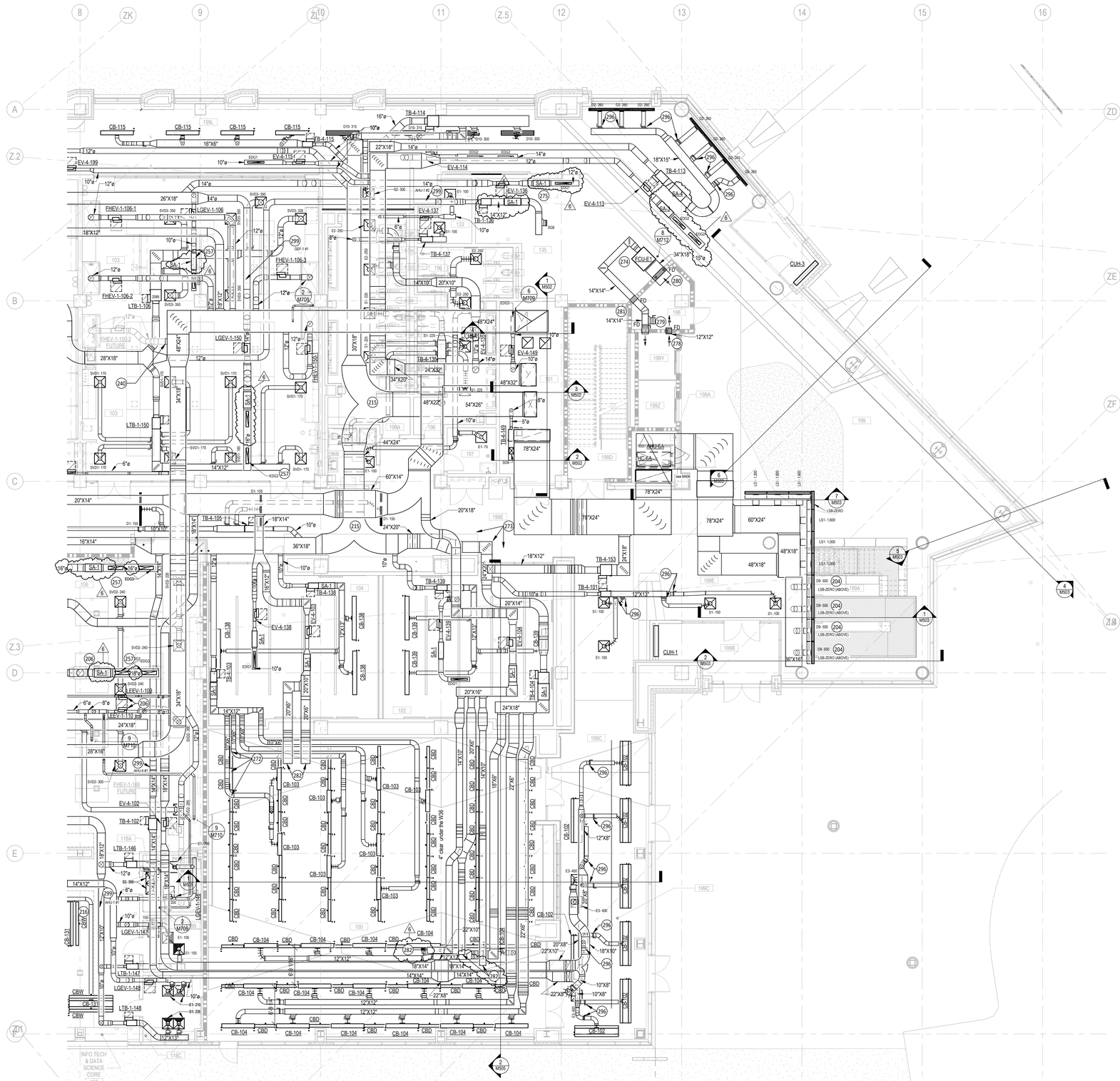

1 M201B EAST DUCTWORK PLAN - LEVEL 1
1/8" = 1'-0"

X00	PLAN NOTES
204	ORIENT ALL FOUR LS1 SLOTS TO DISCHARGE HORIZONTALLY TOWARD THE STAIR LANDING. THE LSB ABOVE (IN LINE WITH THE OTHER ACTIVE LSB) DO NOT DISCHARGE AIR.
206	DUCTWORK ROUTED SUCH THAT TERMINAL BOX/AFCV IS MAXIMUM 3' ABOVE CEILING. MAINTAIN DUCT ROUTING AS SHOWN FOR ACCESS TO TERMINAL BOX/AFCV.
215	CONSTRUCT FITTING WITH BOTH DISCHARGE SIZES THE SAME SIZE AS THE INLET SIZE.
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
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.
257	EDG'S IN THIS SPACE TO BE LOCATED 14" AFF.
272	PROVIDE A SHEETMETAL BLANKING PLATE ON THIS CBD THAT IS SCREW ATTACHED TO THE DIFFUSER.
273	SEE CONTRACTUAL REQUIREMENTS TO NOT PENETRATE WOOD WALL ON SHEET A131B.
274	PROVIDE CLEAR ACCESS SPACE BELOW ALL INSTALLATIONS RELATED TO THIS FCU IN THIS SHELL SPACE OF NO LOWER THAN 10'-6" AFF. MOUNT BOTTOM OF FCU NO HIGHER THAN 11'-0" AFF.
275	PROVIDE CLEAR ACCESS SPACE BELOW ALL INSTALLATIONS RELATED TO THIS TB AND EV IN THIS SHELL SPACE OF NO LOWER THAN 10'-6" AFF. MOUNT BOTTOM OF TB AND EV NO HIGHER THAN 11'-0" AFF.
278	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.
279	BALANCE TO ACHIEVE 800 CFM AT MAX AIRFLOW.
280	MOUNT TOP OF RETURN DUCT NO LOWER THAN 10'-6" AFF. TERMINATE DUCT ON INTERIOR SURFACE OF WALL. NO GRILLE ON END OF DUCT, FIRE DAMPER LINKS ARE VISIBLE FROM INSIDE THE CONTROLLER ROOM.
281	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.
282	CAP END OF DUCT AND CUT A 16"x20" LONG OPENING IN THE TOP OF THE DUCT.
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.

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

CUMULATIVE DOCUMENTS

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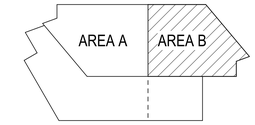

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PETER HOGAN LAWRENCE
REGISTERED
No.
PE19500446
STATE OF
INDIANA
PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 1 - AREA B

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

M201B

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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.

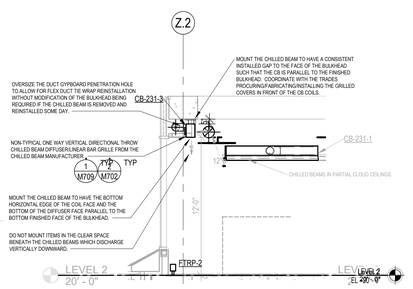
C. THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **10'-0"** A.F.F. (ABOVE THE FINISHED FLOOR) IN ALL SPACES **WHICH DO NOT HAVE ANY CEILINGS NOR ANY PARTIAL CEILINGS** WITHIN THAT SPACE UNLESS IT IS KEYNOTED AS REQUIRING A TALLER CLEAR ACCESS 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.

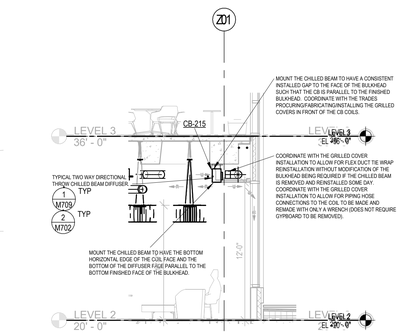
E. IN SPACES WHICH CONTAIN **MORE THAN ONE PARTIAL CEILING** SURFACE, THE CLEAR ACCESS SPACE TO BE PROVIDED SHALL EXTEND FROM THE FINISHED FLOOR TO A HEIGHT WHICH IS A MINIMUM OF **1" ABOVE THE HEIGHT OF THE LOWEST HORIZONTAL SURFACE PARTIAL CEILING** ("CLOUD" CEILING, "SPECIAL" CEILING, EXPOSED BULKHEAD 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.

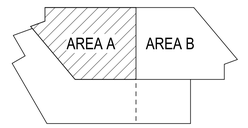
1 M202A WEST DUCTWORK PLAN - LEVEL 2
3/16" = 1'-0"



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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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

PETER VICAN LANZAFAME REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 2 - AREA A

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M202A

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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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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 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

ZF
AREA A
AREA B

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LAWSON
REGISTERED
No. PE19500446
STATE OF
PROFESSIONAL ENGINEERS

DUCTWORK PLAN - LEVEL 2 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M202B

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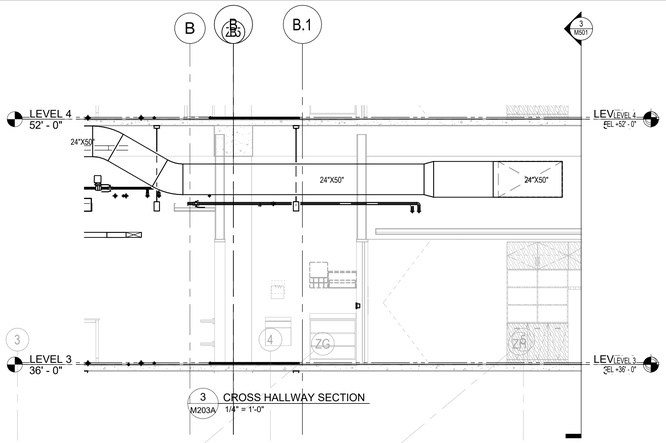
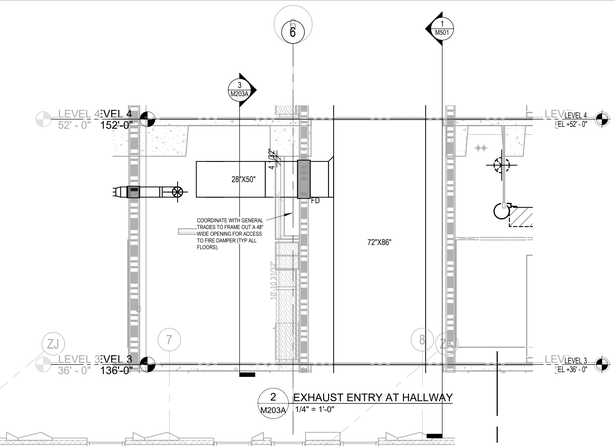
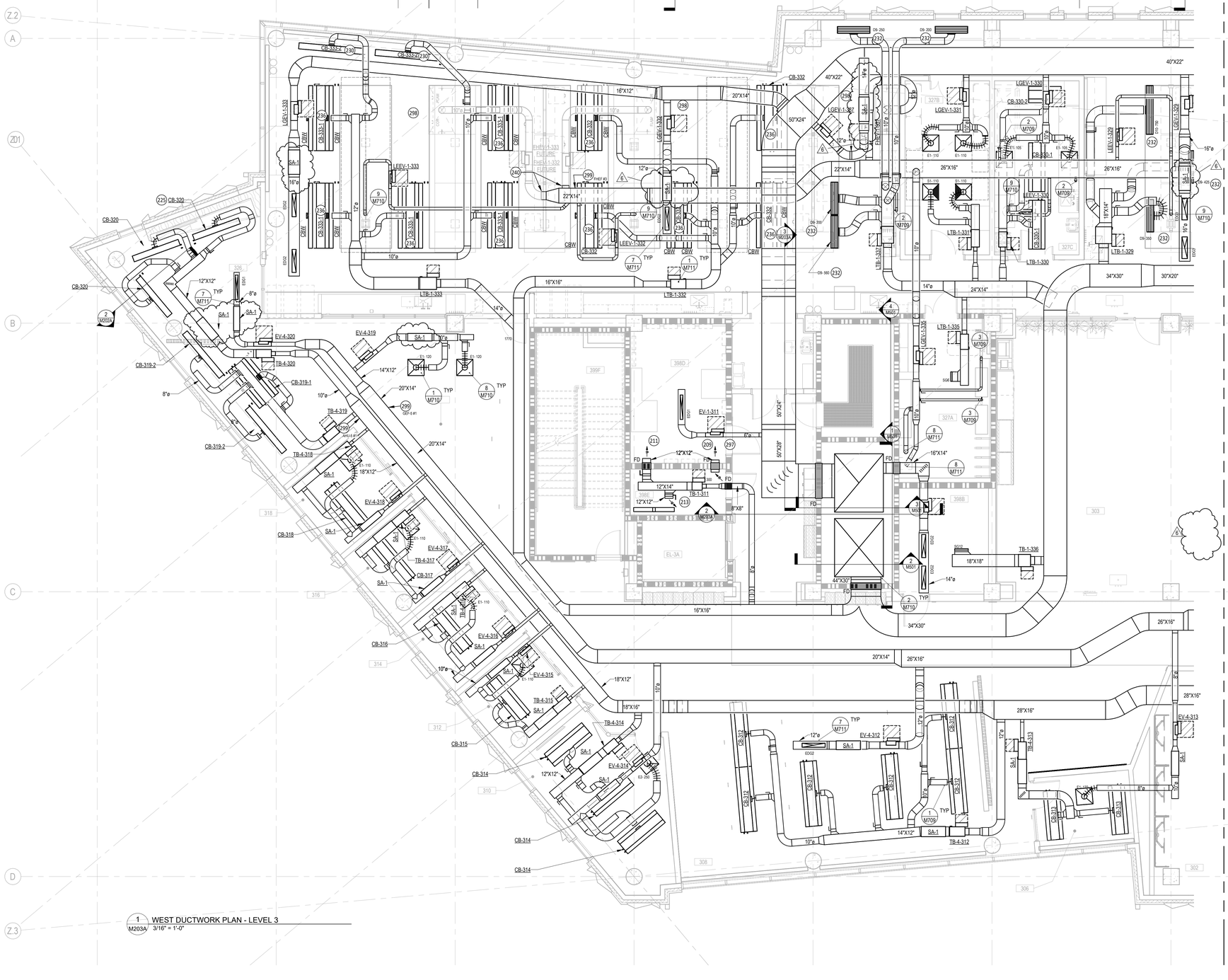


3 M203A CROSS HALLWAY SECTION 1/4" = 1'-0"



2 M203A EXHAUST ENTRY AT HALLWAY 1/4" = 1'-0"



X00	PLAN NOTES
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.

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.

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3/16" = 1'-0"

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

AREA A | AREA B

KEYPLAN
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REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 3 - AREA B

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BSA PROJECT NO. 00360481

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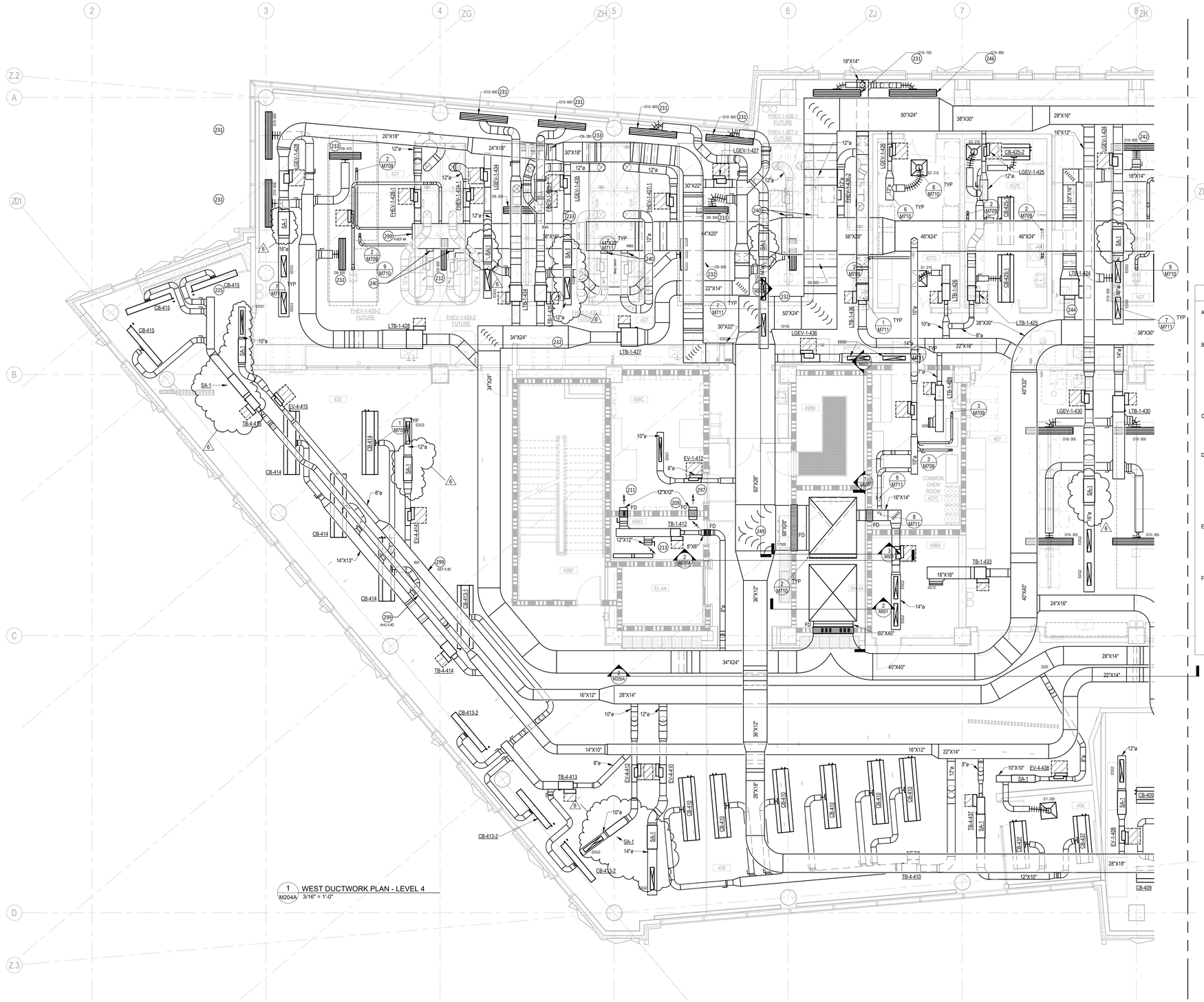
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X00	PLAN NOTES
232	ADJUST TWO SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION AND TWO SLOTS TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION.
233	ADJUST ALL FOUR SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY AWAY FROM THE EXTERIOR 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.
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.

X00	PLAN NOTES
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.
245	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY IN ONE DIRECTION OFF THE EDGE OF THE CLOUD CEILING AND ONE SLOT TO DISCHARGE HORIZONTALLY IN THE OPPOSITE DIRECTION ALONG THE CLOUD CEILING TOWARDS THE OVERHEAD SERVICE CARRIER.
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.
247	ADJUST ALL FOUR SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY TOWARD THE EXTERIOR GLASS.
248	ADJUST THREE SLOTS OF THIS DIFFUSER TO DISCHARGE HORIZONTALLY TOWARD THE EXTERIOR GLASS AND ONE SLOT TO DISCHARGE HORIZONTALLY TOWARD THE SIDE FACE OF THE FUME HOODS.
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.

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1 M204B EAST DUCTWORK PLAN - LEVEL 4
3/16" = 1'-0"

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INDIANAPOLIS, INDIANA

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AREA A | AREA B

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PETER VOGAN LAZARONI REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 4 - AREA B

DATE
BSA PROJECT NO. 00360481

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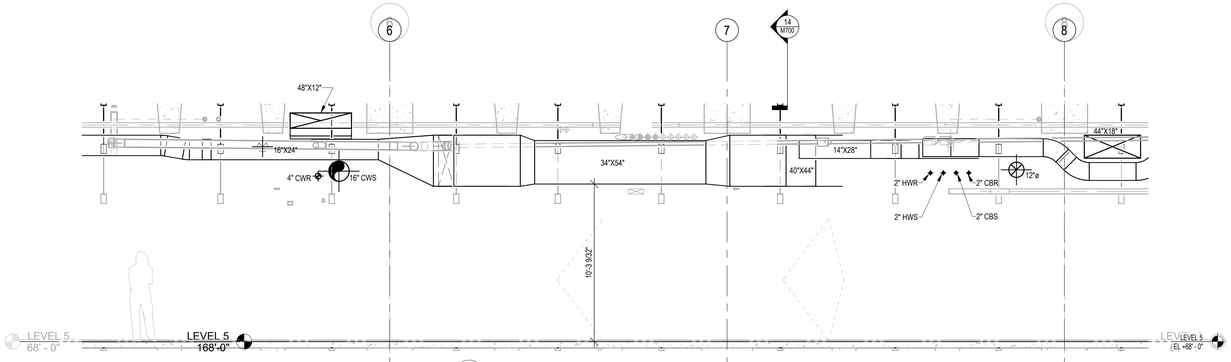
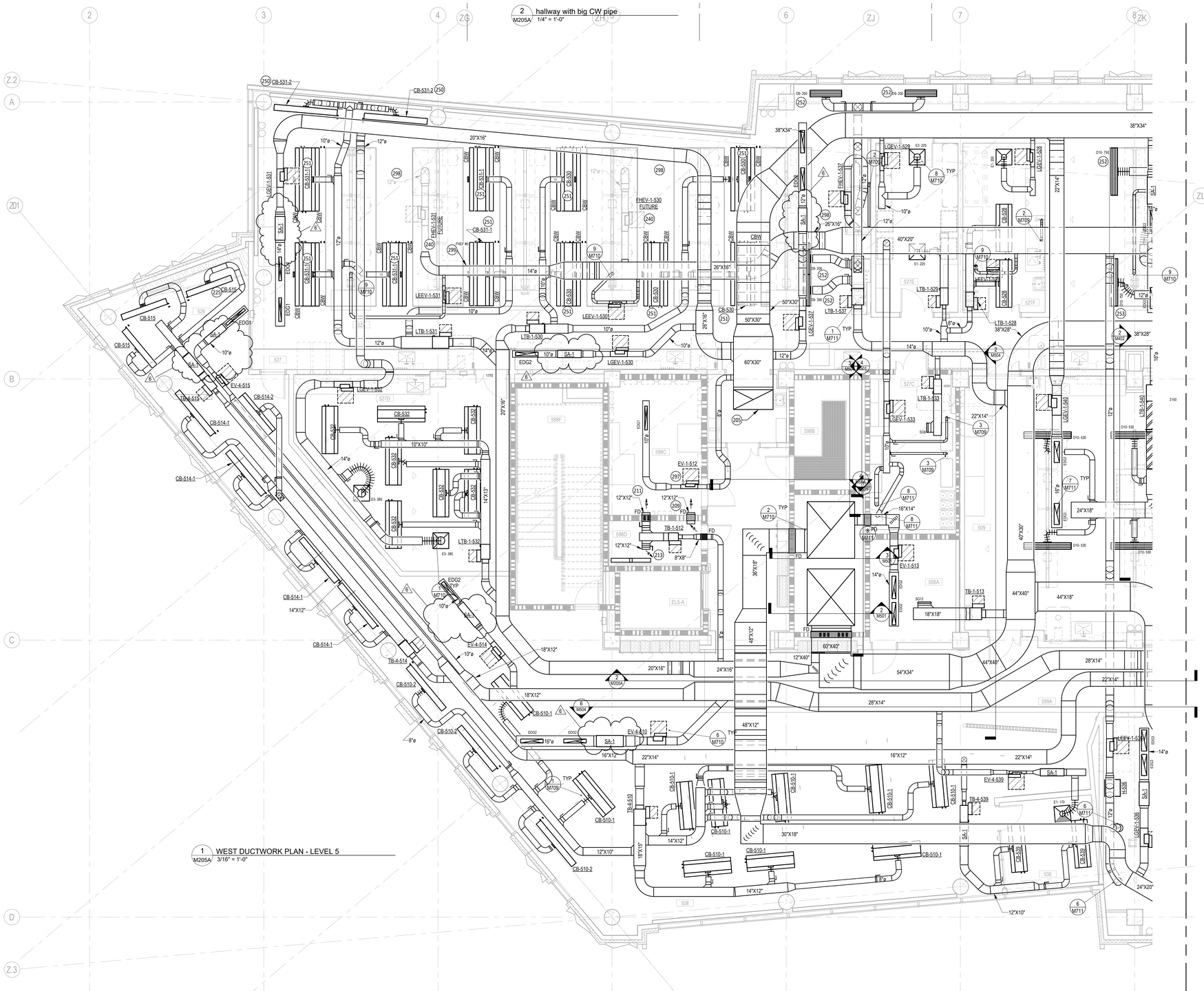


2 M205A hallway with big CW pipe
1/4" = 1'-0"



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 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.
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.

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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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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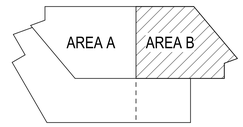

KEYPLAN
PROJECT NORTH
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ISSUED / REVISIONS SCHEDULE

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3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



DUCTWORK PLAN - LEVEL 5 - AREA A

DATE REF: SHEET INDEX

BSA PROJECT NO. 00360481

M205A

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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.

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.

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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.

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1 EAST DUCTWORK PLAN - LEVEL 5
M205B 3/16" = 1'-0"

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AREA A AREA B

KEYPLAN
PROJECT NORTH
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MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER KOJAN LANZANI
REGISTERED
No. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

DUCTWORK PLAN - LEVEL 5 - AREA B

DATE
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M205B

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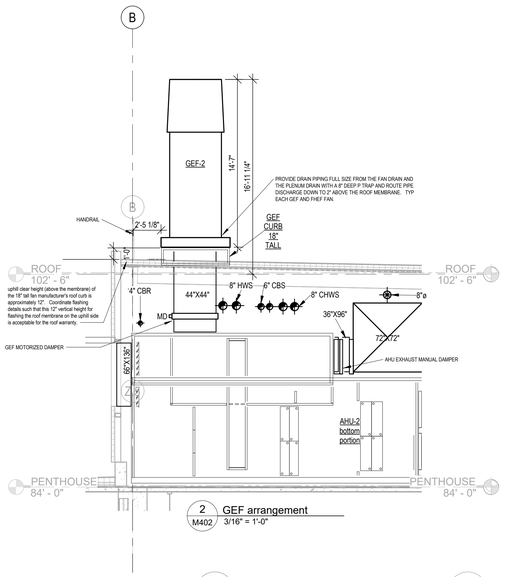
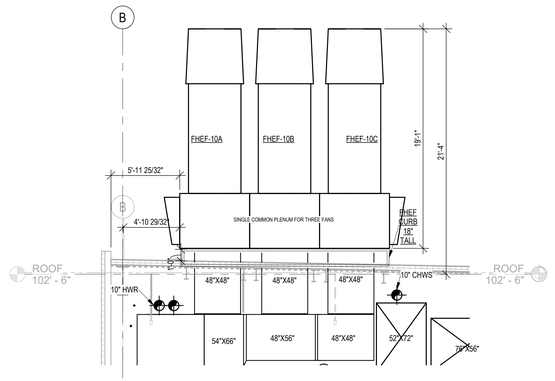


2 GEF arrangement
M402 3/16" = 1'-0"



3 FHEF section
M402 3/16" = 1'-0"

X00	PLAN NOTES
680	COORDINATE WITH ALL TRADES CONCERNING THE VAPOR MITIGATION PIPING AND SUPPORTS WHICH ROUTE UP THROUGH THE PENTHOUSE ROOF.
681	OA SRV VENT. 90 DEGREE ELBOW DOWN AT 3'-0" ABOVE THE ROOF MEMBRANE.
682	HB OA INTAKE. 90 DEGREE ELBOW OVER AND ELBOW DOWN (GOOSENECK) WITH TOP OF THE ELBOWS AT 4'-0" ABOVE THE ROOF MEMBRANE AND BOTTOM OF THE OPENING APPROX 2'-9" ABOVE THE ROOF MEMBRANE. PAINT THE ENTIRE INTAKE PIPE ASSEMBLY OFF-WHITE WITH RUSTOLEUM EPOXY MASTIC TWO PART HIGH SOLIDS COATING. TACKWELD A STAINLESS STEEL HARDWARE CLOTH WITH 1.0" SQUARE OPENINGS ON THE END OF THE PIPE.
683	COORDINATE WITH ALL TRADES SUCH THAT THE EDGE OF THE FAN IS A MINIMUM OF 18'-0" FROM THE EDGE OF THE ROOF WALKING SURFACE.

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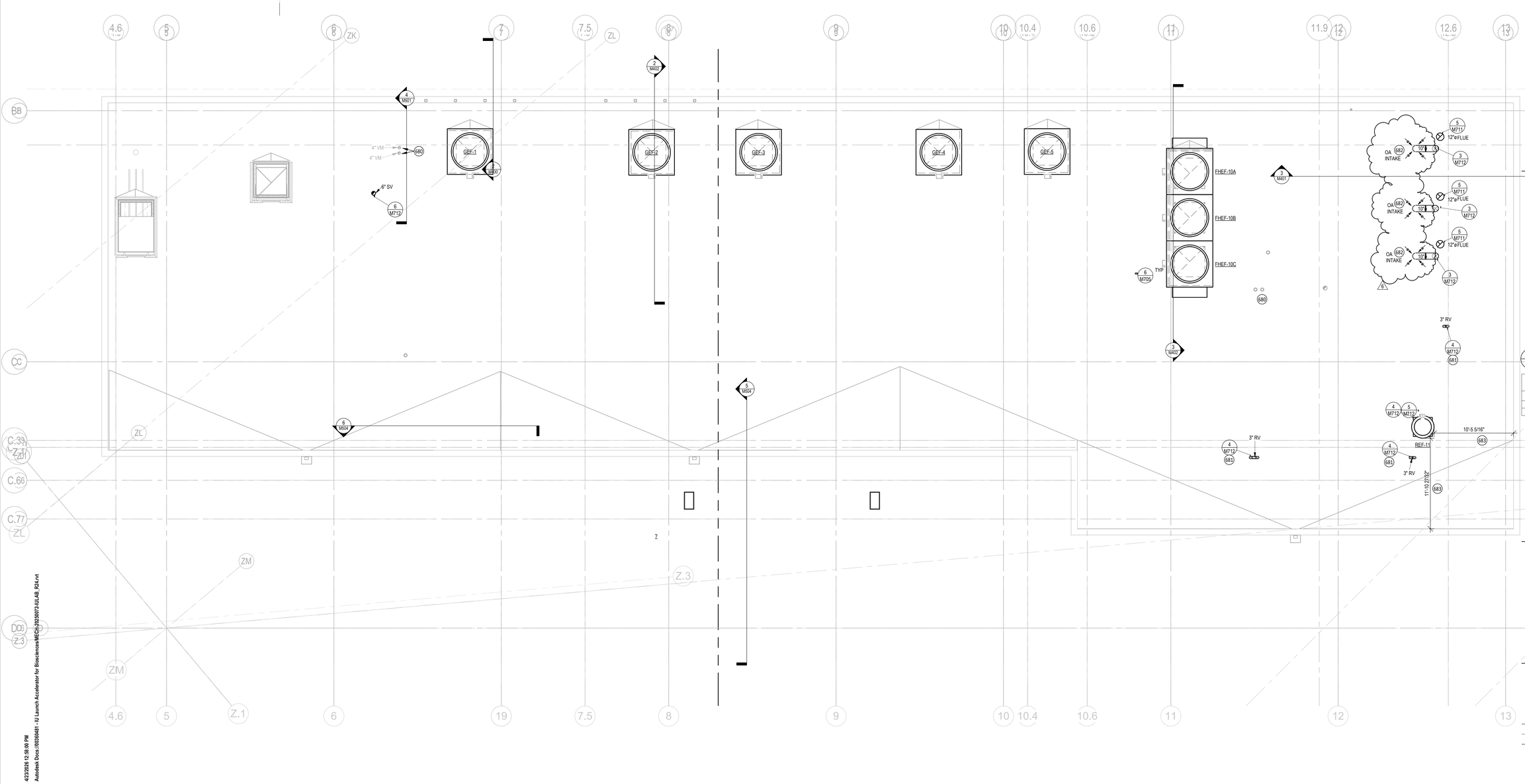

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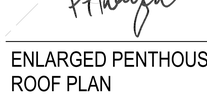

ENLARGED PENTHOUSE ROOF PLAN

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M402

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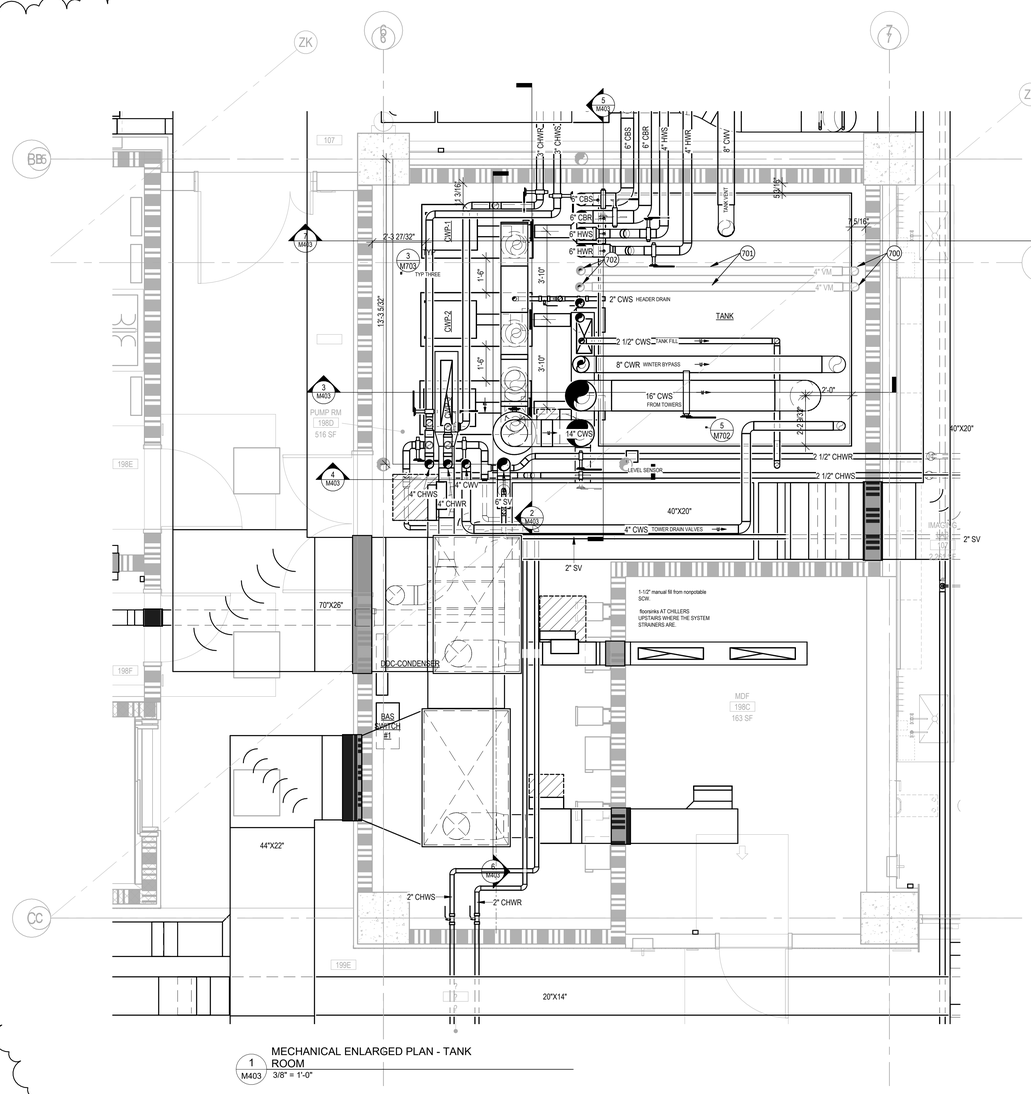
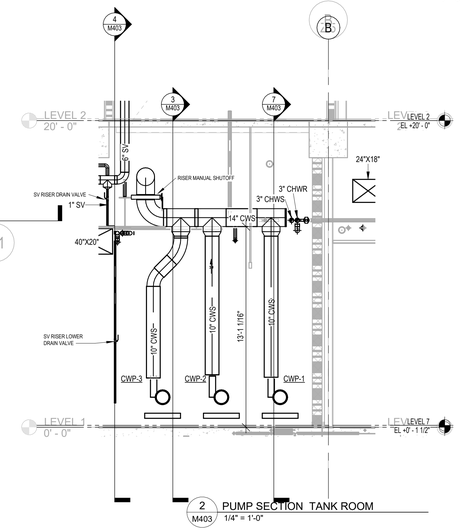
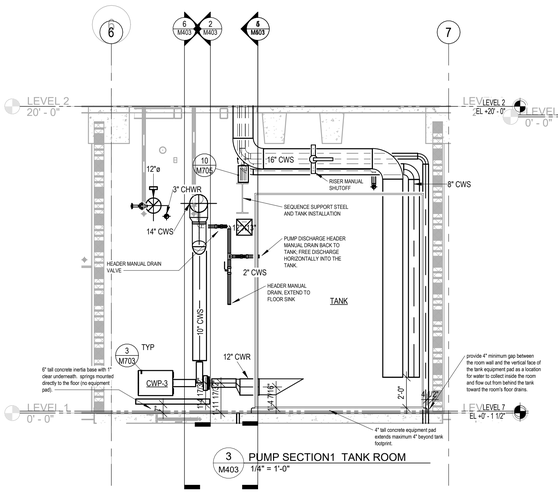


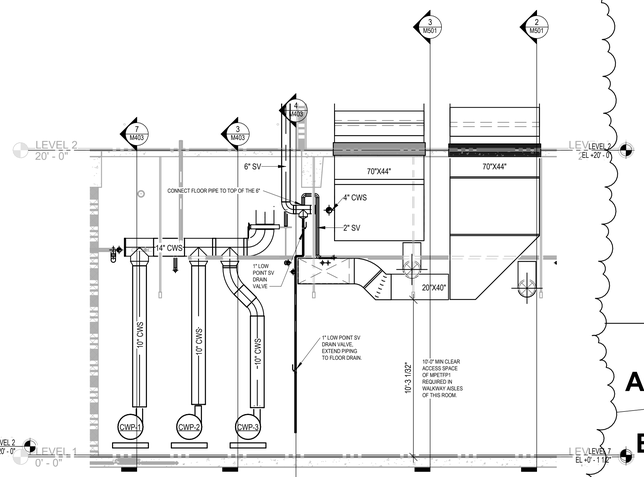
1 M403 MECHANICAL ENLARGED PLAN - TANK ROOM
3/8" = 1'-0"



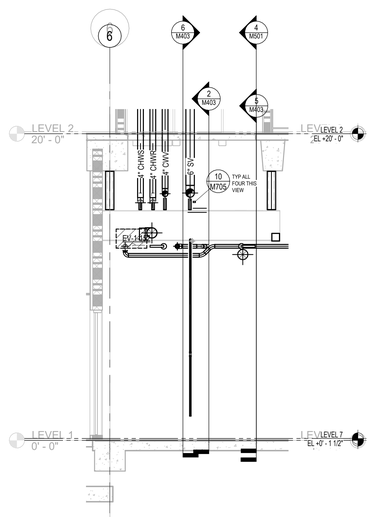
2 M403 PUMP SECTION TANK ROOM
1/4" = 1'-0"



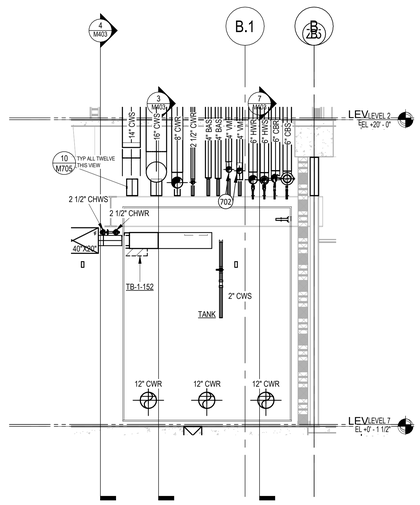
3 M403 PUMP SECTION1 TANK ROOM
1/4" = 1'-0"



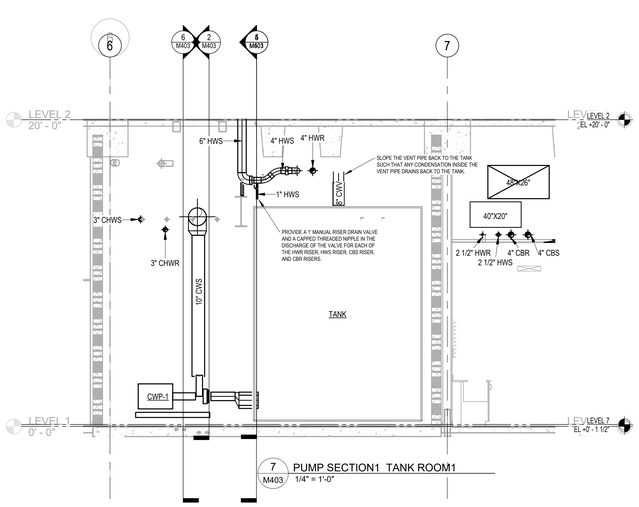
6 M403 TANK ROOM LOOKING EAST
1/4" = 1'-0"



4 Section at pipe support
1/4" = 1'-0"



5 M403 section at pipe support2
1/4" = 1'-0"



7 M403 PUMP SECTION1 TANK ROOM1
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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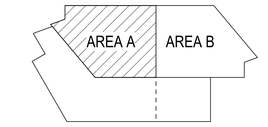

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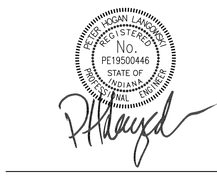
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



ENLARGED TANK ROOM PLAN

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M403

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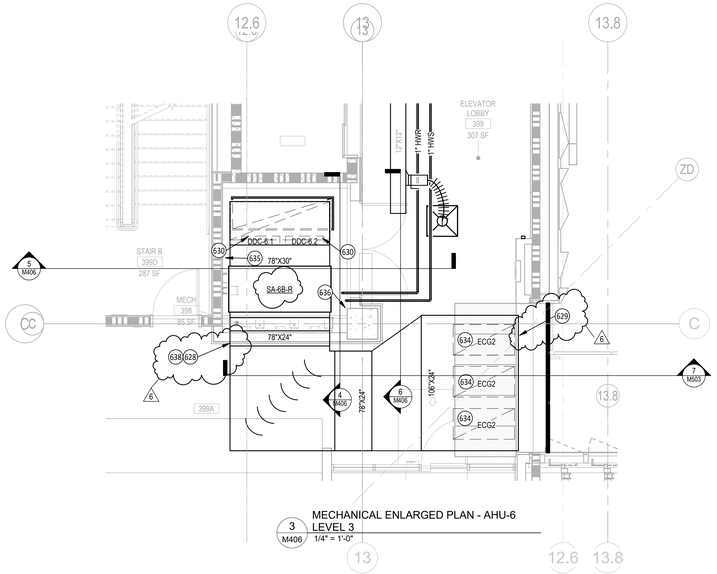
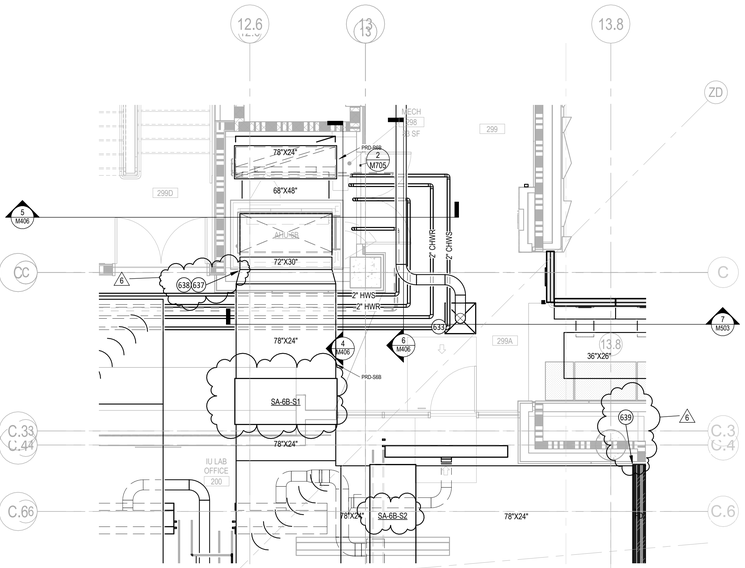
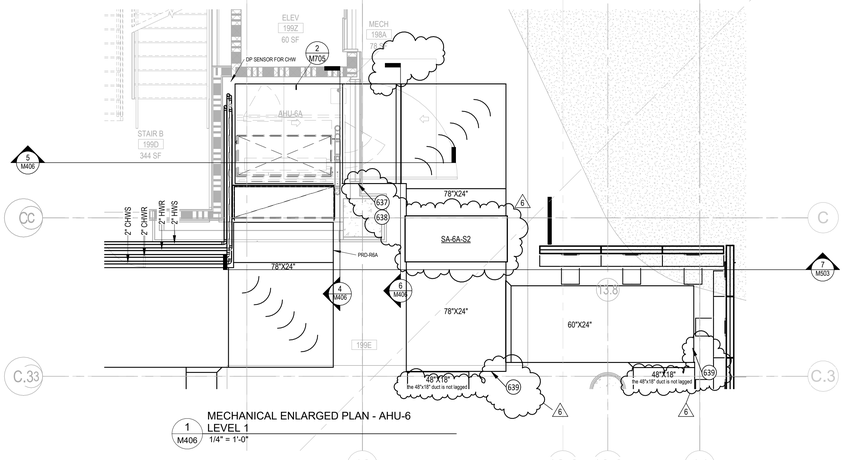


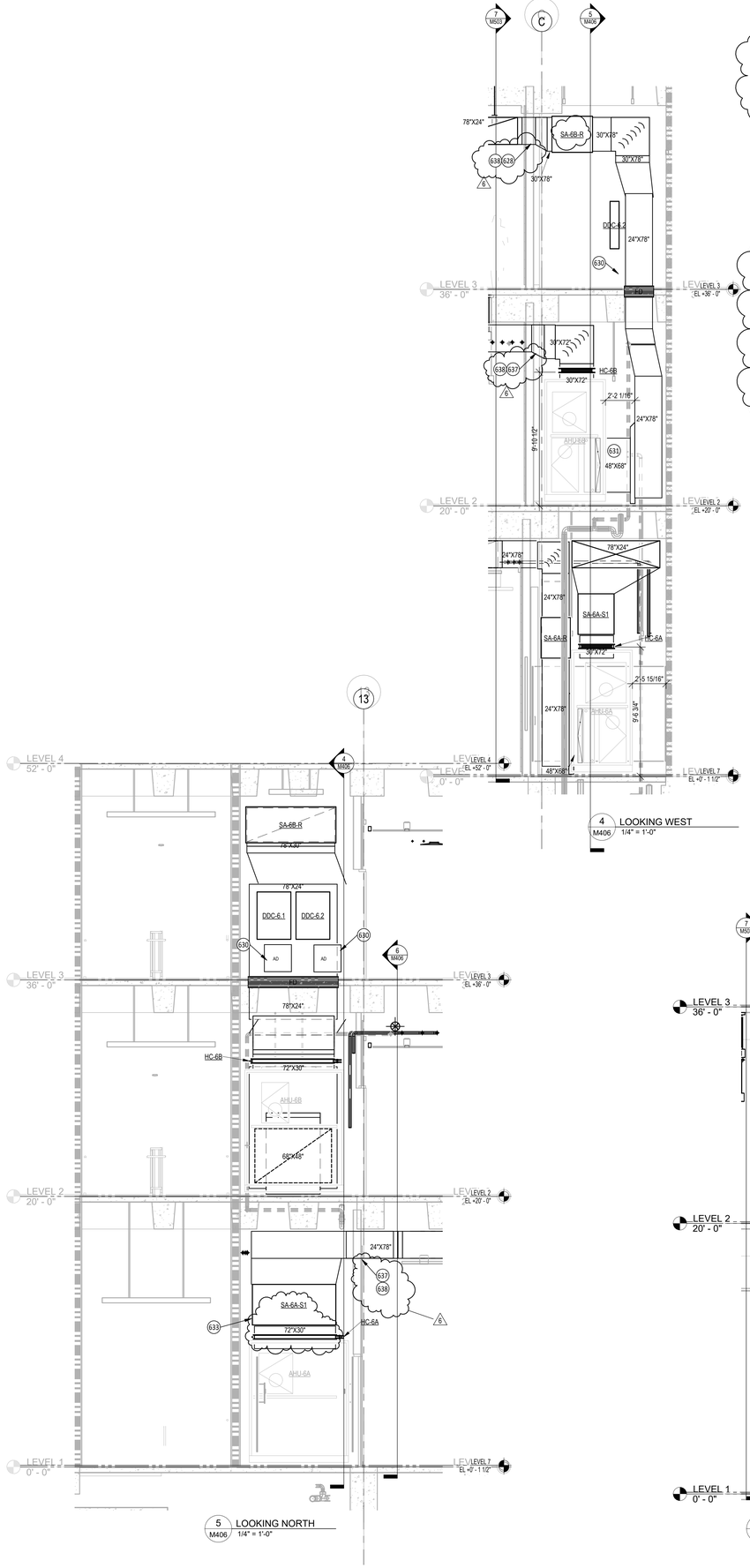
MECHANICAL ENLARGED PLAN - AHU-6
LEVEL 3
3 M406 1/4" = 1'-0"



MECHANICAL ENLARGED PLAN - AHU-6
LEVEL 2
2 M406 1/4" = 1'-0"

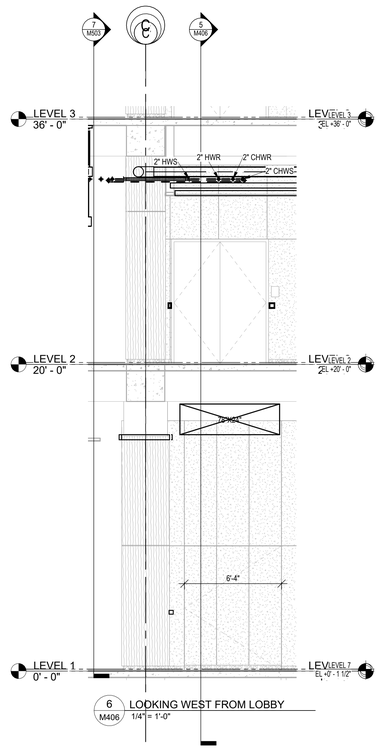


MECHANICAL ENLARGED PLAN - AHU-6
LEVEL 1
1 M406 1/4" = 1'-0"



4 LOOKING WEST
M406 1/4" = 1'-0"

5 LOOKING NORTH
M406 1/4" = 1'-0"



6 LOOKING WEST FROM LOBBY
M406 1/4" = 1'-0"

PLAN NOTES

X00	
628	PROVIDE EXTERIOR DUCT LAGGING ON THE RETURN DUCT FROM WHERE IT PENETRATES THE CLOSET UNTIL WHERE IT IS SHOWN TO STOP. PROVIDE EXTERIOR PINS SPACED EVERY 12" ON CENTER ON THE FOUR SIDES OF THE DUCT TO ATTACH THE LAGGING TO.
629	PROVIDE EXTERIOR DUCT LAGGING ON THE RETURN DUCT FROM WHERE IT PENETRATES THE CLOSET UNTIL THIS LOCATION WHERE IT IS SHALL STOP WITH LAGGING ON THE END CAP OF THE DUCT ALSO.
630	DUCT ACCESS DOOR, BOTTOM OF DOOR 6" AFF FOR FIRE DAMPER ACCESS. COORDINATE ACCESS TO LINE THROUGH DOOR PANEL SUPPORTS, TYP.
631	FLANGED REMOVEABLE 30" LENGTH SEGMENT OF RETURN DUCT TO ALLOW ACCESS TO THE FANS ON THE UPPER PART OF THE AHU.
633	CENTER THE SOUND ATTENUATOR BETWEEN THE FITTING FLANGES ON EITHER SIDE.
634	EACH OF THE THREE ECG MOUNTS ON THE BOTTOM OF THE LARGE RETURN DUCT MAIN, WITH THE ECG LOCATED AS CLOSE TO THE LOBBY OPENING AS IS PHYSICALLY POSSIBLE. COORDINATE PERFORATED CEILING LOCATION AND FIRE SHUTTER LOCATION AND ECG LOCATIONS WITH ALL TRADES.
635	MOUNT DSF CONTROLLERS WITHIN THIS MECHANICAL ROOM AND ROUTE CABLING WITHIN EMT ALONG PATHWAY SIMILAR TO THE CABLING AND PULLEYS. COORDINATE WITH TRADES INSTALLING WINCH LOWERING SYSTEM.
636	DP SYSTEM DP SENSOR. PROVIDE 1" BALL VALVES AT THE HEADERS. SEE DETAIL.
637	PROVIDE EXTERIOR DUCT LAGGING ON THE SUPPLY DUCT FROM WHERE IT PENETRATES THE CLOSET UNTIL WHERE IT IS SHOWN TO STOP. PROVIDE EXTERIOR PINS SPACED EVERY 12" ON CENTER ON THE FOUR SIDES OF THE DUCT TO ATTACH THE LAGGING TO. DUCT WRAP INSULATE WITH THE PINS PENETRATING THE FOIL VAPOR BARRIER AND THEN FOIL TAPE SEAL EACH PIN PENETRATION.
638	EXTERIOR DUCT LAGGING SHALL CONSIST OF A FLEXIBLE ONE POUND PER SQUARE FOOT REINFORCED FOIL-FACED LOADED VINYL NOISE BARRIER BONDED TO A 1" THICK QUILTED FIBERGLASS SOUND ABSORBER (NOMINAL THICKNESS OF THE ASSEMBLY IS 1.1"). DUCT LAGGING SHALL HAVE A SMOKE DENSITY AND FLAME SPREAD LESS THAN 20, MINIMUM STC-29 AS TESTED PER ASTM E90 AND ASTM E413, SIMILAR TO SOUNDSEAL B-10 LAG/QFA-3 ACOUSTICAL DUCT WRAP.
639	PROVIDE EXTERIOR DUCT LAGGING ON THE SUPPLY DUCT FROM WHERE IT PENETRATES THE CLOSET UNTIL THIS LOCATION WHERE IT IS SHOWN TO STOP.

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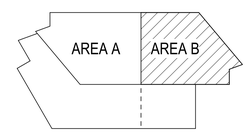
LAUNCH ACCELERATOR FOR BIOSCIENCES

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
6	4/27/2026	BP4-CD: Addendum 02
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LANGHOLZ
REGISTERED
NO. PE19500446
STATE OF INDIANA
PROFESSIONAL ENGINEER

ENLARGED AHU-6 ROOMS PLAN

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

M406

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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.

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.

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 ENDPIECE/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.

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.

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). PROVIDE NATURAL GAS FIRED BURNER NOX EMISSIONS OF LESS THAN 9 PPM AT ALL FIRING RATES.

NOTE 4: PROVIDE BOILER MANUFACTURER'S INDIVIDUAL CONDENSATE NEUTRALIZATION ASSEMBLY AND DRAIN TRAP AT EACH INDIVIDUAL BOILER.

6

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.

PUMP SCHEDULE

TAG (6)	CAPACITY	DUTY POINT MAX BHP	MINIMUM MOTOR HP (NOTE 1)	VOLT / PHASE	PUMP STYLE / MINIMUM INLET SIZE	DESIGN REFERENCE	NOTES
CWP-1	1350 GPM @ 142 FT TDH	58	75 HP	460 / 3	END SUCTION / 6"	B&G e-1510 : 5GB	
CWP-2	1350 GPM @ 142 FT TDH	58	75 HP	460 / 3	END SUCTION / 6"	B&G e-1510 : 5GB	
CWP-3	1350 GPM @ 142 FT TDH	58	75 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	125 GPM @ 40 FT TDH	1.8	2 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	150 GPM @ 40 FT TDH	2.2	3 HP	460 / 3	INLINE / 3"	B&G e-80 : 3x3x7C	FOR WWHP

6

SCHEDULE NOTES:
1. DO NOT PROVIDE 3600 RPM MOTORS UNLESS SPECIFICALLY INDICATED.

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.

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.

MAGNETIC FLOW METER SCHEDULE

TAG	SERVICE	PIPE MAIN SIZE / METER FLANGE SIZE	MAXIMUM OF THE FLOW (4) RANGE LOWER SETTING (GPM)	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.

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.

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 8'-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 CONNECTION 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.

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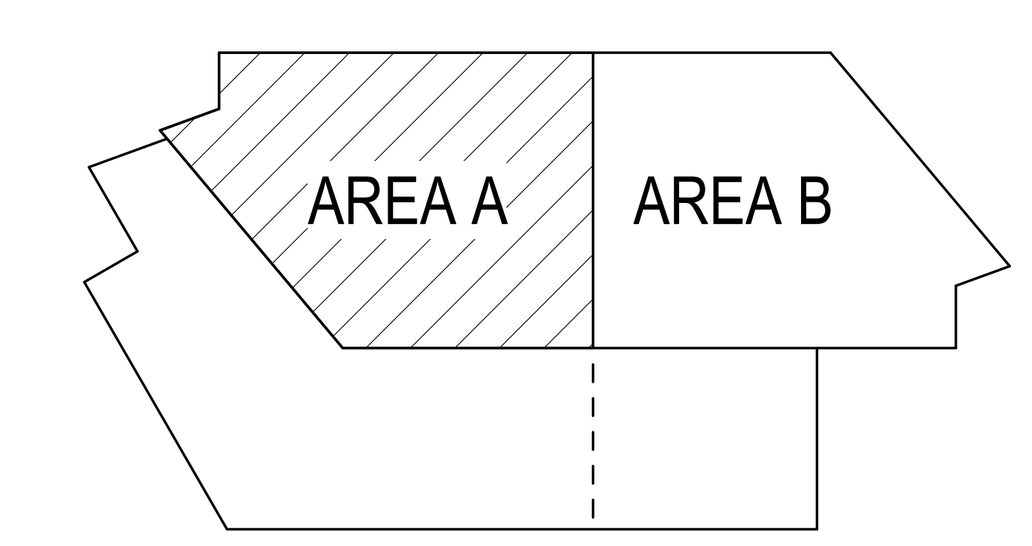
LAUNCH ACCELERATOR FOR BIOSCIENCES

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
6	4/27/2026	BP4-CD: Addendum 02
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	9,000	170	600	0.60	ONE	2	8 / 11	20	70.0 FDB	87.0 FDB	72"X30" DUCT CONNECTION FLANGE SIZE
HC-6B	9,000	170	600	0.60	ONE	2	8 / 11	20	70.0 FDB	87.0 FDB	72"X30" DUCT CONNECTION FLANGE SIZE

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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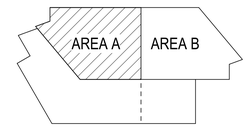
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

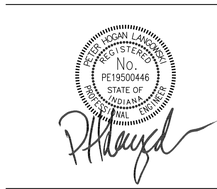
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
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 (5) MFG	MODEL
SA-6A-R	9,000	- 750	30	78	36	0.15	9	10	13	13	18	30	17	11	VIBRO-ACOUSTICS	RFL-ULV-F1
SA-6A-S1	9,000	+ 500	30	72	36	0.11	10	12	14	14	22	29	20	12	VIBRO-ACOUSTICS	RFL-ULV-F2
SA-6A-S2	9,000	+ 750	24	78	36	0.15	7	9	12	12	17	23	18	11	VIBRO-ACOUSTICS	RFL-LV-F1
SA-6B-R	9,000	- 500	30	78	36	0.11	10	13	15	15	23	27	18	11	VIBRO-ACOUSTICS	RFL-ULV-F2
SA-6B-S1	9,000	+ 500	30	72	36	0.16	5	6	12	19	25	30	28	12	VIBRO-ACOUSTICS	RFL-ULV-F8
SA-6B-S2	9,000	+ 750	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-7	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" ELLIPTICAL 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 DEGFD

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.

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-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)

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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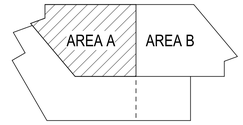
LAUNCH ACCELERATOR FOR BIOSCIENCES

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
6	4/27/2026	BP4-CD: Addendum 02
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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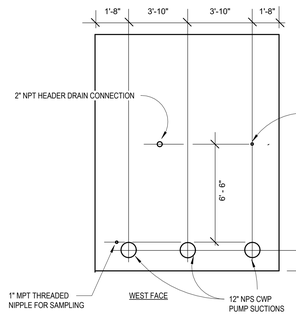
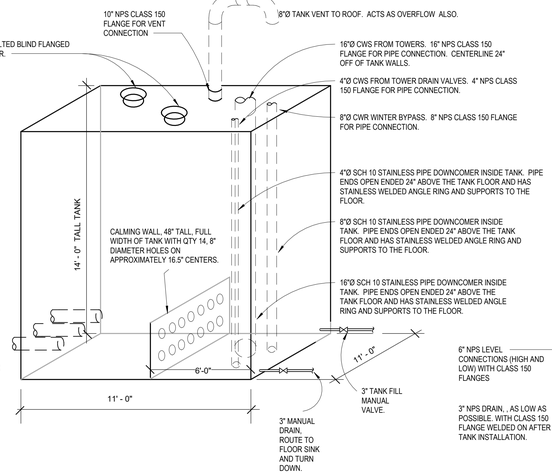
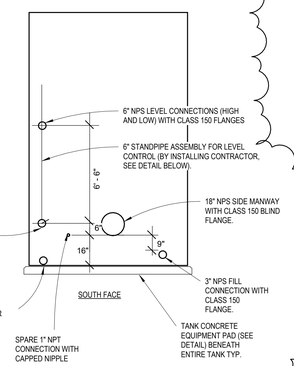
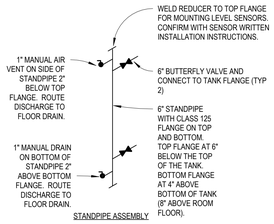
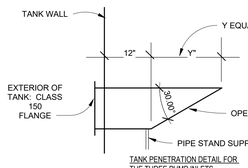










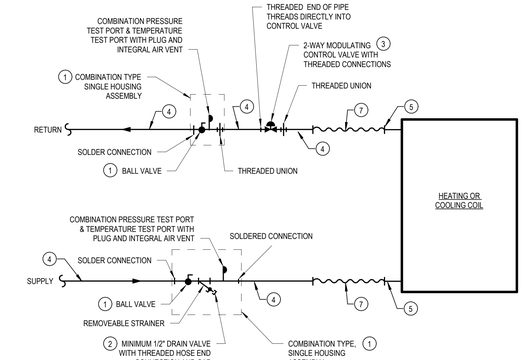
TANK PENETRATION DETAIL FOR THE THREE PUMP INLETS.

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

6



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

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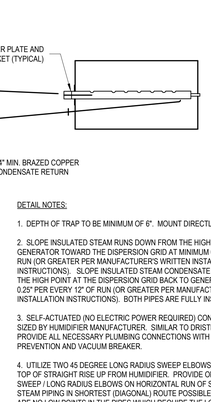
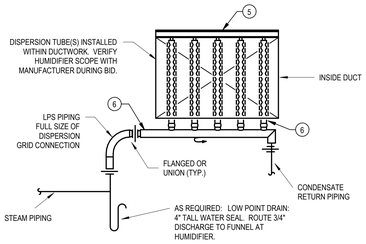




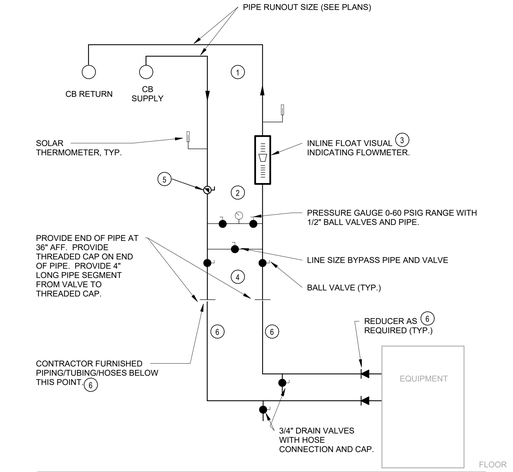
DETAIL NOTES:

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.

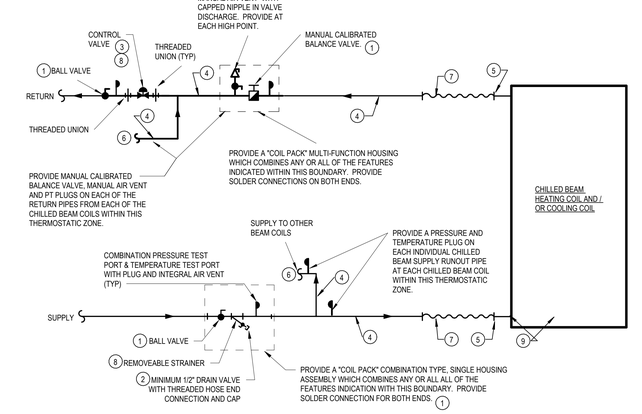
4 M702 STEAM HUMIDIFIER PIPING (DUCT MOUNTED) LOW PRESSURE DISPERSION GRID DETAIL
NO SCALE



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.

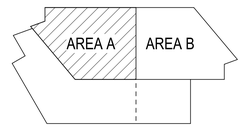
3 M702 COOLING WATER PIPE DROP DETAIL
1/8" = 1'-0"



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



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
5	4/20/2026	BP4-CD: Addendum 01
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE

PETER HOGAN LANGHORST REGISTERED No. PE19500446 STATE OF INDIANA PROFESSIONAL ENGINEER

PIPING RELATED DETAILS

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

M702

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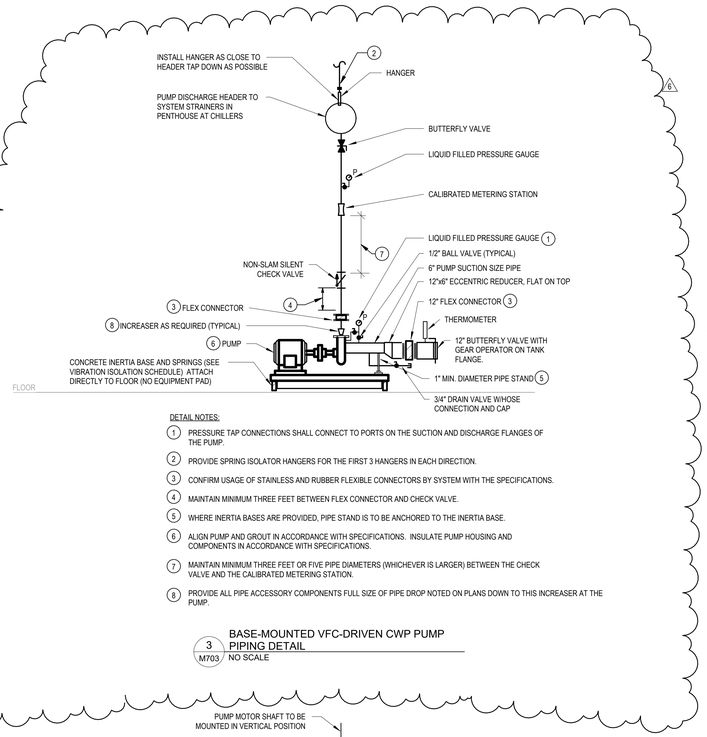
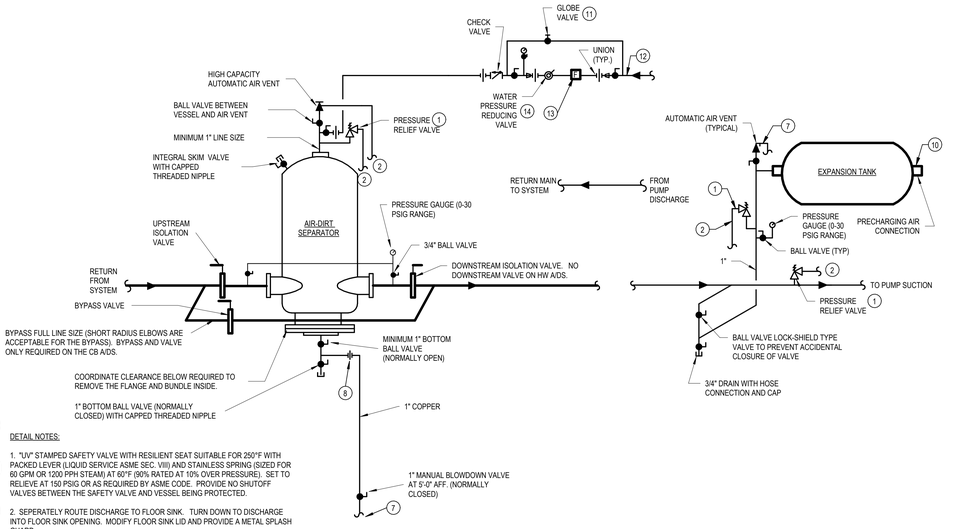


DETAIL NOTES:

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 USAGE OF STAINLESS AND RUBBER FLEXIBLE CONNECTORS BY SYSTEM WITH THE SPECIFICATIONS.
4. MAINTAIN MINIMUM THREE FEET BETWEEN FLEX CONNECTOR AND CHECK VALVE.
5. WHERE INERTIA BASES ARE PROVIDED, PIPE STAND IS TO BE ANCHORED TO THE INERTIA BASE.
6. ALIGN PUMP AND GROUT IN ACCORDANCE WITH SPECIFICATIONS. INSULATE PUMP HOUSING AND COMPONENTS IN ACCORDANCE WITH SPECIFICATIONS.
7. MAINTAIN MINIMUM THREE FEET OR FIVE PIPE DIAMETERS (WHICHEVER IS LARGER) BETWEEN THE CHECK VALVE AND THE CALIBRATED METERING STATION.
8. PROVIDE ALL PIPE ACCESSORY COMPONENTS FULL SIZE OF PIPE DROP NOTED ON PLANS DOWN TO THIS INCREASER AT THE PUMP.

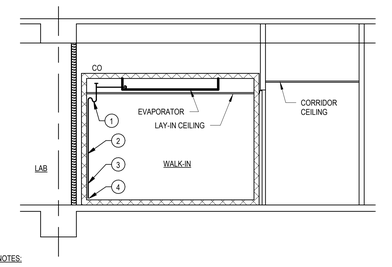
3 M703 BASE-MOUNTED VFC-DRIVEN CWP PUMP PIPING DETAIL
NO SCALE



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.

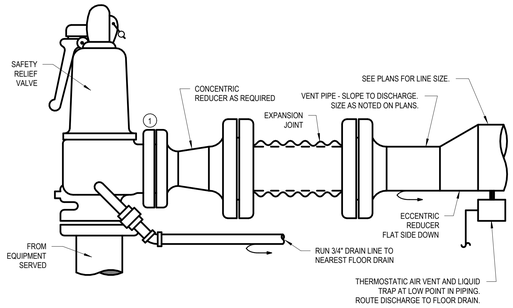
4 M703 AIR-DIRT SEPARATOR (CB & HW) AND EXPANSION TANK DETAIL
NO SCALE



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:

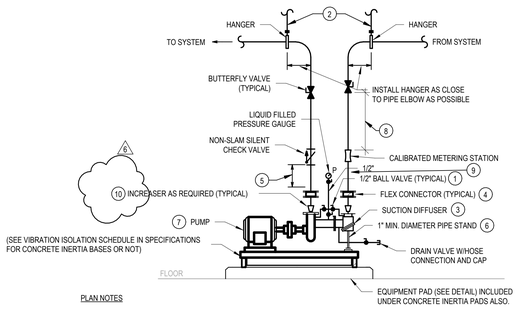
1. USE UNIONS FOR THREADED PIPE.

2 M703 SAFETY RELIEF VALVE DISCHARGE PIPING DETAIL
NO SCALE

PLAN NOTES:

1. 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.

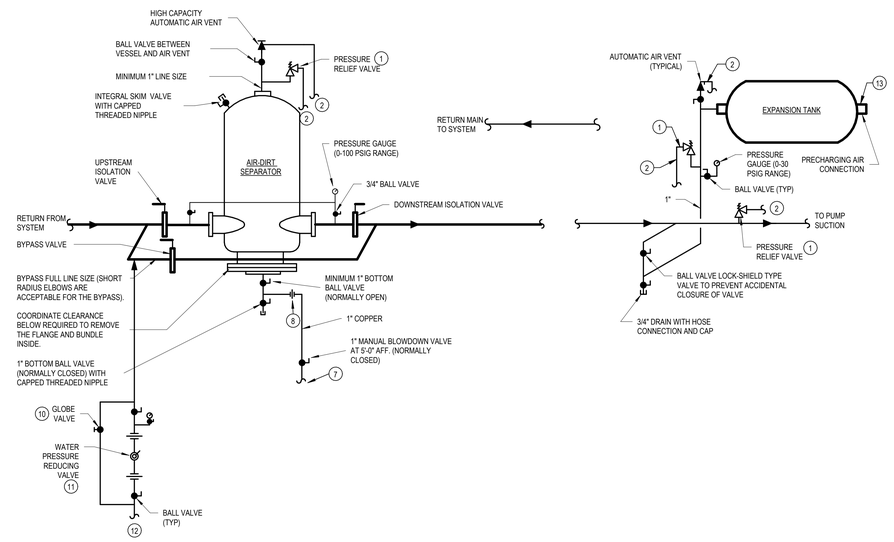
7 M703 IN-LINE PUMP PIPING DETAIL
NO SCALE



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 CONNECTION.
10. PROVIDE ALL PIPE ACCESSORY COMPONENTS FULL SIZE OF PIPE DROP NOTED ON PLANS DOWN TO THIS INCREASER, EACH SIDE OF THE PUMP.

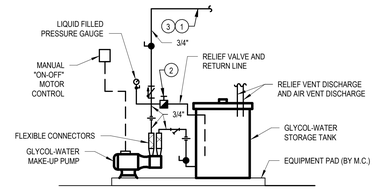
6 M703 BASE-MOUNTED VFC-DRIVEN CENTRIFUGAL PUMP PIPING DETAIL
NO SCALE



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 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. 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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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
6	4/27/2026	BP4-CD: Addendum 02
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

M703

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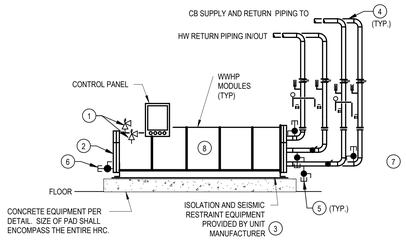


DETAIL NOTES:

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.

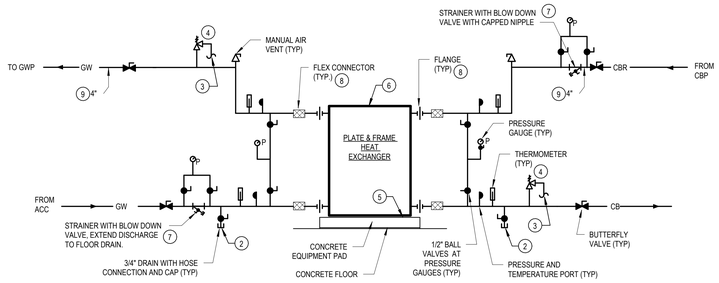
5. SEE CONDENSER CONNECTION DETAIL AND EVAPORATOR CONNECTION DETAIL.

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).

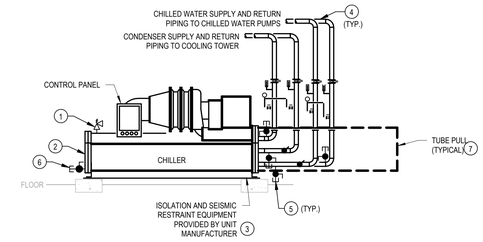
6. COORDINATE INSULATION OF HEAT EXCHANGER FOR REMOVEABILITY AND PLATE ADJUSTMENT.

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.

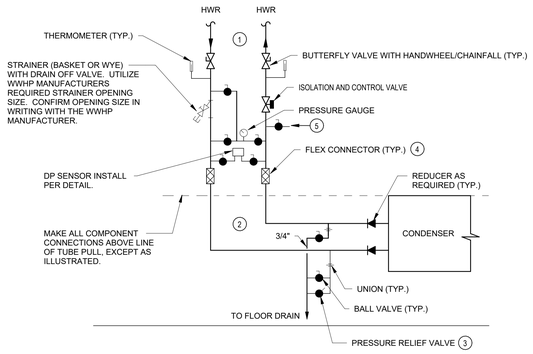
4. SUPPORT WEIGHT OF PIPE DROP AT ELBOW IN VERTICAL RISE SO AS TO NOT INDUCE STRAIN ON CHILLER CONNECTIONS. COORDINATE VERTICAL PIPE DROP LOCATIONS OF THE EVAPORATOR CONNECTION DETAIL AND THE CONDENSER CONNECTION DETAIL AS REQUIRED TO MAINTAIN ALL THE REQUIRED CHILLER MAINTENANCE ACCESS AS DEFINED IN 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.

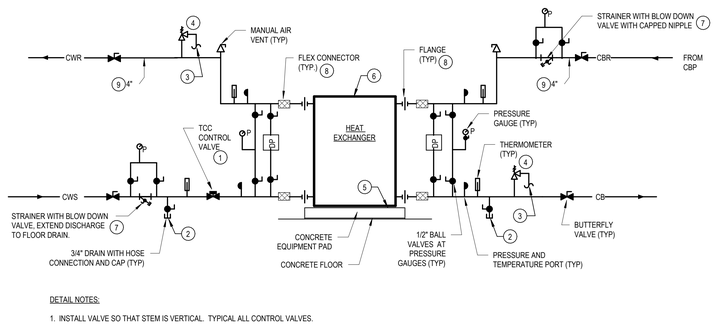
7. COORDINATE WITH ALL TRADES TO MAINTAIN TUBE PULL AREA AS DESCRIBED IN THE MANUFACTURER'S WRITEN INSTALLATION INSTRUCTIONS CLEAR OF ALL INSTALLATIONS BY ALL TRADES.

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).

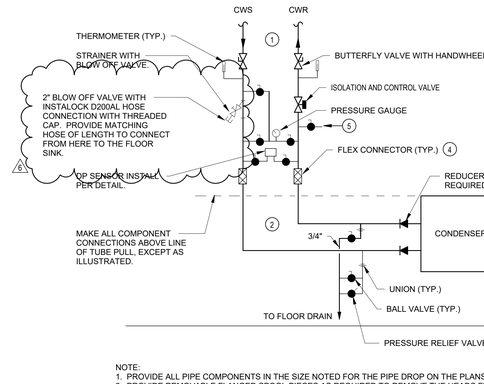
6. COORDINATE INSULATION OF HEAT EXCHANGER FOR TUBE BUNDLE REMOVEABILITY.

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.

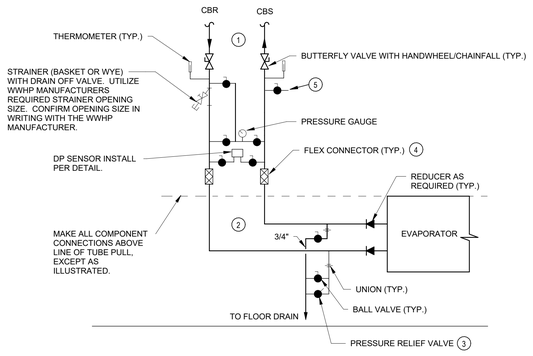
9. PROVIDE ALL COMPONENTS FULL SIZE OF PIPING DROP NOTED AND REDUCE AT HEAT EXCHANGER AS REQUIRED, TYPICAL.

5 M704 HEAT EXCHANGER (HE-2 CW TO CB) DETAIL
NO SCALE



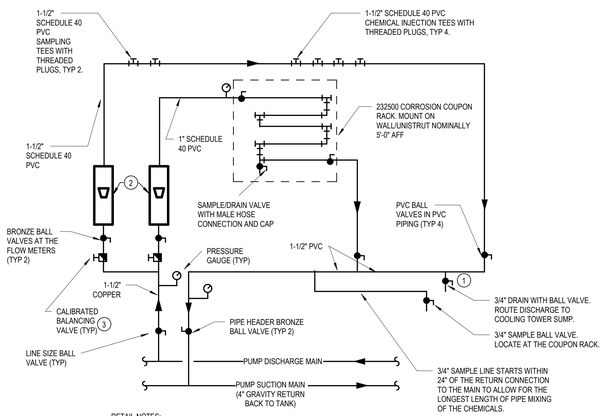
NOTE:
1. PROVIDE ALL PIPE COMPONENTS IN THE SIZE NOTED FOR THE PIPE DROP ON THE PLANS.
2. PROVIDE REMOVABLE FLANGED SPOOL PIECES AS REQUIRED TO REMOVE THE HEADS FROM THIS END OF THE CHILLER.
3. WATERSIDE RELIEF VALVE DISCHARGE, ELBOW DOWN AND ROUTE TO FLOOR DRAIN. EACH BUNDLE SHALL HAVE A 175 PSIG RELIEF 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 RETURN 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



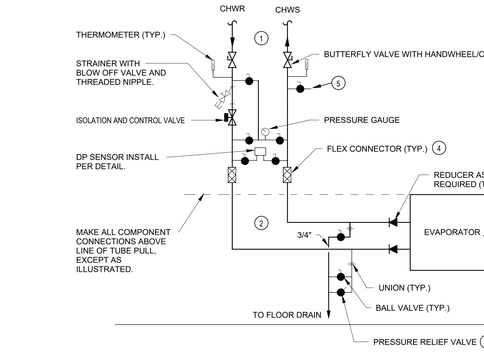
DETAIL NOTES:

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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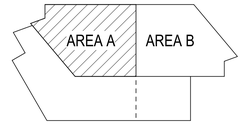
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

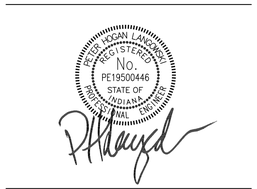
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
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

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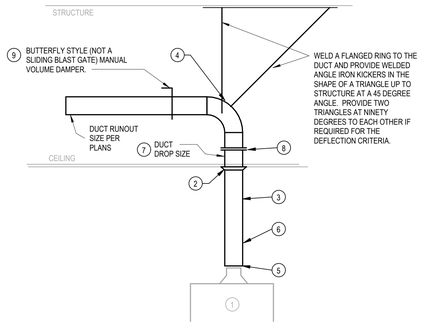




DETAIL NOTES:

1. SEQUENCER WITH "CHIMNEY" FURNISHED BY THE OWNER AND INSTALLED BY OTHER TRADES. COORDINATE CLOSELY WITH THOSE TRADES.

2. PROVIDE CHROME PLATED STEEL ESCUTCHEON PLATE IF EQUIPMENT IS BELOW FINISHED CEILING.

3. PROVIDE WELDED STAINLESS STEEL (NOT SPIRAL) DUCT DROP BELOW CEILING (OR "CEILING LINE" IF CLOUD CEILINGS). MATCH THE FINISH OF THE DUCT DROP BELOW THE CEILING TO THE MATTE STAINLESS FINISH OF THE CHIMNEY. CONNECT STAINLESS DUCTWORK WITH STAINLESS SCREWS AND SILICONE.

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..

5. BOTTOM OF OPEN DUCT DROP SHALL TERMINATE 1.5" ABOVE THE TOP OF THE CHIMNEY. DUCT DROP SHALL BE CENTERED ON THE APPROX. 10" ROUND TERMINATION OF THE TOP OF THE CHIMNEY WITH A CONSISTENT GAP.

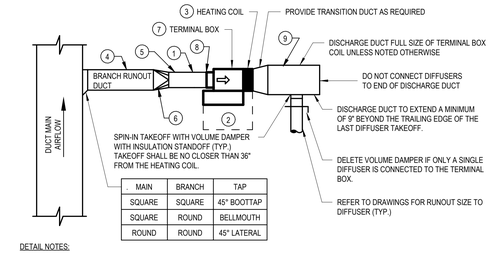
6. VERIFY EQUIPMENT LOCATION WITHIN ROOM AND EQUIPMENT DUCT CONNECTION LOCATIONS WITH THE OWNER PRIOR TO FABRICATING DUCTWORK.

7. DUCT DROP SIZE THROUGH THE CEILING SHALL BE 2.0" GREATER IN DIAMETER THAN THE ROUND DIAMETER OF THE TOP OF THE CHIMNEY AND NO SMALLER THAN THE DUCT RUNOUT SIZE. PHYSICALLY FIELD VERIFY AND CONFIRM ROUND DIAMETER DIMENSION OF TOP OF CHIMNEY PRIOR TO FABRICATING THE DUCT DROP.

8. PROVIDE A DOUBLE FLANGED CONNECTION WITH NUTS AND BOLTS CONNECTION. COORDINATE WITH THE OWNER AND CONFIRM WHICH LOCATIONS WILL NOT HAVE THE LOWER PORTION OF THE DUCT DROP (BELOW THE FLANGE) INSTALLED THROUGH THE CEILING. PROVIDE THESE LOWER PORTIONS OF THE DUCT DROPS TO THE OWNER FOR STORAGE AND FUTURE INSTALLATION. SEND AN RFI TO THE DESIGN ENGINEER TO CLARIFY THE TAB SETTINGS FOR THE EXHAUST AIR VALVES AND SUPPLY AIR VALVES FOR THE SPACE AND REVISE SETPOINTS AS CLARIFIED.

9. BALANCE EACH DUCT DROP TO 500 CFM FOR FULL SYSTEM TAB. WHERE THE LOWER PORTION OF THE DUCT DROP IS NOT INSTALLED (SEE NOTE 8), THE BUTTERFLY DAMPER SHALL BE FULLY CLOSED AFTER FULL SYSTEM TAB, THE LEEV SETTINGS SHALL BE REVISED AND THE DUCT DROP WHICH IS INSTALLED SHALL BE REBALANCED TO 500 CFM.

6 / M711 SEQUENCER EXHAUST DROP DETAIL
NO SCALE



MAIN	BRANCH	TAP
SQUARE	SQUARE	45° BOOTTAP
SQUARE	ROUND	BELLMOUTH
ROUND	ROUND	45° LATERAL

DETAIL NOTES:

1. PROVIDE THREE (3) DUCT DIAMETERS (BUT NO MORE THAN A MAXIMUM OF 3'-0" LENGTH FOR 12" INLET AND LARGER UNITS) OF STRAIGHT HARDRIGID METAL DUCT (THE SAME SIZE AS THE TERMINAL BOX INLET) DIRECTLY UPSTREAM OF THE TERMINAL BOX INLET AFTER THE TRANSITION TO THE TERMINAL BOX INLET SIZE. CONNECT THE RIGID INLET DUCT TO THE TERMINAL BOX SLIP JOINT INLET CONNECTION WITHOUT THE USE OF FLEXIBLE DUCTWORK.

2. MAINTAIN A MINIMUM OF 24" CLEARANCE FOR SERVICE AND MAINTENANCE OF THE BAS CONTROLLER AND HEATING COIL VALVING AND PIPED ACCESSORIES. PROVIDE 36" MINIMUM CLEARANCE WHERE VOLTAGE EXCEEDS 24V. COORDINATE ACCESS CLEARANCE FOR THESE COMPONENTS THROUGH THE CEILING BELOW WITH ALL TRADES. PROVIDE THE EXTENSIVE SPECIFICATION 230500 DETAILED COORDINATION EFFORT AND RESULTANT ACCESS REQUIREMENTS.

3. INSULATE ALL EXPOSED METAL AT THE COIL (FOR TERMINAL BOXES WITH COILS). INSULATE THE COIL RETURN BENDS. SEAL THE CLEAT JOINTS. DUCTWORK INSULATION SHALL OVERLAP THE INTERNALLY INSULATED TERMINAL UNIT BY TWO INCHES AT BOTH THE INLET AND THE DISCHARGE AND BE FOIL TAPED TO THE TERMINAL BOX. INSULATE THE COIL PIPING BETWEEN THE CONTROL VALVE AND THE COIL PIPING CONNECTIONS.

4. A BRANCH RUNOUT DUCT IS REQUIRED FOR ALL TERMINAL BOXES WHICH ARE MORE THAN THREE DIAMETERS OR MORE THAN THREE FEET FROM THE DUCT MAIN. REFER TO DRAWINGS FOR BRANCH RUNOUT DUCT SIZES; PROVIDE BRANCH RUNOUT DUCTS LARGER THAN THE TERMINAL BOX INLET WHERE ILLUSTRATED OR SCHEDULED.

5. INLET DUCT SIZE AFTER THE DUCT TRANSITION IS THE SAME SIZE AS THE SCHEDULED TERMINAL BOX INLET SIZE (AS MODIFIED BY COMPLETED SUBMITTALS).

6. PROVIDE DUCT TRANSITION AS REQUIRED IF BRANCH DUCT RUNOUT SIZE DIFFERS FROM THE TERMINAL BOX INLET SIZE.

7. SUPPORT THE TERMINAL BOX SUCH THAT IT CAN HANG INDEPENDENTLY OF ANY DUCTWORK CONNECTIONS. ATTACH FOUR STRAP HANGERS TO THE TERMINAL UNIT WITH AT LEAST TWO SCREWS TO CONNECT EACH HANGER TO THE TERMINAL UNIT. SEAL SCREW PENETRATIONS OF THE TERMINAL BOX.

8. INSULATE ALL EXPOSED METAL AT TERMINAL BOX INLET. INSULATE AROUND FLOW SENSORS.

9. IF THE TERMINAL BOX IS INSTALLED WITH A DISCHARGE SOUND ATTENUATOR, PROVIDE THESE ADDITIONAL FEATURES:
   a. MINIMUM 36" STRAIGHT DUCT BETWEEN THE SOUND ATTENUATOR DISCHARGE AND ANY DISCHARGE DUCT ELBOWS.
   b. MINIMUM 24" STRAIGHT DUCT BETWEEN THE DISCHARGE OF THE SOUND ATTENUATOR AND THE LEADING EDGE OF ANY SPINOFF TAKEOFFS.

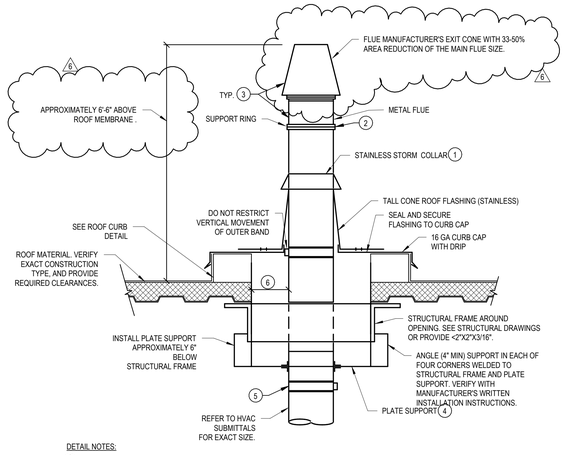
1 / M711 TERMINAL BOX DETAIL
NO SCALE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

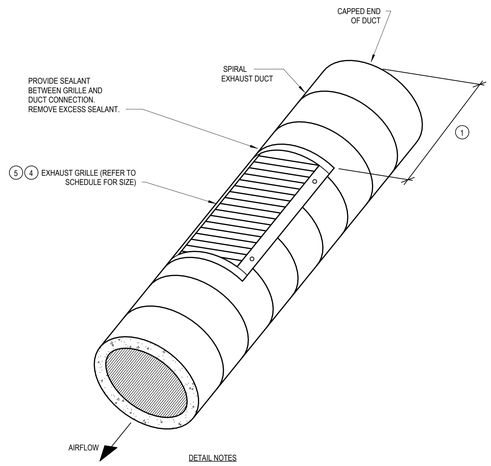
MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
3	3/30/2026	BP4-CD: BUILD-OUT PACKAGE



DETAIL NOTES:

1. CONTINUOUS WELD COLLAR TO FLUE PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
2. SUPPORT AS REQUIRED WITH GUY WIRES ATTACHED TO BUILDING STRUCTURE, PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
3. ANY EXPOSED NON-STAINLESS STEEL PARTS PROVIDED ARE TO BE PAINTED WITH HIGH TEMPERATURE EPOXY EXTERIOR PAINT. CUSTOM COLOR AS SELECTED BY ENGINEER. VERIFY STAINLESS MATERIALS REQUIRED IN FLUE SPECIFICATION.
4. PLATE SUPPORT AND ANGLE RING CONNECTIONS SHALL BE SUITABLE FOR STACK HEIGHT SHOWN AS DETERMINED BY FLUE MANUFACTURER.
5. EXPANSION JOINTS AS REQUIRED PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
6. PROVIDE REQUIRED CLEARANCES TO COMBUSTIBLES.

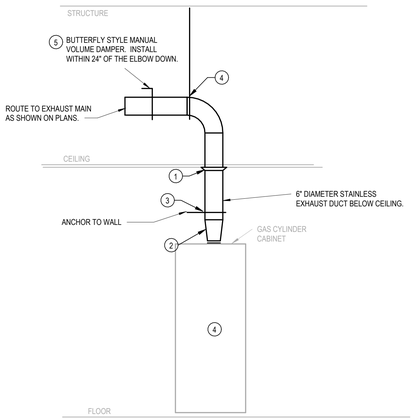
5 / M711 BOILER FLUE DETAIL
NO SCALE



DETAIL NOTES

1. MINIMUM 2'-0" FROM END OF DUCT.
2. CURVATURE OF GRILLE TO MATCH OUTER DIAMETER OF DUCT.
3. UTILIZE PAINT GRIP FINISH ON DUCT AND GRILLE.
4. GRILLE TO BE MOUNTED DIRECTLY ON TOP OF DUCT IN ALL SPACES.
5. GRILLES MOUNTED ON TOP OF DUCTS DO NOT NEED TO BE BALANCED.

7 / M711 EXPOSED DUCT SPIRAL GRILLE DETAIL
NO SCALE



DETAIL NOTES:

1. PROVIDE CHROME PLATED STEEL ESCUTCHEON PLATE AT CEILING PENETRATION.

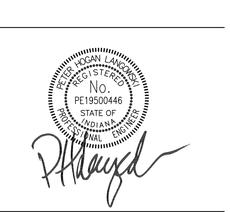
2. PROVIDE STAINLESS STEEL TRANSITION PIECE FROM 6" DIAMETER DUCT TO GAS CYLINDER CABINET CONNECTION SIZE WITH APPROX 30 DEGREE INCLUDED ANGLE. CONNECT TRANSITION PIECE TO CABINET AND SEAL WITH SILICONE.

3. ANCHOR THE DUCT ELBOW WITH A WELDED ANGLE RING APPROX 96" AFF.

4. VERIFY EQUIPMENT LOCATION WITHIN ROOM AND EQUIPMENT DUCT CONNECTION LOCATIONS AND PROPOSED DUCT ROUTING DIRECTLY WITH THE OWNER ONE WEEK PRIOR TO FABRICATING DUCTWORK.

5. BALANCE EACH DUCT DROP TO 175 CFM WHERE TWO OR MORE GAS CYLINDER CABINETS ARE SERVED BY A SINGLE EXHAUST VALVE. CONFIRM AIRFLOW VALUE WITH THE FINAL PROCESSED GAS CYLINDER CABINET SUBMITTAL; SUBMIT RFI TO MECHANICAL ENGINEER AND ADJUST VALUE AS CLARIFIED BY THE ENGINEER.

8 / M711 GAS CABINET EXHAUST CONNECTION DETAIL
NO SCALE



DUCTWORK RELATED DETAILS

DATE	REF: SHEET INDEX
BSA PROJECT NO.	00360481

M711

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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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. 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 **50°F (ADJ).**
DISABLE: THE CHILLED WATER SYSTEM SHALL SHUT DOWN WHENEVER THE OUTDOOR AIR TEMPERATURE FALLS BELOW **48°F (ADJ).** THE CHILLED WATER SYSTEM SHALL BE SHUT DOWN WHENEVER THE OAT IS BELOW **58°F (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 **42.0°F (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 **2°F (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 **57°F (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 **80°F (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 **15°F (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 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 **35°F (ADJ)** FOR HEAT EXCHANGER OPERATION.
DISABLE: THE CONDENSER WATER SYSTEM SHALL SHUT DOWN WHENEVER THE OUTDOOR AIR TEMPERATURE FALLS BELOW **34°F (ADJ).** THE CONDENSER WATER SYSTEM HEAT EXCHANGER OPERATION SHALL BE SHUT DOWN WHENEVER THE OAT IS BELOW **58° F (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 **1°F (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 **1°F (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* **29" (ADJ)**; *TANK LOW LEVEL* **36" (ADJ)**; *TANK FILL SETPOINT LEVEL* **48" (ADJ)**; *TANK HIGH LEVEL* **162" (ADJ)**; *TANK HIGH LEVEL CRITICAL LEVEL* **165" (ADJ)**. PROVIDE ALARMS AT EACH LEVEL OTHER THAN *TANK FILL SETPOINT LEVEL*.
6 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 **1.0°F (ADJ)** PER HOUR.
  - WHEN AVERAGE OAT WET BULB IS LESS THAN **63°FWB (ADJ)** THE *CONDENSER WATER TEMPERATURE SETPOINT* SHALL BE **68°F (ADJ).**
  - WHEN AVERAGE OAT WET BULB IS BETWEEN **63°FWB (ADJ)** AND **80°FWB (ADJ)** THE *CONDENSER WATER TEMPERATURE SETPOINT* SHALL BE EQUAL TO THE AVERAGE OAT WET BULB **PLUS 5°F (ADJ.).**
  - WHEN AVERAGE OAT WET BULB IS GREATER THAN **80°FWB (ADJ)** THE *CONDENSER WATER TEMPERATURE SETPOINT* SHALL BE **85°F (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 **2.0°F (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 3.0°F (ADJ)**. SIGNAL AN ALARM IF THE CONDENSER WATER TEMPERATURE DROPS BELOW **40°F (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 **15 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).**

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 FOR THE CASES OF ONE, TWO, AND THREE TOWERS OPERATING. THE *INDIVIDUAL SENSOR SETPOINTS* SHALL BE NO HIGHER THAN **5.0 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 (**60 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 CB SYSTEM FLOW RATE ABOVE THE REQUIRED MINIMUM FLOW RATE BASED ON THE WWHP AS DETERMINED FROM TEMPERATURES READINGS. IF THE WWHP CBR ENTERING WATER TEMPERATURE IS MORE THAN **1.0 °F (ADJ)** LOWER THAN THE SYSTEM RETURN TEMPERATURE READING (INDICATING SHORT CIRCUITING DUE TO LOW SYSTEM FLOW OR THE SYSTEM LOAD BEING BELOW THE WWHP MINIMUM OPERATING LOAD) OPEN THE CB SYSTEM BYPASS VALVE AN ADDITIONAL **20% (ADJ)** [ADDITIONAL IF IT IS ALREADY OPEN, OR OPEN IF IT WAS AT 0% OPEN]. TUNE THIS SEQUENCE WITH THE WWHP MANUFACTURER STARTUP PERSONNEL.
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 **58.0°F (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 1.0°F (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 0.5°F (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 1.5°F (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 1.0°F (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 0.5°F (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 1.0°F (ADJUSTABLE).** WWHP PACKAGED CONTROLS SHALL LIMIT THE WWHP LEAVING HEATING WATER TEMPERATURE TO A MAXIMUM OF **135°F (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 **0.5°F (ADJ)** AND **1.0°F (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 **1.0°F (ADJ)** AND **2.0°F (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 **2.0°F (ADJ)** GREATER THAN THE *BASIC CB SYSTEM SUPPLY WATER TEMPERATURE SETPOINT* .
  iii. THE *MINIMUM FLOW SETPOINT* SHALL BE DETERMINED AS FOLLOWS: **100 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 **150 GPM (ADJ).**

B. HWP SHALL MODULATE IN SPEED TO MAINTAIN:
  i. A MINIMUM DIFFERENTIAL PRESSURE ACROSS THE CONDENSER OF **10.0 PSID (ADJUSTABLE) PLUS *OFF

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-1-112-2 FUTURE	10	
FHEV-1-121	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		

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 OPEN 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 (3) (5)	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	525	THREE	NONE	- 75	NO	NO	
107	107	585	290	NONE	ONE	- 150	NO	NO	
108	107	1,020	765	NONE	ONE	- 150	NO	NO	
109	106	760	550	ONE	ONE	- 75	NO	NO	
110	106	1,035	760	NONE	ONE	- 75	NO	NO	
111	108A	560	410	NONE	NONE	- 50	NO	NO	
112	108A	435	310	TWO	ONE	- 50	NO	NO	
121	127	200	140	ONE	NONE	- 50	NO	NO	
122	113	75	20	NONE	NONE	- 50	NO	NO	
124	111	75	20	NONE	NONE	- 50	NO	NO	
130	118	400	400	NONE	NONE	NEUTRAL	YES	NO	
131	118	400	400	NONE	NONE	NEUTRAL	YES	NO	
143	108B	235	160	ONE	NONE	- 50	NO	NO	
144	108BA	300	300	NONE	NONE	NEUTRAL	NO	NO	
146	118A	85	80	ONE	NONE	- 50	NO	NO	
147	118B	120	120	NONE	NONE	PLUS 50	NO	NO	
148	118C	130	130	NONE	NONE	PLUS 50	NO	NO	
150	103	1,085	770	TWO	NONE	- 75	NO	NO	
219	227N	90	65	NONE	NONE	NEUTRAL	NO	NO	
220	227M	170	110	ONE	ONE	- 75	NO	NO	
221	227L	260	185	NONE	NONE	NEUTRAL	NO	NO	
223	227JB	105	80	NONE	NONE	NEUTRAL	NO	NO	
224	227JA	140	105	NONE	NONE	NEUTRAL	YES	NO	
225	227J	170	110	NONE	ONE	- 75	YES	NO	
226	227H	430	305	ONE	ONE	- 75	NO	NO	
227	227G	690	475	ONE	ONE	- 100	NO	NO	
228	227F	430	305	NONE	ONE	- 75	YES	NO	
229	227E	365	240	NONE	ONE	- 75	YES	YES	
230	227D	155	85	NONE	ONE	- 75	YES	YES	
231	227C	660	450	ONE	ONE	- 100	YES	YES	
232	227	425	425	NONE	NONE	PLUS 425	NO	NO	NO LGEV IN THIS ZONE
234	227A	350	350	NONE	NONE	NEUTRAL	NO	NO	
324	327F	90	65	NONE	NONE	NEUTRAL	NO	NO	
325	327	480	345	ONE	NONE	- 75	NO	NO	
326	327E	180	135	NONE	NONE	NEUTRAL	YES	NO	
327	327D	180	135	NONE	NONE	NEUTRAL	NO	NO	
328	327	695	475	ONE	ONE	- 75	NO	NO	
329	327	670	440	NONE	ONE	- 75	NO	NO	
330	327C	130	85	NONE	ONE	PLUS 50	YES	NO	
331	327B	60	60	NONE	NONE	NEUTRAL	NO	NO	
332	327	750	525	ONE	ONE	- 75	YES	YES	
333	327	965	620	ONE	ONE	- 75	YES	YES	
335	327A	350	350	NONE	NONE	NEUTRAL	NO	NO	
337	327	525	395	ONE	NONE	NEUTRAL	NO	NO	
338	327	515	390	ONE	ONE	NEUTRAL	NO	NO	
405	407	725	545	NONE	NONE	NEUTRAL	NO	NO	
419	427H	90	65	NONE	NONE	NEUTRAL	NO	NO	
420	427	345	240	TWO	NONE	- 75	NO	NO	
421	427G	180	135	NONE	NONE	NEUTRAL	YES	NO	
422	427F	180	135	NONE	NONE	NEUTRAL	NO	NO	
423	427	345	235	THREE	NONE	- 75	NO	NO	
424	427	1,005	755	TWO	ONE	NEUTRAL	NO	NO	
425	427E	130	85	NONE	NONE	PLUS 50	YES	NO	
426	427D	180	135	NONE	NONE	NEUTRAL	NO	NO	
427	427	450	320	THREE	NONE	- 75	NO	NO	
428	427	660	480	TWO	ONE	NEUTRAL	NO	YES	
429	427C	350	350	NONE	NONE	NEUTRAL	NO	YES	
430	407	720	695	NONE	NONE	PLUS 150	NO	NO	
431	427B	245	185	NONE	NONE	NEUTRAL	NO	NO	
434	427	215	145	TWO	NONE	- 75	NO	YES	
435	427	280	210	TWO	NONE	NEUTRAL	NO	YES	
436	427	400	270	TWO	NONE	- 125	NO	NO	
437	427	765	575	THREE	ONE	NEUTRAL	NO	NO	
502	504	1,000	1,000	NONE	NONE	NEUTRAL	NO	NO	
507	504A	115	85	NONE	NONE	NEUTRAL	YES	NO	
508	504B	120	90	NONE	NONE	NEUTRAL	YES	NO	
509	504	1,000	1,000	NONE	ONE	NEUTRAL	NO	NO	
521	527	585	400	NONE	ONE	- 150	NO	NO	
522	527J	90	65	NONE	NONE	NEUTRAL	NO	NO	
523	527	480	345	ONE	NONE	- 75	NO	NO	
524	527H	180	135	NONE	NONE	NEUTRAL	YES	NO	
526	527	615	430	NONE	ONE	- 125	NO	NO	
528	527F	180	180	NONE	ONE	PLUS 50	YES	NO	
529	527E	180	135	NONE	NONE	NEUTRAL	NO	NO	
530	527	760	570	ONE	ONE	- 75	YES	YES	
531	527	1,070	595	ONE	ONE	- 75	YES	YES	
532	527D	490	365	NONE	NONE	NEUTRAL	YES	NO	
533	527C	350	350	NONE	NONE	NEUTRAL	NO	NO	
534	509	720	695	NONE	NONE	PLUS 150	NO	NO	
535	527B	255	190	NONE	NONE	NEUTRAL	NO	NO	
536	504	1,075	1075	NONE	ONE	- 75	NO	NO	
537	527	435	325	ONE	ONE	NEUTRAL	NO	NO	
538	527	505	380	ONE	NONE	NEUTRAL	NO	NO	
540	509	715	695	NONE	NONE	PLUS 150	NO	NO	

(6)

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SMITHGROUP

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

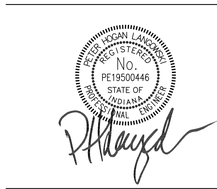
BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
6	4/27/2026	BP4-CD: Addendum 02
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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ELECTRICAL GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

X00	PLAN NOTES
100	ELECTRIC DUAL-VEHICLE CHARGING STATION. PROVIDE (2) 208V/1-PHASE, 60A CIRCUITS INDICATED (CONDUCTORS UPSIZED FOR VOLTAGE DROP) AND FINAL CONNECTION TO CHARGERS. PROVIDE FOUNDATION BOX FOR EV CHARGING STATIONS AS MANUFACTURED BY EV BLOCKS MODEL "THE STANDARD", 22" X 22" X 24" TALL. EV CHARGING STATION PROVIDED BY OTHERS. COORDINATE FINAL CONNECTIONS WITH SYSTEM PROVIDED. PROVIDE ONE 1-1/2" C. TO THE MDF ROOM FOR DATA AS INDICATED ON THE ICT DRAWINGS.
108	PROVIDE CONNECTION TO SCULPTURE LIGHTING THROUGH LIGHTING CONTACTOR INDICATED. FINAL VOLTAGE OF SCULPTURE TO BE CONFIRMED PRIOR TO INSTALLATION.
110	PROVIDE A 1" EMPTY CONDUIT WITH PULL STRING FOR DATA. ROUTE MDF ROOM.
122	PROVIDE A PEDESTAL-MOUNTED RECEPTACLE LIKE LEGRAND #XPP1G16C-BK, 16" HEIGHT, 1-GANG DEVICE PLATE WITH HINGED LOCKABLE COVER, BLACK FINISH AND RATED NEMA 3R.
154	PROVIDE FOUR EMPTY 1"C. FROM HAND HOLE TO ELEC 198E.

1 E100 ELECTRICAL SITE PLAN - BP2
1/16" = 1'-0"

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
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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
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL SITE PLAN

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E100

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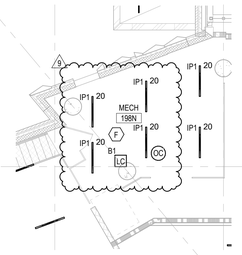
1 ELECTRICAL LIGHTING PLAN - LEVEL 1 - AREA A
E151A 1/8" = 1'-0"



2 ELECTRICAL LIGHTING PLAN - LEVEL 1 - MEZZANINE
E151A 1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

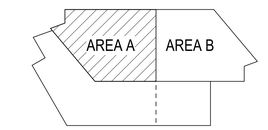
X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
214	LIGHT FIXTURES TO BE MOUNTED WITHIN EXTERIOR SOFFIT. COORDINATE WITH ARCHITECTURAL DETAILS PRIOR TO INSTALLATION.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
239	LOCATION OF LIGHTING CONTRACTORS FOR CONTROL OF EXTERIOR BUILDING LIGHTING. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CONNECTED LOADS. REFER TO PENTHOUSE LIGHTING PLAN FOR LOCATION OF BUILDING MOUNTED PHOTOCELL FOR DAYLIGHTING CONTROL INPUT.
241	CONNECT NIGHT LIGHT TO UNSWITCHED EGRESS LIGHTING CIRCUIT INDICATED.
242	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #12 IN EGRESS POWER PANEL INDICATED.
243	CONNECT ALL LIGHTING WITHIN THIS ELEVATOR SHAFT TO CIRCUIT FROM OPTIONAL STANDBY PANEL INDICATED. ALL LIGHTING WITHIN THIS SHAFT SHALL OPERATE TOGETHER VIA SWITCHING INDICATED.
244	OCCUPANCY SENSOR TO BE PROVIDED BY EC FOR CONNECTION TO BMS OF MECHANICAL USE. NOT TO BE USED FOR LIGHTING IN THIS SPACE.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE

BRIAN D. HOACK
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PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 1 - AREA A

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E151A

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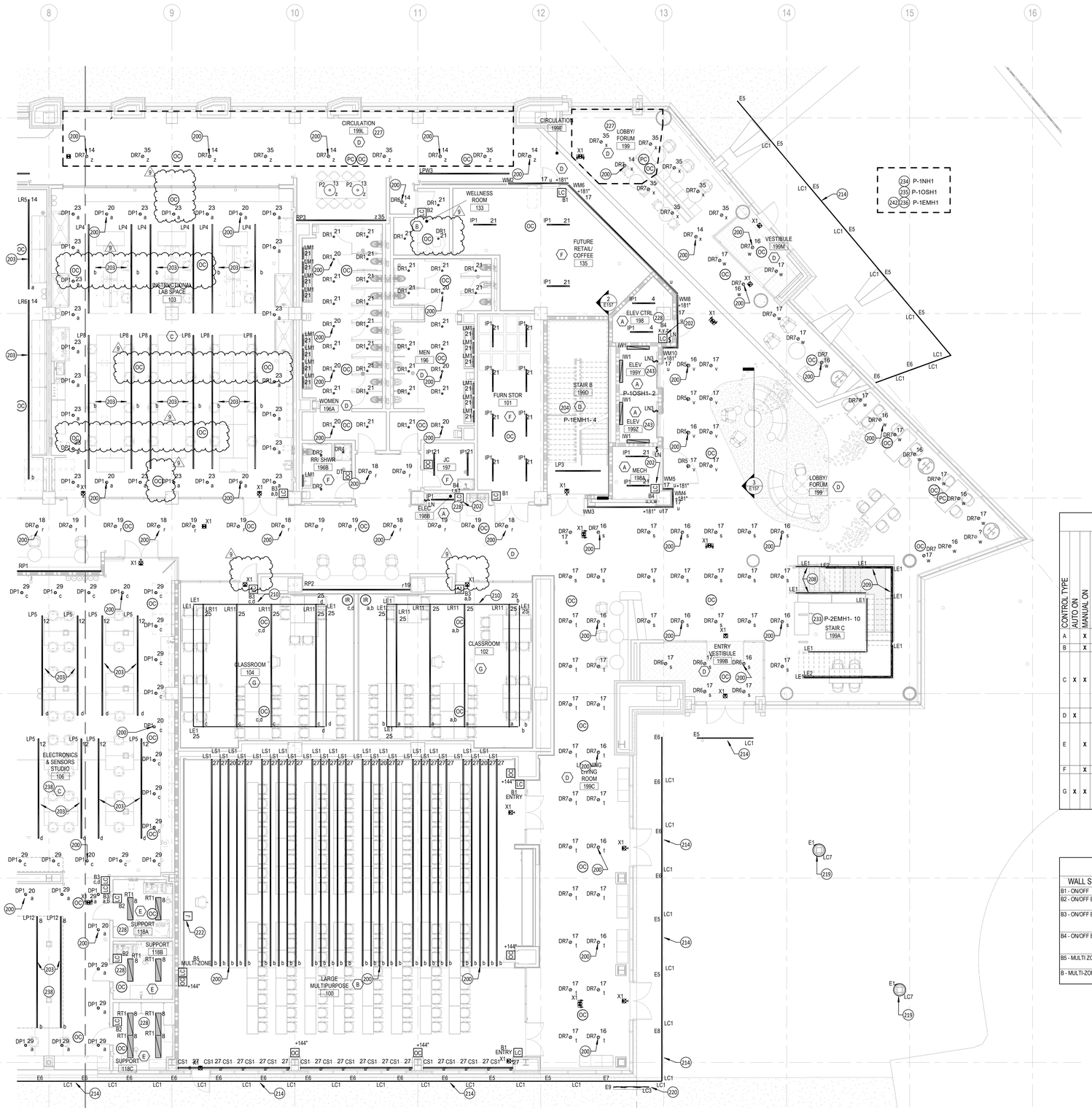


1 E151B ELECTRICAL LIGHTING PLAN - LEVEL 1 - AREA B
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
208	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF THE GUARDRAILING STRUCTURE OF THE STAIR. EACH SECTION WILL BE CONNECTED VIA CABLE WHICH PASSES THROUGH OPENING IN VERTICAL STAIR SUPPORT STRUCTURE TO CREATE A CONTINUOUSLY CONNECTED ROW OF FIXTURES. DRIVERS TO BE LOCATED BEHIND ACCESS PANEL AT SECOND FLOOR LANDING. REFER TO ARCHITECTURAL STAIR DETAILS FOR ADDITIONAL INFORMATION.
209	LIGHT FIXTURE TYPE LE2 IS LOCATED IN RECESS ON UNDER SIDE OF STAIR. FIXTURE TO HAVE CONTINUOUS LENSING WITH MITERED CORNERS. DRIVERS TO BE LOCATED BEHIND ACCESS PANEL AT SECOND FLOOR LANDING. REFER TO ARCHITECTURAL STAIR DETAILS FOR ADDITIONAL INFORMATION.
210	LIGHT FIXTURES TYPE LE1 IS LOCATED ABOVE THE FLOATING CEILING CLOUD TO CREATE AN INDIRECT LIGHTING GLOW. VERIFY MOUNTING WITH ARCHITECTURAL CLOUD DETAILS PRIOR TO INSTALLATION.
214	LIGHT FIXTURES TO BE MOUNTED WITHIN EXTERIOR SOFFIT. COORDINATE WITH ARCHITECTURAL DETAILS PRIOR TO INSTALLATION.
219	LIGHT FIXTURE TYPE E1 IS LOCATED WITHIN REVEAL AT THE BASE OF THE COLUMN. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
220	LIGHT FIXTURES TYPE E9 TO BE MOUNTED ON THE BACK SIDE OF THE "IU" LOGO SIGNAGE TO PROVIDE BACKLIGHTING EFFECT. COORDINATE WITH ARCHITECTURAL DETAILS PRIOR TO INSTALLATION.
222	PROVIDE RS232 INTERFACE FOR LECTERN CONNECTION TO ALLOW FOR LIGHTING CONTROL FROM AV SYSTEM.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
233	CONNECT ALL LIGHTING WITHIN RAILING AND UNDER SIDE OF FEATURE STAIRS TO EGRESS LIGHTING CIRCUIT INDICATED.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
238	LINEAR PENDANT FIXTURES IN THIS ROOM TO BE MOUNTED ABOVE METAL PANEL CEILING. COORDINATE EXACT MOUNTING WITH ARCHITECTURAL ELEVATIONS/DETAILS.
242	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #12 IN EGRESS POWER PANEL INDICATED.
243	CONNECT ALL LIGHTING WITHIN THIS ELEVATOR SHAFT TO CIRCUIT FROM OPTIONAL STANDBY PANEL INDICATED. ALL LIGHTING WITHIN THIS SHAFT SHALL OPERATE TOGETHER VIA SWITCHING INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
313.983.3600
smithgroup.com

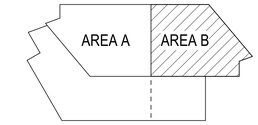
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRYAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 1 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E151B

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1 E152A ELECTRICAL LIGHTING PLAN - LEVEL 2 - AREA A
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
205	FACADE LIGHTING TO BE MOUNTED ON ROOF AND AIMED TO HIGHLIGHT THE UPPER PART OF BUILDING REVEAL. COORDINATE AIMING AND DIMMING LEVEL OF EACH ZONE IN FIELD WITH ARCHITECT/ENGINEER TO ACHIEVE DESIGN INTENT. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CIRCUITING INFORMATION.
206	WINDOW REVEAL FACADE LIGHTING TO BE MOUNTED ON VERTICAL SURFACE AND AIMED UPWARD TO ILLUMINATE THE VERTICAL SIDES OF THE WINDOW REVEAL. COORDINATE AIMING IN FIELD WITH ARCHITECT/ENGINEER TO ACHIEVE DESIGN INTENT. CONNECT COMPETE TO CIRCUIT INDICATED THROUGH LIGHTING CONTACTOR INDICATED TO ALLOW FOR TIME-OF-DAY CONTROL. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CIRCUITING INFORMATION.
207	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 20% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT WORK SURFACES.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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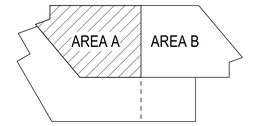

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE



ELECTRICAL LIGHTING PLAN - LEVEL 2 - AREA A

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

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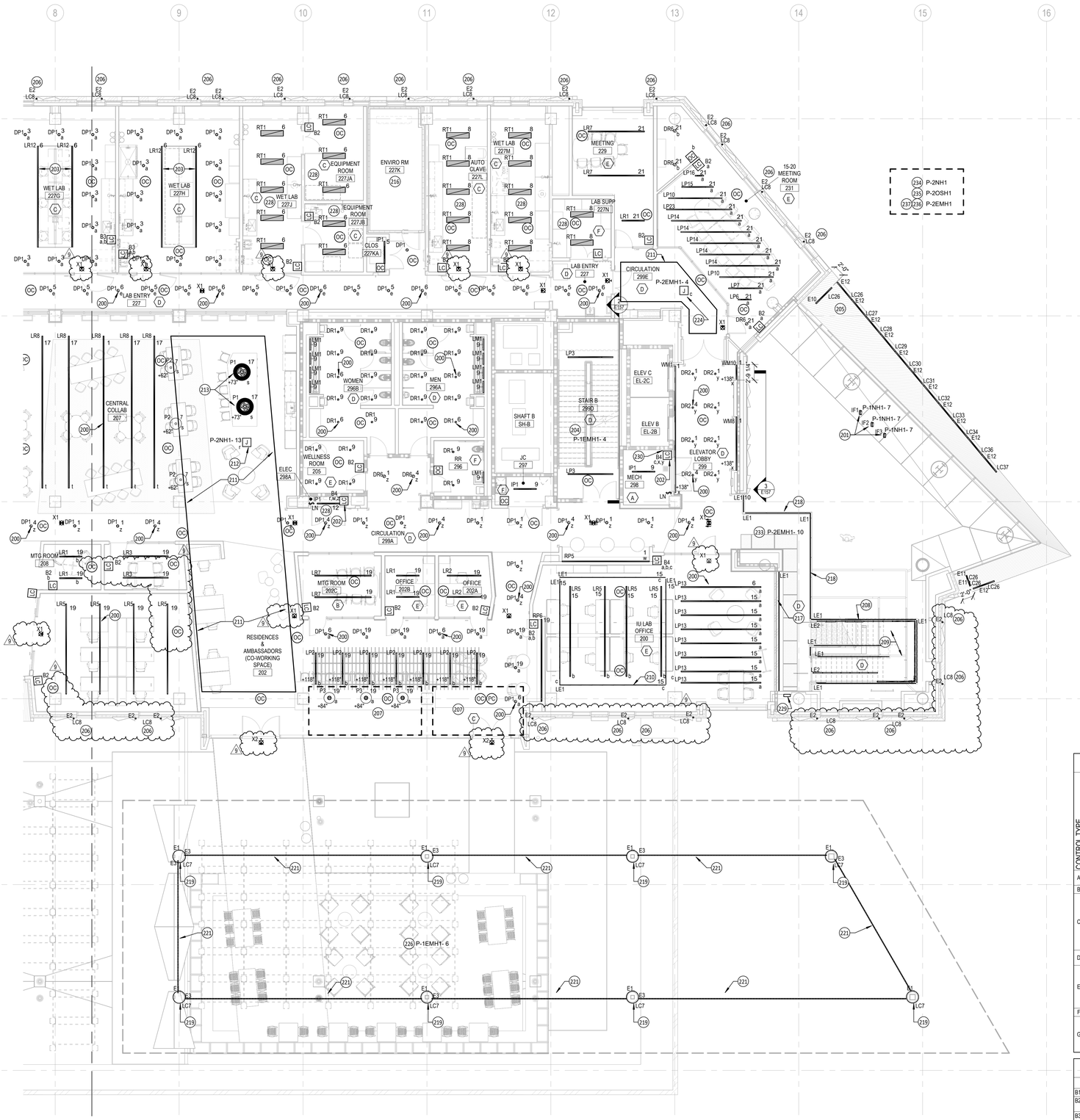

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
201	FLOOD LIGHTS TO BE MOUNTED ON LEDGE AND AIMED AT FEATURE WALL. EXACT AIMING ANGLES TO BE DETERMINED IN FIELD TO EVENLY ILLUMINATE WALL.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
205	FACADE LIGHTING TO BE MOUNTED ON ROOF AND AIMED TO HIGHLIGHT THE UPPER PART OF BUILDING REVEAL. COORDINATE AIMING AND DIMMING LEVEL OF EACH ZONE IN FIELD WITH ARCHITECT/ENGINEER TO ACHIEVE DESIGN INTENT. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CIRCUITING INFORMATION.
206	WINDOW REVEAL FACADE LIGHTING TO BE MOUNTED ON VERTICAL SURFACE AND AIMED UPWARD TO ILLUMINATE THE VERTICAL SIDES OF THE WINDOW REVEAL. COORDINATE AIMING IN FIELD WITH ARCHITECT/ENGINEER TO ACHIEVE DESIGN INTENT. CONNECT COMPETE TO CIRCUIT INDICATED THROUGH LIGHTING CONTACTOR INDICATED TO ALLOW FOR TIME-OF-DAY CONTROL. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CIRCUITING INFORMATION.
207	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 20% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT WORK SURFACES.
208	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF THE GUARDRAILING STRUCTURE OF THE STAIR. EACH SECTION WILL BE CONNECTED VIA CABLE WHICH PASSES THROUGH OPENING IN VERTICAL STAIR SUPPORT STRUCTURE TO CREATE A CONTINUOUSLY CONNECTED ROW OF FIXTURES. DRIVERS TO BE LOCATED BEHIND ACCESS PANEL AT SECOND FLOOR LANDING. REFER TO ARCHITECTURAL STAIR DETAILS FOR ADDITIONAL INFORMATION.
209	LIGHT FIXTURE TYPE LE2 IS LOCATED IN RECESS ON UNDER SIDE OF STAIR. FIXTURE TO HAVE CONTINUOUS LENSING WITH MITERED CORNERS. DRIVERS TO BE LOCATED BEHIND ACCESS PANEL AT SECOND FLOOR LANDING. REFER TO ARCHITECTURAL STAIR DETAILS FOR ADDITIONAL INFORMATION.
210	LIGHT FIXTURES TYPE LE1 IS LOCATED ABOVE THE FLOATING CEILING CLOUD TO CREATE AN INDIRECT LIGHTING GLOW. VERIFY MOUNTING WITH ARCHITECTURAL CLOUD DETAILS PRIOR TO INSTALLATION.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
212	EC TO PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. CONNECT COMPLETE TO 277V NORMAL POWER CIRCUIT SPECIFIED THROUGH LIGHTING CONTROL INDICTATED. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
213	COORDINATE MOUNTING OF PENDANT FIXTURES WITH ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
216	LIGHTING WITHIN ENVIRO ROOM SHALL BE PROVIDED AS PART OF ROOM ENCLOSURE. REFER TO POWER PLAN FOR ELECTRICAL CONNECTION TO ENVIRO ROOM.
217	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF WALL REVEAL STRUCTURE. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
218	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF RAILING STRUCTURE. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
219	LIGHT FIXTURE TYPE E1 IS LOCATED WITHIN REVEAL AT THE BASE OF THE COLUMN. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
221	LIGHT FIXTURE TYPE E3 IS LOCATED WITHIN COVE REVEAL OF CANOPY. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
226	CONNECT ALL TERRACE E1 AND E3 LIGHT FIXTURES TO CIRCUIT INDICATED THROUGH LIGHTING CONTACTOR.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
229	LOCATE DRIVERS FOR HANDRAIL LIGHTING ALONG 2ND FLOOR INTERIOR WALL AND UP THE OUTSIDE RAILING TO BETWEEN 1ST AND 2ND FLOOR AND INSIDE RAILING BETWEEN 1ST AND 2ND FLOOR AS WELL AS 2ND AND 3RD FLOORS. COORDINATE EXACT PLACEMENT WITH ARCHITECTURAL ACCESS PANEL TO ALLOW FOR ACCESS.
230	LOCATE DRIVER FOR HANDRAIL LIGHTING ALONG 2ND FLOOR AND UP THE OUTSIDE RAILING TO 3RD FLOOR ON WALL AT THIS LOCATION. COORDINATE EXACT PLACEMENT WITH MECHANICAL EQUIPMENT TO ALLOW FOR ACCESS.
233	CONNECT ALL LIGHTING WITHIN RAILING AND UNDER SIDE OF FEATURE STAIRS TO EGRESS LIGHTING CIRCUIT INDICATED.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X			X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

1 E152B ELECTRICAL LIGHTING PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
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313.983.3600
smithgroup.com

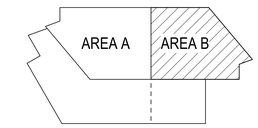
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
TRUE NORTH
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HEADLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 2 - AREA B

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BSA PROJECT NO. 00360481

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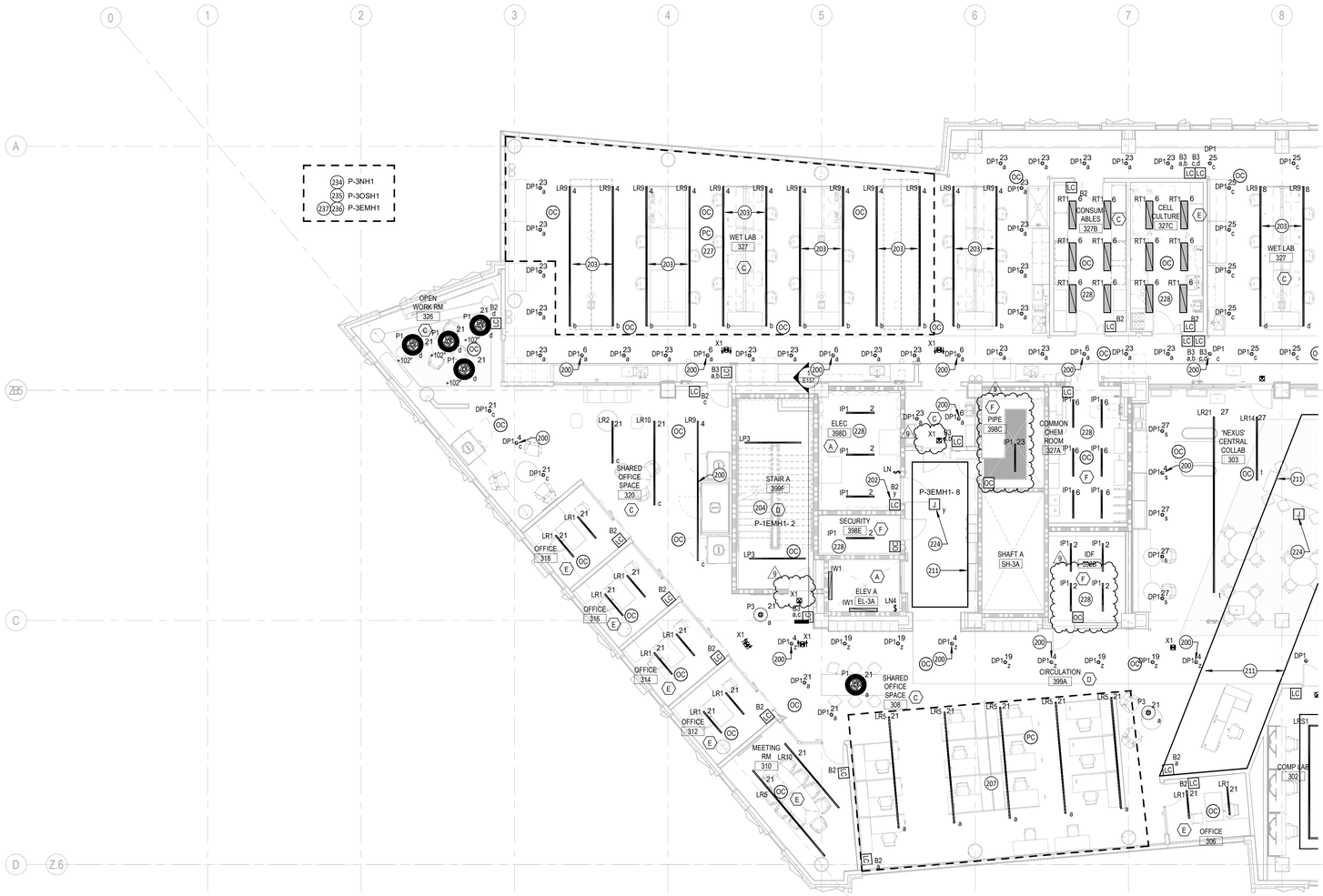

1 E153A ELECTRICAL LIGHTING PLAN - LEVEL 3 - AREA A
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
207	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 20% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT WORK SURFACES.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X					X		LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
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smithgroup.com

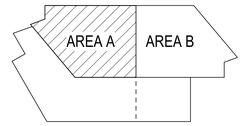
LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

BP4-CD: BUILD-OUT PACKAGE



KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRYAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 3 - AREA A

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E153A

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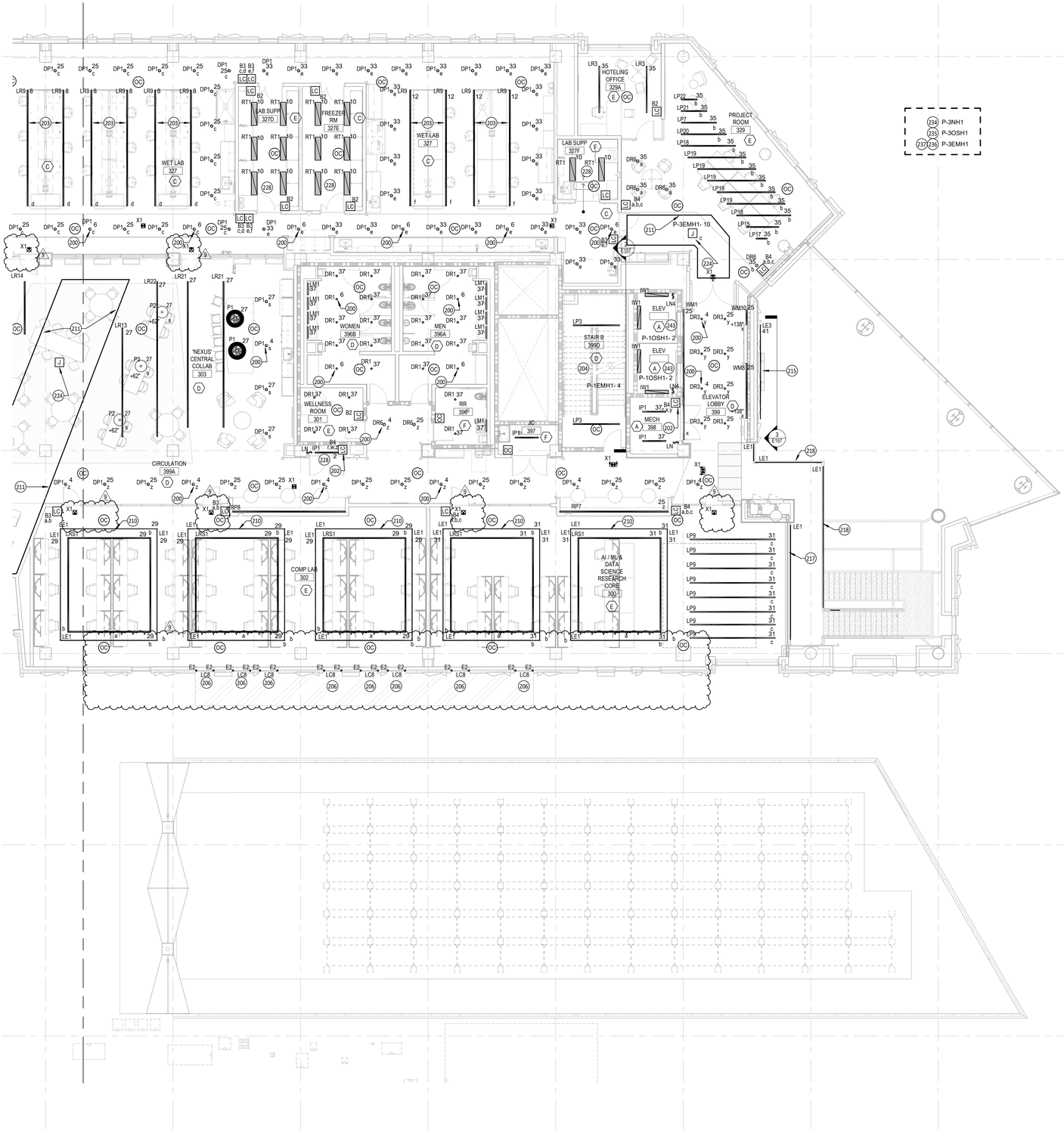

1 E153B ELECTRICAL LIGHTING PLAN - LEVEL 3 - AREA B
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
206	WINDOW REVEAL FACADE LIGHTING TO BE MOUNTED ON VERTICAL SURFACE AND AIMED UPWARD TO ILLUMINATE THE VERTICAL SIDES OF THE WINDOW REVEAL. COORDINATE AIMING IN FIELD WITH ARCHITECT/ENGINEER TO ACHIEVE DESIGN INTENT. CONNECT COMPETE TO CIRCUIT INDICATED THROUGH LIGHTING CONTACTOR INDICATED TO ALLOW FOR TIME-OF-DAY CONTROL. REFER TO LIGHTING CONTACTOR SCHEDULE ON SHEET E650 FOR CIRCUITING INFORMATION.
210	LIGHT FIXTURES TYPE LE1 IS LOCATED ABOVE THE FLOATING CEILING CLOUD TO CREATE AN INDIRECT LIGHTING GLOW. VERIFY MOUNTING WITH ARCHITECTURAL CLOUD DETAILS PRIOR TO INSTALLATION.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
215	LIGHT FIXTURES TYPE LE1 TO BE MOUNTED ON THE BACK SIDE OF THE "IU" LOGO SIGNAGE TO PROVIDE BACKLIGHTING EFFECT. COORDINATE WITH ARCHITECTURAL DETAILS PRIOR TO INSTALLATION.
217	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF WALL REVEAL STRUCTURE. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
218	LIGHT FIXTURE TYPE LE1 IS LOCATED ALONG THE BASE OF RAILING STRUCTURE. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.
243	CONNECT ALL LIGHTING WITHIN THIS ELEVATOR SHAFT TO CIRCUIT FROM OPTIONAL STANDBY PANEL INDICATED. ALL LIGHTING WITHIN THIS SHAFT SHALL OPERATE TOGETHER VIA SWITCHING INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X			X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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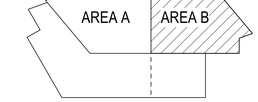

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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BRIAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 3 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E153B

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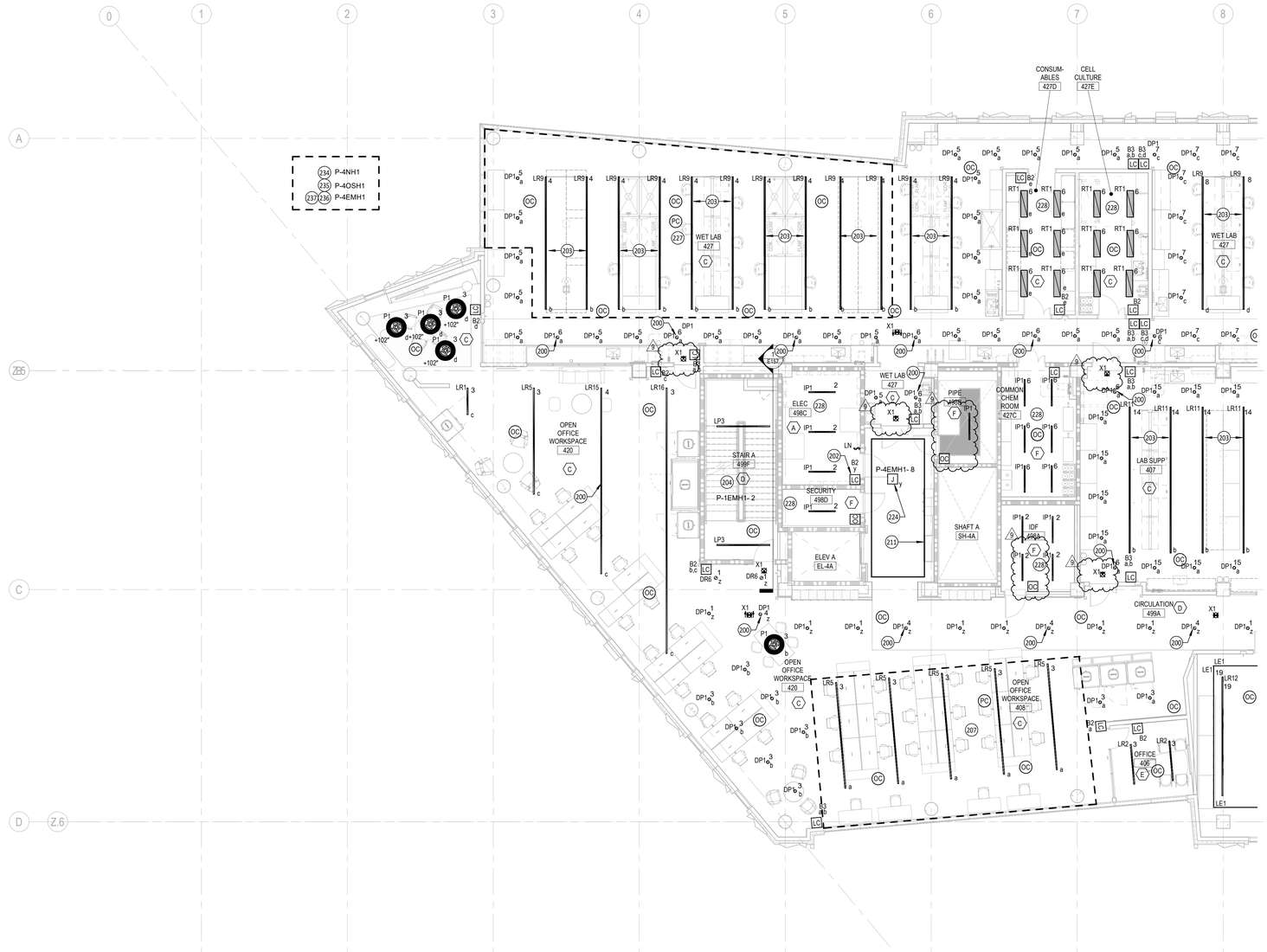


1 E154A ELECTRICAL LIGHTING PLAN - LEVEL 4 - AREA A
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

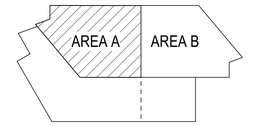
X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
207	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 20% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT WORK SURFACES.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X			X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'e' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.



KEYPLAN
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TRUE NORTH

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MARK	DATE	DESCRIPTION
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BRIAN D. HOAG AND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 4 - AREA A

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E154A

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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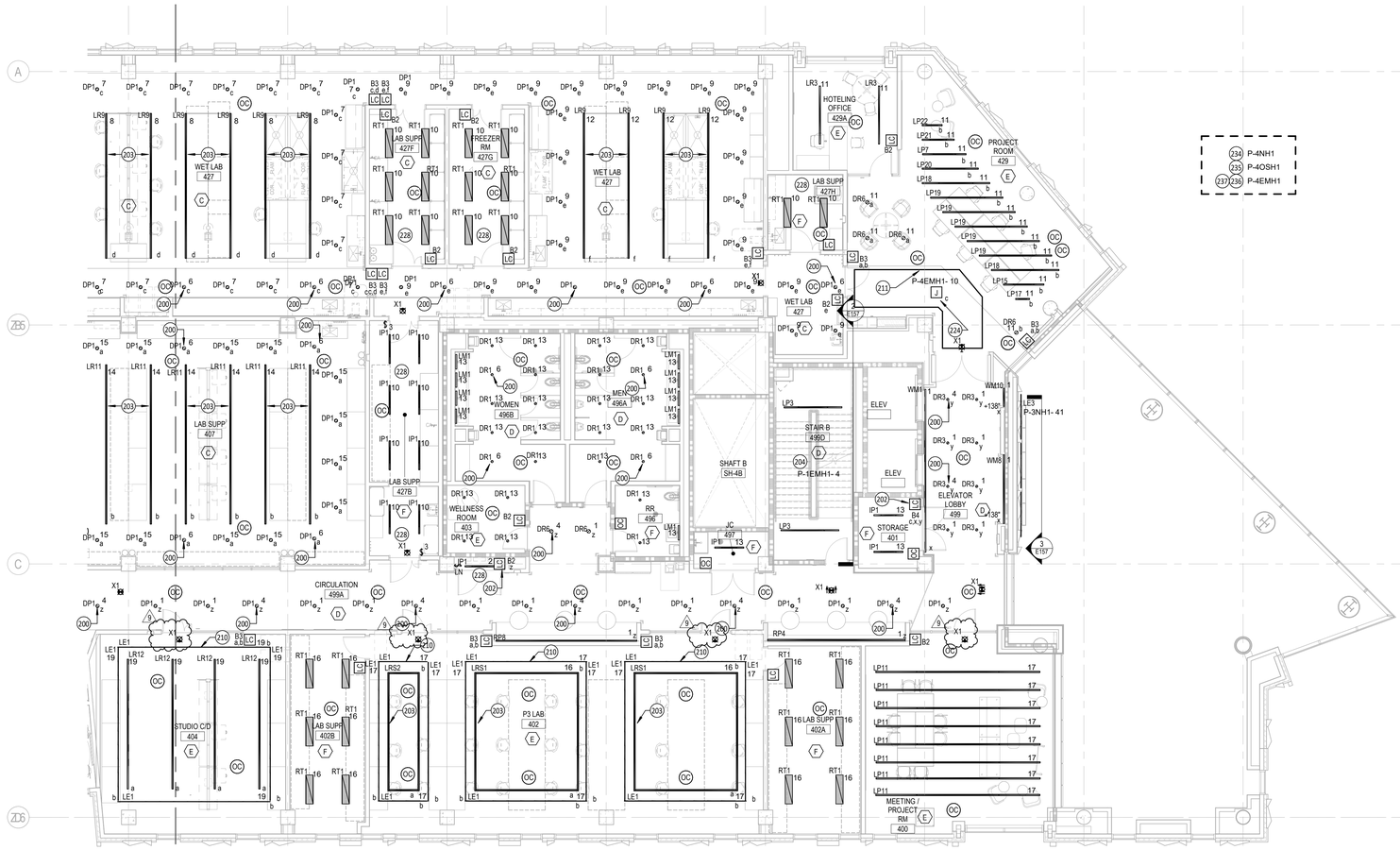

1 E154B ELECTRICAL LIGHTING PLAN - LEVEL 4 - AREA B
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
210	LIGHT FIXTURES TYPE LE1 IS LOCATED ABOVE THE FLOATING CEILING CLOUD TO CREATE AN INDIRECT LIGHTING GLOW. VERIFY MOUNTING WITH ARCHITECTURAL CLOUD DETAILS PRIOR TO INSTALLATION.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

	CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A			X		X					X		LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B			X	X	X	X						
C	X	X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X							LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X								ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X					LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

BSA

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TYPE FOR CORRECT BSA OFFICE

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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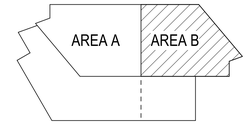

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 4 - AREA B

DATE REF: SHEET INDEX
BSA PROJECT NO. 00360481

E154B

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1 E155A ELECTRICAL LIGHTING PLAN - LEVEL 5 - AREA A
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
207	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 20% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT WORK SURFACES.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
227	CONNECT LIGHTING WITHIN DASHED BOUNDRY TO DAYLIGHTING HARVESTING SYSTEM IN THIS ROOM. LIGHTING SHALL DIM TO NO MORE THAN 50% OUTPUT TO MAINTAIN OPTIMAL FOOTCANDLE LEVELS AT LAB SURFACES.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

	CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X					X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B			X	X	X	X						
C		X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X							LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F			X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X			X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

BSA

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TYPE FOR CORRECT BSA OFFICE

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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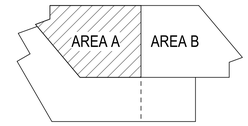

KEYPLAN
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REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAK
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 5 - AREA A

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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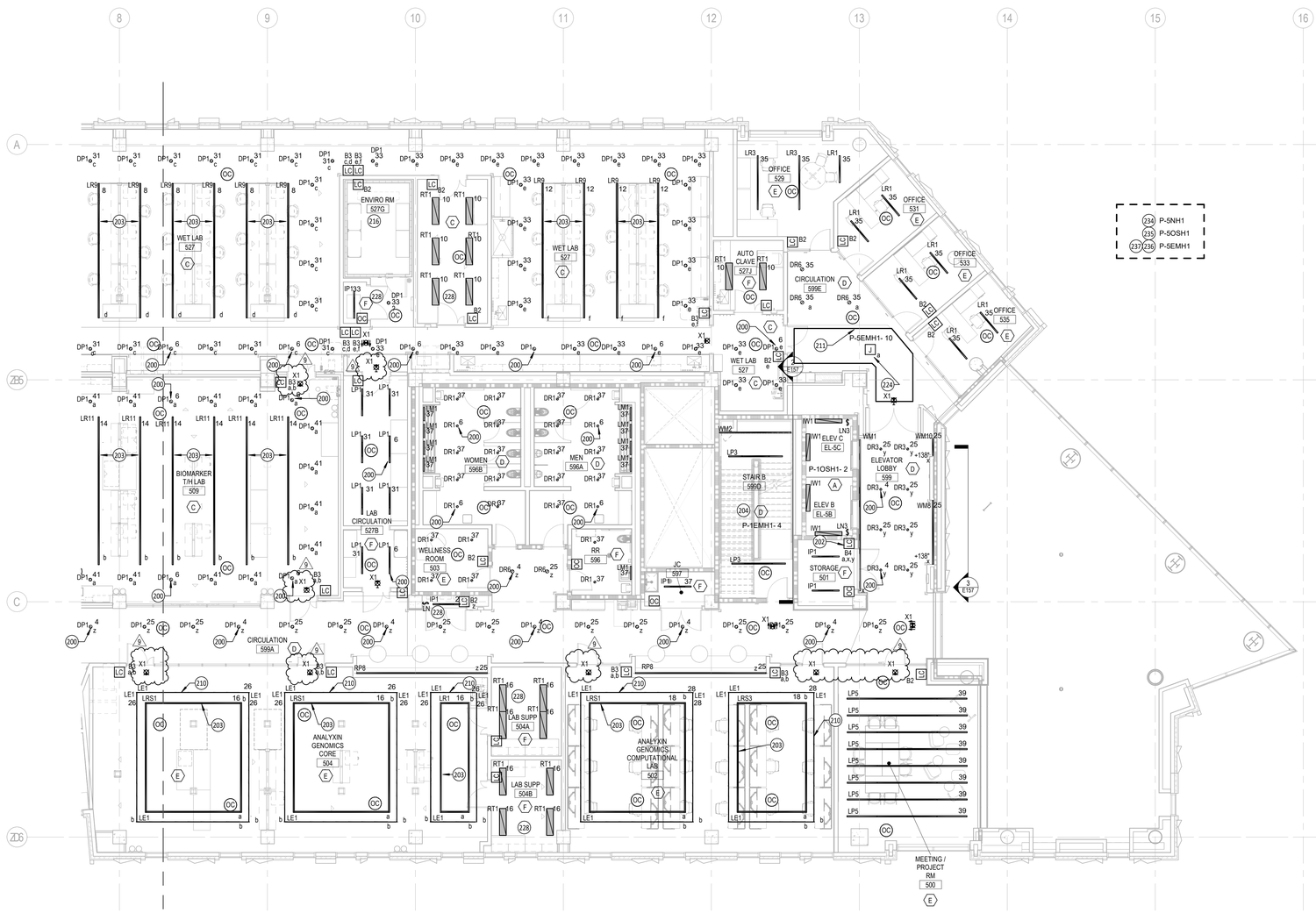

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
200	LIGHT FIXTURE INDICATED SHALL BE CONTROLLED WITH THE OTHER FIXTURES ON THE SAME SWITCHLEG OR WITHIN THE ROOM/AREA UNDER NORMAL OPERATION. UPON LOSS OF POWER, THE UL924 LISTED TRANSFER DEVICE (AS PART OF ROOM CONTROLLER OR SEPARATE COMPONENT) SHALL TRANSFER POWER TO UNSWITCHED EGRESS CIRCUIT INDICATED. PROVIDE NORMAL POWER, EMERGENCY POWER, AND SENSING CIRCUIT TO ROOM CONTROLLER AS REQUIRED.
202	LIGHTING CONTROL STATION TO CONTROL CORRIDOR LIGHTING TO ALLOW FOR THE OWNER TO CALIBRATE THE AUTO-ON LEVELS.
203	CONNECT LIGHT FIXTURE TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
210	LIGHT FIXTURES TYPE LE1 IS LOCATED ABOVE THE FLOATING CEILING CLOUD TO CREATE AN INDIRECT LIGHTING GLOW. VERIFY MOUNTING WITH ARCHITECTURAL CLOUD DETAILS PRIOR TO INSTALLATION.
211	ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
216	LIGHTING WITHIN ENVIRO ROOM SHALL BE PROVIDED AS PART OF ROOM ENCLOSURE. REFER TO POWER PLAN FOR ELECTRICAL CONNECTION TO ENVIRO ROOM.
224	PROVIDE CONNECTION FOR POWER AND LIGHTING CONTROLS TO ILLUMINATED PANEL SYSTEM. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
228	CONNECT LIGHT FIXTURES IN THIS ROOM TO OPTIONAL STANDBY POWER CIRCUIT INDICATED FROM OPTIONAL STANDBY POWER PANEL SERVING THIS AREA.
234	CONNECT NORMAL POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
235	CONNECT OPTIONAL STANDBY POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
236	CONNECT EGRESS POWER LIGHTING IN THIS AREA TO PANEL INDICATED.
237	CONNECT ALL EXIT SIGNS ON THIS FLOOR TO CIRCUIT #1 IN EGRESS POWER PANEL INDICATED.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X			X			LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

1 E155B ELECTRICAL LIGHTING PLAN - LEVEL 5 - AREA B
1/8" = 1'-0"

BSA
SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

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smithgroup.com

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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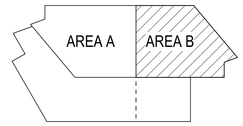

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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9	4/27/2026	BP4-CD: ADDENDUM #2
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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOLMQUIST REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - LEVEL 5 - AREA B

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BSA PROJECT NO. — 00360481

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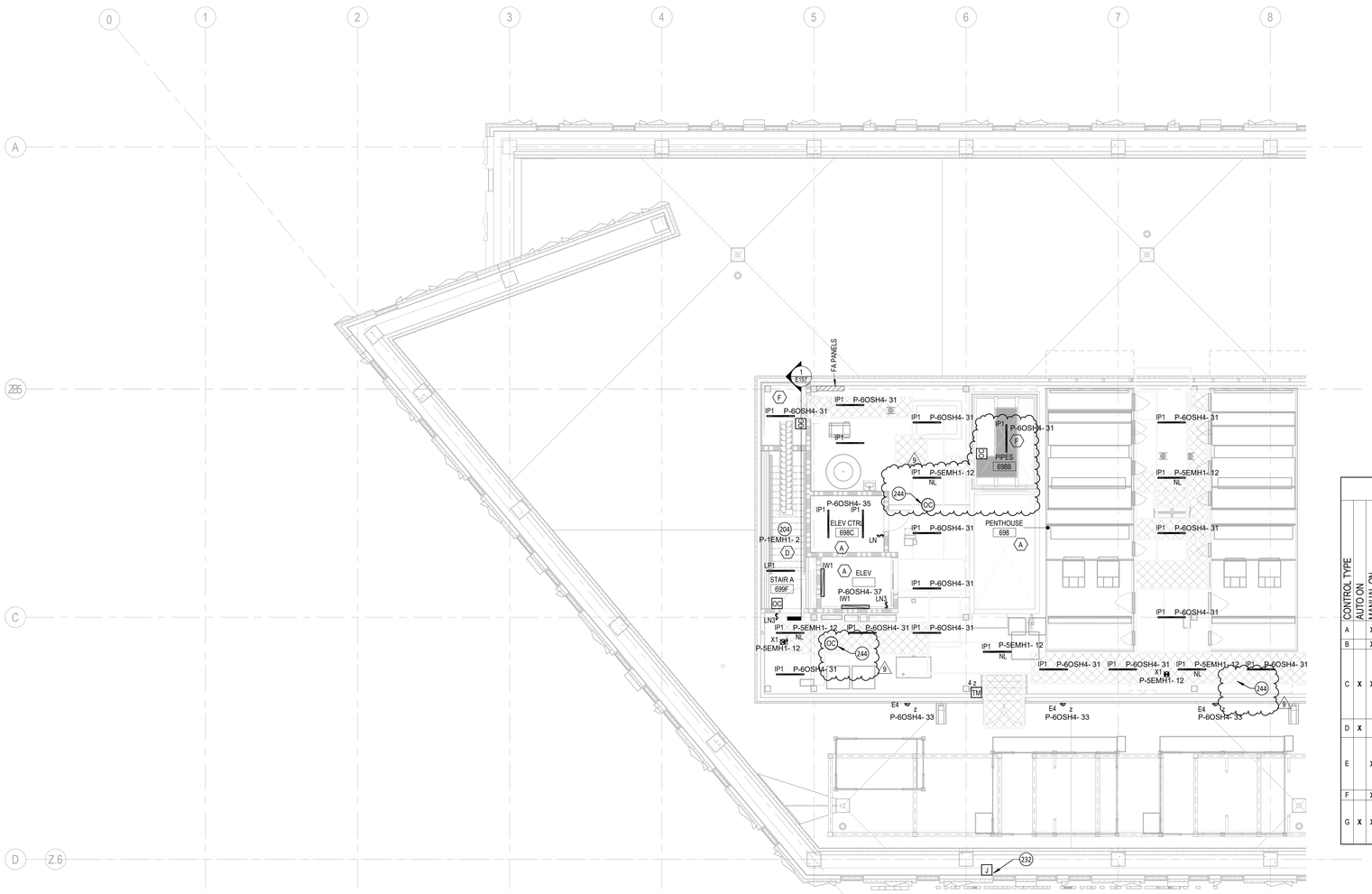

2 E156A ELECTRICAL LIGHTING PLAN - PENTHOUSE - AREA A
1/8" = 1'-0"

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
232	PROVIDE ELECTRICAL CONNECTION TO EXTERIOR BUILDING MOUNTED SIGNAGE.
244	OCCUPANCY SENSOR TO BE PROVIDED BY EC FOR CONNECTION TO BMS OF MECHANICAL USE. NOT TO BE USED FOR LIGHTING IN THIS SPACE.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X					X		LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B			X	X	X	X					
C	X	X	X	X	X	X				X	LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X				X	SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X			X			LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
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B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

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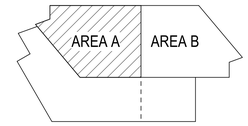

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TRUE NORTH

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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP1-CD: SITE AND FOUNDATION PACKAGE

BRIAN D. HOAK AND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - PENTHOUSE - AREA A

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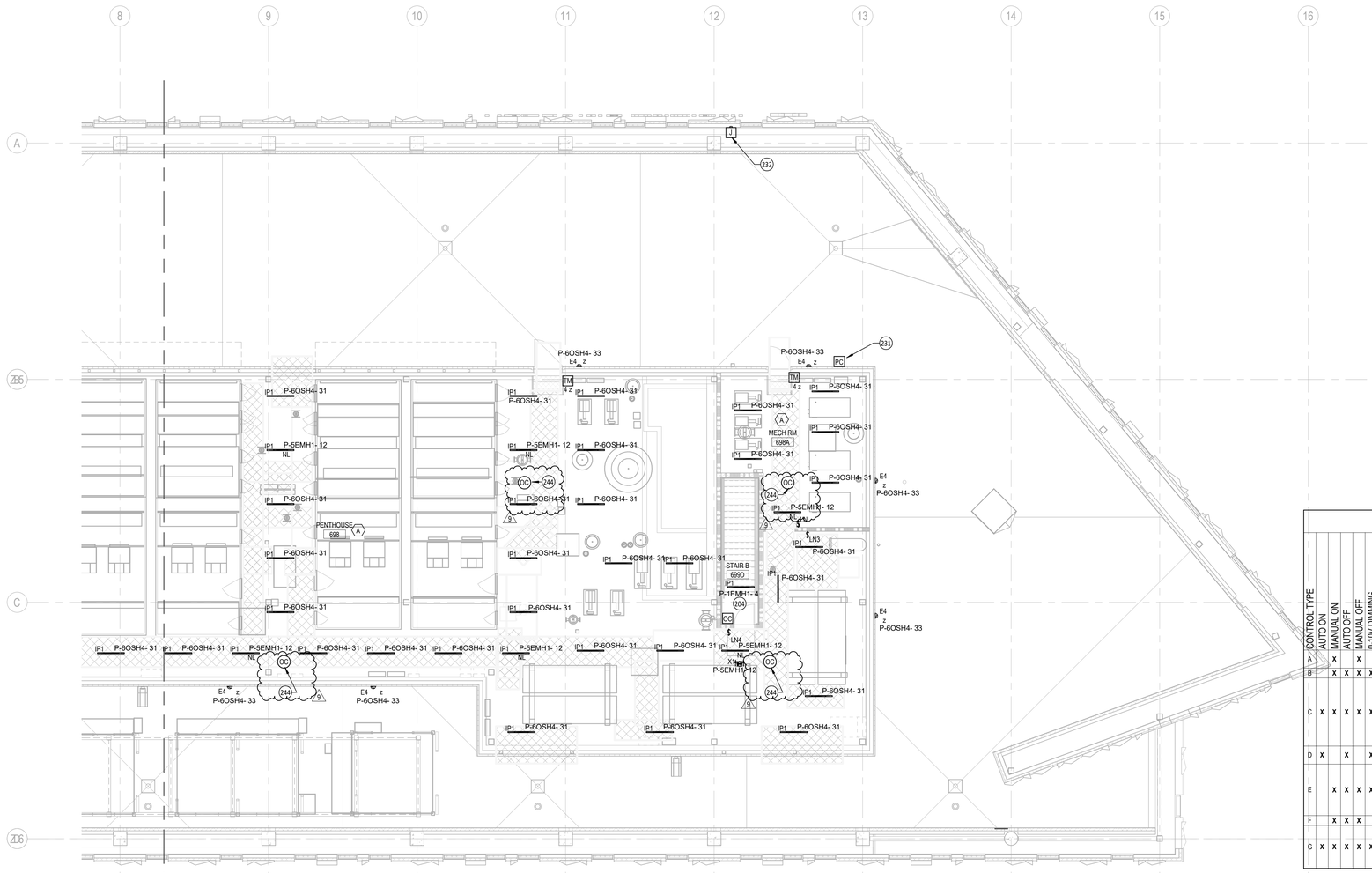

LIGHTING GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. ALL PENDANT FIXTURES SHALL BE MOUNTED AT +10'-0" ABOVE FINISHED FLOOR HEIGHT UNLESS NOTED OTHERWISE.

PLAN NOTES

X00	PLAN NOTES
204	CONNECT ALL LIGHTING IN THIS STAIRWELL TO EGRESS LIGHTING CIRCUIT AND PANEL INDICATED.
231	PROVIDE PHOTOCELL FOR TIME-OF-DAY INPUT TO LIGHTING CONTACTORS FOR EXTERIOR LIGHTING.
232	PROVIDE ELECTRICAL CONNECTION TO EXTERIOR BUILDING MOUNTED SIGNAGE.
244	OCCUPANCY SENSOR TO BE PROVIDED BY EC FOR CONNECTION TO BMS OF MECHANICAL USE. NOT TO BE USED FOR LIGHTING IN THIS SPACE.

LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	AUTO ON	MANUAL ON	AUTO OFF	MANUAL OFF	0-10V DIMMING	TASK LIGHTING ON SENSOR	IR PARTITION SENSOR	LINE VOLTAGE SWITCHING	SWITCHED RECEPTACLE	MOTORIZED SHADE CONTROL	CONTROL REMARKS
A		X		X				X			LIGHTS IN THIS ROOM/AREA SHALL OPERATE AS MANUAL ON MANUAL OFF WITH NO AUTOMATIC CONTROL DUE TO SAFETY CONCERNS.
B		X	X	X	X						
C	X	X	X	X	X	X			X		LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
D	X		X		X						LIGHTS IN T HIS ROOM/AREA SHALL COME ON TO 100% OUTPUT AUTOMATICALLY. IN UNOCCUPIED STATE, LIGHTS WILL DIM TO 20% OUTPUT.
E		X	X	X	X	X			X		SOME AREAS WITHIN THIS CONTROL TYPE CONTAINED OCCUPANCY CONTROLLED OUTLETS. PROVIDE ADDITIONAL POWER PACKS AS REQUIRED FOR RECEPTACLE CONTROL. SOME AREAS OF THIS TYPE INCLUDE TASK LIGHTING. WHERE PROVIDED, TASK LIGHTING SHALL BE CONTROLLED VIA SWITCHED RECEPTACLE. REFER TO LAB FURNITURE PLANS FOR TASK LIGHTING LOCATIONS.
F		X	X	X							ON/OFF WITH NO MANUAL DIMMING
G	X	X	X	X	X		X				LIGHTS IN THIS ROOM/AREA SHALL COME ON TO 50% OUTPUT AUTOMATICALLY WITH MANUAL CONTROL TO BRING LIGHTS TO FULL BRIGHTNESS WITH RAISE/LOWER CONTROL. WHEN PARTITION IS CLOSED, BOTH ROOMS SHALL OPERATE AS INDEPENDANT ROOMS. WHEN PARTION IS OPEN, 'a' AND 'c' SHALL OPERATE TOGETHER AND 'b' AND 'd' SHALL OPERATE TOGETHER.

LIGHTING WALL STATION CONTROLLER SCHEDULE

WALL STATION TYPE	WALL STATION DESCRIPTION
B1 - ON/OFF	
B2 - ON/OFF BRIGHT/DIM	PUSH BUTTON CONTROL WITH SINGE ZONE OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM. SINGLE GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B3 - ON/OFF BRIGHT/DIM 2-ZONE	PUSH BUTTON CONTROL WITH TWO ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B4 - ON/OFF BRIGHT/DIM 3-ZONE	PUSH BUTTON CONTROL WITH THREE ZONES OF CONTROL. PUSH BUTTONS FOR ON/OFF AND BRIGHT DIM FOR EACH ZONE. SINGLE OR TWO GANG CONTROLLER MOUNTED IN TWO GANG BOX WITH MUD RING
B5 - MULTI ZONE TOUCH SCREEN	PROGRAMMABLE TOUCH-SCREEN INTERFACE ALLOWING FOR MULTIPLE ZONES OF CONTROL THROUGH PRE-PROGRAMMED ROOM SCENES.
B - MULTI-ZONE CONTROL	MULTI ZONE CONTROL WITH PRE-PROGRAMMED SCENES AND MANUAL ZONE OVERRIDE FOR ON/OFF/BRIGHT/DIM.

2 E156B ELECTRICAL LIGHTING PLAN - PENTHOUSE - AREA B
1/8" = 1'-0"

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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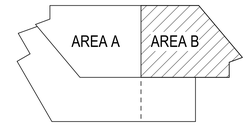

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP1-CD: SITE AND FOUNDATION PACKAGE

BRYAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL LIGHTING PLAN - PENTHOUSE - AREA B

DATE **REF: SHEET INDEX**
BSA PROJECT NO. **00360481**

E156B

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ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTION BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	PLAN NOTES
101	PROVIDE #6 AWG GROUND FROM FLAMMABLE CABINET GROUNDING LUG TO GROUND BUS IN PANEL SERVING THIS ROOM.
102	DISCONNECT BY DIVISION 23.
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX, REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
113	RECEPTACLE MOUNTED IN COUNTERTOP PEDESTAL, PEDESTAL BY OTHERS. REFER TO Q SERIES PLANS FOR MORE INFORMATION.
115	RECEPTACLES SHOWN WITH TAG "SW" SHALL BE TIED TO THE ROOM OCCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND SHALL BE LABELED AS CONTROLLED PER SPECIFICATIONS. LOCATIONS WHERE TWO RECEPTACLES ARE SHOWN DIRECTLY ADJACENT TO EACH OTHER AND ONE IS TAGGED "SW" SHALL BE A 2-GANG ROUGH-IN WITH ONE OUTLET SWITCHED AND THE OTHER NON-SWITCHED.
119	RECEPTACLE FOR VACUUM PUMP MOUNTED IN BASE CABINET. COORDINATE ROUGH-IN LOCATION WITH APPROVED CASEWORK SHOP DRAWINGS AND EQUIPMENT.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
125	REFER TO THE EMERGENCY RISER DIAGRAM ON E50H FOR CIRCUITING INFORMATION.
127	PROVIDE L6-20 RECEPTACLE FOR RACK POWER. LOCATE WITHIN 12 INCHES OF THE NEAREST RACK, BUT NOT BETWEEN THE RACK AND WALL. REFER TO ICT SERIES DRAWINGS FOR RACK LOCATION. CONNECT TO PANEL INDICATED.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
132	POWER CONNECTION TO SECURITY PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
135	MOUNT DEVICE HORIZONTALLY IN TOE SPACE.
136	THREE (3) 120V, 20A CIRCUITS TO BULK NITROGEN SYSTEM. (1) FOR RECEPTACLES AND LIGHTS, (1) FOR TELEMETRY, (1) FOR VIDEO SURVEILLANCE. COORDINATE EXACT REQUIREMENTS WITH GAS VENDOR.
137	PROVIDE (5) EMPTY 1" CONDUITS TO THE BULK NITROGEN SYSTEM. COORDINATE EXACT REQUIREMENTS WITH GAS VENDOR.
138	PROVIDE A 15KVA TRANSFORMER 480V DELTA TO 240V DELTA, SUSPENDED ABOVE THE CEILING AND CONNECT TO 480V CIRCUIT INDICATED. COORDINATE EXACT LOCATION WITH ABOVE CEILING OBSTRUCTIONS. PROVIDE A 50A, 3-POLE, 240V ENCLOSED BREAKER FED FROM THE TRANSFORMER WITH F50 (3 HOT + 1 GROUND) CONDUCTORS AND CONNECT COMPLETE TO CNC MACHINE. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT PROVIDED.
147	COORDINATE EXACT ELCTRICAL REQUIREMENTS WITH TRASH COMPACTOR VENDOR.
148	BOND THE STATIC DISSIPATIVE FLOOR SYSTEM TO GROUND WIRE IN WALL RECEPTACLE WITH #10 AWG (VERIFY WIRE SIZE WITH FLOOR MANUFACTURER).
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
152	EC SHALL FURNISH AND INSTALL 480V, 3PH, 400A FUSIBLE DISCONNECT TO SERVE PV SYSTEM. EC SHALL PROVIDE DISCONNECT, LINE SIDE CONDUIT AND WIRING. PV CONTRACTOR SHALL PROVIDE FUSE AND ALL LOAD SIDE CONDUIT WIRING AND COMPONENTS. PV DESIGN SHALL INCLUDE UTILITY AGREEMENT AND WILL DEFINE EXACT LOCATION FOR THIS DISCONNECT COORDINATE PLACEMENT WITH PV CONTRACTOR AND UTILITY AGREEMENT PRIOR TO ROUGH-IN.
153	EC SHALL COORDINATE SCOPE OF WORK IN THIS ROOM WITH PV CONTRACTOR. REFER TO SHEETS E190 & E191 FOR PV SCOPE OF WORK AND OTHER REQUIREMENTS.

1 E161A ELECTRICAL POWER PLAN - LEVEL 1 - AREA A
1/8" = 1'-0"

2 E161A ELECTRICAL POWER PLAN - LEVEL 1 MEZZANINE - AREA A
1/8" = 1'-0"

BSA

SWITCH PLACEHOLDER FAMILY
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500 GRISWOLD
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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
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 1 - AREA A

DATE: REF: SHEET INDEX
BSA PROJECT NO.: 00360481

E161A

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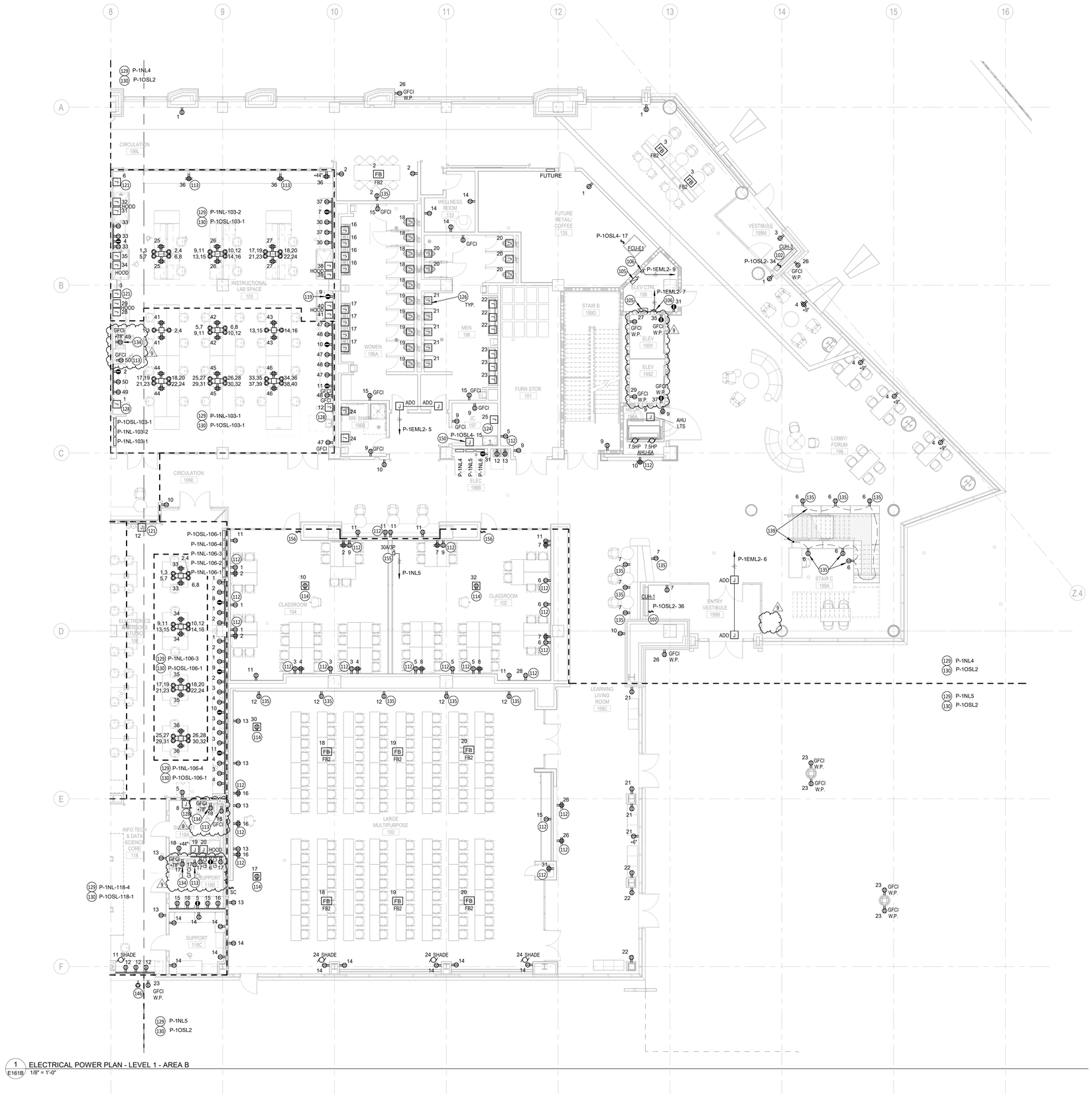

1 E161B ELECTRICAL POWER PLAN - LEVEL 1 - AREA B
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTON BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

XOO	PLAN NOTES
102	DISCONNECT BY DIVISION 23.
105	CONNECT 3P, 480VAC FEED TO DISCONNECT FOR ELEVATOR MAIN POWER SUPPLY. REFER TO RISER DIAGRAM ON SHEET E501 FOR ADDITIONAL INFORMATION. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR PROVIDER PRIOR TO INSTALLATION.
106	CONNECT TO DISCONNECT FOR ELEVATOR 120V REQUIREMENTS. CONNECT TO 20A, 1P, 120VAC CIRCUIT INDICATED WITH 3/4"C, 2#10 + 1#10 GND.
112	DEVICE INSTALLED IN AV BACK-BOX. REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
113	RECEPTACLE MOUNTED IN COUNTERTOP PEDESTAL. PEDESTAL BY OTHERS. REFER TO Q SERIES PLANS FOR MORE INFORMATION.
114	REFER TO FLOORBOX SCHEDULE ON ICT SERIES SHEETS FOR ADDITIONAL INFORMATION.
119	RECEPTACLE FOR VACUUM PUMP MOUNTED IN BASE CABINET. COORDINATE ROUGH-IN LOCATION WITH APPROVED CASEWORK SHOP DRAWINGS AND EQUIPMENT.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
124	POWER CONNECTION TO DIGITAL MIXING VLAVLE. COORDIANTE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
126	POWER CONNECTION TO TRANSFORMER ABOVE ACCESSIBLE CEILING SPACE FOR SENSOR-OPERATED PLUMBING FIXTURE. LOW-VOLTAGE WIRING DOWN TO FIXTURE BY PLUMBING CONTRACTOR. VERIFY LOCATION OF TRANSFORMERS WITH PLUMBING CONTRACTOR.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
135	MOUNT DEVICE HORIZONTALLY IN TOE SPACE.
139	STUB CONDUIT FROM UNDER SLAB UP INTO BASE OF BENCH SEATING AT LOCATION SHOWN. TRANSITION TO FLEX AND ROUTE HORIZONTALLY IN THE BASE OF THE BENCHES TO EACH RECEPTACLE.
146	PROVIDE A 100A, PIN AND SLEEVE HUBBELL # HBL4100R-12W RECEPTACLE WITH BOX #BB100N. MOUNT AT +36" ABOVE FINISHED GRADE. CONNECT TO PANEL S1N-B-1. REFER TO RISER DIAGRAM FOR MORE INFORMATION.
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
155	POWER CONNECTION TO MOTORIZED PARTITION WALL. COORDINATE EXACT REQUIREMENTS WITH PARTITION VENDOR PRIOR TO ROUGH-IN.
156	PARTITION WALL CONTROLLER. COORDINATE REQUIREMENTS WITH PARTITION VENDOR PRIOR TO ROUIGH-IN.

BSA

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TYPE FOR CORRECT BSA OFFICE

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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
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 1 - AREA B

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BSA PROJECT NO.	00360481

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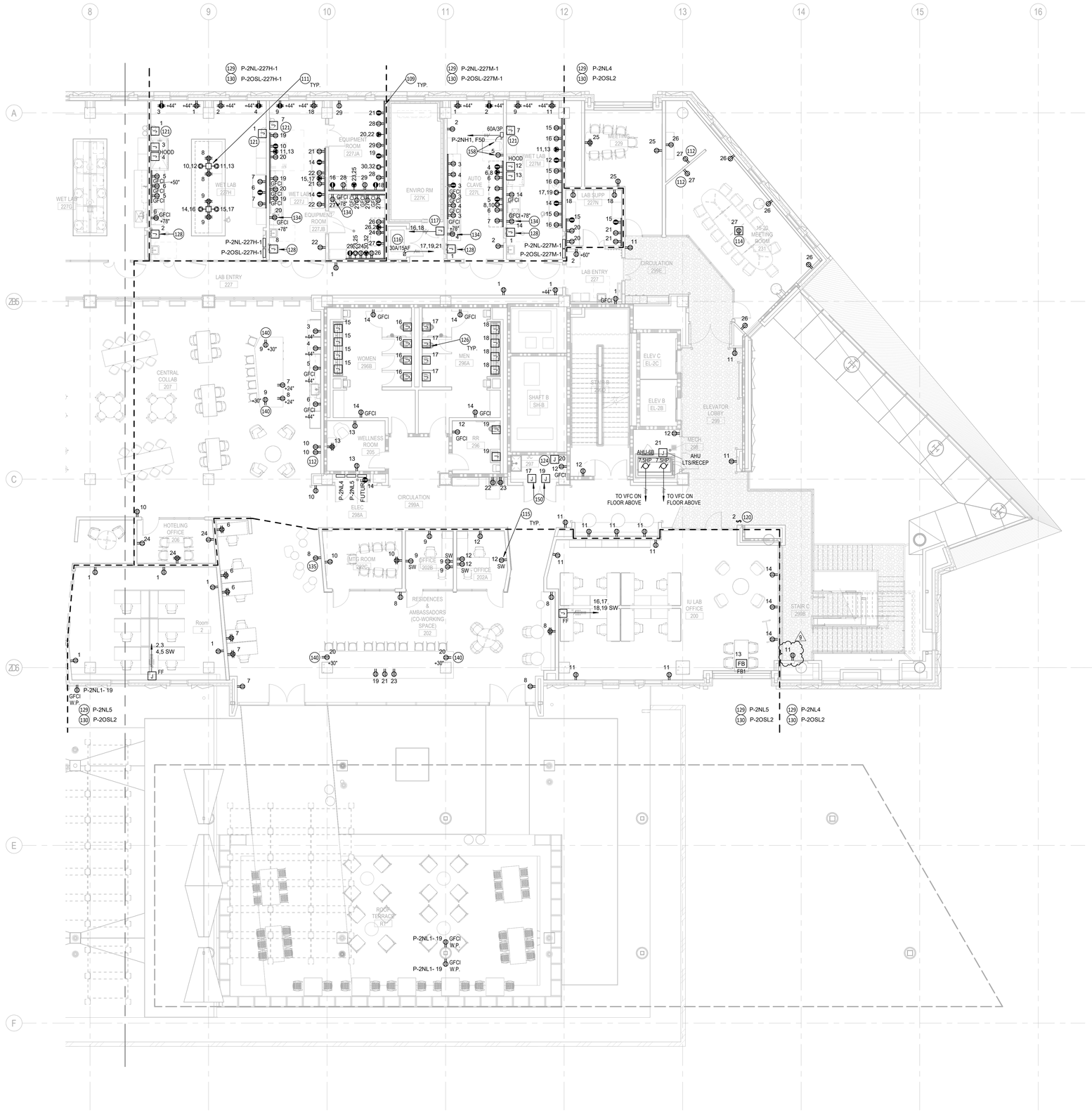

1 E162B ELECTRICAL POWER PLAN - LEVEL 2 - AREA B
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTION BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	PLAN NOTES
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX, REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
114	REFER TO FLOORBOX SCHEDULE ON ICT SERIES SHEETS FOR ADDITIONAL INFORMATION.
115	RECEPTACLES SHOWN WITH TAG "SW" SHALL BE TIED TO THE ROOM OCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND SHALL BE LABELED AS CONTROLLED PER SPECIFICATIONS. LOCATIONS WHERE TWO RECEPTACLES ARE SHOWN DIRECTLY ADJACENT TO EACH OTHER AND ONE IS TAGGED "SW" SHALL BE A 2-GANG ROUGH-IN WITH ONE OUTLET SWITCHED AND THE OTHER NON-SWITCHED.
116	ENVIRONMENTAL ROOM CONDENSING UNIT, PROVIDE FUSED DISCONNECT AND CONNECT TO STANDBY CIRCUIT INDICATED. COORDINATE WITH VENDOR.
117	PROVIDE SINGLE POINT POWER CONNECTION TO VENDOR PROVIDED CONTROL PANEL. CONNECT WITH 3/4" C., (3) #6 AWG + (1) #10 AWG GROUND FROM STANDBY CIRCUIT INDICATED. VERIFY LOCATION OF CONTROL PANEL WITH VENDOR PRIOR TO ROUGH-IN.
120	EMERGENCY POWER CONNECTION TO FIRE SHUTTER, PROVIDE DISCONNECT SWITCH AND CONNECT COMPLETE TO CONTROLLER.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
124	POWER CONNECTION TO DIGITAL MIXING VLAVLE, COORDIANTE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
126	POWER CONNECTION TO TRANSFORMER ABOVE ACCESSIBLE CEILING SPACE FOR SENSOR-OPERATED PLUMBING FIXTURE. LOW-VOLTAGE WIRING DOWN TO FIXTURE BY PLUMBING CONTRACTOR. VERIFY LOCATION OF TRANSFORMERS WITH PLUMBING CONTRACTOR.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
135	MOUNT DEVICE HORIZONTALLY IN TOE SPACE.
140	MOUNT DEVICE HORIZONTALLY IN WING WALL UNDER COUNTER.
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
158	POWER CONNECTION TO STERILIZER AND RECEPTACLE FOR STERILIZER CONTROLS.

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CLIENT PROJECT NO. - 20250072

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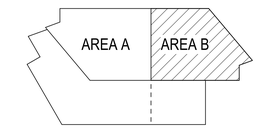

KEYPLAN
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TRUE NORTH

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BRIAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 2 - AREA B

DATE
BSA PROJECT NO. 00360481

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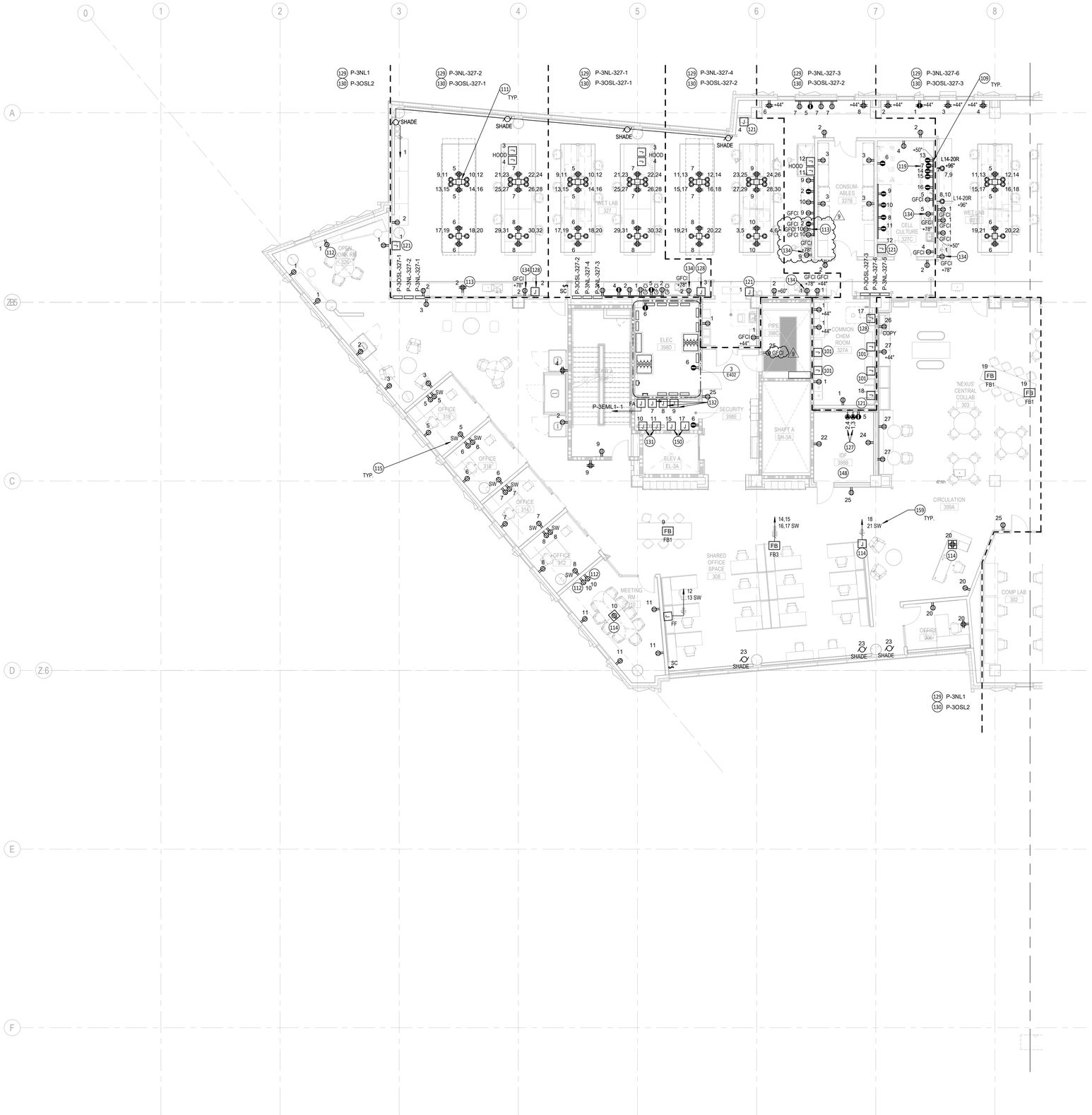

1 E163A ELECTRICAL POWER PLAN - LEVEL 3 - AREA A
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTION BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	PLAN NOTES
101	PROVIDE #6 AWG GROUND FROM FLAMMABLE CABINET GROUNDING LUG TO GROUND BUS IN PANEL SERVING THIS ROOM.
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX. REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
113	RECEPTACLE MOUNTED IN COUNTERTOP PEDESTAL, PEDESTAL BY OTHERS. REFER TO Q SERIES PLANS FOR MORE INFORMATION.
114	REFER TO FLOORBOX SCHEDULE ON ICT SERIES SHEETS FOR ADDITIONAL INFORMATION.
115	RECEPTACLES SHOWN WITH TAG "SW" SHALL BE TIED TO THE ROOM OCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND SHALL BE LABELED AS CONTROLLED PER SPECIFICATIONS. LOCATIONS WHERE TWO RECEPTACLES ARE SHOWN DIRECTLY ADJACENT TO EACH OTHER AND ONE IS TAGGED "SW" SHALL BE A 2-GANG ROUGH-IN WITH ONE OUTLET SWITCHED AND THE OTHER NON-SWITCHED.
119	RECEPTACLE FOR VACUUM PUMP MOUNTED IN BASE CABINET, COORDINATE ROUGH-IN LOCATION WITH APPROVED CASEWORK SHOP DRAWINGS AND EQUIPMENT.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
127	PROVIDE L6-20 RECEPTACLE FOR RACK POWER. LOCATE WITHIN 12 INCHES OF THE NEAREST RACK, BUT NOT BETWEEN THE RACK AND WALL. REFER TO ICT SERIES DRAWINGS FOR RACK LOCATION. CONNECT TO PANEL INDICATED.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
132	POWER CONNECTION TO SECURITY PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
148	BOND THE STATIC DISSIPATIVE FLOOR SYSTEM TO GROUND WIRE IN WALL RECEPTACLE WITH #10 AWG (VERIFY WIRE SIZE WITH FLOOR MANUFACTURER).
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
159	CIRCUIT NUMBERS FOR FURNITURE FEEDS SHOWN WITH TAG "SW", SHALL BE TIED TO THE ROOM OCCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND BE LABELED AS CONTROLLED PER SPECIFICATIONS. COORDINATE WITH FURNITURE VENDOR.

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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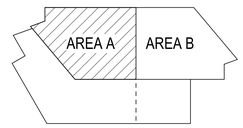

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
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8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 3 - AREA A

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E163A

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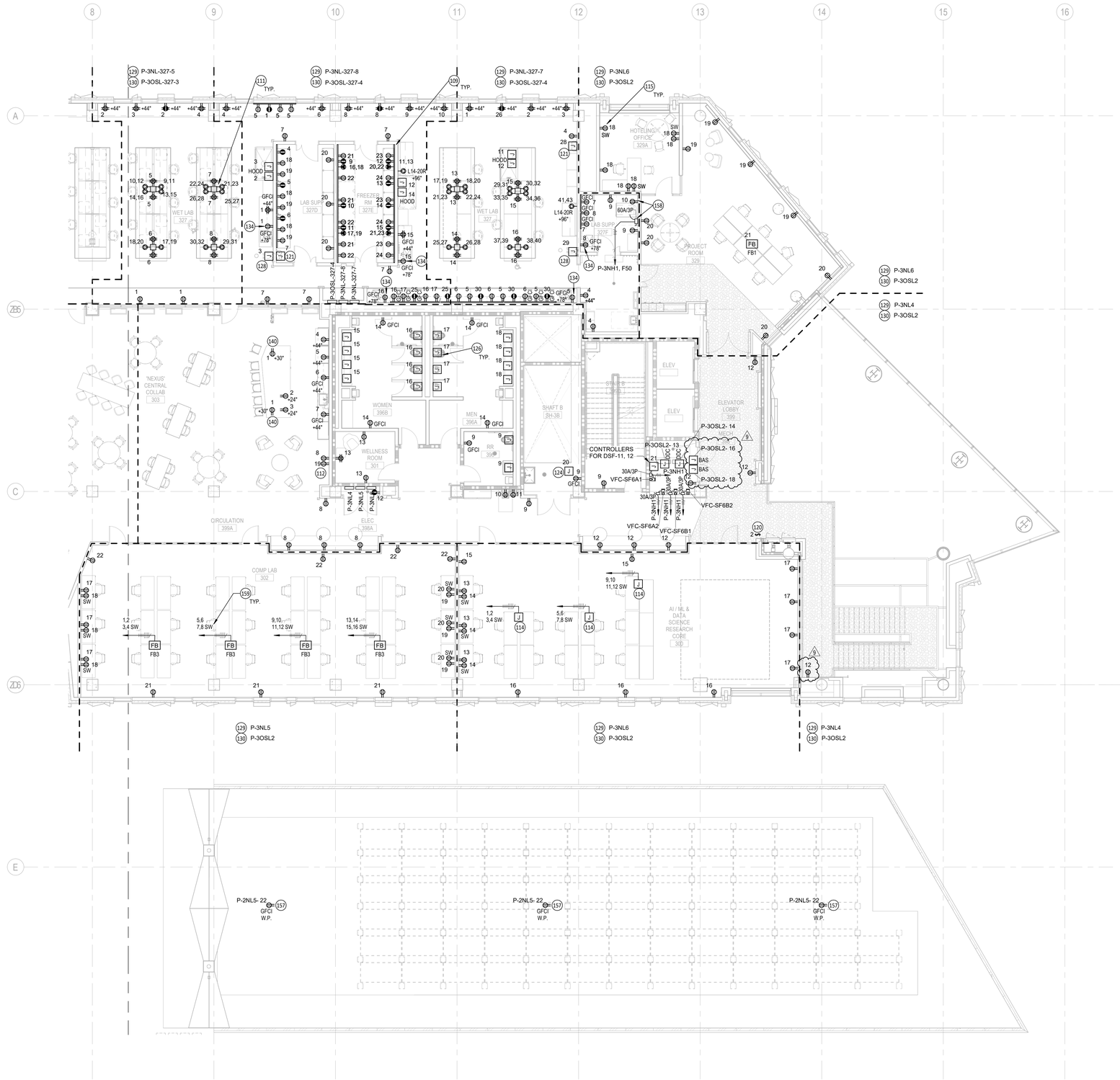

1 E163B ELECTRICAL POWER PLAN - LEVEL 3 - AREA B
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTON BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	PLAN NOTES
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX, REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
114	REFER TO FLOORBOX SCHEDULE ON ICT SERIES SHEETS FOR ADDITIONAL INFORMATION.
115	RECEPTACLES SHOWN WITH TAG "SW" SHALL BE TIED TO THE ROOM OCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND SHALL BE LABELED AS CONTROLLED PER SPECIFICATIONS. LOCATIONS WHERE TWO RECEPTACLES ARE SHOWN DIRECTLY ADJACENT TO EACH OTHER AND ONE IS TAGGED "SW" SHALL BE A 2-GANG ROUGH-IN WITH ONE OUTLET SWITCHED AND THE OTHER NON-SWITCHED.
120	EMERGENCY POWER CONNECTION TO FIRE SHUTTER. PROVIDE DISCONNECT SWITCH AND CONNECT COMPLETE TO CONTROLLER.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
124	POWER CONNECTION TO DIGITAL MIXING VLAVLE. COORDIANTE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
126	POWER CONNECTION TO TRANSFORMER ABOVE ACCESSIBLE CEILING SPACE FOR SENSOR-OPERATED PLUMBING FIXTURE. LOW-VOLTAGE WIRING DOWN TO FIXTURE BY PLUMBING CONTRACTOR. VERIFY LOCATION OF TRANSFORMERS WITH PLUMBING CONTRACTOR.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
140	MOUNT DEVICE HORIZONTALLY IN WING WALL UNDER COUNTER.
157	COORDINATE LOCATION WITH SOLAR PANEL SYSTEM.
158	POWER CONNECTION TO STERILIZER AND RECEPTACLE FOR STERILIZER CONTROLS.
159	CIRCUIT NUMBERS FOR FURNITURE FEEDS SHOWN WITH TAG "SW", SHALL BE TIED TO THE ROOM OCCOUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND BE LABELED AS CONTROLLED PER SPECIFICATIONS. COORDINATE WITH FURNITURE VENDOR.

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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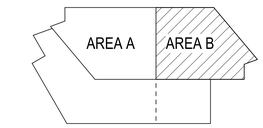

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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BRIAN D. HOADLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 3 - AREA B

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

E163B

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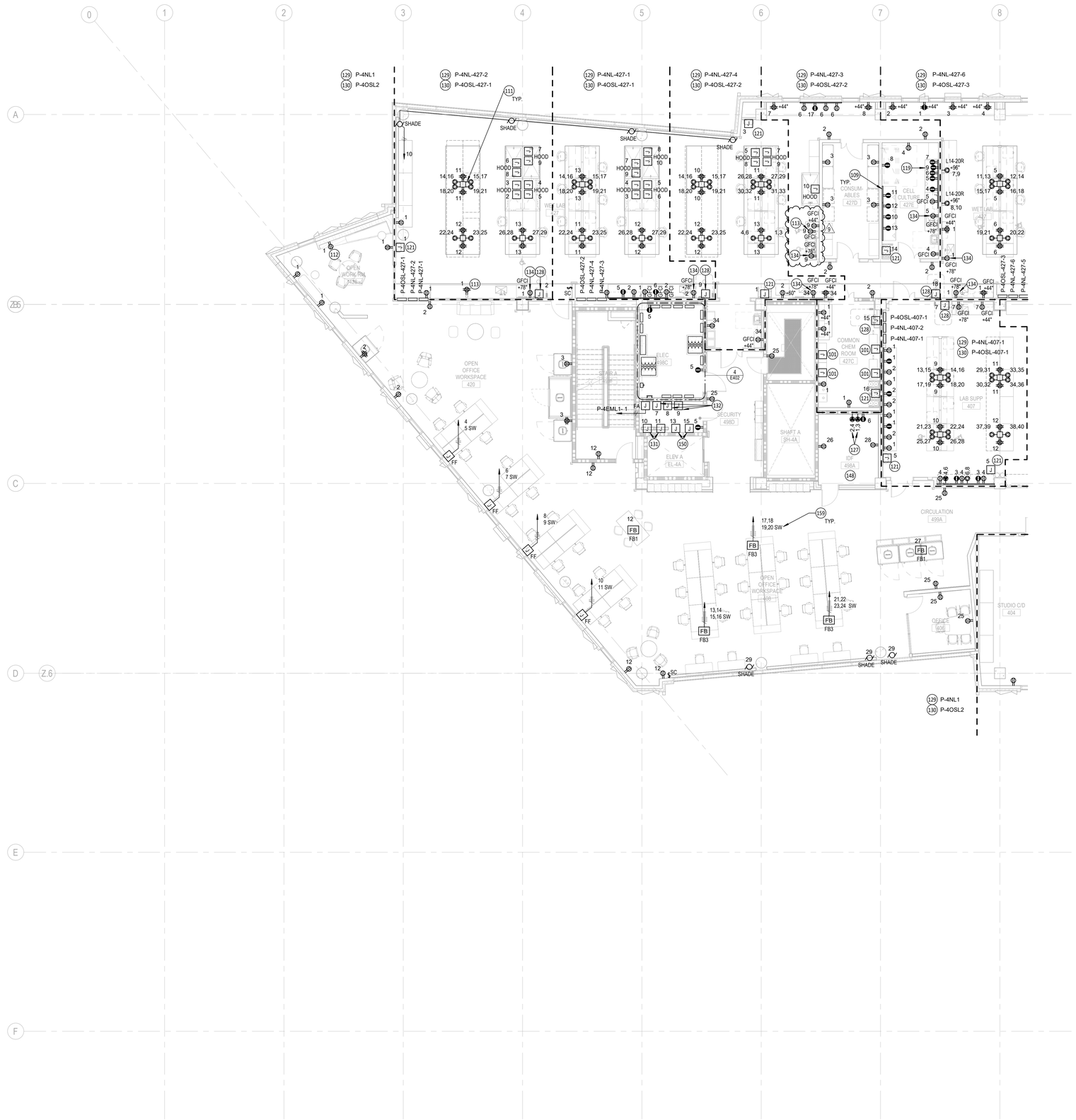

1 E164A ELECTRICAL POWER PLAN - LEVEL 4 - AREA A
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTION BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	PLAN NOTES
101	PROVIDE #6 AWG GROUND FROM FLAMMABLE CABINET GROUNDING LUG TO GROUND BUS IN PANEL SERVING THIS ROOM.
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX. REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
113	RECEPTACLE MOUNTED IN COUNTERTOP PEDESTAL. PEDESTAL BY OTHERS. REFER TO Q SERIES PLANS FOR MORE INFORMATION.
119	RECEPTACLE FOR VACUUM PUMP MOUNTED IN BASE CABINET; COORDINATE ROUGH-IN LOCATION WITH APPROVED CASEWORK SHOP DRAWINGS AND EQUIPMENT.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
127	PROVIDE L6-20 RECEPTACLE FOR RACK POWER. LOCATE WITHIN 12 INCHES OF THE NEAREST RACK, BUT NOT BETWEEN THE RACK AND WALL. REFER TO ICT SERIES DRAWINGS FOR RACK LOCATION. CONNECT TO PANEL INDICATED.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
132	POWER CONNECTION TO SECURITY PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
148	BOND THE STATIC DISSIPATIVE FLOOR SYSTEM TO GROUND WIRE IN WALL RECEPTACLE WITH #10 AWG (VERIFY WIRE SIZE WITH FLOOR MANUFACTURER).
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
159	CIRCUIT NUMBERS FOR FURNITURE FEEDS SHOWN WITH TAG "SW", SHALL BE TIED TO THE ROOM OCCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND BE LABELED AS CONTROLLED PER SPECIFICATIONS. COORDINATE WITH FURNITURE VENDOR.

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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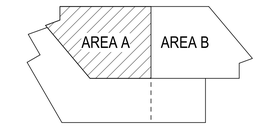

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 4 - AREA A

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BSA PROJECT NO. — 00360481

E164A

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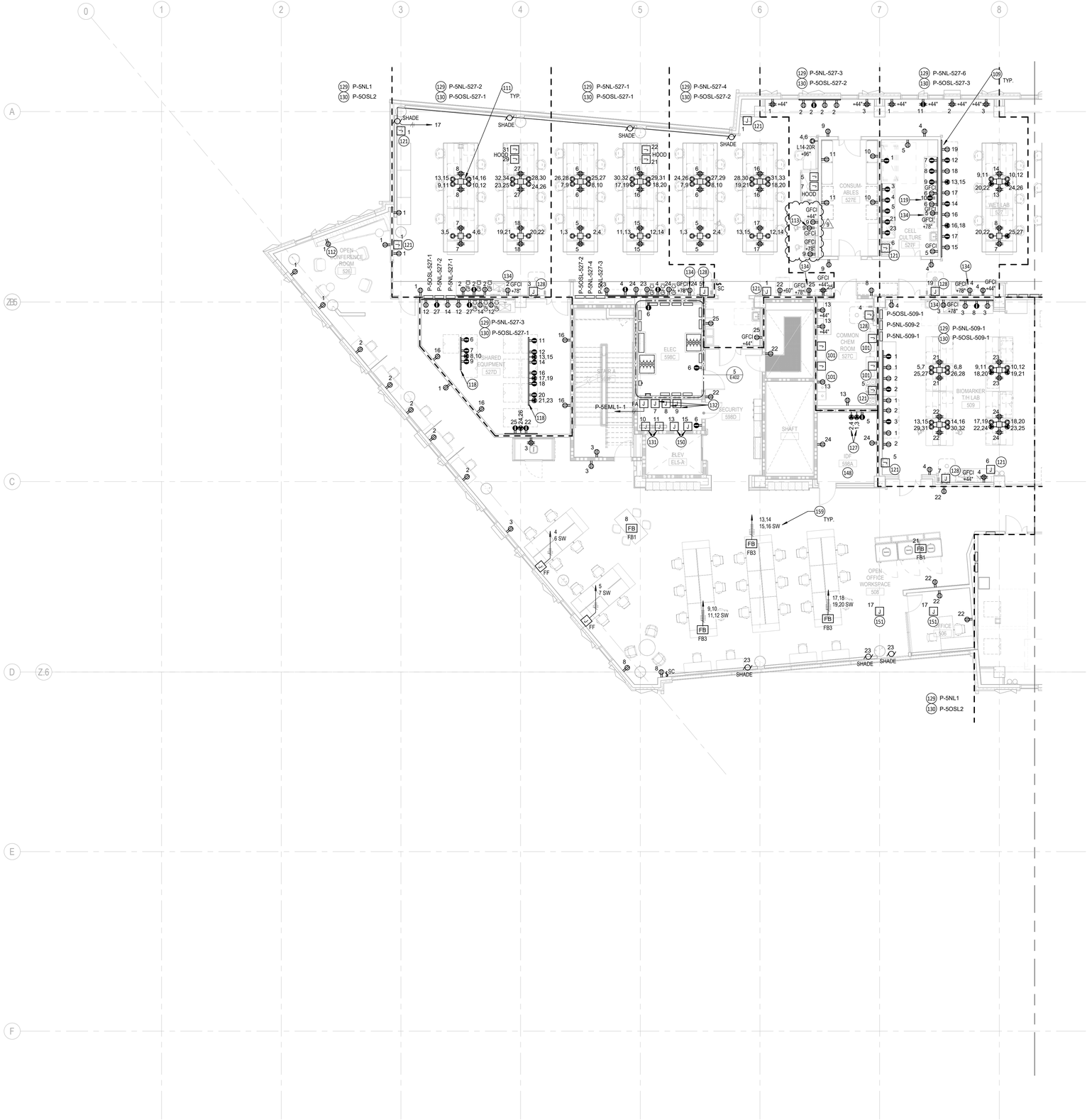

1 E165A ELECTRICAL POWER PLAN - LEVEL 5 - AREA A
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
D. JUNCTION BOXES, SWITCHES, MOTORS ARE CONNECTED TO NORMAL POWER UNLESS OTHERWISE NOTED.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.
F. FOR CLARITY, THE CONNECTION BETWEEN DISCONNECTS AND EQUIPMENT ARE NOT SHOWN. THE EC SHALL PROVIDE EQUIPMENT CONNECTION COMPLETE.

PLAN NOTES

X00	
101	PROVIDE #6 AWG GROUND FROM FLAMMABLE CABINET GROUNDING LUG TO GROUND BUS IN PANEL SERVING THIS ROOM.
109	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. MOUNT AT HEIGHT INDICATED ON THE Q SERIES SHEETS. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
112	DEVICE INSTALLED IN AV BACK-BOX, REFER TO ICT SERIES DRAWINGS FOR MORE INFORMATION.
113	RECEPTACLE MOUNTED IN COUNTERTOP PEDESTAL, PEDESTAL BY OTHERS. REFER TO Q SERIES PLANS FOR MORE INFORMATION.
118	PROVIDE DUAL COMPARTMENT RACEWAY (MULTI-OUTLET ASSEMBLY) FOR POWER AND TELECOM DEVICES SHOWN. SUSPEND FROM ABOVE AT +86" TO CENTERLINE OF RACEWAY UNLESS OTHERWISE NOTED. REFER TO SYSTEMS DRAWINGS FOR TELECOM DEVICES. COORDINATE EXACT LOCATIONS WITH LAB PLANNING DRAWINGS PRIOR TO ROUGH-IN.
119	RECEPTACLE FOR VACUUM PUMP MOUNTED IN BASE CABINET, COORDINATE ROUGH-IN LOCATION WITH APPROVED CASEWORK SHOP DRAWINGS AND EQUIPMENT.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
127	PROVIDE L6-20 RECEPTACLE FOR RACK POWER, LOCATE WITHIN 12 INCHES OF THE NEAREST RACK, BUT NOT BETWEEN THE RACK AND WALL. REFER TO ICT SERIES DRAWINGS FOR RACK LOCATION. CONNECT TO PANEL INDICATED.
128	POWER CONNECTION TO EMERGENCY SHOWER ALARM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
132	POWER CONNECTION TO SECURITY PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
148	BOND THE STATIC DISSIPATIVE FLOOR SYSTEM TO GROUND WIRE IN WALL RECEPTACLE WITH #10 AWG (VERIFY WIRE SIZE WITH FLOOR MANUFACTURER).
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
151	POWER CONNECTION TO CONTROL VALVES, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
159	CIRCUIT NUMBERS FOR FURNITURE FEEDS SHOWN WITH TAG "SW", SHALL BE TIED TO THE ROOM OCCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND BE LABELED AS CONTROLLED PER SPECIFICATIONS. COORDINATE WITH FURNITURE VENDOR.

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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
TRUE NORTH

ISSUED / REVISIONS SCHEDULE

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BRIAN D. HOWARD
REGISTERED
PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 5 - AREA A

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BSA PROJECT NO. — 00360481

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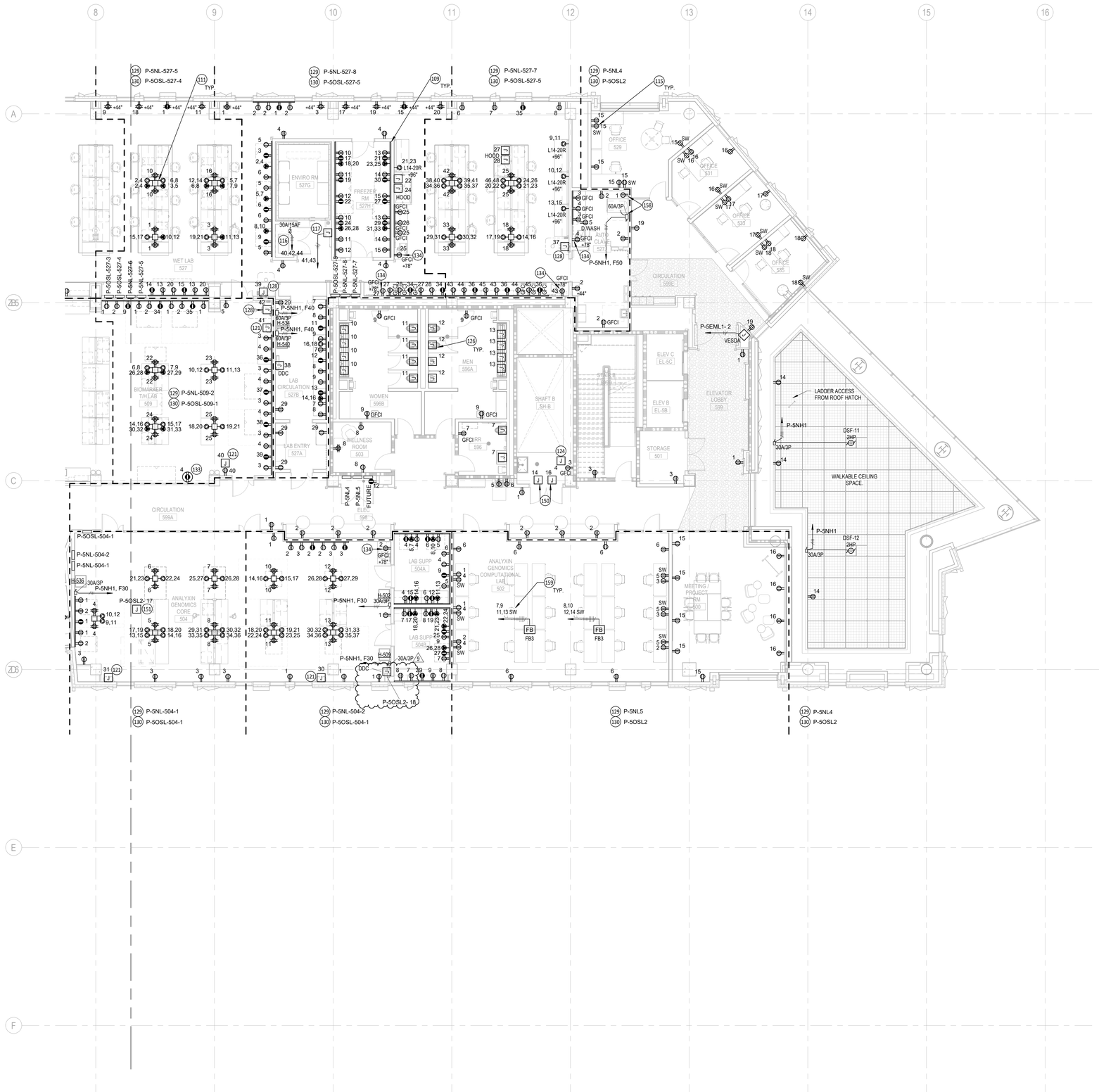

1 ELECTRICAL POWER PLAN - LEVEL 5 - AREA B
E165B 1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. COORDINATE FINAL FLOORBOX LOCATIONS WITH INTERIOR DESIGNER PRIOR TO ROUGH-IN.
C. IN LABS, REFER TO "Q" SERIES SHEETS FOR SCHEDULES, DETAILS AND ELEVATIONS FOR ADDITIONAL INFORMATION ON DEVICE LOCATIONS PRIOR TO ROUGH-IN.
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111	PRE-WIRED OVERHEAD SERVICE COLUMN (OSC) PROVIDED WITH NEMA 5-20R QUAD RECEPTACLES, AND NEMA L14-20R TWIST-LOCK RECEPTACLES. CONNECT COMPLETE VIA CIRCUIT(S) INDICATED. REFER TO LAB PLANNING DRAWINGS FOR ADDITIONAL INFORMATION.
115	RECEPTACLES SHOWN WITH TAG "SW" SHALL BE TIED TO THE ROOM OCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND SHALL BE LABELED AS CONTROLLED PER SPECIFICATIONS. LOCATIONS WHERE TWO RECEPTACLES ARE SHOWN DIRECTLY ADJACENT TO EACH OTHER AND ONE IS TAGGED "SW" SHALL BE A 2-GANG ROUGH-IN WITH ONE OUTLET SWITCHED AND THE OTHER NON-SWITCHED.
116	ENVIRONMENTAL ROOM CONDENSING UNIT. PROVIDE FUSED DISCONNECT AND CONNECT TO STANDBY CIRCUIT INDICATED. COORDINATE WITH VENDOR.
117	PROVIDE SINGLE POINT POWER CONNECTION TO VENDOR PROVIDED CONTROL PANEL. CONNECT WITH 3/4" C., (3) #6 AWG + (1) #10 AWG GROUND FROM STANDBY CIRCUIT INDICATED. VERIFY LOCATION OF CONTROL PANEL WITH VENDOR PRIOR TO ROUGH-IN.
121	POWER CONNECTION TO GAS MANIFOLD SYSTEM, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
124	POWER CONNECTION TO DIGITAL MIXING VLAVLE. COORDIANTE EXACT LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR.
126	POWER CONNECTION TO TRANSFORMER ABOVE ACCESSIBLE CEILING SPACE FOR SENSOR-OPERATED PLUMBING FIXTURE. LOW-VOLTAGE WIRING DOWN TO FIXTURE BY PLUMBING CONTRACTOR. VERIFY LOCATION OF TRANSFORMERS WITH PLUMBING CONTRACTOR.
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129	CONNECT NORMAL CIRCUITS IN THIS BOUNDARY TO NORMAL BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
130	CONNECT EMERGENCY RECEPTACLES IN THIS BOUNDARY TO OPTIONAL STANDBY BRANCH PANELBOARD INDICATED, UNLESS OTHERWISE NOTED.
133	PROVIDE DROP CORD WITH A DUPLEX RECEPTACLE SUSPENDED +12" AFF WITH STRAIN RELIEF. ALIGN CORD WITH WINDOW MULLION.
134	REFER TO WATER POLISHER DETAIL ON THE Q SERIES PLANS FOR EXACT ROUGH-IN LOCATION OF RECEPTACLE.
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
151	POWER CONNECTION TO CONTROL VALVES, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
158	POWER CONNECTION TO STERILIZER AND RECEPTACLE FOR STERILIZER CONTROLS.
159	CIRCUIT NUMBERS FOR FURNITURE FEEDS SHOWN WITH TAG "SW", SHALL BE TIED TO THE ROOM OCCUPANCY SENSOR FOR AUTOMATIC SHUT OFF AND BE LABELED AS CONTROLLED PER SPECIFICATIONS. COORDINATE WITH FURNITURE VENDOR.

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

500 GRISWOLD
SUITE 1700
DETROIT, MI 48226
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smithgroup.com

LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

CUMULATIVE DOCUMENTS

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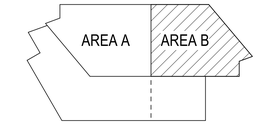

KEYPLAN
PROJECT NORTH
REFER TO CIVIL DRAWINGS FOR TRUE NORTH
TRUE NORTH

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9	4/27/2026	BP4-CD: ADDENDUM #2
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BRYAN D. HOAGLAND
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PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - LEVEL 5 - AREA B

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BSA PROJECT NO.	00360481

E165B

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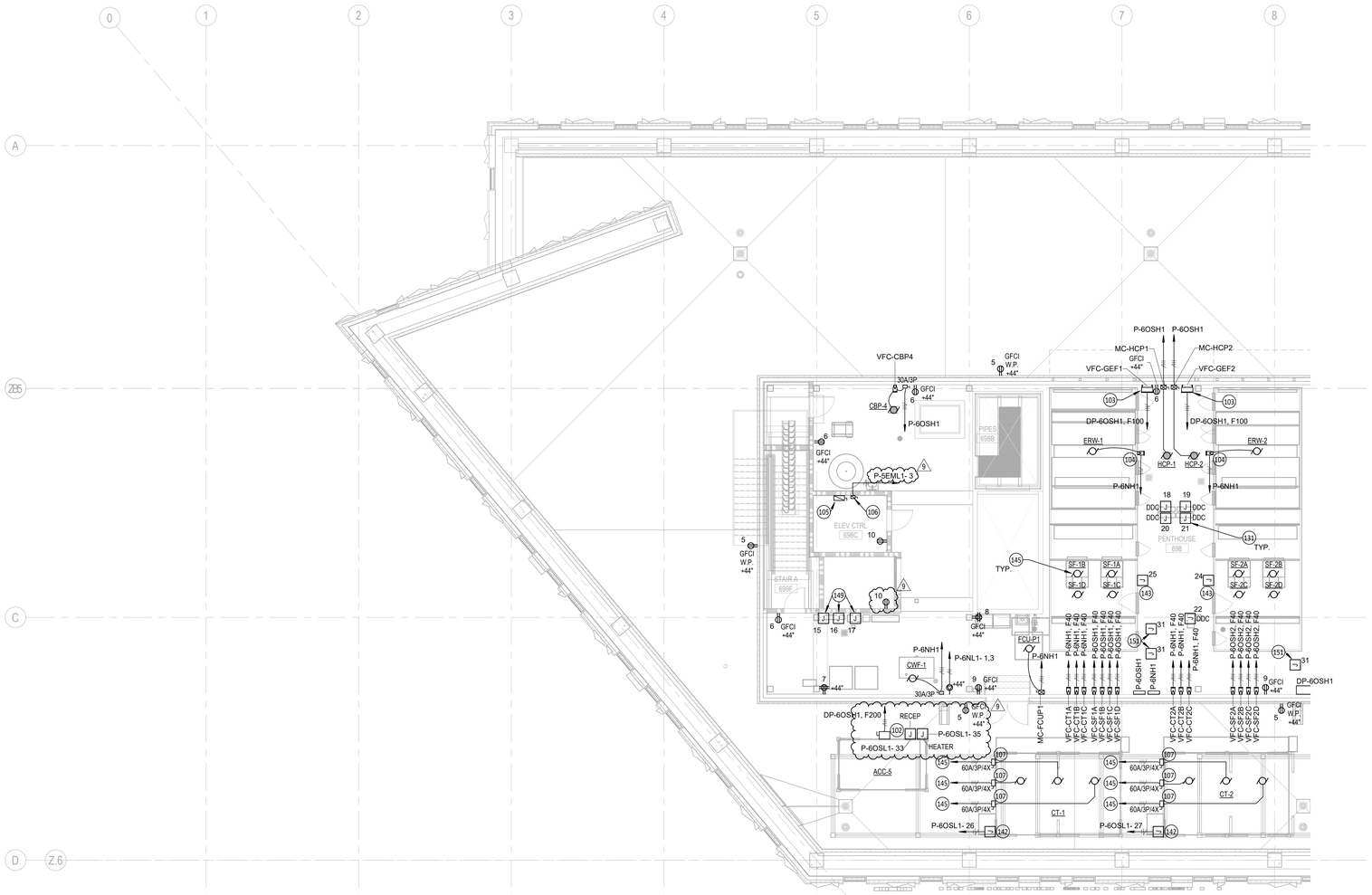

2 E166A ELECTRICAL POWER PLAN - PENTHOUSE - AREA A
1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES
A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. 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.

X00	PLAN NOTES
102	DISCONNECT BY DIVISION 23.
103	UP TO FAN ON ROOFTOP.
104	VFC PROVIDED BY DIVISION 23.
105	CONNECT 3P, 480VAC FEED TO DISCONNECT FOR ELEVATOR MAIN POWER SUPPLY. REFER TO RISER DIAGRAM ON SHEET E501 FOR ADDITIONAL INFORMATION. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR PROVIDER PRIOR TO INSTALLATION.
106	CONNECT TO DISCONNECT FOR ELEVATOR 120V REQUIREMENTS. CONNECT TO 20A, 1P, 120VAC CIRCUIT INDICATED WITH 3/4"C, 2#10 + 1#10 GND.
107	PROVIDE AUXILLARY CONTACTS TO TRIP THE VFC WHEN THE DISCONNECT IS OPENED. CONTROL WIRING SHALL BE IN A SEPARATE CONDUIT FROM THE POAER.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
142	PROVIDE 120V POWER CONNECTION TO COOLING TOWER. REFER TO CONTROL DIAGRAMS ON M SERIES SHEETS FOR ADDITIONAL SCOPE.
143	POWER CONNECTION TO AHU LIGHTS AND RECEPTACLES. RECONNECT CONDUCTORS ACROSS SHIPPING SPLITS.
145	FOR DRAWING CLARITY, THE FEEDER HAS NOT BEEN SHOWN BETWEEN MOTOR/EQUIPMENT AND VFC/DISCONNECT. ELECTRICAL CONTRACTOR SHALL CONNECT COMPLETE FROM BREAKER IN PANEL THROUGH VFC/DISCONNECT TO MOTOR/EQUIPMENT.
149	FLOW COMPUTER, COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR. REFER TO DETAIL ON E701 FOR MORE INFORMATION.
151	POWER CONNECTION TO CONTROL VALVES, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.

BSA

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CLIENT PROJECT NO. - 20250072

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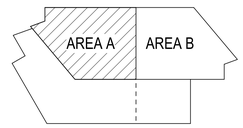

KEYPLAN
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7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
1	09/29/2025	BP1-CD: SITE AND FOUNDATION PACKAGE

BRIAN D. HOWLAND
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PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL POWER PLAN - PENTHOUSE - AREA A

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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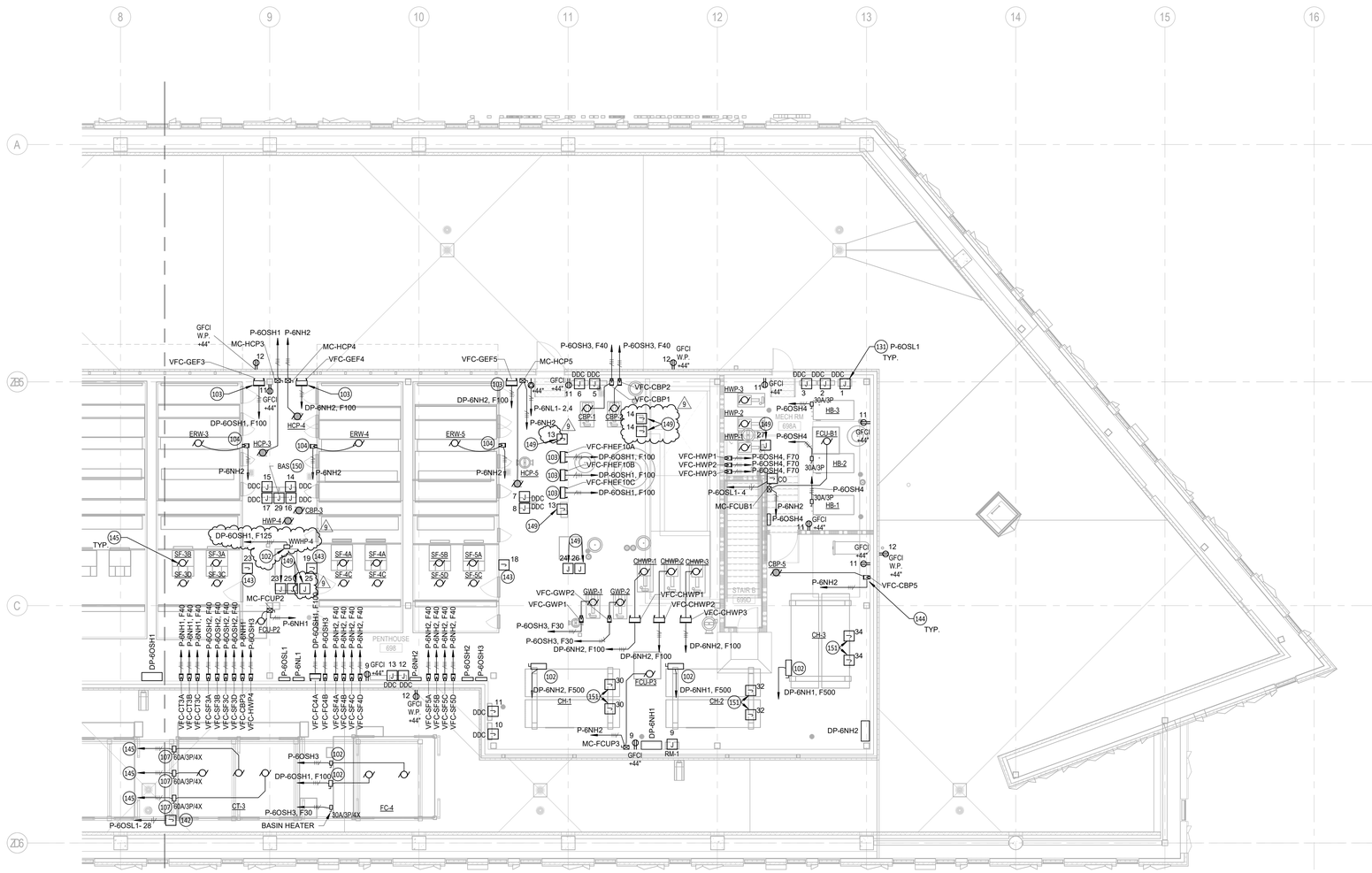

2 ELECTRICAL POWER PLAN - PENTHOUSE - AREA B
E166B 1/8" = 1'-0"

ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. 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.

PLAN NOTES

X00	PLAN NOTES
102	DISCONNECT BY DIVISION 23.
103	UP TO FAN ON ROOFTOP.
104	VFC PROVIDED BY DIVISION 23.
107	PROVIDE AUXILLARY CONTACTS TO TRIP THE VFC WHEN THE DISCONNECT IS OPENED. CONTROL WIRING SHALL BE IN A SEPARATE CONDUIT FROM THE POAER.
131	POWER CONNECTION TO DDC PANEL, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
142	PROVIDE 120V POWER CONNECTION TO COOLING TOWER. REFER TO CONTROL DIAGRAMS ON M SERIES SHEETS FOR ADDITIONAL SCOPE.
143	POWER CONNECTION TO AHU LIGHTS AND RECEPTACLES. RECONNECT CONDUCTORS ACROSS SHIPPING SPLITS.
144	EQUIPMENT CAN NOT BE MOUNTED TO EXTERIOR WALLS, PROVIDE STRUT SUPPORT FOR ALL EQUIPMENT ON THESE WALLS.
145	FOR DRAWING CLARITY, THE FEEDER HAS NOT BEEN SHOWN BETWEEN MOTOR/EQUIPMENT AND VFC/DISCONNECT. ELECTRICAL CONTRACTOR SHALL CONNECT COMPLETE FROM BREAKER IN PANEL THROUGH VFC/DISCONNECT TO MOTOR/EQUIPMENT.
149	FLOW COMPUTER, COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR. REFER TO DETAIL ON E701 FOR MORE INFORMATION.
150	POWER CONNECTION TO BAS, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.
151	POWER CONNECTION TO CONTROL VALVES, 120V, 20A OPTIONAL STANDBY CIRCUIT INDICATED.

BSA

SWITCH PLACEHOLDER FAMILY
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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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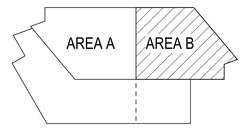

KEYPLAN
PROJECT NORTH
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TRUE NORTH

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1	09/29/2025	BP1-CD: SITE AND FOUNDATION PACKAGE



ELECTRICAL POWER PLAN - PENTHOUSE - AREA B

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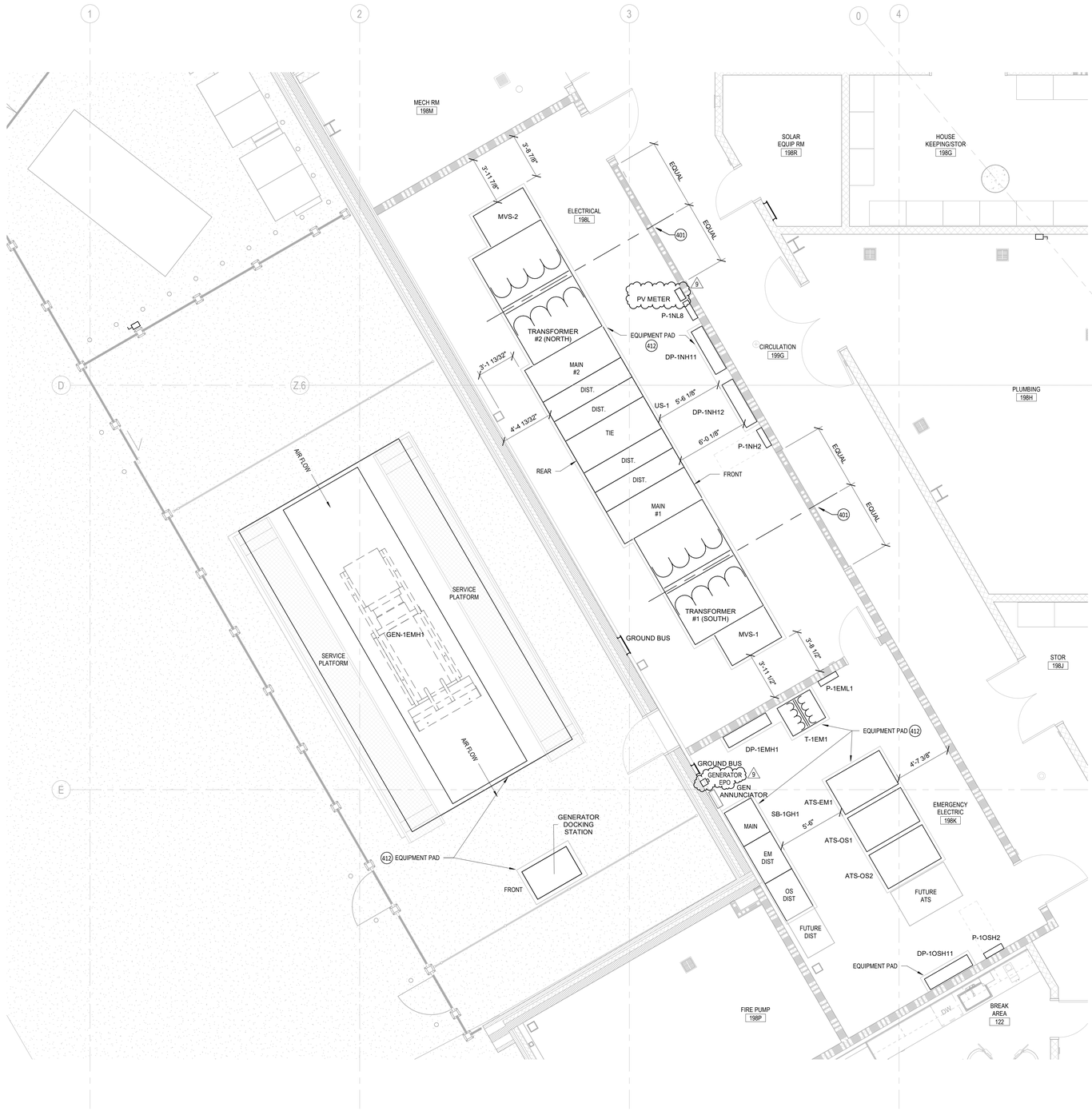
ELECTRICAL GENERAL NOTES
A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

XOO	PLAN NOTES
401	REMOVEABLE WALL PANEL TO BE CENTERED ON TRASNFORMER. COORDINATE EXACT PLACEMENT OF REMOVEABLE WALL PANEL BASED ON APPROVED ELECTRICAL SUBMITTALS.
412	REFER TO EQUIPMENT PAD DETAIL 3/E700 FOR MORE INFORMATION.



1 E401 ELECTRICAL ENLARGED ROOMS 182 AND 183 PLAN - LEVEL 1
1/4" = 1'-0"

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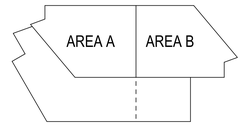

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PROJECT NORTH
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ELECTRICAL ENLARGED PLANS

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E401

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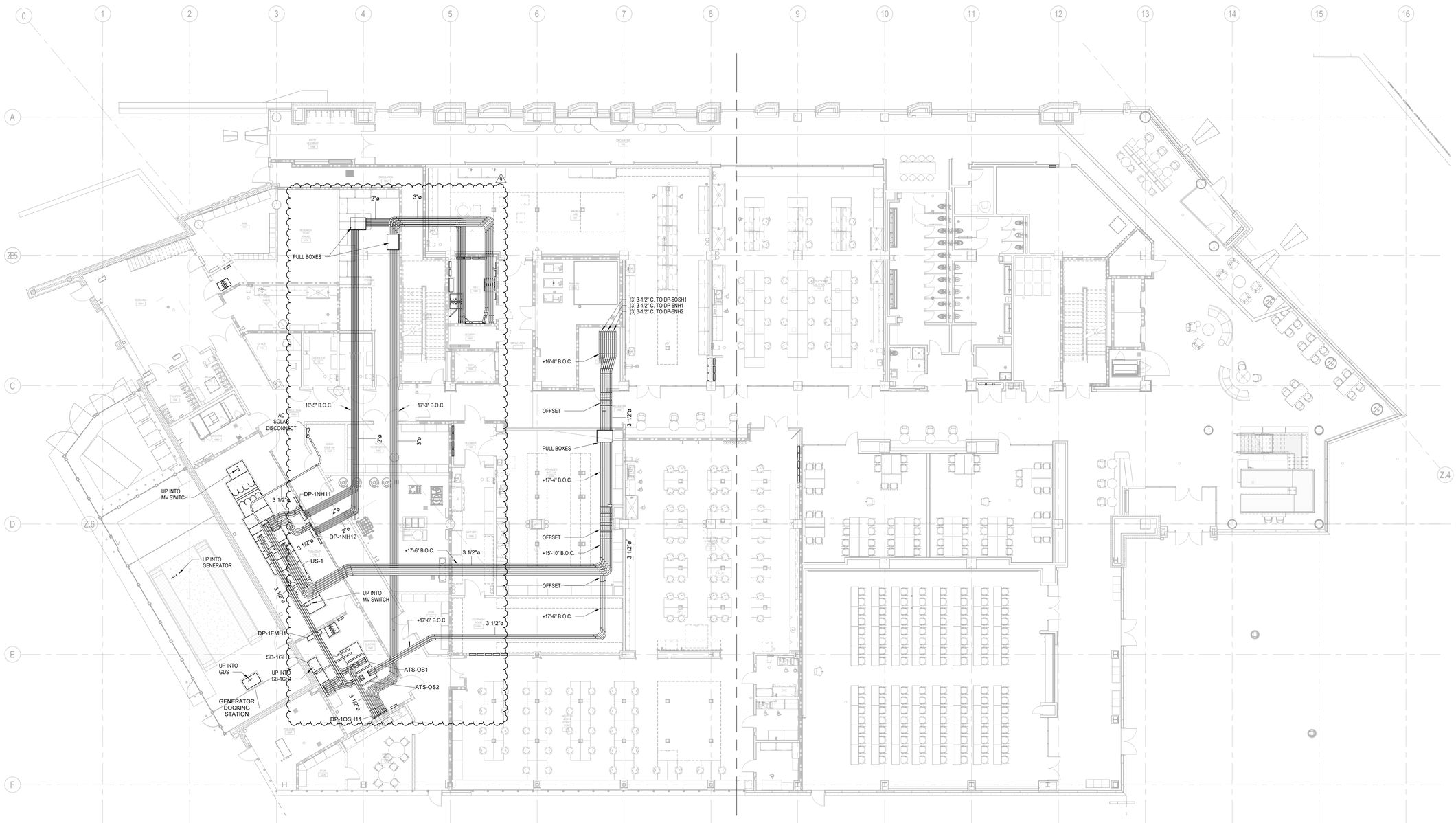
ELECTRICAL POWER GENERAL NOTES

A. REFER TO SHEET E002 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. CONDUIT ROUTES ARE DIAGRAMMATIC AND ARE SHOWN TO DESCRIBE INTENT. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE EXACT ROUTES WITH DUCTS, PIPING, STRUCTURE, ETC. AS REQUIRED FOR INSTALLATION.
C. PULL BOXES ARE SHOWN DIAGRAMMATICALLY, BOX SIZES TO BE DETERMINED BY THE CONTRACTOR. ADD PULL BOXES AS REQUIRED FOR INSTALLATION. PULL BOXES TO BE LOCATED SO THEY ARE ACCESSIBLE FOR PULLING CONDUCTORS AFTER CONSTRUCTION IS COMPLETE.
D. CONDUITS SMALLER THAN 2" ARE NOT SHOWN.
E. ALL CONDUIT PENETRATIONS THROUGH THE FLOOR SHALL HAVE EITHER A SLEEVE EXTENDING A MINIMUM OF 4" AFF OR A 4" CONCRETE CURB.

X00 PLAN NOTES



1 E421 ELECTRICAL CONDUIT ROUTING PLAN - LEVEL 1
3/32" = 1'-0"

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

SMITHGROUP

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LAUNCH ACCELERATOR FOR BIOSCIENCES

INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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AREA A | AREA B

KEYPLAN
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ELECTRICAL CONDUIT ROUTING PLAN - LEVEL 1

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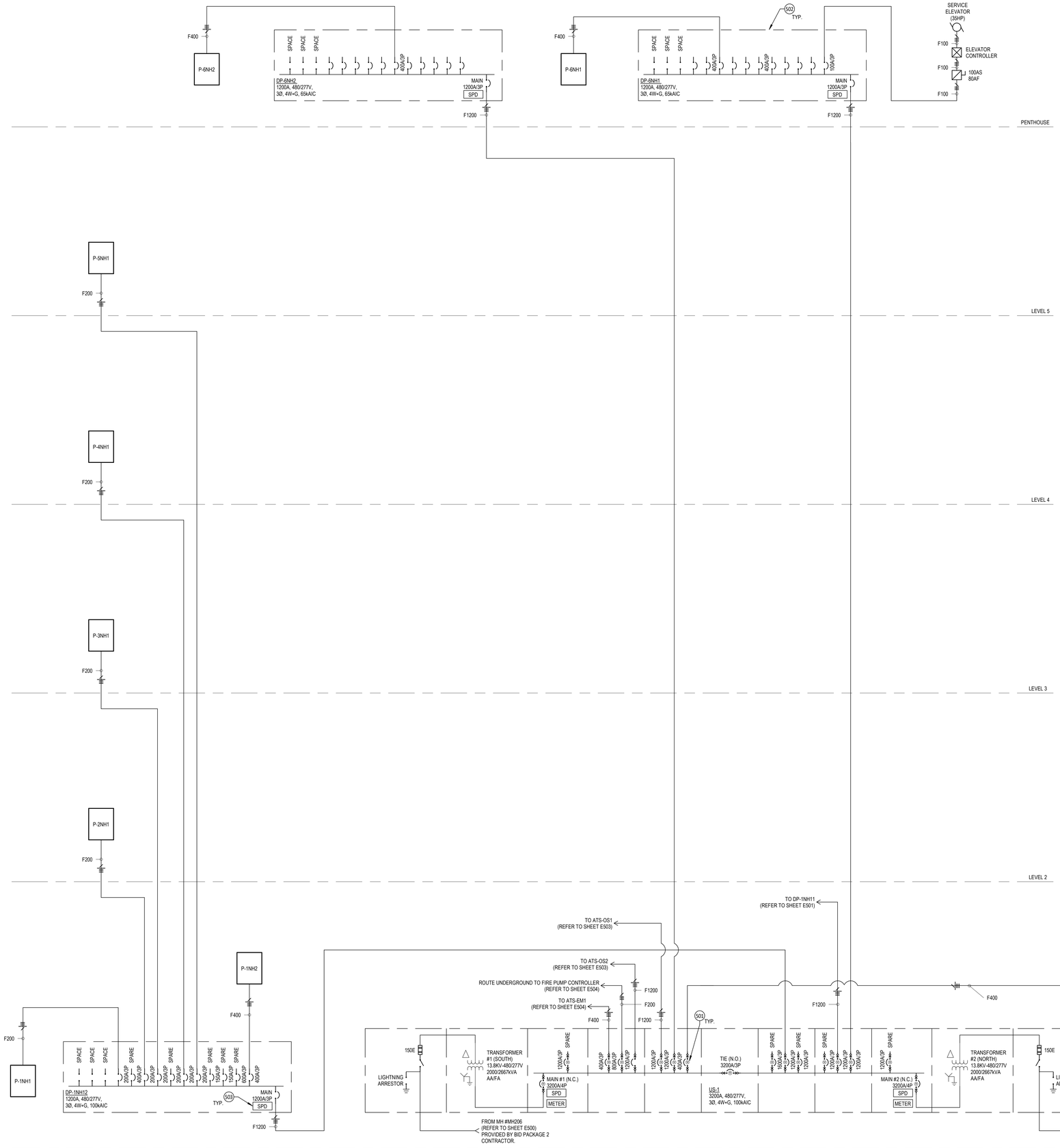

1 E501 NORMAL POWER RISER DIAGRAM 1
NO SCALE

ELECTRICAL GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

PLAN NOTES

X00	PLAN NOTES
501	EACH FEEDER BREAKER, MAIN BREAKERS AND TIE BREAKER IS PROVIDED WITH METERING CAPABILITIES FOR GATHERING ELECTRICAL DATA.
502	REFER TO SWITCHBOARD AND/OR DISTRIBUTION PANEL SCHEDULES ON E600 SERIES DRAWINGS FOR EXACT BREAKER QUANTITIES, SIZES, SPARES, AND SPACES.
503	COORDINATE REQUIRED BREAKER AND FEEDER SIZE AS RECOMMENDED BY SURGE PROTECTION DEVICE (SPD) MANUFACTURER AND PROVIDE ACCORDINGLY. LOCATE SPD TO MAINTAIN FEEDER LENGTH REQUIREMENTS AND PROVIDE TYPE OF WIRE PER MANUFACTURERS RECOMMENDATION.
519	EC SHALL FURNISH AND INSTALL 480V, 3PH, 400A FUSIBLE DISCONNECT TO SERVE PV SYSTEM. EC SHALL PROVIDE DISCONNECT, LINE SIDE CONDUIT AND WIRING. PV CONTRACTOR SHALL PROVIDE FUSE AND ALL LOAD SIDE CONDUIT WIRING AND COMPONENTS. PV DESIGN SHALL INCLUDE UTILITY AGREEMENT AND WILL DEFINE EXACT LOCATION FOR THIS DISCONNECT COORDINATE PLACEMENT WITH PV CONTRACTOR AND UTILITY AGREEMENT PRIOR TO ROUGH-IN.
527	PV METER, PROVIDE ION 5560 IN NEMA 1 ENCLOSURE AND ALL NECESSARY COMPONENTS COMPLETE FOR MEASURING THE FEEDER FOR THE SOLAR SYSTEM. LOCATE ON WALL IN ELECTRICAL 198L. REFER TO E401 FOR LOCATION.

CONDUIT SIZE AND QUANTITY

DESIGNATION	CONDUCTOR SIZE PER CONDUIT		CONDUIT SIZE AND QUANTITY			
FXXX	PHASE & NEUTRAL	BUILDING GROUND	OR 1P, 1N, 1G 2P, 1G	OR 2P, 1N, 1G 3P, 1G	3P, 1N, 1G	3P, 3N, 1G
F20	12	12	3/4"	3/4"	3/4"	3/4"
F30	10	10	3/4"	3/4"	3/4"	3/4"
F40	8	10	3/4"	3/4"	3/4"	1"
F50	6	10	3/4"	3/4"	1"	1"
F60	4	10	3/4"	1"	1-1/4	1-1/4"
F70	4	8	3/4"	1"	1-1/4"	1-1/4"
F80	3	8	1"	1"	1-1/4"	1-1/2"
F90	2	8	1"	1-1/4	1-1/4"	1-1/2"
F100	1	8	1-1/4"	1-1/4"	1-1/2"	2"
F110	2	6	1"	1-1/4"	1-1/4"	1-1/2"
F125	1	6	1-1/4"	1-1/4"	1-1/2"	2"
F150	1/0	6	1-1/4"	1-1/2"	1-1/2"	2"
F175	2/0	6	1-1/4"	1-1/2"	2"	2-1/2"
F200	3/0	6	1-1/4"	2"	2"	2-1/2"
F225	4/0	4	1-1/2"	2"	2-1/2"	2-1/2"
F250	250	4	2"	2"	2-1/2"	3"
F251	250	2	2"	2"	2-1/2"	3"
F300	350	4	2"	2-1/2"	3"	3-1/2"
F301	350	2	2-1/2"	3"	3"	4"
F350	500	3	2-1/2"	3"	3"	4"
F400	600	3		(1) 3-1/2"	(1) 3-1/2"	(1) 4"
F401	600	2		(1) 3-1/2"	(1) 3-1/2"	(1) 4"
F450	4/0	2		(2) 2"	(2) 2-1/2"	(2) 3"
F500	250	2		(2) 2"	(2) 2-1/2"	(2) 3"
F600	350	1		(2) 2-1/2"	(2) 3"	(2) 3-1/2"
F700	500	1/0		(2) 3"	(2) 3"	(2) 4"
F800	600	1/0		(2) 3-1/2"	(2) 3-1/2"	(2) 4"
F900	350	2/0		(3) 2-1/2"	(3) 3"	(3) 3-1/2"
F1000	500	2/0		(3) 3"	(3) 3"	(3) 4"
F1200	600	3/0		(3) 3-1/2"	(3) 3-1/2"	(3) 4"
F1600	600	4/0		(4) 3-1/2"	(4) 3-1/2"	(4) 4"
F2000	600	250		(5) 3-1/2"	(5) 3-1/2"	(5) 4"
F2500	600	350		(6) 3-1/2"	(6) 3-1/2"	(6) 4"
F3000	500	500		(8) 4"	(8) 4"	(8) 4"
F4000	600	500		(10) 3-1/2"	(10) 3-1/2"	(10) 4"
F5000	600	(2) 350		(12) 3-1/2"	(12) 3-1/2"	(12) 4"

BSA

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INDIANAPOLIS, INDIANA

CLIENT PROJECT NO. - 20250072

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BRIAN D. HOAGLAND
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STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL RISER DIAGRAMS - NORMAL

DATE
BSA PROJECT NO. 00360481

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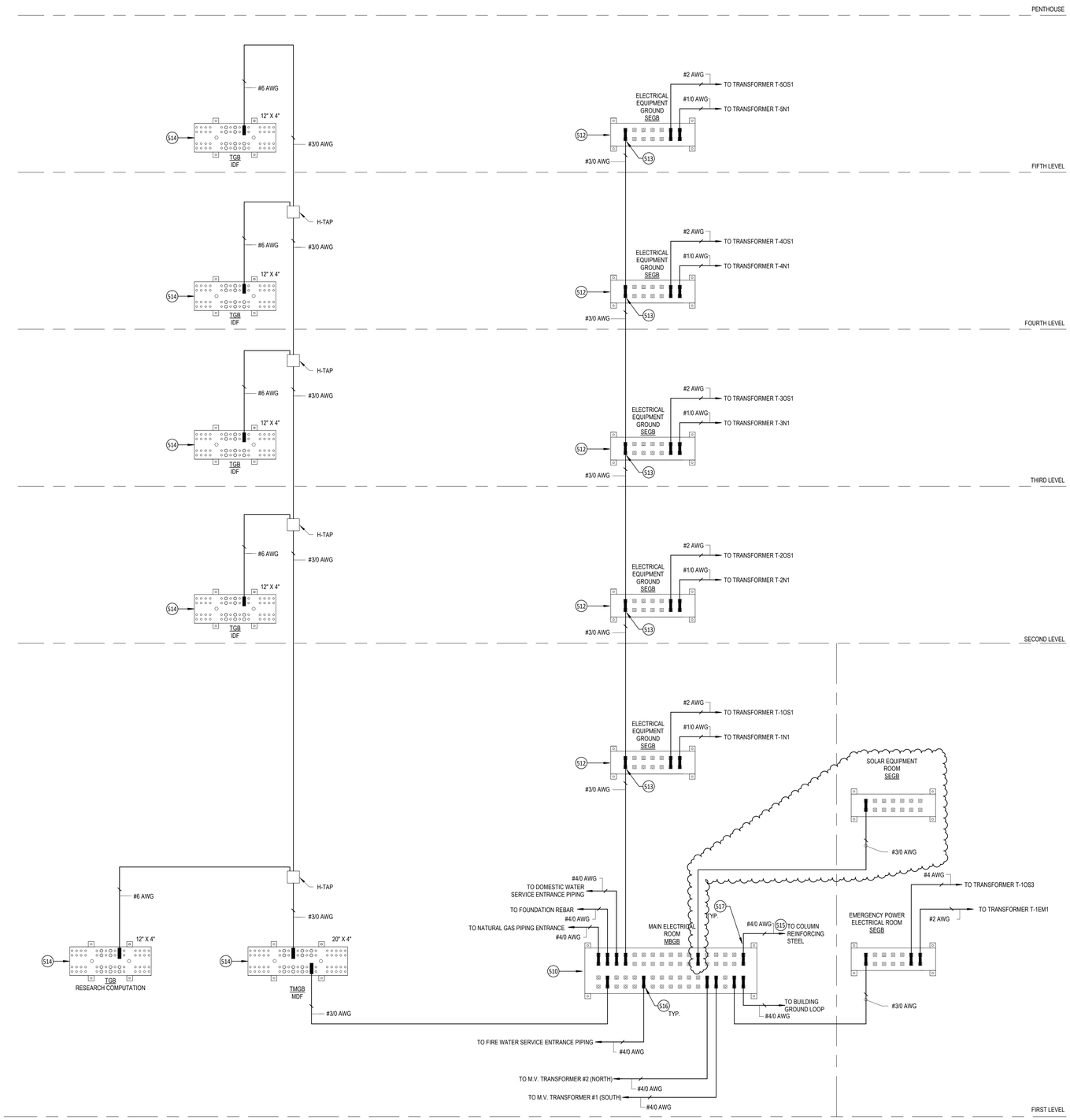

1 E510 ELECTRICAL GROUNDING RISER
NO SCALE

ELECTRICAL GENERAL NOTES

A. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.
B. GROUND CONDUCTORS SHALL BE GREEN, INSULATED, STRANDED,THHN COPPER SIZE AS NOTED ON SCHEMATIC. ROUTE CONDUCTORS IN CONDUIT. MINIMUM SIZE OF 1-INCH. GROUNDING ELECTRODE CONDUCTORS SHALL BE ROUTED IN PVC CONDUIT. CONDUCTORS GOING IN A COMMON DIRECTION ARE PERMITTED TO ROUTE IN THE SAME CONDUIT PROVIDED THE CONDUIT IS SIZED PER NEC ANNEX C.
C. ALL TERMINATIONS AT THE GROUND BARS SHALL BE LABELED TO IDENTIFY THE SOURCE OR EQUIPMENT BEING SERVED.
D. REFER TO ELECTRICAL GROUNDING PLAN ON SHEET E410 FOR ADDITIONAL REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, GROUND LOOP AND GROUNDING AT STANDBY EMERGENCY GENERATOR.
E. THE STANDBY EMERGENCY GENERATOR SHALL BE TREATED AS A SEPARATELY DERIVED SYSTEM. BOND THE NEUTRAL AND GROUND AT THE GENERATOR.

PLAN NOTES

XOO	PLAN NOTES
510	MAIN ELECTRICAL ROOM 20-INCH WIDE WALL MOUNTED COPPER GROUND BAR. REFER TO ENLARGED FLOOR PLAN FOR LOCATION. REFER TO DIVISION 26 SECTION "GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS" FOR ADDITIONAL REQUIREMENTS.
512	ELECTRICAL ROOM/CLOSET 12-INCH WIDE WALL MOUNTED COPPER GROUND BAR. REFER TO ENLARGED FLOOR PLAN FOR LOCATION. REFER TO DIVISION 26 SECTION "GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS" FOR ADDITIONAL REQUIREMENTS.
513	THERE SHALL BE NO SPLICES IN THE #3/0AWG GROUND RISER CONDUCTOR. PROVIDE CONNECTION TO BUS VIA JUMPER AROUND THE BUS BAR MADE VIA IRREVERSIBLE CRIMP STYLE CONNECTORS.
514	REFER TO DIVISION 27 SPECIFICATIONS AND ICT SERIES DRAWINGS FOR ADDITIONAL INFORMATION ON GROUNDING REQUIREMENTS.
515	CONNECTION SHALL BE MADE VIA IRREVERSIBLE METHOD.
516	TERMINATIONS AT GROUND BUSSES SHALL BE MADE VIA A TWO HOLE LUG CONNECTION.
517	ALL GROUNDING AND BONDING CONDUCTORS TO BE LABELED.

BSA

SWITCH PLACEHOLDER FAMILY
TYPE FOR CORRECT BSA OFFICE

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LAUNCH ACCELERATOR FOR BIOSCIENCES

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CLIENT PROJECT NO. - 20250072

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BRIAN D. HOLLAND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL GROUNDING RISER

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FLOOR BOX SCHEDULE

DESIGNATION	TYPE	SYSTEM	NUMBER OF DUPLEX RECEPTACLES	CONDUIT	DESIGN REFERENCE		COMMENTS
					MANUFACTURER	MODEL	
FB1	POKE-THROUGH	POWER	(2) NEMA 5-20R	(1) 3/4"	WIREMOLD	6AT	
FB2	ON-GRADE	POWER	(2) NEMA 5-20R	(1) 3/4"	WIREMOLD	EFB4SS-OG	
FB3	POKE-THROUGH	POWER	NA	(1) 1"	WIREMOLD	6 ATC	FURNITURE FEED

MOTOR CONTROLLER SCHEDULE

DESIGNATION	EQUIPMENT DATA					DISCONNECT SWITCH		STARTER		NEMA ENCLOSURE	COMMENTS
	LOCATION	HP	FLA	VOLTAGE	PHASE	SWITCH SIZE	FUSE SIZE	TYPE	NEMA SIZE		
MC-FCUP1	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-FCUP2	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-FCUP3	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-HCP1	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-HCP2	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-HCP3	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-HCP4	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-HCP5	PENTHOUSE 698	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-FCUB1	MECH RM 698A	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	
MC-CCP7	MECH RM 198M	1.5	3	480	3	20	5.6	FVNR	0	NEMA 1	

VARIABLE FREQUENCY CONTROLLER SCHEDULE

DESIGNATION	EQUIPMENT DATA					CIRCUIT BREAKER		NEMA ENCLOSURE	COMMENTS
	LOCATION	HP	FLA	VOLTAGE	PHASE	FRAME SIZE	TRIP SIZE		
VFC-CWP1	PUMP RM 198D	75	96	480	3	125	125	NEMA 1	1
VFC-CWP2	PUMP RM 198D	75	96	480	3	125	125	NEMA 1	1
VFC-CWP3	PUMP RM 198D	75	96	480	3	125	125	NEMA 1	1
VFC-CBP1	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CBP2	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CBP3	PENTHOUSE 698	2	3.4	480	3	20	20	NEMA 1	
VFC-CBP4	PENTHOUSE 698	5	7.6	480	3	20	20	NEMA 1	
VFC-CBP5	PENTHOUSE 698	5	7.6	480	3	20	20	NEMA 1	
VFC-CHWP1	PENTHOUSE 698	50	65	480	3	100	100	NEMA 1	1
VFC-CHWP2	PENTHOUSE 698	50	65	480	3	100	100	NEMA 1	1
VFC-CHWP3	PENTHOUSE 698	50	65	480	3	100	100	NEMA 1	1
VFC-CT1A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT1B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT1C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT2A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT2B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT2C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT3A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT3B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-CT3C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-FC4A	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-FC4B	PENTHOUSE 698	5	7.6	480	3	20	20	NEMA 1	
VFC-FHEF10A	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-FHEF10B	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-FHEF10C	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GEF1	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GEF2	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GEF3	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GEF4	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GEF5	PENTHOUSE 698	40	52	480	3	90	90	NEMA 1	
VFC-GWP1	PENTHOUSE 698	7.5	11	480	3	20	20	NEMA 1	
VFC-GWP2	PENTHOUSE 698	7.5	11	480	3	20	20	NEMA 1	
VFC-HWP4	PENTHOUSE 698	3	4.8	480	3	20	20	NEMA 1	
VFC-SF1A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF1B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF1C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF1D	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF2A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF2B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF2C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF2D	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF3A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF3B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF3C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF3D	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF4A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF4B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF4C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF4D	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF5A	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF5B	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF5C	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-SF5D	PENTHOUSE 698	15	21	480	3	40	40	NEMA 1	
VFC-HWP1	MECH RM 698A	25	34	480	3	70	70	NEMA 1	
VFC-HWP2	MECH RM 698A	25	34	480	3	70	70	NEMA 1	
VFC-HWP3	MECH RM 698A	25	34	480	3	70	70	NEMA 1	
VFC-RF7	MECH RM 198M	15	21	480	3	40	40	NEMA 1	
VFC-SF7	MECH RM 198M	15	21	480	3	40	40	NEMA 1	
VFC-SF6A1	MECH 398	5	7.6	480	3	20	20	NEMA 1	
VFC-SF6A2	MECH 398	5	7.6	480	3	20	20	NEMA 1	
VFC-SF6B1	MECH 398	5	7.6	480	3	20	20	NEMA 1	
VFC-SF6B2	MECH 398	5	7.6	480	3	20	20	NEMA 1	
VFC-SF8A	MAIL 131	15	21	480	3	40	40	NEMA 1	
VFC-SF8B	MAIL 131	15	21	480	3	40	40	NEMA 1	

COMMENTS:

1. PROVIDE WITH HARMONIC FILTER PER SPECIFICATION SECTION VARIABLE FREQUENCY MOTOR CONTROLLERS.

TRANSFORMER SCHEDULE

DESIGNATION	SIZE	PHASE	PRIMARY VOLTAGE	SECONDARY VOLTAGE	PRIMARY CONNECTION	SECONDARY CONNECTION	MOUNTING	TYPE	COMMENTS
T-1EM1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-1N1	225 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-1OS1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-1OS3	45 KVA	3	480 V	208\120 V	DELTA	WYE	WALL	Dry	
T-2N1	112.5. KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-2OS1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-3N1	112.5. KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-3OS1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-4N1	112.5. KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-4OS1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-5N1	112.5. KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	
T-5OS1	75 KVA	3	480 V	208\120 V	DELTA	WYE	PAD	Dry	

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAK
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL SCHEDULES

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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Distribution Panel: DP-1OSH11

Location: EMERGENCY ELECTRIC 198K
Supplied From: ATS-OS1
Mounting: PAD/SURFACE
Enclosure Type: NEMA 1

Voltage: 480/277 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

Branch: OPTIONAL STANDBY
A.I.C. Rating: 100,000
Main Type: MCB
Main Rating: 1200 A

General Panel Comments:

A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	SPARE	X							3	200 A	200 A	0.0	
2	SPARE			X	X	X			3	400 A	350 A	0.0	
3	SPARE			X	X	X			3	400 A	400 A	0.0	
4	P-1OSH2	X							3	100 A	100 A	58.6	
5	SPARE			X	X	X			3	400 A	400 A	0.0	
6	P-5OSH1			X	X	X			3	400 A	350 A	120.9	
7	P-4OSH1			X	X	X			3	400 A	350 A	42.6	
8	P-3OSH1			X	X	X			3	400 A	350 A	26.9	
9	P-2OSH1			X	X	X			3	400 A	350 A	41.1	
10	SPARE			X	X	X			3	400 A	400 A	0.0	
11	P-1OSH1			X	X	X			3	400 A	350 A	66.9	
12	T-1OS3	X							3	100 A	80 A	58.0	
13	SPACE								3	400 A	400 A	0.0	
14	SPACE								3	400 A	400 A	0.0	
											Total Connected Load (kVA):		414.8
											Total Connected Load (Amps):		498.9

Remarks:

Distribution Panel: DP-1NH11

Location: ELECTRICAL 198L
Supplied From: MAIN #2 (NORTH)
Mounting: PAD/SURFACE
Enclosure Type: NEMA 1

Voltage: 480/277 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

Branch: NORMAL
A.I.C. Rating: 100,000
Main Type: MCB
Main Rating: 1200 A

General Panel Comments:

A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	SPARE		X						3	200 A	200 A	0.0	
2	SPARE			X	X	X			3	600 A	600 A	0.0	
3	SPARE		X						3	200 A	200 A	0.0	
4	SPARE		X						3	200 A	200 A	0.0	
5	T-5N1		X						3	200 A	200 A	244.8	
6	T-4N1		X						3	200 A	200 A	225.2	
7	SPARE		X						3	200 A	200 A	0.0	
8	T-3N1		X						3	200 A	200 A	186.1	
9	T-2N1		X						3	200 A	200 A	143.7	
10	SPARE			X	X	X			3	400 A	400 A	0.0	
11	T-1N1			X	X	X			3	400 A	400 A	351.6	
12	SPACE			X	X	X			3	400 A	400 A	0.0	
13	SPACE			X	X	X			3	400 A	400 A	0.0	
14	SPACE			X	X	X			3	400 A	400 A	0.0	
											Total Connected Load (kVA):		1151.3
											Total Connected Load (Amps):		1384.8

Remarks:

Distribution Panel: DP-1NH12

Location: ELECTRICAL 198L
Supplied From: MAIN #2 (NORTH)
Mounting: PAD/SURFACE
Enclosure Type: NEMA 1

Voltage: 480/277 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

Branch: NORMAL
A.I.C. Rating: 100,000
Main Type: MCB
Main Rating: 1200 A

General Panel Comments:

A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	P-1NH2			X	X	X			3	400 A	400 A	122.3	
2	SPARE			X	X	X			3	600 A	600 A	0.0	
3	SPARE	X							3	150 A	150 A	0.0	
4	SPARE	X							3	150 A	150 A	0.0	
5	P-5NH1	X							3	200 A	200 A	143.3	
6	P-4NH1	X							3	200 A	200 A	41.6	
7	SPARE	X							3	200 A	200 A	0.0	
8	P-3NH1	X							3	200 A	200 A	82.9	
9	P-2NH1	X							3	200 A	200 A	43.9	
10	SPARE			X	X	X			3	400 A	400 A	0.0	
11	P-1NH1	X							3	200 A	200 A	20.3	
12	Chilled Water Pump VFC-CWP1		X						3	150 A	125 A	79.7	
13	Chilled Water Pump VFC-CWP2		X						3	150 A	125 A	79.7	
14	Chilled Water Pump VFC-CWP3		X						3	150 A	125 A	79.7	
15	SPACE			X	X	X			3	400 A	400 A	0.0	
16	SPACE			X	X	X			3	400 A	400 A	0.0	
											Total Connected Load (kVA):		692.7
											Total Connected Load (Amps):		833.2

9

Remarks:

Distribution Panel: DP-1NL1

Location: Space 227QQ
Supplied From: T-1N1
Mounting: PAD/SURFACE
Enclosure Type: NEMA 1

Voltage: 120/208 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

Branch: NORMAL
A.I.C. Rating: 35,000
Main Type: MCB
Main Rating: 800 A

General Panel Comments:

A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	P-1NL-106-3, P-1NL-106-4	X							3	150 A	150 A	22.3	
2	P-1NL-106-1, P-1NL-106-2	X							3	150 A	150 A	34.1	
3	P-1NL-103-1, P-1NL-103-2	X							3	150 A	150 A	48.7	
4	P-1NL-118-3, P-1NL-118-4	X							3	150 A	150 A	32.0	
5	P-1NL-118-1, P-1NL-118-2	X							3	150 A	150 A	38.4	
6	P-1NL-108-3	X							3	150 A	150 A	17.2	
7	P-1NL-108-1, P-1NL-108-2	X							3	150 A	150 A	27.1	
8	P-1NL-107-3	X							3	150 A	150 A	18.8	
9	P-1NL-107-1, P-1NL-107-2	X							3	150 A	150 A	27.1	
10	P-1NL6	X							3	100 A	100 A	8.0	
11	P-1NL4, P-1NL5	X							3	150 A	150 A	35.7	
12	P-1NL8	X							3	100 A	100 A	10.9	
13	RECEPTACLE - EVENT POWER	X							2	100 A	100 A	1.0	
14	P-1NL1, P-1NL2	X							3	150 A	150 A	30.4	
15	SPARE	X							3	100 A	100 A	0.0	
16	SPARE	X							3	100 A	100 A	0.0	
17	SPARE	X							3	150 A	150 A	0.0	
18	SPACE	X							3	150 A	150 A	0.0	
											Total Connected Load (kVA):		351.6
											Total Connected Load (Amps):		976.0

Remarks:

Switchboard: SB-1GH1

Location: EMERGENCY ELECTRIC 198K
Supplied From: GEN-1EMH1
Mounting: PAD
Enclosure Type: NEMA 1

Voltage: 480/277 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

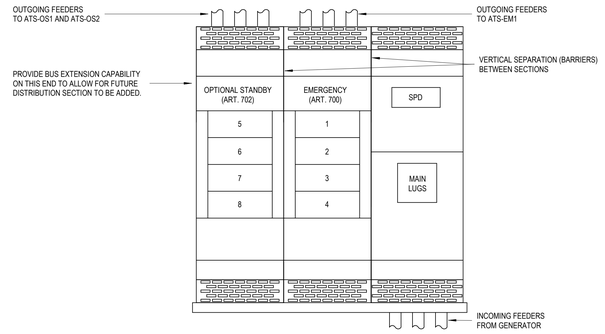
Branch: EMERGENCY
A.I.C. Rating: 65000
Main Type: MLO
Main Rating: 1600 A

General Panel Comments:

A. SWITCHBOARD SHALL BE PROVIDED WITH FULL HEIGHT VERTICAL BARRIERS BETWEEN EACH SECTION FOR SEPARATION BETWEEN BRANCHES.
B. VERTICAL BARRIERS SHALL BE HEAVY GAUGE STEEL OF EQUAL OR GREATER GAUGE THAN THE EXTERIOR.
C. THE GENERATOR SYSTEM SHALL BE A SEPARATELY DERIVED SYSTEM WITH THE NEUTRAL/GROUND BOND OCCURING AT THE GENERATOR.
D. PROVIDE ONE-LINE DRAWING ON THIS SWITCHBOARD SHOWING ALL OUTGOING AND INCOMING FEEDS.
E. THE SWITCHBOARD DIMENSIONS SHALL BE NO LARGER THAN WHAT IS SHOWN ON THE PLANS.
F. THE SWITCHBOARD SHALL BE PROTECTED VIA INTEGRAL SURGE PROTECTION DEVICE (SPD) IN A BARRIERED COMPARTMENT.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	ATS-EM1			X	X	X			3	400 A	400 A	98.3	
2	SPACE								3	400 A	0 A	0.0	
3	SPACE								3	400 A	0 A	0.0	
4	SPACE								3	400 A	0 A	0.0	
5	ATS-OS1			X	X	X			3	1200 A	1200 A	414.8	
6	ATS-OS2			X	X	X			3	1200 A	1200 A	916.0	
7	SPACE								3	800 A	0 A	0.0	
8	SPACE								3	800 A	0 A	0.0	
											Total Connected Load (kVA):		1428.8
											Total Connected Load...		1718.6

Remarks:



Distribution Panel: DP-1EMH1

Location: EMERGENCY ELECTRIC 198K
Supplied From: ATS-EM1
Mounting: PAD/SURFACE
Enclosure Type: NEMA 1

Voltage: 480/277 Wye
Phase: 3
Wire: 4
Ground: EQUIPMENT GROUND BUS

Branch: EMERGENCY SYSTEM
A.I.C. Rating: 100,000
Main Type: MCB
Main Rating: 400 A

General Panel Comments:

A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	Jockey Pump - FIRE PUMP 198P		X						3	100 A	20 A	0.0	
2	Passenger Elevator			X	X	X			3	100 A	100 A	27.4	
3	Passenger Elevator			X	X	X			3	100 A	100 A	27.4	
4	P-5EMH1			X	X	X			3	100 A	100 A	2.8	
5	P-4EMH1			X	X	X			3	100 A	100 A	1.9	
6	P-3EMH1			X	X	X			3	100 A	100 A	2.4	
7	P-2EMH1			X	X	X			3	100 A	100 A	4.7	
8	P-1EMH1			X	X	X			3	100 A	100 A	9.7	
9	T-1EM1			X	X	X			3	125 A	125 A	22.3	
10	SPARE			X	X	X			3	100 A	100 A	0.0	
11	SPARE			X	X	X			3	100 A	100 A	0.0	
12	SPARE			X	X	X			3	125 A	125 A	0.0	
13	SPACE								3	125 A	0 A	0.0	
14	SPACE								3	125 A	0 A	0.0	
											Total Connected Load (kVA):		98.3
											Total Connected Load (Amps):		118.2

Remarks:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL DISTRIBUTION PANEL SCHEDULES

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E602

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4/24/2026 1:45:03 PM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ELEC-20250073-IULAB_R24.rvt

Distribution Panel: DP-6OSH1

Location: PENTHOUSE 698 | **Voltage:** 480/277 Wye | **Branch:** Optional Standby
Supplied From: ATS-OS2 | **Phase:** 3 | **A.I.C. Rating:** 65,000
Mounting: PAD | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** Equipment Ground Bus | **Main Rating:** 1200 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	Fume Hood Ex Fan FHEF-10A	X							3	100 A	100 A	43.2	
2	Fume Hood Ex Fan FHEF-10B	X							3	100 A	100 A	43.2	
3	Fume Hood Ex Fan FHEF-10C	X							3	100 A	100 A	43.2	
4	General Exhaust Fan GEF-1	X							3	100 A	100 A	43.2	
5	General Exhaust Fan GEF-2	X							3	100 A	100 A	43.2	
6	General Exhaust Fan GEF-3	X							3	100 A	100 A	43.2	
7	P-6OSH1			X	X	X			3	400 A	400 A	83.5	
8	P-6OSH2			X	X	X			3	400 A	400 A	139.5	
9	ACC-5	X							3	200 A	200 A	123.0	
10	VFC-FC4A	X							3	100 A	100 A	43.2	
11	P-6OSH3			X	X	X			3	400 A	400 A	74.1	
12	P-6OSH4			X	X	X			3	400 A	400 A	117.1	9
13	Process Cooling Heat Pump WWHP-4		X						3	200 A	125 A	76.5	
14	SPARE			X	X	X			3	400 A	400 A	0.0	
15	SPARE	X							3	200 A	200 A	0.0	
16	SPARE	X							3	100 A	100 A	0.0	
17	SPARE	X							3	100 A	100 A	0.0	
18	SPACE	X							3	200 A	200 A	0.0	

Total Connected Load (kVA): 916.0
Total Connected Load (Amps): 1101.8

Remarks:

Distribution Panel: DP-5NL1

Location: ELEC 598C | **Voltage:** 120/208 Wye | **Branch:** NORMAL
Supplied From: T-5N1 | **Phase:** 3 | **A.I.C. Rating:** 35,000
Mounting: PAD/SURFACE | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** EQUIPMENT GROUND BUS | **Main Rating:** 800 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	P-5NL-527-1, P-5NL-527-2	X							3	150 A	150 A	34.5	
2	P-5NL-527-3, P-5NL-527-4	X							3	150 A	150 A	25.2	
3	P-5NL-527-5, P-5NL-527-6	X							3	150 A	150 A	19.6	
4	P-5NL-527-7, P-5NL-527-8	X							3	150 A	150 A	35.6	
5	P-5NL-509-1, P-5NL-509-2	X							3	150 A	150 A	32.1	
6	SPARE	X							3	150 A	150 A	0.0	
7	P-5NL-504-1, P-5NL-504-2	X							3	150 A	150 A	39.3	
8	P-5NL1, P-5NL2	X							3	150 A	150 A	18.8	
9	SPARE	X							3	100 A	100 A	0.0	
10	P-5NL4, P-5NL5	X							3	150 A	150 A	23.7	
11	SPARE	X							3	100 A	100 A	0.0	
12	P-6NL1	X							3	100 A	100 A	15.9	
13	SPARE	X							3	100 A	100 A	0.0	
14	SPARE	X							3	150 A	150 A	0.0	

Total Connected Load (kVA): 244.8
Total Connected Load (Amps): 679.4

Remarks:

Distribution Panel: DP-2NL1

Location: ELEC 298D | **Voltage:** 120/208 Wye | **Branch:** NORMAL
Supplied From: T-2N1 | **Phase:** 3 | **A.I.C. Rating:** 35,000
Mounting: PAD/SURFACE | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** EQUIPMENT GROUND BUS | **Main Rating:** 400 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	P-2NL-227C-1	X							3	150 A	150 A	16.2	
2	P-2NL-227E-1	X							3	150 A	150 A	10.7	
3	P-2NL-227F-1	X							3	150 A	150 A	14.5	
4	P-2NL-227G-1, P-2NL-227G-2	X							3	150 A	150 A	19.9	
5	P-2NL-227H-1	X							3	150 A	150 A	13.8	
6	P-2NL-227M-1	X							3	150 A	150 A	7.6	
7	P-2NL1	X							3	150 A	150 A	19.2	
8	SPARE	X							3	100 A	100 A	0.0	
9	P-2NL4, P-2NL5	X							3	150 A	150 A	41.8	
10	SPARE	X							3	100 A	100 A	0.0	
11	SPARE	X							3	100 A	100 A	0.0	
12	SPARE	X							3	150 A	150 A	0.0	
13	SPARE	X							3	150 A	150 A	0.0	
14	SPARE	X							3	150 A	150 A	0.0	

Total Connected Load (kVA): 143.7
Total Connected Load (Amps): 398.9

Remarks:

Distribution Panel: DP-6NH1

Location: PENTHOUSE 698 | **Voltage:** 480/277 Wye | **Branch:** Normal
Supplied From: MAIN #2 (NORTH) | **Phase:** 3 | **A.I.C. Rating:** 65,000
Mounting: PAD | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** Equipment Ground Bus | **Main Rating:** 1200 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	Chiller CH-2			X	X	X			3	600 A	500 A	251.0	
2	Chiller CH-3			X	X	X			3	600 A	500 A	251.0	
3	P-6NH1			X	X	X			3	400 A	400 A	174.9	
4	Service Elevator			X	X	X			3	150 A	100 A	0.0	
5	SPARE			X	X	X			3	400 A	400 A	0.0	
6	SPARE			X	X	X			3	400 A	400 A	0.0	
7	SPARE			X	X	X			3	600 A	600 A	0.0	
8	SPARE			X	X	X			3	600 A	600 A	0.0	
9	SPARE			X	X	X			3	400 A	400 A	0.0	
10	SPACE								3	400 A	400 A	0.0	
11	SPACE								3	400 A	400 A	0.0	
12	SPACE								3	400 A	400 A	0.0	

Total Connected Load (kVA): 676.9
Total Connected Load (Amps): 814.2

Remarks:

Distribution Panel: DP-3NL1

Location: ELEC 398D | **Voltage:** 120/208 Wye | **Branch:** NORMAL
Supplied From: T-3N1 | **Phase:** 3 | **A.I.C. Rating:** 35,000
Mounting: PAD/SURFACE | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** EQUIPMENT GROUND BUS | **Main Rating:** 400 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	P-3NL-327-1, P-3NL-327-2	X							3	150 A	150 A	34.3	
2	P-3NL-327-3, P-3NL-327-4	X							3	150 A	150 A	23.8	
3	P-3NL-327-5, P-3NL-327-6	X							3	150 A	150 A	28.3	
4	P-3NL-327-7, P-3NL-327-8	X							3	150 A	150 A	34.1	
5	P-3NL1	X							3	150 A	150 A	16.2	
6	SPARE	X							3	100 A	100 A	0.0	
7	P-3NL4, P-3NL5	X							3	150 A	150 A	31.3	
8	P-3NL6	X							3	100 A	100 A	18.0	
9	SPARE	X							3	150 A	150 A	0.0	
10	SPARE	X							3	100 A	100 A	0.0	
11	SPARE	X							3	150 A	150 A	0.0	
12	SPARE	X							3	150 A	150 A	0.0	
13	SPARE	X							3	100 A	100 A	0.0	
14	SPARE	X							3	100 A	100 A	0.0	

Total Connected Load (kVA): 186.1
Total Connected Load (Amps): 516.6

Remarks:

Distribution Panel: DP-6NH2

Location: PENTHOUSE 698 | **Voltage:** 480/277 Wye | **Branch:** Normal
Supplied From: MAIN #1 (SOUTH) | **Phase:** 3 | **A.I.C. Rating:** 65,000
Mounting: PAD | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** Equipment Ground Bus | **Main Rating:** 1200 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks:
1	General Exhaust Fan GEF-4	X							3	100 A	100 A	43.2	
2	General Exhaust Fan GEF-5	X							3	100 A	100 A	43.2	
3	Chiller CH-1			X	X	X			3	600 A	500 A	251.0	
4	Chilled Water Pump VFC-CHWP1	X							3	100 A	100 A	54.0	
5	Chilled Water Pump VFC-CHWP2	X							3	100 A	100 A	54.0	
6	Chilled Water Pump VFC-CHWP3	X							3	100 A	100 A	54.0	
7	P-6NH2			X	X	X			3	400 A	400 A	163.3	
8	SPARE			X	X	X			3	400 A	400 A	0.0	
9	SPARE			X	X	X			3	600 A	600 A	0.0	
10	SPARE	X							3	100 A	100 A	0.0	
11	SPACE								3	400 A	400 A	0.0	
12	SPACE								3	400 A	400 A	0.0	

Total Connected Load (kVA): 662.5
Total Connected Load (Amps): 796.9

Remarks:

Distribution Panel: DP-4NL1

Location: ELEC 498C | **Voltage:** 120/208 Wye | **Branch:** NORMAL
Supplied From: T-4N1 | **Phase:** 3 | **A.I.C. Rating:** 35,000
Mounting: PAD/SURFACE | **Wire:** 4 | **Main Type:** MCB
Enclosure Type: NEMA 1 | **Ground:** EQUIPMENT GROUND BUS | **Main Rating:** 400 A

General Panel Comments:
A. The main breaker shall be individually-mounted, solid-state, electronic-trip with field adjustable LSI settings.
B. External SPD with integral disconnect in NEMA 1 enclosure.

		Breaker Information											
		Thermal Mag		Electronic Trip									
CKT	Circuit Description	Fixed	Adj. Inst.	L	S	I	G	100% Rated	Poles	Frame Size	Trip Rating	Load (kVA)	Remarks
1	P-4NL-427-1, P-4NL-427-2	X							3	150 A	150 A	30.7	
2	P-4NL-427-3, P-4NL-427-4	X							3	150 A	150 A	24.2	
3	P-4NL-407-1, P-4NL-407-2	X							3	150 A	150 A	40.6	
4	P-4NL-427-5, P-4NL-427-6	X							3	150 A	150 A	29.1	
5	P-4NL-427-7, P-4NL-427-8	X							3	150 A	150 A	36.7	
6	P-4NL-402-1, P-4NL-402-2	X							3	150 A	150 A	24.1	
7	P-4NL-404-1	X							3	150 A	150 A	12.7	
8	P-4NL1, P-4NL2	X							3	150 A	150 A	15.4	
9	SPARE	X							3	100 A	100 A	0.0	
10	P-4NL4, P-4NL5	X							3	150 A	150 A	11.7	
11	SPARE	X							3	100 A	100 A	0.0	
12	SPARE	X							3	150 A	150 A	0.0	
13	SPARE	X							3	150 A	150 A	0.0	
14	SPARE	X							3	100 A	100 A	0.0	

Total Connected Load (kVA): 225.2
Total Connected Load (Amps): 625.0

Remarks:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAG AND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL DISTRIBUTION PANEL SCHEDULES

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E603

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BRANCH PANEL: P-1EMH1

LOCATION: Space 227QQ
SUPPLIED FROM: DP-1EMH1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	SPARE		20 A	1	0	1,545					1	20 A		LIGHTING - STAIR A	2
3	SPARE		20 A	1			0	764			1	20 A		LIGHTING - STAIR B	4
5	SPARE		20 A	1					0	1,593	1	20 A		LIGHTING - EXTERIOR SECOND FLOOR TARRACE LIGHTING	6
7	SPARE		20 A	1	0	1,171					1	20 A		LIGHTING - EXTERIOR FIRST FLOOR CANOPY	8
9	SPARE		20 A	1			0	520			1	20 A		LIGHTING - EXTERIOR SERVICE YARD	10
11	SPARE		20 A	1					0	240	1	20 A		EXIT SIGNS	12
13	SPARE		20 A	1	0	340					1	20 A		LIGHTING ROOM 199L-1, 199K	14
15	SPARE		20 A	1			0	500			1	20 A		LIGHTING ROOM 199E-1, 199C, 199B, 199, 199M	16
17	SPARE		20 A	1					0	275	1	20 A		LIGHTING Room 199E-1, 199N	18
19	SPARE		20 A	1	0	1,507					1	20 A		LIGHTING ROOM 196A, 196	20
21	SPARE		20 A	1			0	320			1	20 A		LIGHTING CIRCULATION 199G	22
23	SPARE		20 A	1					0	962	1	20 A		LIGHTING - EXTERIOR PARKING AND STAIRS	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
	TOTAL LOAD:				4,558 VA		2,086 VA		3,033 VA						
	TOTAL CURRENT:				17.0 A		7.5 A		11.5 A						
	TOTAL CONNECTED LOAD (VA): 9,669 VA														
	TOTAL CONNECTED CURRENT (AMPS): 11.6 A														

NOTES:

BRANCH PANEL: P-1EML1

LOCATION: EMERGENCY ELECTRIC 198K
SUPPLIED FROM: T-1EM1
MOUNTING: Surface
ENCLOSURE TYPE: Type 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 250 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	P-1EML2		100 A	3	2,000	500					3	100 A		P-2EML1	2
3	--		--	--			2,000	0			--	--		--	4
5	--		--	--					1,000	0	--	--		--	6
7	P-3EML1		100 A	3	500	500					3	100 A		P-4EML1	8
9	--		--	--			0	0			--	--		--	10
11	--		--	--					0	0	--	--		--	12
13	P-5EML1		100 A	3	750	0					3	100 A		SPARE	14
15	--		--	--			0	0			--	--		--	16
17	--		--	--					0	0	--	--		--	18
19	SPARE		20 A	3	0	0					3	20 A		SPARE	20
21	--		--	--			0	0			--	--		--	22
23	--		--	--					0	0	--	--		--	24
25	GENERATOR PANEL		60 A	3	5,000	--					1	--		SPACE	26
27	--		--	--			5,000	--			1	--		SPACE	28
29	--		--	--					5,000	--	1	--		SPACE	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				9,250 VA		7,000 VA		6,000 VA						
	TOTAL CURRENT:				78.4 A		59.6 A		50.0 A						
	TOTAL CONNECTED LOAD (VA): 22,250 VA														
	TOTAL CONNECTED CURRENT (AMPS): 61.8 A														

NOTES:

BRANCH PANEL: P-1EML2

LOCATION: Space 227QQ
SUPPLIED FROM: P-1EML1
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	AUTO DOORS - ENTRY VESTIBULE 199K		20 A	1	500	500					1	20 A	1	FIRE ALARM PANEL - SECURITY CLOSET	2
3	FIRE ALARM PANEL - FIRE PUMP ROOM	1	20 A	1			500	500			1	20 A	1	FIRE ALARM PANEL - FIRE PUMP ROOM	4
5	AUTO DOORS - MENS AND WOMENS RESTROOMS		20 A	1					500	500	1	20 A		AUTO DOORS - ENTRY VESTIBULE 199B	6
7	ELEV CAB - ELEV CTRL 198		20 A	1	1,000	0					1	20 A		SPARE	8
9	ELEV CAB - ELEV CTRL 198		20 A	1			1,000	0			1	20 A		SPARE	10
11	SPARE		20 A	1					0	0	1	20 A		SPARE	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPACE		--	1	--	--					1	--		SPACE	20
21	SPACE		--	1			--	--			1	--		SPACE	22
23	SPACE		--	1					--	--	1	--		SPACE	24
25	SPACE		--	1	--	--					1	--		SPACE	26
27	SPACE		--	1			--	--			1	--		SPACE	28
29	SPACE		--	1					--	--	1	--		SPACE	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				2,000 VA		2,000 VA		1,000 VA						
	TOTAL CURRENT:				17.9 A		17.9 A		8.3 A						
	TOTAL CONNECTED LOAD (VA): 5,000 VA														
	TOTAL CONNECTED CURRENT (AMPS): 13.9 A														

NOTES:
1. BREAKERS SERVING FIRE ALARM TO BE RED.

BRANCH PANEL: P-1OSH1

LOCATION: Space 227QQ
SUPPLIED FROM: DP-1OSH11
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 350 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	T-1OS1		125 A	3	16,620	480					1	20 A		LIGHTING ELEVATOR SHAFT	2
3	--		--	--			18,250	80			1	20 A		LIGHTING ELEV CTRL 198	4
5	--		--	--					16,720	2,395	1	20 A		LIGHTING ROOM 108BA, 108B, 108A, 108	6
7	SPARE		20 A	1	0	2,548					1	20 A		LIGHTING Room 118A, 118B, 118C	8
9	SPARE		20 A	1			0	2,220			1	20 A		LIGHTING Room 103	10
11	SPARE		20 A	1					0	1,884	1	20 A		LIGHTING Room 107	12
13	SPARE		20 A	1	0	2,725					1	20 A		LIGHTING IMAGING LAB 107	14
15	SPARE		20 A	1			0	560			1	20 A		LIGHTING	16
17	SPARE		20 A	1					0	1,440	1	20 A		LIGHTING	18
19	SPARE		20 A	1	0	1,128					1	20 A		LIGHTING ROOM 129, 109, 115	20
21	SPARE		20 A	1			0	410			1	20 A		LIGHTING RESEARCH COMP RACKS 129	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				23,256 VA		21,381 VA		22,225 VA						
	TOTAL CURRENT:				84.4 A		77.2 A		80.7 A						
	TOTAL CONNECTED LOAD (VA): 66,850 VA														
	TOTAL CONNECTED CURRENT (AMPS): 80.4 A														

NOTES:

BRANCH PANEL: P-1OSH2

LOCATION: EMERGENCY ELECTRIC 198K
SUPPLIED FROM: DP-1OSH11
MOUNTING: Surface
ENCLOSURE TYPE: Type 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 65,000
MAIN TYPE: MLO
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	Supply Fan SF-7 - MECH RM 198M		40 A	3	5,813	5,813					3	40 A		Supply Fan SF-8A	2
3	--		--	--			5,813	5,813			--	--		--	4
5	--		--	--					5,813	5,813	--	--		--	6
7	Supply Fan SF-8b		40 A	3	5,813	2,104					3	20 A		Return Fan RF-7 - MECH RM 198M	8
9	--		--	--			5,813	2,104			--	--		--	10
11	--		--	--					5,813	2,104	--	--		--	12
13	SPARE		40 A	3	0	0					3	40 A		SPARE	14
15	--		--	--			0	0			--	--		--	16
17	--		--	--					0	0	--	--		--	18
19	SPARE		30 A	3	0	0					3	40 A		SPARE	20
21	--		--	--			0	0			--	--		--	22
23	--		--	--					0	0	--	--		--	24
25	SPACE		--	1	--	0					3	30 A		SPARE	26
27	SPACE		--	1			--	0			--	--		--	28
29	SPACE		--	1					--	0	--	--		--	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				19,542 VA		19,542 VA		19,542 VA						
	TOTAL CURRENT:				70.5 A		70.5 A		70.5 A						
	TOTAL CONNECTED LOAD (VA): 58,626 VA														
	TOTAL CONNECTED CURRENT (AMPS): 70.5 A														

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 1

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E604

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BRANCH PANEL: P-1OSL1

LOCATION: Space 227QQ
SUPPLIED FROM: T-1OS1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 250 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	SPARE		100 A	3	0	1,680					3	100 A		P-1OSL-107-1	2
3	--		--	--			0	720			--	--		--	4
5	--		--	--					0	720	--	--		--	6
7	P-1OSL-103-1		100 A	3	860	1,220					3	100 A		P-1OSL-118-1	8
9	--		--	--			1,060	720			--	--		--	10
11	--		--	--					1,180	360	--	--		--	12
13	SPARE		100 A	3	0	3,140					3	100 A		P-1OSL-108-1	14
15	--		--	--			0	3,280			--	--		--	16
17	--		--	--					0	2,580	--	--		--	18
19	P-1OSL-106-1		100 A	3	1,040	0					3	100 A		SPARE	20
21	--		--	--			720	0			--	--		--	22
23	--		--	--					1,380	0	--	--		--	24
25	P-1OSL2		100 A	3	7,600	0					3	100 A		SPARE	26
27	--		--	--			8,100	0			--	--		--	28
29	--		--	--					8,300	0	--	--		--	30
31	P-1OSL4		100 A	3	1,080	--					1	--		SPACE	32
33	--		--	--			3,650	--			1	--		SPACE	34
35	--		--	--					2,200	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
				TOTAL LOAD:	16,620 VA		18,250 VA		16,720 VA						
				TOTAL CURRENT:	138.5 A		152.2 A		139.5 A						

TOTAL CONNECTED LOAD (VA): 51,590 VA
TOTAL CONNECTED CURRENT (AMPS): 143.2 A

NOTES:

BRANCH PANEL: P-1OSL2

LOCATION: Space 227QQ
SUPPLIED FROM: P-1OSL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - MDF RACK		20 A	2	850	850					2	20 A		RECEPTACLE - MDF RACK	2
3	--		--	--			850	850			--	--		--	4
5	RECEPTACLE - MDF RACK		20 A	2					850	850	2	20 A		RECEPTACLE - MDF RACK	6
7	--		--	--	850	850					--	--		--	8
9	RECEPTACLE - MDF RACK		20 A	2			850	850			2	20 A		RECEPTACLE - MDF RACK	10
11	--		--	--					850	850	--	--		--	12
13	RECEPTACLE - MDF ROOM		20 A	1	200	500					1	20 A		DDC PANEL - PUMP ROOM	14
15	DDC PANEL - PUMP ROOM		20 A	1			500	500			1	20 A		SECURITY PANEL - SECURITY CLOSET	16
17	SECURITY PANEL - SECURITY CLOSET		20 A	1					500	500	1	20 A		SECURITY PANEL - SECURITY CLOSET	18
19	DDC PANEL - SECURITY CLOSET		20 A	1	500	500					1	20 A		DDC PANEL - SECURITY CLOSET	20
21	DDC PANEL - MECH RM 198M		20 A	1			500	500			1	20 A		AHU LIGHTS, RECEPS - MECH RM 198M	22
23	RECEPTACLE - ELECTRICAL ROOM		20 A	1					800	500	1	20 A		DDC PANEL - MECH RM 198M	24
25	RECEPTACLE - EXTERIOR, MECH YARD		20 A	1	600	800					1	20 A		RECEPTACLE - EMERG ELEC RM, FIRE PUMP RM	26
27	RECEPTACLE - ELEC 198E, SECURITY CLOSET		20 A	1			600	200			1	20 A		RECEPTACLE - ELEV 199X (9) (2)	28
29	DDC PANEL - PLUMBING ROOM		20 A	1					500	500	1	20 A		DDC PANEL - PLUMBING ROOM	30
31	RECEPTACLE		20 A	1	400	500					1	20 A		BAS - SECURITY ROOM	32
33	BAS - SECURITY ROOM (9)		20 A	1			500	1,400			1	20 A		CUH-3, VESTIBULE 199M	34
35	RECEPTACLE - ELEV 199Y		20 A	1					200	1,400	1	20 A		CUH-1, ENTRY VESTIBULE 199B	36
37	RECEPTACLE - ELEV 199Z		20 A	1	200	0					1	20 A		SPARE	38
39	SPARE		20 A	1			0	0			1	20 A		SPARE	40
41	SPARE		20 A	1					0	0	1	20 A		SPARE	42
				TOTAL LOAD:	7,600 VA		8,100 VA		8,300 VA						
				TOTAL CURRENT:	63.3 A		68.1 A		69.8 A						

TOTAL CONNECTED LOAD (VA): 24,000 VA
TOTAL CONNECTED CURRENT (AMPS): 66.6 A

NOTES:

BRANCH PANEL: P-1OSL3

LOCATION: RESEARCH COMP RACKS 129
SUPPLIED FROM: T-1OS3
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 150 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - RESEARCH COMP RACK		20 A	2	1,800	1,800					2	20 A		RECEPTACLE - RESEARCH COMP RACK	2
3	--		--	--			1,800	1,800			--	--		--	4
5	RECEPTACLE - RESEARCH COMP RACK		20 A	2					1,800	1,800	2	20 A		RECEPTACLE - RESEARCH COMP RACK	6
7	--		--	--	1,800	1,800					--	--		--	8
9	RECEPTACLE - RESEARCH COMP RACK		20 A	2			1,800	1,800			2	20 A		RECEPTACLE - RESEARCH COMP RACK	10
11	--		--	--					1,800	1,800	--	--		--	12
13	RECEPTACLE - RESEARCH COMP RACK		20 A	2	1,800	1,800					2	20 A		RECEPTACLE - RESEARCH COMP RACK	14
15	--		--	--			1,800	1,800			--	--		--	16
17	RECEPTACLE - RESEARCH COMP RACK		20 A	2					1,800	1,800	2	20 A		RECEPTACLE - RESEARCH COMP RACK	18
19	--		--	--	1,800	1,800					--	--		--	20
21	RECEPTACLE - RESEARCH COMP RACK		20 A	2			1,800	1,800			2	20 A		RECEPTACLE - RESEARCH COMP RACK	22
23	--		--	--					1,800	1,800	--	--		--	24
25	RECEPTACLE - RESEARCH COMP RACK		20 A	2	1,800	1,800					2	20 A		RECEPTACLE - RESEARCH COMP RACK	26
27	--		--	--			1,800	1,800			--	--		--	28
29	RECEPTACLE - RESEARCH COMP RACK		20 A	2					1,800	1,800	2	20 A		RECEPTACLE - RESEARCH COMP RACK	30
31	--		--	--	1,800	1,800					--	--		--	32
33	RECEPTACLE - RESEARCH COMP RACK		20 A	1	200	200					1	20 A		RECEPTACLE - RESEARCH COMP RACK	34
35	SPARE		20 A	2					0	0	2	20 A		SPARE	36
37	--		--	--	0	0					--	--		--	38
39	SPARE		30 A	2			0	0			2	30 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
				TOTAL LOAD:	21,600 VA		18,400 VA		18,000 VA						
				TOTAL CURRENT:	180.5 A		153.8 A		150.0 A						

TOTAL CONNECTED LOAD (VA): 58,000 VA
TOTAL CONNECTED CURRENT (AMPS): 161.0 A

NOTES:

BRANCH PANEL: P-1OSL4

LOCATION: Space 227QQ
SUPPLIED FROM: P-1OSL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - CHEM WASTE ROOM		20 A	1	180	200					1	20 A		RECEPTACLE - VAC PUMP, CHEM WASTE ROOM	2
3	EMERG SHOWER - CHEM WASTE ROOM		20 A	1			500	500			1	20 A		DDC PANEL RECEIVING	4
5	GAS MANIFOLD - CYL STOR		20 A	1					0	500	1	20 A		DDC PANEL - CYL STOR.	6
7	GAS MANIFOLD - CYL STOR		20 A	1	0	0					1	20 A		GAS MANIFOLD - BIO STOR	8
9	EMERG SHOWER - BIO STOR		20 A	1			0	1,000			1	20 A		EMERG SHOWER - CHEM STOR, BIO WASTE	10
11	AHU LIGHTS, RECEPS - MEZZANINE		20 A	1					500	500	1	20 A		DDC PANEL - MEZZANINE	12
13	DDC PANEL - MEZZANINE		20 A	1	500	200					1	20 A		RECEPTACLE - MEZZANINE	14
15	BAS - JAN CLOSET		20 A	1			250	1,400			1	20 A		CUH - ENTRY VESTIBULE	16
17	MISCELLANEOUS		20 A	1					700	0	1	20 A		SPARE	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
				TOTAL LOAD:	1,080 VA		3,650 VA		2,200 VA						
				TOTAL CURRENT:	9.0 A		31.9 A		19.8 A						

TOTAL CONNECTED LOAD (VA): 6,930 VA
TOTAL CONNECTED CURRENT (AMPS): 19.2 A

NOTES:

BRANCH PANEL: P-1OSL-103-1

LOCATION: INSTRUCTIONAL LAB SPACE 103
SUPPLIED FROM: P-1OSL1
MOUNTING: RECESSED
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. Provide a keyed BEST lock per division 8 hardware.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	EMERG. SHOWER, S.W. CORNER		20 A	1	500	180					1	20 A		RECEPTACLE - RACEWAY, W. WALL	2
3	GAS MANIFOLD, W. WALL		20 A	1			500	180			1	20 A		RECEPTACLE - RACEWAY, W. WALL	4
5	SPARE		20 A	1					0	500	1	20 A		GAS MANIFOLD, N. . CORNER	6
7	RECEPTACLE - RACEWAY, E. WALL		20 A	1	180	0					1	20 A		SPARE	8
9	RECEPTACLE - VAC PUMP, E. WALL		20 A	1			200	180			1	20 A		RECEPTACLE - RACEWAY, E. WALL	10
11	RECEPTACLE - RACEWAY, E. WALL		20 A	1					180	500	1	20 A		EMERG. SHOWER, S.E. CORNER	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	2			0	0			2	30 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
				TOTAL LOAD:	860 VA		1,060 VA		1,180 VA						
				TOTAL CURRENT:	7.2 A		9.1 A		10.1 A						

TOTAL CONNECTED LOAD (VA): 3,100 VA
TOTAL CONNECTED CURRENT (AMPS): 8.6 A

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE



ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 1

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E605

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BRANCH PANEL: P-1NH1

LOCATION: Space 227QQ
SUPPLIED FROM: DP-1NH12
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: NORMAL
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 200 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	SPARE - FUTURE 16KW HUMIDIFIER - IMAGING 107		30 A	3	0	0					3	30 A		SPARE - FUTURE 16KW HUMIDIFIER - IMAGING 107	2
3	--		--	--			0	0			--	--		--	4
5	--		--	--					0	0	--	--		--	6
7	LIGHTING - FEATURE WALL ACCENT		20 A	1	150	0					1	20 A		SPARE	8
9	LIGHTING - FACADE UPLIGHTING		20 A	1			684	0			1	20 A		SPARE	10
11	LIGHTING - FACADE BROW UPLIGHTING		20 A	1					2,880	0	1	20 A		SPARE	12
13	LIGHTING - EXTERIOR IU LOGO		20 A	1	1,904	0					1	20 A		SPARE	14
15	LIGHTING - EXTERIOR TREES AND FLAGS		20 A	1			492	0			1	20 A		SPARE	16
17	LIGHTING LOBBY/ FORUM 199		20 A	1					1,624	0	1	20 A		SPARE	18
19	LIGHTING CIRCULATION-1 199E-1		20 A	1	831	0					1	20 A		SPARE	20
21	LIGHTING Room 135, 196, 196A, 227O		20 A	1			1,530	0			1	20 A		SPARE	22
23	LIGHTING INSTRUCTIONAL LAB SPACE 103		20 A	1					726	0	1	20 A		SPARE	24
25	LIGHTING CLASSROOM 102, 104		20 A	1	2,200	0					1	20 A		SPARE	26
27	LIGHTING LARGE MULTIPURPOSE 100		20 A	1			3,040	0			1	20 A		SPARE	28
29	LIGHTING		20 A	1					1,584	0	1	20 A		SPARE	30
31	LIGHTING ROOM 122		20 A	1	1,398	0					1	20 A		SPARE	32
33	LIGHTING		20 A	1			480	0			1	20 A		SPARE	34
35	LIGHTING Room 199K, 199L-1, 199E-1, 199		20 A	1					958	0	1	20 A		SPARE	36
37	SPARE		20 A	3	0	--					1	--		SPACE	38
39	--		--	--			0	--			1	--		SPACE	40
41	--		--	--					0	--	1	--		SPACE	42
	TOTAL LOAD:				6,476 VA		6,195 VA		7,699 VA						
	TOTAL CURRENT:				23.5 A		22.4 A		27.9 A						

TOTAL CONNECTED LOAD (VA): 20,349 VA
TOTAL CONNECTED CURRENT (AMPS): 24.5 A

NOTES:

BRANCH PANEL: P-1NH2

LOCATION: ELECTRICAL 198L
SUPPLIED FROM: DP-1NH12
MOUNTING: Surface
ENCLOSURE TYPE: Type 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: Normal
AIC RATING: 100,000
MAIN TYPE: MLO
MAIN RATING: 400 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	TRASH COMPACTOR		30 A	3	3,875	830					3	15 A		CCP-7, MECH RM 198M	2
3	--		--	--			3,875	830			--	--		--	4
5	--		--	--					3,875	830	--	--		--	6
7	DOMESTIC WATER BOOSTER PUMP DWBP-1, PLUMBING ROOM		50 A	3	9,134	23,251					3	125 A		AIR COMPRESSOR AC-1, PLUMBING ROOM	8
9	--		--	--			9,134	23,251			--	--		--	10
11	--		--	--					9,134	23,251	--	--		--	12
13	CNC MILL - ELECTRONICS STUDIO		30 A	3	3,667	0					3	100 A		SPARE	14
15	--		--	--			3,667	0			--	--		--	16
17	--		--	--					3,667	0	--	--		--	18
19	SPARE		50 A	3	0	0					3	30 A		SPARE	20
21	--		--	--			0	0			--	--		--	22
23	--		--	--					0	0	--	--		--	24
25	SPARE		15 A	3	0	--					1	--		SPACE	26
27	--		--	--			0	--			1	--		SPACE	28
29	--		--	--					0	--	1	--		SPACE	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				40,758 VA		40,758 VA		40,758 VA						
	TOTAL CURRENT:				147.1 A		147.1 A		147.1 A						

TOTAL CONNECTED LOAD (VA): 122,274 VA
TOTAL CONNECTED CURRENT (AMPS): 147.1 A

NOTES:

BRANCH PANEL: P-1NL1

LOCATION: Space 227QQ
SUPPLIED FROM: DP-1NL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: NORMAL
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 150 A

GENERAL PANEL COMMENTS:
A. FEED THROUGH LUGS

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - CIRCULATION NORTH		20 A	1	1,080	1,000					1	20 A		RECEPTACLE - CIRCULATION NORTH	2
3	SPARE		20 A	1			0	1,400			1	20 A		RECEPTACLE - LAB STORAGE	4
5	RECEPTACLE - RESEARCH RACK ROOM		20 A	1					400	600	1	20 A		RECEPTACLE - RESEARCH RACK ROOM	6
7	RECEPTACLE - MAIL ROOM		20 A	1	800	800					1	20 A		RECEPTACLE - RECEIVING	8
9	OVERHEAD DOOR - RECEIVING		20 A	1			0	0			1	20 A		OVERHEAD DOOR - RECEIVING	10
11	RECEPTACLE - CHEM WASTE		20 A	1					1,000	360	1	20 A		RECEPTACLE - CHEM WASTE	12
13	RECEPTACLE - CHEM WASTE		20 A	1	560	500					1	20 A		HOOD - CHEM WASTE	14
15	UH-2 - RECEIVING		20 A	1			700	800			1	20 A		RECEPTACLE - OFFICE	16
17	RECEPTACLE - CHEM STOR, BIO WASTE		20 A	1					800	800	1	20 A		RECEPTACLE - CYL STOR., BIO STOR.	18
19	RECEPTACLE - NORTH EXTERIOR		20 A	1	800	1,400					1	20 A		EUH-1 - CIRCULATION 199J	20
21	UH-1 - RECEIVING		20 A	1			700	700			1	20 A		UH-3 - RECEIVING	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				13,840 VA		9,400 VA		7,160 VA						
	TOTAL CURRENT:				118.2 A		81.2 A		59.7 A						

TOTAL CONNECTED LOAD (VA): 30,400 VA
TOTAL CONNECTED CURRENT (AMPS): 84.4 A

NOTES:

BRANCH PANEL: P-1NL2

LOCATION: Space 227QQ
SUPPLIED FROM: P-1NL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: NORMAL
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 150 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - CENTER CIRCULATION		20 A	1	1,200	1,200					1	20 A		RECEPTACLE - SOUTH CIRCULATION	2
3	RECEPTACLE - CENTER CIRCULATION		20 A	1			1,000	800			1	20 A		RECEPTACLE - PUMP ROOM	4
5	RECEPTACLE - MDF		20 A	1					600	1,000	1	20 A		RECEPTACLE - SOLAR RM, HOUSE KEEPING	6
7	RECEPTACLE - STORAGE		20 A	1	600	1,200					1	20 A		RECEPTACLE - BREAK ROOM	8
9	REFRIGERATOR - BREAK ROOM		20 A	1			1,200	1,000			1	20 A		MICROWAVE - BREAK ROOM	10
11	MICROWAVE - BREAK ROOM		20 A	1					400	800	1	20 A		COFFEE - BREAK ROOM	12
13	FCU-FP - FIRE PUMP ROOM		20 A	1	1,200	1,000					1	20 A		RECEPTACLE - PLUMBING ROOM	14
15	RECEPTACLE		20 A	1			600	500			1	20 A		LEVEL SENSOR - PIPE ROOM (9)	16
17	RECEPTACLE - DISHWASHER, BREAK ROOM		20 A	1					200	200	1	20 A		RECEPTACLE - ELEV 199X SUMP PUMP (9)	18
19	G. DISPOSAL - BREAK ROOM		20 A	1	500	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
	TOTAL LOAD:				6,900 VA		5,100 VA		3,200 VA						
	TOTAL CURRENT:				59.9 A		44.9 A		26.7 A						

TOTAL CONNECTED LOAD (VA): 15,200 VA
TOTAL CONNECTED CURRENT (AMPS): 42.2 A

NOTES:

BRANCH PANEL: P-1NL4

LOCATION: Space 4
SUPPLIED FROM: DP-1NL1
MOUNTING: Surface
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: NORMAL
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 150 A

GENERAL PANEL COMMENTS:
A. PROVIDE FEED THROUGH LUGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - CIRCULATION, NORTH		20 A	1	800	780					1	20 A		RECEPTACLE - CIRCULATION, NORTH COLLAB	2
3	RECEPTACLE - LOBBY		20 A	1			600	1,000			1	20 A		RECEPTACLE - LOBBY WINDOWS	4
5	RECEPTACLE - AV RACK, FURN. STORAGE		20 A	1					200	1,080	1	20 A		RECEPTACLE - BENCH SEATS AT STAIR	6
7	RECEPTACLE - LOBBY		20 A	1	920	0					1	20 A		SPARE	8
9	RECEPTACLE - CLOSETS		20 A	1			1,450	1,000			1	20 A		RECEPTACLE - CIRCULATION SOUTH	10
11	RECEPTACLE - CIRCULATION SOUTH		20 A	1					800	200	1	20 A	1	EWC	12
13	EWC	1	20 A	1	200	600					1	20 A		RECEPTACLE - WELLNESS ROOM	14
15	RECEPTACLE - REST ROOMS		20 A	1			800	400			1	20 A		AUTO-FAUCETS - WOMEN 196A	16
17	AUTO-FAUCETS - WOMEN 196A		20 A	1					400	500	1	20 A		AUTO-FLUSH VALVES - WOMEN 196A	18
19	AUTO-FLUSH VALVES - WOMEN 196A		20 A	1	500	500					1	20 A		AUTO-FLUSH VALVES - MEN 196	20
21	AUTO-FLUSH VALVES - MEN 196		20 A	1			500	300			1	20 A		AUTO-FAUCETS - MEN 196	22
23	AUTO-FAUCETS - MEN 196		20 A	1					300	200	1	20 A		AUTO-FAUCET AND FLUSH VALVE - RR 196B	24
25	DIGITAL MIXING VLAVE - JAN CLOSET		20 A	1	250	600					1	20 A		RECEPTACLE - EXTERIOR	26
27	RECEPTACLE - ELEV C (9)		20 A	1			200	600			1	20 A		RECEPTACLE - EXTERIOR AT TREES AT MAIN ENTRY	28
29	RECEPTACLE - ELEV B (9)		20 A	1					200	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	2			0	0			2	30 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
	TOTAL LOAD:				13,997 VA		12,497 VA		9,207 VA						
	TOTAL CURRENT:				120.9 A		108.4 A		76.7 A						

TOTAL CONNECTED LOAD (VA): 35,700 VA
TOTAL CONNECTED CURRENT (AMPS): 99.1 A

NOTES:
1. PROVIDE GFCI BREAKER.

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE



ELECTRICAL PANEL SCHEDULES - LEVEL 1

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

E607

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4/24/2026 1:45:06 PM
Autodesk Docs://00360481 - IU Launch Accelerator for Biosciences/ELEC-20250072-ALL-AB_R24.rvt

BRANCH PANEL: P-3EMH1

LOCATION: ELEC 398D
SUPPLIED FROM: DP-1EMH1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	SPARE		20 A	1	0	95					1	20 A		EXIT SIGNS	2
3	SPARE		20 A	1			0	672			1	20 A		LIGHTING ROOM 320, 399A, 399	4
5	SPARE		20 A	1					0	467	1	20 A		LIGHTING ROOM 327, 396B, 396A	6
7	SPARE		20 A	1	0	600					1	20 A		LIGHTING CIRCULATION 399A	8
9	SPARE		20 A	1			0	550			1	20 A		LIGHTING CIRCULATION 399C	10
11	SPARE		20 A	1					0	0	1	20 A		SPARE	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
				TOTAL LOAD:	695 VA		1,220 VA		467 VA						
				TOTAL CURRENT:	2.6 A		4.5 A		1.7 A						
				TOTAL CONNECTED LOAD (VA): 2,381 VA											
				TOTAL CONNECTED CURRENT (AMPS): 2.9 A											

NOTES:

BRANCH PANEL: P-3EML1

LOCATION: ELEC 398D
SUPPLIED FROM: P-1EML1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	FIRE ALARM - SECURITY CLOSET		20 A	1	500	0					1	20 A		FIRE CURTAIN	2
3	SPARE		20 A	1			0	0			1	20 A		SPARE	4
5	SPARE		20 A	1					0	0	1	20 A		SPARE	6
7	SPARE		20 A	1	0	0					1	20 A		SPARE	8
9	SPARE		20 A	1			0	0			1	20 A		SPARE	10
11	SPARE		20 A	1					0	0	1	20 A		SPARE	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPACE		--	1	--	--					1	--		SPACE	20
21	SPACE		--	1			--	--			1	--		SPACE	22
23	SPACE		--	1					--	--	1	--		SPACE	24
25	SPACE		--	1	--	--					1	--		SPACE	26
27	SPACE		--	1			--	--			1	--		SPACE	28
29	SPACE		--	1					--	--	1	--		SPACE	30
				TOTAL LOAD:	500 VA		0 VA		0 VA						
				TOTAL CURRENT:	4.2 A		0.0 A		0.0 A						
				TOTAL CONNECTED LOAD (VA): 500 VA											
				TOTAL CONNECTED CURRENT (AMPS): 1.4 A											

NOTES:

BRANCH PANEL: P-3OSH1

LOCATION: ELEC 398D
SUPPLIED FROM: DP-1OSH11
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 350 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	T-3OS1		125 A	3	8,480	360					1	20 A		LIGHTING ROOM 398D, 398E, 398B	2
3	--		--	--			7,090	2,232			1	20 A		LIGHTING WET LAB 327 WEST	4
5	--		--	--					5,770	732	1	20 A		LIGHTING ROOM 327A, 327B, 327C	6
7	SPARE		20 A	1	0	1,116					1	20 A		LIGHTING WET LAB 327 CENTRAL	8
9	SPARE		20 A	1			0	574			1	20 A		LIGHTING ROOM 327D, 327E	10
11	SPARE		20 A	1					0	744	1	20 A		LIGHTING WET LAB 327 EAST	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	1			0	0			1	20 A		SPARE	40
41	SPARE		20 A	1					0	0	1	20 A		SPARE	42
				TOTAL LOAD:	9,893 VA		9,795 VA		7,187 VA						
				TOTAL CURRENT:	37.2 A		36.8 A		25.9 A						
				TOTAL CONNECTED LOAD (VA): 26,870 VA											
				TOTAL CONNECTED CURRENT (AMPS): 32.3 A											

NOTES:

BRANCH PANEL: P-3OSL1

LOCATION: ELEC 398D
SUPPLIED FROM: T-3OS1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 250 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	P-3OSL-327-1		100 A	3	500	1,100					3	100 A		P-3OSL-327-2	2
3	--		--	--			680	720			--	--		--	4
5	--		--	--					180	1,060	--	--		--	6
7	P-3OSL-327-3		100 A	3	800	2,380					3	100 A		P-3OSL-327-4	8
9	--		--	--			0	1,990			--	--		--	10
11	--		--	--					0	2,030	--	--		--	12
13	P-3OSL2		100 A	3	3,700	0					3	100 A		SPARE	14
15	--		--	--			3,700	0			--	--		--	16
17	--		--	--					2,500	0	--	--		--	18
19	SPARE		100 A	3	0	--					1	--		SPACE	20
21	--		--	--			0	--			1	--		SPACE	22
23	--		--	--					0	--	1	--		SPACE	24
25	SPACE		--	1	--	--					1	--		SPACE	26
27	SPACE		--	1			--	--			1	--		SPACE	28
29	SPACE		--	1					--	--	1	--		SPACE	30
31	SPACE		--	1	--	--					1	--		SPACE	32
33	SPACE		--	1			--	--			1	--		SPACE	34
35	SPACE		--	1					--	--	1	--		SPACE	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
				TOTAL LOAD:	8,480 VA		7,090 VA		5,770 VA						
				TOTAL CURRENT:	72.4 A		60.8 A		48.1 A						
				TOTAL CONNECTED LOAD (VA): 21,340 VA											
				TOTAL CONNECTED CURRENT (AMPS): 59.2 A											

NOTES:

BRANCH PANEL: P-3OSL2

LOCATION: ELEC 398D
SUPPLIED FROM: P-3OSL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - IDF RACK		20 A	2	850	850					2	20 A		RECEPTACLE - IDF RACK	2
3	--		--	--			850	850			--	--		--	4
5	RECEPTACLE - IDF ROOM		20 A	1					200	600	1	20 A		RECEPTACLE - ELEC AND SECURITY ROOMS	6
7	SECURITY PANEL		20 A	1	500	500					1	20 A		SECURITY PANEL	8
9	SECURITY PANEL		20 A	1			500	500			1	20 A		DDC PANEL	10
11	DDC PANEL		20 A	1					500	200	1	20 A		RECEPTACLE	12
13	DDC PANEL - MECH 398		20 A	1	500	500					1	20 A		DDC PANEL - MECH 398	14
15	BAS - SECURITY ROOM		20 A	1			500	500			1	20 A		BAS - MECH 398 (2/3)	16
17	BAS - SECURITY ROOM		20 A	1					500	500	1	20 A		BAS - MECH 398	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	2					0	0	2	20 A		SPARE	36
37	--		--	--	0	0					--	--		--	38
39	SPARE		30 A	2			0	0			2	30 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
				TOTAL LOAD:	3,700 VA		3,700 VA		2,500 VA						
				TOTAL CURRENT:	32.4 A		32.4 A		20.8 A						
				TOTAL CONNECTED LOAD (VA): 9,900 VA											
				TOTAL CONNECTED CURRENT (AMPS): 27.5 A											

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAG AND REGISTERED PE10606505 STATE OF INDIANA PROFESSIONAL ENGINEER

ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 3

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

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BRANCH PANEL: P-5EMH1

LOCATION: ELEC 598C
SUPPLIED FROM: DP-1EMH1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	SPARE		20 A	1	0	120					1	20 A		EXIT SIGNS	2
3	SPARE		20 A	1			0	425			1	20 A		LIGHTING ROOM 508, 599A, 520	4
5	SPARE		20 A	1					0	736	1	20 A		LIGHTING ROOM 527, 509, 596A, 596B, 527B, 527A	6
7	SPARE		20 A	1	0	550					1	20 A		LIGHTING LAB ENTRY WEST	8
9	SPARE		20 A	1			0	550			1	20 A		LIGHTING LAB ENTRY EAST	10
11	SPARE		20 A	1					0	454	1	20 A		LIGHTING - PENTHOUSE	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPACE		--	1	--	--					1	--		SPACE	20
21	SPACE		--	1			--	--			1	--		SPACE	22
23	SPACE		--	1					--	--	1	--		SPACE	24
25	SPACE		--	1	--	--					1	--		SPACE	26
27	SPACE		--	1			--	--			1	--		SPACE	28
29	SPACE		--	1					--	--	1	--		SPACE	30
	TOTAL LOAD:				670 VA		975 VA		1,181 VA						
	TOTAL CURRENT:				2.4 A		3.7 A		4.4 A						
	TOTAL CONNECTED LOAD (VA): 2,820 VA														
	TOTAL CONNECTED CURRENT (AMPS): 3.4 A														

NOTES:

BRANCH PANEL: P-5EML1

LOCATION: ELEC 598C
SUPPLIED FROM: P-1EML1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: EMERGENCY SYSTEM
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	FIRE ALARM - SECURITY CLOSET		20 A	1	500	250					1	20 A		VESDA - CIRCULATION 599E	2
3	SERVICE ELEV CAB LIGHTS (9)		20 A	1			0	0			1	20 A		SPARE	4
5	SPARE		20 A	1					0	0	1	20 A		SPARE	6
7	SPARE		20 A	1	0	0					1	20 A		SPARE	8
9	SPARE		20 A	1			0	0			1	20 A		SPARE	10
11	SPARE		20 A	1					0	0	1	20 A		SPARE	12
13	SPARE		20 A	1	0	0					1	20 A		SPARE	14
15	SPARE		20 A	1			0	0			1	20 A		SPARE	16
17	SPARE		20 A	1					0	0	1	20 A		SPARE	18
19	SPACE		--	1	--	--					1	--		SPACE	20
21	SPACE		--	1			--	--			1	--		SPACE	22
23	SPACE		--	1					--	--	1	--		SPACE	24
25	SPACE		--	1	--	--					1	--		SPACE	26
27	SPACE		--	1			--	--			1	--		SPACE	28
29	SPACE		--	1					--	--	1	--		SPACE	30
	TOTAL LOAD:				750 VA		0 VA		0 VA						
	TOTAL CURRENT:				6.3 A		0.0 A		0.0 A						
	TOTAL CONNECTED LOAD (VA): 750 VA														
	TOTAL CONNECTED CURRENT (AMPS): 2.1 A														

NOTES:

BRANCH PANEL: P-5OSH1

LOCATION: ELEC 598C
SUPPLIED FROM: DP-1OSH11
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 480/277 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 35,000
MAIN TYPE: MCB
MAIN RATING: 350 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	T-5OS1		125 A	3	39,000	360					1	20 A		LIGHTING ROOM 598C, 598D, 598A	2
3	--		--	--			34,940	2,232			1	20 A		LIGHTING WET LAB 527 WEST	4
5	--		--	--					36,370	1,101	1	20 A		LIGHTING ROOM 527C, 527E, 527F, 527D	6
7	SPARE		20 A	1	0	1,116					1	20 A		LIGHTING WET LAB 527 CENTRAL	8
9	SPARE		20 A	1			0	328			1	20 A		LIGHTING ROOM 527H, 527J	10
11	SPARE		20 A	1					0	744	1	20 A		LIGHTING WET LAB 527 EAST	12
13	SPARE		20 A	1	0	1,632					1	20 A		LIGHTING BIOMARKER T/H LAB 509	14
15	SPARE		20 A	1			0	1,788			1	20 A		LIGHTING ROOM 504, 504A, 504B	16
17	SPARE		20 A	1					0	1,832	1	20 A		LIGHTING ANALYXIN GENOMICS COMPUTATIONAL LAB 502	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	1			0	0			1	20 A		SPARE	40
41	SPARE		20 A	1					0	0	1	20 A		SPARE	42
	TOTAL LOAD:				41,964 VA		39,094 VA		39,880 VA						
	TOTAL CURRENT:				151.9 A		141.1 A		144.4 A						
	TOTAL CONNECTED LOAD (VA): 120,938 VA														
	TOTAL CONNECTED CURRENT (AMPS): 145.5 A														

NOTES:

BRANCH PANEL: P-5OSL1

LOCATION: ELEC 598C
SUPPLIED FROM: T-5OS1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1

VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4

BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 250 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	P-5OSL-527-1		100 A	3	5,540	1,180					3	100 A		P-5OSL-527-2	2
3	--		--	--			4,490	500			--	--		--	4
5	--		--	--					4,770	500	--	--		--	6
7	P-5OSL-509-1		100 A	3	7,400	1,760					3	100 A		P-5OSL-504-1	8
9	--		--	--			6,400	1,350			--	--		--	10
11	--		--	--					7,360	1,670	--	--		--	12
13	P-5OSL-527-3		100 A	3	4,330	4,580					3	100 A		P-5OSL-527-4	14
15	--		--	--			3,100	4,180			--	--		--	16
17	--		--	--					4,350	4,000	--	--		--	18
19	P-6OSL1		100 A	3	6,000	3,450					3	100 A		P-5OSL2	20
21	--		--	--			5,400	3,450			--	--		--	22
23	--		--	--					4,900	3,250	--	--		--	24
25	SPARE		100 A	3	0	4,760					3	100 A		P-5OSL-527-5	26
27	--		--	--			0	6,070			--	--		--	28
29	--		--	--					0	5,570	--	--		--	30
31	SPACE		--	3	--	--					3	--		SPACE	32
33	--		--	--			--	--			--	--		--	34
35	--		--	--					--	--	--	--		--	36
37	SPARE		100 A	3	0	0					3	100 A		SPARE	38
39	--		--	--			0	0			--	--		--	40
41	--		--	--					0	0	--	--		--	42
	TOTAL LOAD:				39,000 VA		34,940 VA		36,370 VA						
	TOTAL CURRENT:				326.8 A		291.2 A		304.9 A						
	TOTAL CONNECTED LOAD (VA): 110,310 VA														
	TOTAL CONNECTED CURRENT (AMPS): 306.2 A														

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE



ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 5

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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BRANCH PANEL: P-5OSL2

LOCATION: ELEC 598C
SUPPLIED FROM: P-5OSL1
MOUNTING: SURFACE
ENCLOSURE TYPE: NEMA 1
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MLO
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - IDF RACK		20 A	2	850	850					2	20 A		RECEPTACLE - IDF RACK	2
3	--		--	--			850	850			--	--		--	4
5	RECEPTACLE - IDF		20 A	1					200	600	1	20 A		RECEPTACLE - ELEC & SECURITY RMS	6
7	SECURITY PANEL - SECURTY ROOM		20 A	1	500	500					1	20 A		SECURITY PANEL - SECURTY ROOM	8
9	SECURITY PANEL - SECURTY ROOM		20 A	1			500	500			1	20 A		DDC PANEL - SECURTY ROOM	10
11	DDC PANEL - SECURTY ROOM		20 A	1					500	200	1	20 A		RECEPTACLE - ELEC CLOSET	12
13	BAS - SECURITY CLOSET		20 A	1	500	250					1	20 A		BAS - JAN CLOSET	14
15	BAS - SECURITY CLOSET		20 A	1			500	250			1	20 A		BAS - JAN CLOSET (9)	16
17	CONTROL VALVES - SOUTH		20 A	1					1,500	250	1	20 A		DDC - ANALYXIN GENOMICS CORE	18
19	SPARE		20 A	1	0	0					1	20 A		SPARE	20
21	SPARE		20 A	1			0	0			1	20 A		SPARE	22
23	SPARE		20 A	1					0	0	1	20 A		SPARE	24
25	SPARE		20 A	1	0	0					1	20 A		SPARE	26
27	SPARE		20 A	1			0	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	2					0	0	2	20 A		SPARE	36
37	--		--	--	0	0					--	--		--	38
39	SPARE		30 A	2			0	0			2	30 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
	TOTAL LOAD:				3,450 VA		3,450 VA		3,250 VA						
	TOTAL CURRENT:				29.0 A		29.0 A		27.1 A						

TOTAL CONNECTED LOAD (VA): 10,150 VA
TOTAL CONNECTED CURRENT (AMPS): 28.2 A

NOTES:

BRANCH PANEL: P-5OSL-504-1

LOCATION: ANALYXIN GENOMICS CORE 504
SUPPLIED FROM: P-5OSL1
MOUNTING: RECESSED
ENCLOSURE TYPE: NEMA 1
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. Provide a keyed BEST lock per division 8 hardware.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEP - ANALYXIN GENOM, W. WALL		20 A	1	180	180					1	20 A		RECEP - ANALYXIN GENOM, N. WALL	2
3	RECEP - ANALYXIN GENOM, N. WALL		20 A	1			180	180			1	20 A		RECEP - N. LAB SUPPORT, N. WALL	4
5	RECEP - N. LAB SUPPORT, N. WALL		20 A	2					90	180	1	20 A		RECEP - N. LAB SUPPORT, N. WALL	6
7	--		--	--	90	90					2	20 A		RECEP - N. LAB SUPPORT, N. WALL	8
9	RECEP - N. LAB SUPPORT, E. WALL		20 A	1			180	90			--	--		--	10
11	RECEP - N. LAB SUPPORT, S. WALL		20 A	2					90	180	1	20 A		RECEP - N. LAB SUPPORT, S. WALL	12
13	--		--	--	90	90					2	20 A		RECEP - N. LAB SUPPORT, S. WALL	14
15	RECEP - N. LAB SUPPORT, S. WALL		20 A	1			180	90			--	--		--	16
17	RECEP - S. LAB SUPPORT, N. WALL		20 A	1					180	90	2	20 A		RECEP - S. LAB SUPPORT, N. WALL	18
19	RECEP - S. LAB SUPPORT, N. WALL		20 A	1	180	90					--	--		--	20
21	RECEP - S. LAB SUPPORT, N. WALL		20 A	2			90	90			2	20 A		RECEP - S. LAB SUPPORT, E. WALL	22
23	--		--	--					90	90	--	--		--	24
25	RECEP - S. LAB SUPPORT, E. WALL		20 A	1	180	90					2	20 A		RECEP - S. LAB SUPPORT, E. WALL	26
27	RECEP - S. LAB SUPPORT, E. WALL		20 A	1			180	90			--	--		--	28
29	RECEP - S. LAB SUPPORT, S. WALL		20 A	1					180	500	1	20 A		GAS MANIFOLD	30
31	GAS MANIFOLD		20 A	1	500	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	1			0	0			1	20 A		SPARE	40
41	SPARE		20 A	1					0	0	1	20 A		SPARE	42
	TOTAL LOAD:				1,760 VA		1,350 VA		1,670 VA						
	TOTAL CURRENT:				15.1 A		11.3 A		14.3 A						

TOTAL CONNECTED LOAD (VA): 4,780 VA
TOTAL CONNECTED CURRENT (AMPS): 13.3 A

NOTES:

BRANCH PANEL: P-5OSL-509-1

LOCATION: BIOMARKER T/H LAB 509
SUPPLIED FROM: P-5OSL1
MOUNTING: RECESSED
ENCLOSURE TYPE: NEMA 1
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. Provide a keyed BEST lock per division 8 hardware.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	RECEPTACLE - BIOMARKER RM, W. WALL		20 A	1	180	180					1	20 A		RECEPTACLE - BIOMARKER RM, W. WALL	2
3	RECEPTACLE - BIOMARKER RM, W. WALL		20 A	1			180	180			1	20 A		CEILIBNG RECEPTACLE - BIOMARKER RM, TECAN FLUENT, S. WALL	4
5	GAS MAIFOLD - BIOMARKER RM., W. WALL		20 A	1					500	500	1	20 A		GAS MAIFOLD - BIOMARKER RM., S. WALL	6
7	EM. SHOWER - BIOMARKER RM., S. WALL		20 A	1	500	180					1	20 A		RECEPTACLE - BIOMARKER RM, N. WALL	8
9	RECEPTACLE - BIOMARKER RM, N. WALL		20 A	1			180	0			2	20 A		SPARE	10
11	SPARE		20 A	2					0	0	--	--		--	12
13	--		--	--	0	0					2	20 A		SPARE	14
15	SPARE		20 A	2			0	0			--	--		--	16
17	--		--	--					0	1,000	2	20 A		RECEPTACLE - BIOMARKER RM, LAB BENCH	18
19	RECEPTACLE - BIOMARKER RM, LAB BENCH		20 A	2	1,000	1,000					--	--		--	20
21	--		--	--			1,000	1,000			2	20 A		RECEPTACLE - BIOMARKER RM, LAB BENCH	22
23	RECEPTACLE - BIOMARKER RM, LAB BENCH		20 A	2					1,000	1,000	--	--		--	24
25	--		--	--	1,000	1,000					2	20 A		RECEPTACLE - BIOMARKER RM, LAB BENCH	26
27	RECEPTACLE - BIOMARKER RM, LAB BENCH		20 A	2			1,000	1,000			--	--		--	28
29	--		--	--					1,000	1,000	2	20 A		RECEPTACLE - BIOMARKER RM, LAB BENCH	30
31	RECEPTACLE - BIOMARKER RM, LAB BENCH		20 A	2	1,000	1,000					--	--		--	32
33	--		--	--			1,000	180			1	20 A		RECEPTACLE - BIOMARKER RM, N. WALL	34
35	RECEPTACLE - BIOMARKER RM, N. WALL		20 A	1					180	180	1	20 A		RECEPTACLE - BIOMARKER RM, E. WALL	36
37	RECEPTACLE - BIOMARKER RM, E. WALL		20 A	1	180	180					1	20 A		RECEPTACLE - BIOMARKER RM, E. WALL	38
39	RECEPTACLE - BIOMARKER RM, E. WALL		20 A	1			180	500			1	20 A		GAS MAIFOLD - BIOMARKER RM., S. WALL	40
41	GAS MAIFOLD - BIOMARKER RM., E. WALL		20 A	1					500	500	1	20 A		EM. SHOWER - BIOMARKER RM., E. WALL	42
43	SPARE		20 A	1	0	0					1	20 A		SPARE	44
45	SPARE		20 A	1			0	0			1	20 A		SPARE	46
47	SPARE		20 A	1					0	0	1	20 A		SPARE	48
49	SPARE		20 A	1	0	0					1	20 A		SPARE	50
51	SPARE		20 A	1			0	0			1	20 A		SPARE	52
53	SPARE		20 A	1					0	0	1	20 A		SPARE	54
55	SPARE		20 A	1	0	0					1	20 A		SPARE	56
57	SPARE		20 A	2			0	0			2	20 A		SPARE	58
59	--		--	--					0	0	--	--		--	60
	TOTAL LOAD:				7,400 VA		6,400 VA		7,360 VA						
	TOTAL CURRENT:				62.9 A		53.3 A		62.6 A						

TOTAL CONNECTED LOAD (VA): 21,160 VA
TOTAL CONNECTED CURRENT (AMPS): 58.7 A

NOTES:

BRANCH PANEL: P-5OSL-527-1

LOCATION: WET LAB 527
SUPPLIED FROM: P-5OSL1
MOUNTING: RECESSED
ENCLOSURE TYPE: NEMA 1
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
BRANCH: OPTIONAL STANDBY
AIC RATING: 22,000
MAIN TYPE: MCB
MAIN RATING: 100 A

GENERAL PANEL COMMENTS:
A. Provide a keyed BEST lock per division 8 hardware.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	GAS MANIFOLDS		20 A	1	1,000	180					1	20 A		RECEPTACLE - SOUTH WALL	2
3	EMERGENCY SHOWER		20 A	1			500	360			1	20 A		RECEPTACLE - SOUTH WALL	4
5	EMERGENCY SHOWER		20 A	1					500	1,000	1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	6
7	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	1	1,000	90					2	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	8
9	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	1			1,000	90			--	--		--	10
11	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	1					1,000	1,000	1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	12
13	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	2	90	1,000					1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	14
15	--		--	--			90	1,000			1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	16
17	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	2					90	1,000	1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	18
19	--		--	--	90	1,000					1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	20
21	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	2			90	1,000			1	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	22
23	--		--	--					90	90	2	20 A		RECEP - SHARED EQUIP RM, -80 FREEZER	24
25	RECEP - SHARED EQUIP RM, -80 FREEZER		20 A	1	1,000	90					--	--		--	26
27	RECEP - SHARED EQUIP RM, N. WALL		20 A	1			360	0			1	20 A		SPARE	28
29	SPARE		20 A	1					0	0	1	20 A		SPARE	30
31	SPARE		20 A	1	0	0					1	20 A		SPARE	32
33	SPARE		20 A	1			0	0			1	20 A		SPARE	34
35	SPARE		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	2			0	0			2	20 A		SPARE	40
41	--		--	--					0	0	--	--		--	42
	TOTAL LOAD:				5,540 VA		4,490 VA		4,770 VA						
	TOTAL CURRENT:				46.5 A		37.4 A		40.1 A						

TOTAL CONNECTED LOAD (VA): 14,800 VA
TOTAL CONNECTED CURRENT (AMPS): 41.1 A

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL EMERGENCY PANEL SCHEDULES - LEVEL 5

DATE — REF: SHEET INDEX
BSA PROJECT NO. — 00360481

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BRANCH PANEL: P-6OSH1

LOCATION: PENTHOUSE 698 | **VOLTAGE:** 480/277 Wye | **BRANCH:** OPTIONAL STANDBY
SUPPLIED FROM: DP-6OSH1 | **PHASE:** 3 | **AIC RATING:** 35,000
MOUNTING: Surface | **WIRE:** 4 | **MAIN TYPE:** MLO
ENCLOSURE TYPE: NEMA 1 | **MAIN RATING:** 400 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	VFC-SF1A		40 A	3	5,813	5,813					3	40 A		VFC-SF1B	2
3	--		--	--			5,813	5,813			--	--		--	4
5	--		--	--					5,813	5,813	--	--		--	6
7	VFC-SF1C		40 A	3	5,813	5,813					3	40 A		VFC-SF1D	8
9	--		--	--			5,813	5,813			--	--		--	10
11	--		--	--					5,813	5,813	--	--		--	12
13	HCP-1		15 A	3	830	830					3	15 A		HCP-2	14
15	--		--	--			830	830			--	--		--	16
17	--		--	--					830	830	--	--		--	18
19	Chilled Beam System Pump VFC-CBP-4		15 A	3	2,104	830					3	15 A		HCP-3	20
21	--		--	--			2,104	830			--	--		--	22
23	--		--	--					2,104	830	--	--		--	24
25	SPARE		40 A	3	0	0					3	30 A		SPARE	26
27	--		--	--			0	0			--	--		--	28
29	--		--	--					0	0	--	--		--	30
31	SPACE		--	1	--	0					3	60 A		SPARE	32
33	SPACE		--	1			--	0			--	--		--	34
35	SPACE		--	1					--	0	--	--		--	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
					TOTAL LOAD:		27,846 VA		27,846 VA						
					TOTAL CURRENT:		100.5 A		100.5 A						

TOTAL CONNECTED LOAD (VA): 83,538 VA
TOTAL CONNECTED CURRENT (AMPS): 100.5 A

NOTES:

BRANCH PANEL: P-6OSH2

LOCATION: PENTHOUSE 698 | **VOLTAGE:** 480/277 Wye | **BRANCH:** Optional Standby
SUPPLIED FROM: DP-6OSH1 | **PHASE:** 3 | **AIC RATING:** 35,000
MOUNTING: Surface | **WIRE:** 4 | **MAIN TYPE:** MLO
ENCLOSURE TYPE: NEMA 1 | **MAIN RATING:** 400 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	AHU-2 VFC-SF2A		40 A	3	5,813	5,813					3	40 A		AHU-2 VFC-SF2B	2
3	--		--	--			5,813	5,813			--	--		--	4
5	--		--	--					5,813	5,813	--	--		--	6
7	AHU-2 VFC-SF2C		40 A	3	5,813	5,813					3	40 A		AHU-2 VFC-SF2D	8
9	--		--	--			5,813	5,813			--	--		--	10
11	--		--	--					5,813	5,813	--	--		--	12
13	AHU-3 VFC-SF3B		40 A	3	5,813	5,813					3	40 A		AHU-3 VFC-SF3A	14
15	--		--	--			5,813	5,813			--	--		--	16
17	--		--	--					5,813	5,813	--	--		--	18
19	AHU-3 VFC-SF3D		40 A	3	5,813	5,813					3	40 A		AHU-3 VFC-SF3C	20
21	--		--	--			5,813	5,813			--	--		--	22
23	--		--	--					5,813	5,813	--	--		--	24
25	SPARE		40 A	3	0	0					3	30 A		SPARE	26
27	--		--	--			0	0			--	--		--	28
29	--		--	--					0	0	--	--		--	30
31	SPACE		--	1	--	0					3	60 A		SPARE	32
33	SPACE		--	1			--	0			--	--		--	34
35	SPACE		--	1					--	0	--	--		--	36
37	SPACE		--	1	--	--					1	--		SPACE	38
39	SPACE		--	1			--	--			1	--		SPACE	40
41	SPACE		--	1					--	--	1	--		SPACE	42
					TOTAL LOAD:		46,502 VA		46,502 VA						
					TOTAL CURRENT:		167.9 A		167.9 A						

TOTAL CONNECTED LOAD (VA): 139,507 VA
TOTAL CONNECTED CURRENT (AMPS): 167.8 A

NOTES:

BRANCH PANEL: P-6OSH3

LOCATION: PENTHOUSE 698 | **VOLTAGE:** 480/277 Wye | **BRANCH:** Optional Standby
SUPPLIED FROM: DP-6OSH1 | **PHASE:** 3 | **AIC RATING:** 35,000
MOUNTING: Surface | **WIRE:** 4 | **MAIN TYPE:** MLO
ENCLOSURE TYPE: NEMA 1 | **MAIN RATING:** 400 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	Fluid Cooler VFC-FC4B		20 A	3	2,104	4,000					3	30 A		Fluid Cooler Basin Heater FC-4	2
3	--		--	--			2,104	4,000			--	--		--	4
5	--		--	--					2,104	4,000	--	--		--	6
7	Chilled Beam System Pump VFC-CBP1		40 A	3	5,813	5,813					3	40 A		Chilled Beam System Pump VFC-CBP2	8
9	--		--	--			5,813	5,813			--	--		--	10
11	--		--	--					5,813	5,813	--	--		--	12
13	Glycol Pump VFC-GWP1		30 A	3	3,045	3,045					3	30 A		Glycol Pump VFC-GWP2	14
15	--		--	--			3,045	3,045			--	--		--	16
17	--		--	--					3,045	3,045	--	--		--	18
19	SPARE (9)		40 A	3	0	--					1	--		SPACE	20
21	--		--	--			0	--			1	--		SPACE	22
23	--		--	--					0	--	1	--		SPACE	24
25	Hot Water Pump VFC-HWP4		20 A	3	886	--					1	--		SPACE	26
27	--		--	--			886	--			1	--		SPACE	28
29	--		--	--					886	--	1	--		SPACE	30
31	SPARE		20 A	3	0	0					3	40 A		SPARE	32
33	--		--	--			0	0			--	--		--	34
35	--		--	--					0	0	--	--		--	36
37	SPARE		30 A	3	0	0					3	60 A		SPARE	38
39	--		--	--			0	0			--	--		--	40
41	--		--	--					0	0	--	--		--	42
					TOTAL LOAD:		24,705 VA		24,705 VA		24,705 VA				
					TOTAL CURRENT:		89.2 A		89.2 A		89.2 A				

TOTAL CONNECTED LOAD (VA): 74,114 VA
TOTAL CONNECTED CURRENT (AMPS): 89.1 A

NOTES:

BRANCH PANEL: P-6OSH4

LOCATION: MECH RM 698A | **VOLTAGE:** 480/277 Wye | **BRANCH:** Optional Standby
SUPPLIED FROM: DP-6OSH1 | **PHASE:** 3 | **AIC RATING:** 22,000
MOUNTING: Surface | **WIRE:** 4 | **MAIN TYPE:** MCB
ENCLOSURE TYPE: Type 1 | **MAIN RATING:** 400 A

GENERAL PANEL COMMENTS:
A. THE MAIN BREAKER SHALL BE INDIVIDUALLY-MOUNTED, SOLID-STATE, ELECTRONIC-TRIP WITH FIELD ADJUSTABLE LSI SETTINGS.

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	Hot Water Pump VFC-HWP1		70 A	3	9,411	9,411					3	70 A		Hot Water Pump VFC-HWP2	2
3	--		--	--			9,411	9,411			--	--		--	4
5	--		--	--					9,411	9,411	--	--		--	6
7	Hot Water Pump VFC-HWP2		70 A	3	9,411	3,333					3	20 A		Boiler HB-1	8
9	--		--	--			9,411	3,333			--	--		--	10
11	--		--	--					9,411	3,333	--	--		--	12
13	Boiler HB-2		20 A	3	3,333	3,333					3	20 A		Boiler HB-3	14
15	--		--	--			3,333	3,333			--	--		--	16
17	--		--	--					3,333	3,333	--	--		--	18
19	SPARE		20 A	3	0	0					3	70 A		SPARE	20
21	--		--	--			0	0			--	--		--	22
23	--		--	--					0	0	--	--		--	24
25	SPARE		30 A	3	0	0					3	70 A		SPARE	26
27	--		--	--			0	0			--	--		--	28
29	--		--	--					0	0	--	--		--	30
31	LIGHTING - PENTHOUSE		20 A	1	1,840	--					1	--		SPACE	32
33	LIGHTING - ROOFTOP		20 A	1			360	--			1	--		SPACE	34
35	LIGHTING - ELEVATOR CONTROL ROOM		20 A	1					80	--	1	--		SPACE	36
37	LIGHTING		20 A	1	240	--					1	--		SPACE	38
39	SPARE		20 A	1			0	--			1	--		SPACE	40
41	SPARE		20 A	1					0	--	1	--		SPACE	42
					TOTAL LOAD:		40,215 VA		38,594 VA		38,310 VA				
					TOTAL CURRENT:		145.3 A		139.5 A		138.3 A				

TOTAL CONNECTED LOAD (VA): 117,115 VA
TOTAL CONNECTED CURRENT (AMPS): 140.9 A

NOTES:

BRANCH PANEL: P-6OSL1

LOCATION: PENTHOUSE 698 | **VOLTAGE:** 120/208 Wye | **BRANCH:** OPTIONAL STANDBY
SUPPLIED FROM: P-5OSL1 | **PHASE:** 3 | **AIC RATING:** 22,000
MOUNTING: Surface | **WIRE:** 4 | **MAIN TYPE:** MCB
ENCLOSURE TYPE: Type 1 | **MAIN RATING:** 100 A

GENERAL PANEL COMMENTS:

CKT	CIRCUIT DESCRIPTION	NOTE	TRIP	POLE	A		B		C		POLE	TRIP	NOTE	CIRCUIT DESCRIPTION	CKT
1	DDC PANEL - BOILER ROOM		20 A	1	500	500					1	20 A		DDC PANEL - BOILER ROOM	2
3	DDC PANEL - BOILER ROOM		20 A	1			500	500			1	20 A		CO MONITOR - BOILER ROOM	4
5	DDC PANEL - N. WALL NEAR AHU-5		20 A	1					500	500	1	20 A		DDC PANEL - N. WALL NEAR AHU-5	6
7	DDC PANEL - AHU-5		20 A	1	500	500					1	20 A		DDC PANEL - AHU-5	8
9	DDC PANEL - S. WALL, NEAR CHILLER 2		20 A	1			500	500			1	20 A		DDC PANEL - NEAR CHILLER 1	10
11	DDC PANEL - NEAR CHILLER 1		20 A	1					500	500	1	20 A		DDC PANEL - S. WALL, NEAR AHU-4/5	12
13	DDC PANEL - S. WALL, NEAR AHU-4/5		20 A	1	500	500					1	20 A		DDC PANEL - BETWEEN AHU-3 & 4	14
15	DDC PANEL - BETWEEN AHU-3 & 4		20 A	1			500	500			1	20 A		DDC PANEL - BETWEEN AHU-3 & 4	16
17	DDC PANEL - BETWEEN AHU-3 & 4		20 A	1					500	500	1	20 A		DDC PANEL - BETWEEN AHU-1 & 2	18
19	DDC PANEL - BETWEEN AHU-1 & 2		20 A	1	500	500					1	20 A		DDC PANEL - BETWEEN AHU-1 & 2	20
21	DDC PANEL - BETWEEN AHU-1 & 2		20 A	1			500	500			1	20 A		DDC PANEL - BETWEEN AHU-1 & 2	22
23	AHU-3 LIGHTS AND RECEPTACLES		20 A	1					500	500	1	20 A		AHU-2 LIGHTS AND RECEPTACLES	24
25	AHU-1 LIGHTS AND RECEPTACLES		20 A	1	500	500					1	20 A		COOLING TOWER CT-1	26
27	COOLING TOWER CT-2		20 A	1			500	500			1	20 A		COOLING TOWER CT-3	28
29	BAS		20 A	1					500	400	1	20 A		CONTROL VALVES AT CH-1	30
31	CONTROL VALVES BETWEEN AHU-1 AND AHU-2		20 A	1	600	400					1	20 A		CONTROL VALVES AT CH-2	32
33	ACC-5 RECEPTACLES (9)		20 A	1			0	400			1	20 A		CONTROL VALVES AT CH-3	34
35	ACC-5 HEATER		20 A	1					0	0	1	20 A		SPARE	36
37	SPARE		20 A	1	0	0					1	20 A		SPARE	38
39	SPARE		20 A	1			0	0			1	20 A		SPARE	40
41	SPARE		20 A	1					0	0	1	20 A		SPARE	42
					TOTAL LOAD:		6,000 VA		5,400 VA		4,900 VA				
					TOTAL CURRENT:		50.6 A		45.6 A		40.8 A				

TOTAL CONNECTED LOAD (VA): 16,300 VA
TOTAL CONNECTED CURRENT (AMPS): 45.2 A

NOTES:

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE

BRIAN D. HOAGLAND
REGISTERED
PE10606505
STATE OF
INDIANA
PROFESSIONAL ENGINEER

ELECTRICAL EMERGENCY PANEL SCHEDULES - PENTHOUSE

DATE | REF: SHEET INDEX
BSA PROJECT NO. | 00360481

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EXTERIOR LIGHTING DIMMING/RELAY PANEL SCHEDULE

CONTROL AREA	RELAY #	WATTAGE	CIRCUIT #	LOAD TYPE	VOLTAGE	BRANCH	CONTROL		
							INPUT	DIMMING	INTENT
BUILDING MOUNTED EGRESS LIGHTING	LC1	1123 W	P-1EMH1: 8	LED	277 V	EMERGENCY	NOTE 1	YES	Y
MECHANICAL COURTYARD LIGHTING	LC2	480 W	P-1EMH1: 10	LED	277 V	EMERGENCY	NOTE 1	NO	Z
BUILDING MOUNTED IU SYMBOL	LC3	1904 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	Y
PARKING AND STEP LIGHTS	LC4	910 W	P-1EMH1: 22	LED	277 V	EMERGENCY	NOTE 1	NO	Z
SIGNAGE FLOOD LIGHTS	LC5	976 W	P-1NH1:15	LED	277 V	NORMAL	NOTE 1	NO	Z
TREE LIGHTS	LC6	976 W	P-1NH1:15	LED	277 V	NORMAL	NOTE 1	NO	Z
TARRACE LIGHTING	LC7	1600 W	P-1EMH1: 6	LED	277 V	EMERGENCY	NOTE 1	YES	Z
BUILDING MOUNTED FACADE UPLIGHTING	LC8	3650 W	P-1NH1: 9	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH FULL	LC9	180 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 1	LC10	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 2	LC11	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 3	LC12	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 4	LC13	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 5	LC14	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 6	LC15	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 7	LC16	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 8	LC17	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 9	LC18	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE NORTH DIM 10	LC19	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST FULL	LC20	0 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST DIM 1	LC21	144 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST DIM 2	LC22	144 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST DIM 3	LC23	144 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST DIM 4	LC24	144 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE WEST DIM 5	LC25	144 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST FULL	LC26	225 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 1	LC27	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 2	LC28	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 3	LC29	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 4	LC30	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 5	LC31	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 6	LC32	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 7	LC33	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 8	LC34	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 9	LC35	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 10	LC36	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
BUILDING BROW FACADE EAST DIM 11	LC37	72 W	P-1NH1:11	LED	277 V	NORMAL	NOTE 1	YES	W
SPARE	LC38	0 W		LED	277 V	NORMAL	NOTE 1		
SPARE	LC39	0 W		LED	277 V	EMERGENCY	NOTE 1		
SPARE	LC40	0 W		LED	277 V	EMERGENCY	NOTE 1		

DIMMING RELAY PANEL NOTES

1. EACH ZONE SHALL BE CAPABLE OF INDIVIDUAL TIME CLOCK CONTROL, PHOTOCELL CONTROL, AND/OR A COMBINATION OF BOTH REGARDLESS OF THE PRELIMINARY CONTROL INTENT INDICATED TO ALLOW FOR FUTURE PROGRAMMING MODIFICATIONS.
2. PRE-INSTALLATION MEETING: THE EXTERIOR LIGHTING CONTROL INTENT DESCRIBED ABOVE IS PRELIMINARY AND IS INTENDED TO DESCRIBE POTENTIAL INTENT. THE ELECTRICAL CONTRACTOR SHALL SCHEDULE A MEETING PRIOR TO INSTALLATION TO DISCUSS EXTERIOR LIGHTING CONTROL INTENT. THE MEETING SHALL INCLUDE THE FOLLOWING: CONSTRUCTION MANAGER, ELECTRICAL CONTRACTOR, LIGHTING CONTROL PRODUCT REPRESENTATIVE/VENDOR, INDIANA UNIVERSITY, ELECTRICAL ENGINEER (BSA), LIGHTING DESIGNER (BSA), ARCHITECT (BSA/SG), COMMISSIONING AGENT (HEAPY). THE OUTCOME OF THE MEETING WILL BE TO DOCUMENT FINAL CONTROL INTENT FOR PROGRAMMING THE EXTERIOR LIGHTING OPERATION. PRELIMINARY DIMMING SET POINTS WILL ALSO BE ESTABLISHED FOR INITIAL PROGRAMMING THAT WILL BE FINE-TUNED AS DESCRIBED BELOW.
3. POST-INSTALLATION MEETING: MANY OF THE EXTERIOR LIGHTING CONTROL ZONES WILL REQUIRE DIMMING SET POINTS. THE ELECTRICAL CONTRACTOR SHALL SCHEDULE A MEETING TOWARDS THE END OF THE CONSTRUCTION PHASE AFTER ALL LIGHTING IS INSTALLED, AND INITIAL PROGRAMMING IS COMPLETED. THE SAME GROUP AS ABOVE SHALL BE INVITED AND WILL NEED TO OCCUR DURING NIGHTTIME HOURS. THE INTENT OF THE MEETING WILL BE TO FINE TUNE THE VARIOUS DIMMING LEVELS FOR EACH ZONE BASED ON INPUT FROM THE DESIGN TEAM.
4. FINAL REPORT: THE ELECTRICAL CONTRACTOR SHALL SUBMIT A FINAL REPORT DETAILING THE FINAL CONTROL INTENT FOR EACH ZONE AS WELL AS THE DIMMING SET POINTS FOR EACH FOR RECORD KEEPING PURPOSES FOR FUTURE REFERENCE.

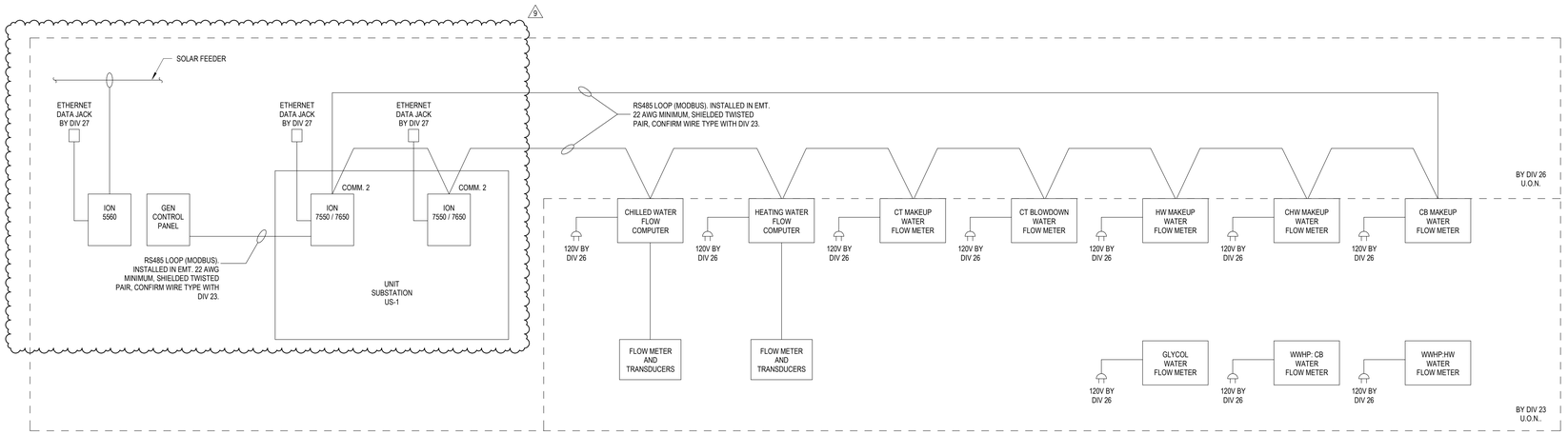
EXTERIOR LIGHTING CONTROL MATRIX SCHEDULE

CONTROL TYPE	PHOTOCELL ON	PHOTOCELL OFF/ON	TIME CLOCK ON	TIME CLOCK OFF	DIMMING	CONTROL REMARKS
W	X			X	X	DIMMED TO A PREDETERMINED STATE
X	X			X		
Y	X	X			X	DIMMED TO A PREDETERMINED STATE
Z	X	X				

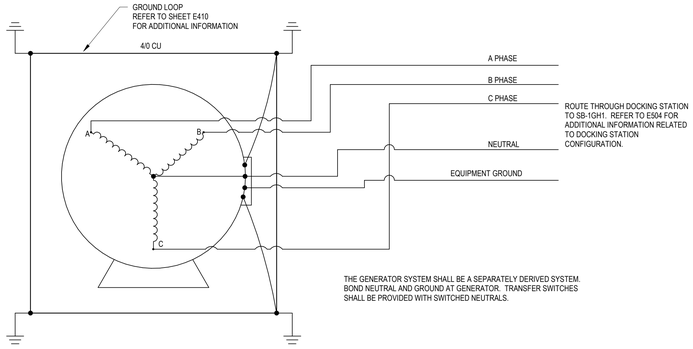
LIGHT FIXTURE SCHEDULE

NOTE: SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING LIGHTING FIXTURES AND INSTALLATION REQUIREMENTS. ALL LIGHTING TO BE A MINIMUM OF 90 CRI UNLESS NOTED OTHERWISE. PROVIDE OPTIONS AND ACCESSORIES BY THE REFERENCED COLUMN TITLED "REMARKS". MANUFACTURERS LISTED SHALL MEET ALL REQUIREMENTS AND FEATURES INDICATED.

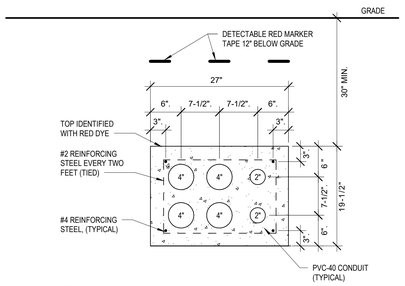
FIXTURE TYPE	DESCRIPTION	VOLTAGE	LAMP DATA			MANUFACTURER CATALOG SERIES			ACCESSORIES/OPTIONS	REMARKS
			WATTAGE	COLOR TEMPERATURE	DELIVERED LUMENS	MANUFACTURER 1	MANUFACTURER 2	MANUFACTURER 3		
CS1	COVE SURFACE: AIMABLE COVE FIXTURE	277 V	32 W	3500 K	6200	FOCAL POINT: CONVERT		TRAXON PLUX	60 DEGREE DISTRIBUTION. TILT UP TO 45 DEGREES MINIMUM FROM CENTER.	
DP1	DOWNLIGHT - 3.5" PENDANT CYLINDER PENDANT	277 V	25 W	3500 K	2300	FOCAL POINT: PURE CYLINDER		ALPHABET BETA 4	WIDE FLOOD DISTRIBUTION, 0-10V DIMMING	
DR1	DOWNLIGHT - 4" RECESSED 1000LM OUTPUT	277 V	10 W	3500 K	1000	PORTFOLIO: LD4D	GOTHAM IVO4	PRESCOLITE: LTR-4RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
DR2	DOWNLIGHT - 4" RECESSED 1500LM OUTPUT	277 V	15 W	3500 K	1500	PORTFOLIO: LD4D	GOTHAM IVO4	PRESCOLITE: LTR-4RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
DR3	DOWNLIGHT - 4" RECESSED 2500LM OUTPUT	277 V	25 W	3500 K	2500	PORTFOLIO: LD4D	GOTHAM IVO4	PRESCOLITE: LTR-4RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
DR4	DOWNLIGHT - 4" RECESSED 1000LM OUTPUT WET LOCATION	277 V	10 W	3500 K	1000	PORTFOLIO: LD4D	GOTHAM IVO4	PRESCOLITE: LTR-4RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
DR5	DOWNLIGHT - 6" RECESSED 2500LM OUTPUT WALL WASH	277 V	30 W	3500 K	3000	PORTFOLIO: LD4D WALL WASH	GOTHAM IVO6 WALL WASH	PRESCOLITE: LTR-4RD WALL WASH	WALL WASH DISTRIBUTION, LSS, 0-10V DIMMING	
DR6	DOWNLIGHT - 6" RECESSED 1500LM OUTPUT	277 V	15 W	3500 K	1500	PORTFOLIO: LD6D	GOTHAM IVO6	PRESCOLITE: LTR-6RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
DR7	DOWNLIGHT - 6" RECESSED 2500LM OUTPUT	277 V	25 W	3500 K	2500	PORTFOLIO: LD6D	GOTHAM IVO6	PRESCOLITE: LTR-6RD	MEDIUM DISTRIBUTION, LSS, 0-10V DIMMING	
E1	EXTERIOR -SURFACE MOUNT EXTERIOR RATED ROUND LED TAPE EXTRUSION	277 V	3 W	4000 K	550lm/ft	LUMINII: KENDO 45	OMNI LIGHT: OCH-45 WET	KLUS: 45-PLUS WET	0-10V DIMMING TO 1%,	
E2	EXTERIOR - FACADE UPLIGHTING	277 V	12 W	4000 K	1012	HEPER: VEGA S [M]	ECOSENSE RISE SINGLE	HK LIGHTING: ZXL16	SQUARE SHAPE, 5-10 DEGREE DISTRIBUTION. 0-10V DIMMING TO 1%	FIXTURES TO BE AIMED PARALLEL TO THE WINDOW FRAME. REFER TO ARCHITECTURAL DETAILS FOR MOUNTING INFORMATION.
E3	EXTERIOR -SURFACE MOUNT EXTERIOR RATED	277 V	32 W	<varies>	359lm/ft	LUMINII: KENDO XL SURFACE WET	OMNI LIGHT: OCH-048	KLUS: GIZA LL EXTRUSION	0-10V DIMMING TO 1%,	
E4	EXTERIOR - WALL MOUNT QUARTER ROUND	277 V	40 W	3500 K	5000	METALUX IMPACT ELITE ISS	ABL LITHONIA MRW LED	CURRENT LIGHTING: BEACON QSP2 GEOPAK		
E5	EXTERIOR - OUTDOOR RATED SLIM LINEAR EXTRUSION 10'-0"	277 V	30 W	3500 K	260lm/ft	LUMINII: KENDO L SURFACE WET	OMNI LIGHT: OCH SCS	KLUS: GIZA EXTRUSION	0-10V DIMMING TO 1%,	
E6	EXTERIOR - OUTDOOR RATED SLIM LINEAR EXTRUSION 8'-0"	277 V	24 W	3500 K	250lm/ft	LUMINII: KENDO L SURFACE WET	OMNI LIGHT: OCH SCS	KLUS: GIZA EXTRUSION	0-10V DIMMING TO 1%,	
E7	EXTERIOR - OUTDOOR RATED SLIM LINEAR EXTRUSION 10'-10"	277 V	50 W	3500 K	250lm/ft	LUMINII: KENDO L SURFACE WET	OMNI LIGHT: OCH SCS	KLUS: GIZA EXTRUSION	0-10V DIMMING TO 1%,	
E8	EXTERIOR - OUTDOOR RATED SLIM LINEAR EXTRUSION 9'-6"	277 V	41 W	3500 K	250lm/ft	LUMINII: KENDO L SURFACE WET	OMNI LIGHT: OCH SCS	KLUS: GIZA EXTRUSION	0-10V DIMMING TO 1%,	
E9	EXTERIOR - OUTDOOR RATED SUFACE MOUNT IU LOGO	277 V	<varies>	3500 K	<varies>	LUMINII: KENDO 45M WET	OMNI LIGHT: OCH-45 WET	KLUS: 45-PLUS WET	0-10V DIMMING TO 1%,	
E10	EXTERIOR - LINEAR FACADE ASYMMETRIC	277 V	72 W	4000 K	1200lm/ft	SSL: LAZERLINE WET	ECOSENSE TROV L60 ASYMMETRIC	LUMENPULSE: LUMENFACADE	0-10V DIMMING TO 1%,	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF BUILDING REVEAL REFER TO ARCHITECTURAL DETAILS FOR MOUNTING INFORMATION.
E11	EXTERIOR - LINEAR FACADE ASYMMETRIC	277 V	18 W	4000 K	1200lm/ft	SSL: LAZERLINE WET	ECOSENSE TROV L60 ASYMMETRIC	LUMENPULSE: LUMENFACADE	0-10V DIMMING TO 1%,	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF BUILDING REVEAL REFER TO ARCHITECTURAL DETAILS FOR MOUNTING INFORMATION.
E12	EXTERIOR - LINEAR FACADE	277 V	72 W	4000 K	1200lm/ft	SSL: LAZERLINE WET	ECOSENSE TROV L60	LUMENPULSE: LUMENFACADE	0-10V DIMMING TO 1%,	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF BUILDING REVEAL REFER TO ARCHITECTURAL DETAILS FOR MOUNTING INFORMATION.
IF1	INTERIOR FLOOD - MEDIUM DISTRIBUTION	277 V	50 W	3500 K	5180	FC LIGHTING	INSITE LIGHTING: PROSPOT	LUMENPULSE: LBL-MV-35K-M	MEDIUM DISTRIBUTION, AIMABLE YOKE, 0-10V DIMMING	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF FEATURE WALL.
IF2	INTERIOR FLOOD - WIDE FLOOD DISTRIBUTION	277 V	50 W	3500 K	4607	FC LIGHTING	INSITE LIGHTING: PROSPOT	LUMENPULSE: LBL-MV-35K-WFL	WIDE FLOOD DISTRIBUTION, AIMABLE YOKE, 0-10V DIMMING	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF FEATURE WALL.
IF3	INTERIOR FLOOD - VERY WIDE FLOOD DISTRIBUTION	277 V	50 W	3500 K	4487	FC LIGHTING	INSITE LIGHTING: PROSPOT	LUMENPULSE: LBL-MV-35K-VWFL	WIDE FLOOD DISTRIBUTION, AIMABLE YOKE, 0-10V DIMMING	FINAL AIMING ANGLE OF FIXTURE TO BE DETERMINED IN FIELD WITH MANUFACTURER'S CONSULTANT TO ENSURE EVEN ILLUMINATION OF FEATURE WALL.
IP1	INDUSTRIAL PENDANT - 4'-0"	277 V	40 W	3500 K	5000	METALUX	ABL LITHONIA: ZL1N	COLUMBIA		
IW1	INDUSTRIAL WALL MOUNT - VAPOR TIGHT	277 V	40 W	3500 K	4000	METALUX: 4VT2	LITHONIA FEM L48	COLUMBIA LXEM		
LE1	LINEAR EXTRUSION - SUFACE MOUNT STAIR RAIL	277 V	<varies>	3500 K	250lm/ft	LUMINII: KENDO 45	OMNI LIGHT: OCH-45	KLUS: 45-PLUS	0-10V DIMMING	
LE2	LINEAR EXTRUSION -SURFACE MOUNT CONTINUOUS LENSING	277 V	<varies>	3500 K	<varies>	LUMINII: SLW36	OMNI LIGHT: OCH-046R	KLUS: LIPOD-50	0-10V DIMMING	
LE3	LINEAR EXTRUSION - SUFACE MOUNT IU LOGO	277 V	<varies>	3500 K	250lm/ft	LUMINII: KENDO 45	OMNI LIGHT: OCH-45	KLUS: 45-PLUS	0-10V DIMMING	
LM1	LIGHTED MIRROR - 24"x36"	277 V	40 W	3500 K	400	VISUAL COMFORT	VERSA LED	MATRIX	0-10V DIMMING	MIRROR TO BE MOUNTED WITH THE 36" DIMENSION VERTICALLY AND THE 24" DIMENSION HORIZONTALLY.
LP1	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 4'-0"	277 V	37 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP2	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 6'-0"	277 V	56 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP3	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 8'-0"	277 V	74 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP4	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 15'-10"	277 V	148 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP5	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 17'-10"	277 V	157 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP6	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 2'-4"	277 V	14 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP7	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 4'-9"	277 V	34 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP8	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 23'-10"	277 V	222 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP9	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 14'-8"	277 V	136 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP10	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 19'-10"	277 V	54 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING TO 1%	
LP11	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 22'-8"	277 V	210 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP12	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 19'-10"	277 V	185 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP13	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 14'-2"	277 V	130 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING TO 1%	
LP14	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 12'-6"	277 V	70 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING TO 1%	
LP15	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 5'-7"	277 V	32 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING TO 1%	
LP16	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 1'-6"	277 V	9 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING TO 1%	
LP17	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 2'-0"	277 V	19 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP18	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 9'-4"	277 V	80 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP19	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 10'-0"	277 V	85 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP20	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 7'-10"	277 V	74 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP21	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 4'-5"	277 V	38 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP22	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 2'-10"	277 V	27 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LP23	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR 11'-7"	277 V	67 W	3500 K	500lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	CABLE SUSPENDED, 0-10V DIMMING.	
LPW1	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR WALL WASH 14'-6"	277 V	85 W	3500 K	700lm/ft	FOCAL POINT: SEEM 2 WW	PINNACLE LIGHTING: EDGE 2 WW	AXIS LIGHTING - BEAM 2 WW	RIGID SUSPENDED, 0-10V DIMMING	
LPW2	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR WALL WASH 13'-6"	277 V	77 W	3500 K	700lm/ft	FOCAL POINT: SEEM 2 WW	PINNACLE LIGHTING: EDGE 2 WW	AXIS LIGHTING - BEAM 2 WW	RIGID SUSPENDED, 0-10V DIMMING	
LPW3	LINEAR PENDANT - 2' APPERATURE ARCHITECTURAL LINEAR WALL WASH 16'-0"	277 V	136 W	3500 K	700lm/ft	FOCAL POINT: SEEM 2 WW	PINNACLE LIGHTING: EDGE 2 WW	AXIS LIGHTING - BEAM 2 WW	RIGID SUSPENDED, 0-10V DIMMING	
LR1	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 4'-0"	277 V	37 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR2	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 6'-0"	277 V	51 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR3	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 8'-0"	277 V	74 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR4	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 36'-0"	277 V	333 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR5	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 16'-0"	277 V	167 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR6	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 32'-0"	277 V	296 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR7	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 10'-0"	277 V	93 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR8	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 27'-0"	277 V	250 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR9	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 20'-0"	277 V	186 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR10	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 12'-0"	277 V	111 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR11	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 22'-0"	277 V	204 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR12	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 17-11"	277 V	167 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR13	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 18-9"	277 V	175 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR14	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 9'-1"	277 V	84 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR15	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 28'-0"	277 V	259 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR16	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 40'-0"	277 V	370 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR21	LINEAR RECESSED - 2' APPERATURE ARCHITECTURAL 25'-2"	277 V	250 W	3500 K	1000lm/ft	FOCAL POINT: SEEM 2	PINNACLE LIGHTING: EDGE 2	AXIS LIGHTING - BEAM 2	0-10V DIMMING, WHITE TRIM FINISH.	
LR22	LINEAR RECESSED - 2' APPERAT



7 E701 FLOW COMPUTER WIRING DETAIL
NO SCALE



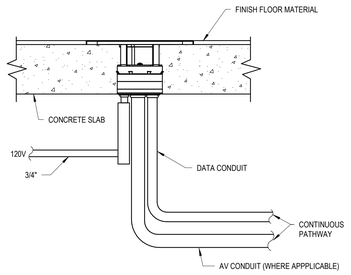
6 E701 GENERATOR SEPARATELY DERIVED SYSTEM GROUNDING DETAIL
NO SCALE



NOTES:

1. THE ABOVE DUCTBANK DETAIL IS AN ILLUSTRATION OF THE BASIC REQUIRMENTS. THE CONDUIT QUANTITIES AND ARRANGEMENTS SHALL BE COORDINATED WITH OTHER DRAWINGS, OTHER TRADES, AND WITH THE OWNER PRIOR TO INSTALLATION.
2. REFER TO SPECIFICATION DIVISION 26 SECTION "UNDERGROUND DUCTS AND UTILITY STRUCTURES FOR ELECTRICAL SYSTEMS" FOR ADDITIONAL INFORMATION.
3. PLASTIC CONDUIT SPACERS SHALL BE USED TO SUPPORT CONDUITS AND TO MAINTAIN PROPER SPACING.
4. INSTALL POLYETHYLENE PLUGS ON UNUSED CONDUITS.
5. TRANSITION TO GRC AT 5'-0" FROM BUILDING FOUNDATION WALL.
6. PULL A MANDREL AND BRUSH THROUGH ALL CONDUITS TO VERIFY ACCESSIBILITY AND CLEANLINESS. THIS TASK SHALL BE WITNESSED BY THE UNIVERSITY.
7. PROVIDE PULL STRINGS IN ALL SPARE CONDUITS.

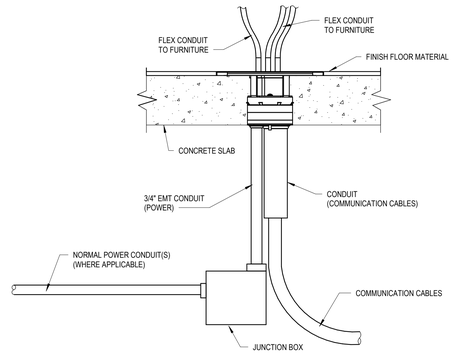
5 E701 CONCRETE ENCASED DUCTBANK DETAIL - GENERATOR
NO SCALE



NOTES:

1. REFER TO FLOORBOX SCHEDULES ON E AND ICT SERIES PLANS.
2. NOT APPLICABLE TO SLAB ON GRADE.
3. FOR FLOORS ABOVE GRADE.

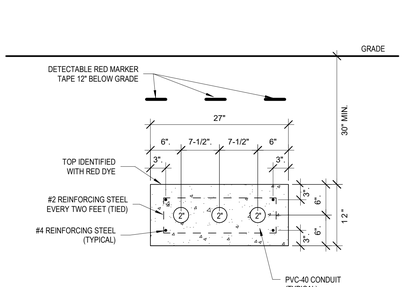
4 E701 FLOOR POKE-THRU DETAIL - FLUSH
NO SCALE



NOTES:

1. REFER TO FLOORBOX SCHEDULES ON E AND ICT SERIES PLANS.
2. NOT APPLICABLE TO SLAB ON GRADE.
3. FOR FLOORS ABOVE GRADE.

2 E701 FLOOR POKE-THRU DETAIL - FLUSH FURNITURE FEED
NO SCALE



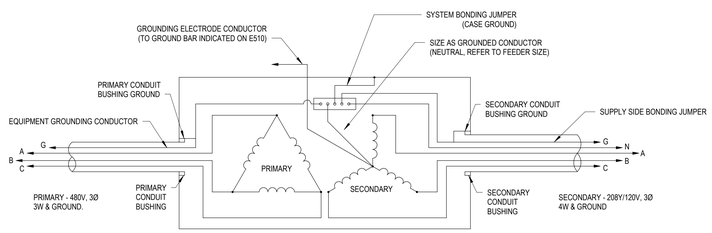
NOTES:

1. THE ABOVE DUCTBANK DETAIL IS AN ILLUSTRATION OF THE BASIC REQUIRMENTS. THE CONDUIT QUANTITIES AND ARRANGEMENTS SHALL BE COORDINATED WITH OTHER DRAWINGS, OTHER TRADES, AND WITH THE OWNER PRIOR TO INSTALLATION.
2. REFER TO SPECIFICATION DIVISION 26 SECTION "UNDERGROUND DUCTS AND UTILITY STRUCTURES FOR ELECTRICAL SYSTEMS" FOR ADDITIONAL INFORMATION.
3. PLASTIC CONDUIT SPACERS SHALL BE USED TO SUPPORT CONDUITS AND TO MAINTAIN PROPER SPACING.
4. INSTALL POLYETHYLENE PLUGS ON UNUSED CONDUITS.
5. TRANSITION TO GRC AT 5'-0" FROM BUILDING FOUNDATION WALL.
6. PULL A MANDREL AND BRUSH THROUGH ALL CONDUITS TO VERIFY ACCESSIBILITY AND CLEANLINESS. THIS TASK SHALL BE WITNESSED BY THE UNIVERSITY.
7. PROVIDE PULL STRINGS IN ALL SPARE CONDUITS.

3 E701 CONCRETE ENCASED DUCTBANK DETAIL - FIRE PUMP EMERGENCY
NO SCALE

TRANSFORMER GROUNDING TABLE

DESIGNATION	COPPER CONDUCTOR SIZE AND QUANTITY			
### KVA	EQUIPMENT GROUNDING CONDUCTOR (EGC)	GROUNDING ELECTRODE CONDUCTOR (GEC)	SUPPLY SIDE BONDING JUMPER (SSBJ)	SYSTEM BONDING JUMPER (SBJ)
15 KVA	#10	#8	#8	#8
30 KVA	#10	#8	#8	#8
45 KVA	#8	#4	#4	#4
75 KVA	#6	#2	#2	#2
112.5 KVA	#6	#1/0	#1/0	#1/0
150 KVA	#4	#2/0	#2/0	#2/0
225 KVA	#3	#3/0	(2) #3/0	#3/0
300 KVA	(2) #2	#3/0	(3) 250 KCMIL	250 KCMIL
500 KVA	(2) #1/0	#3/0	(5) 400 KCMIL	400 KCMIL



NOTES:

1. ALL TRANSFORMERS SHALL BE FLOOR MOUNTED ON A 4 INCH HIGH CONCRETE HOUSE CLEANING PAD.
2. ALL TRANSFORMERS 15 KVA AND SMALLER SHALL BE WALL BRACKET MOUNTED ON MANUFACTURER PROVIDED BRACKETS.
3. MOUNT ALL TRAMSFORMERS 30 KVA AND LARGER A MINIMUM OF 1.5 INCHES FROM CLOSET AND EQUIPMENT ROOM WALLS. VERIFY MINIMUM DISTANCE WITH MANUFACTURER.
4. PROVIDE MINIMUM OF 18 INCHES LENGTHS OF FLEXIBLE METAL CONDUIT FOR BOTH PRIMARY AND SECONDARY RACEWAY FINAL CONNECTIONS.
5. WHERE MULTIPLE SETS ARE REQUIRED, RUN ONE PHASE A,B,C,N & G CONDUCTOR IN EACH CONDUIT.
6. REFER TO TABLE FOR MINIMUM CONDUCTOR SIZES.

1 E701 DRY TYPE TRANSFORMER CONNECTION DIAGRAM
NO SCALE

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

BP4-CD: BUILD-OUT PACKAGE

ISSUED / REVISIONS SCHEDULE

MARK	DATE	DESCRIPTION
9	4/27/2026	BP4-CD: ADDENDUM #2
8	3/30/2026	BP4-100% CD: BUILD-OUT PACKAGE
7	12/15/2025	BP4-100% DD: BUILD-OUT PACKAGE
6	12/08/2025	BP2-CD: ADDENDUM #1



ELECTRICAL DETAILS

DATE
BSA PROJECT NO. 00360481

REF: SHEET INDEX

E701

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